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THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA
सत्यं शिवं सुन्दरम्
Estd. 1949
Accredited Grade "A" by NAAC

2019 INTERNATIONAL TEXTILES AND COSTUME CONGRESS

INDIGENOUS TEXTILE CRAFTS: GLOBAL MARKETS AND TRENDS

PROCEEDINGS

ITCC 2019

October 3-5, 2019

Department of Clothing and Textiles,
Faculty of Family and Community Sciences,
The Maharaja Sayajrao University of Baroda, Vadodara,
Gujarat, INDIA

2019 ITCC

"Indigenous Textile Crafts - Global Markets & Trends"

PROCEEDINGS

Congress

Date: October 3-5, 2019
Opening: 9:00 am, October 3, 2019

Exhibition:

Craft Exhibition
Date: October 2-4, 2019
Opening: 5:30 pm, October 2, 2019

Fashion Show:

Parikrama- The Eternal
Showcase of Indigenous Woven, Embroidered, Painted and Printed Crafts

Venue: Grand Mercure (Surya Palace)
Sayajiganj, Vadodara, Gujarat, 390002, INDIA

Organizing Institution

Department of Clothing and Textiles
Faculty of Family and Community Sciences
The Maharaja Sayajrao University of Baroda, Vadodara

Event Advisor

Mr. Ranvir Sushila Sisodia
Founder, Director, Dharohar Foundation
Vice President, Trade Forum, India

Sponsor

2019 ITCC
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Congress Director

Prof. Madhu Sharan	Head, Department of Clothing and Textiles

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	Prof. Namrita Kola (S.P.University, Vallabh Vidyanagar)
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	Dr. Bhanu Patel (S.P.University, Vallabh Vidyanagar)

International Textiles and Costume Congress (ITCC)

ITCC owes its origins to the combined efforts of Ars Textrina: an organisation with its foundation at The University of Manitoba, Canada, and now operating through The University of Leeds, UK and The Costume Culture Association (CCA) of Korea. International Committee members of ITCC represent UK, The USA, Turkey, Taiwan, China, Belgium and Austria. ITCC promotes partnerships that have long-term mutual benefit for all stakeholders. The shared values were designed to inspire confidence along the supply chain, reflecting the equal contribution of all, including the designer's concept, the artisan's capacity, and the user's desire.

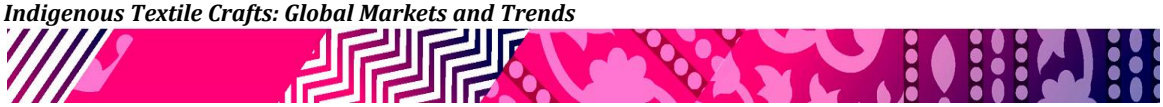
About the Congress

The history of indigenous craft and design is the most important in the world with the design of many indigenous objects virtually unchanged for thousands of years. The rich cultural heritage and exquisite craft forms across the globe have always been a continual source of inspiration for designers worldwide. But today, much of this treasure is lost to time and to the developments in technology. Facing a continual threat from the mass produced goods the textile craft industry needs a premium value, aggressive marketing and sustainable business models. Turning handlooms, including Khadi, into affordable luxury for a discerning clientele, fashionizing the weave, making design interventions in textile crafts, launching sustainable business models with textile craft clusters—designers have introduced an urban sensitivity to Textile Crafts globally. Around the world, traditional crafts are experiencing a revival in the context of sustainable design and social innovation. A number of craft-related initiatives are looking at the potential of revitalizing traditional know-how and connecting them to sustainable design and ethical business practices. Hence, the Congress focuses on:

Theme: Indigenous Textile Crafts - Global Markets & Trends

- Exploring the types of scholarly contributions that can be useful to artisan communities.
- Local crafts and the relationship between humans and their environment within their historical, cultural, and social contexts.
- Effective partnerships between artisans and designers to sustain and take the craft sector ahead.
- Co-creation projects with designers and local craftspeople around the world to expand the market potential of indigenous craft.
- The use of traditional textile craft across time and space with the aim of exchanging knowledge and gaining insights.

"The full- blown lotus growing out of the lake symbolizes the emergence of mind and its triumph over matter. The flame rising from the centre of the lotus is the flame of human knowledge, spreading light and learning for the coming generations. The motto inscribed below the lotus defines the purpose and exist6ence of life which is love of beauty, goodness and intellectual curiosity



THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA
VADODARA, GUJARAT, INDIA
(NAAC Reaccredited 'A' Grade with CGPA 3.16)

The Maharaja Sayajirao University of Baroda (MSU) is recognized as one of the premier institutions of higher learning and research in the country. Since its inception in 1949, the university has demonstrated a keen interest and a commitment to the sustenance and promotion of an environment, favourable to the growth and development of academic excellence - a commitment that forms a part of the rich legacy of the institution. Educational institutions which preceded The Maharaja Sayajirao University of Baroda and which went on enlightened ruler in the year 1909 established the "Kala Bhavan". His Highness Maharaja Pratapsinhrao Gaekward pursued the idea of establishing a University and on the recommendation of the committee, the Government of Baroda on 21st February 1949.

The Maharaja Sayajirao University of Baroda, a State University with English as its medium of instruction is a premier unitary residential University, established on 30th April, 1949 recognized by Government of India under the Indian Universities Act, 1959 and is accredited by National Assessment and Accreditation Council with 'A' Grade with CGPA of 3.16 in the year 2016 It has one main and 6 satellite campuses, spread over 275 acres of land.

The University comprises of 111 Departments under the umbrella of 14 faculties, 3 constituent colleges, 8 Institutions and 13 centers of Specialized Studies, wherein more than 40,000 students pursue higher studies under the care and supervision of more than 1200 highly qualified and experienced teaching staff.

The University has 16 Hostels, Health center, Sports Union Pavilion, Convocation Ground, Printing Press and Stationery Unit, Guest House as well as other academic and administrative units spread across the campus. Besides, there are 9 Multipurpose Auditoriums, 8 well equipped Seminar Halls, 2 Open Air Theatres, an Amphitheatre, a Play Box, an Art Gallery, an Arboretum, a Botanical Garden, several lecture theatres and Conference Rooms and an Archaeological Museum having collection of Harappan Unicorn Seals, Holy relics of Lord Buddha, Toraman, Terracotta Buddha images etc. The University has an Astronomical observatory setup in the year 1939 to promote the field of Science, which holds an 8-inch refractor telescope.

The University offers a wide range of academic programmes from early childhood to Under-Graduate and Post-Graduate levels Degrees and Diploma including Ph.D., with Choice Based Credit System (CBCS) for UG and PG students.

The University also offers innovative Science and Technology programmes through some cutting edge research centers like Centre for Biotechnology, Prof. Bharat Chattoo Genome Research Centre, centre for Molecular Genetics, Cluster Innovation Centre, Centre for Excellence in Polymer, Siemens Centre of Excellence for industry automation.

The University interacts extensively with the industry and the civil society in the curriculum development and updating process. The University has signed MOU's with International University/Institutes like University of Cambridge, University of Laval, University of Stuttgart, University of Cornell, Ithaca, University of South Carolina, and Keio University etc. for the exchange of students and teachers which adds to the enrichment of curriculum from global perspective.

The Centre for Life Long Learning and Extension offers 29 short term and 22 long terms courses on Ancient Indian Studies, Art and craft, Human Social Development Language Proficiency, Computer Education, Hostels /Cookery, Personal Grooming etc. The All India and Centre Services Training Centre conducts classes preparation of UPSC, State PSC and Staff Selection Commission pattern examination and provide guidance for exams like NDA, CDS, SHO, Police, RBI and other banks.

Smt. Hansa Mehta Library is the Central library in the addition to 13 constituent libraries and 25 Departmental libraries with over 8 lakh books/periodicals and above 14000 digitized Dissertation / Thesis and the library is open to the readers 14hours a day.

The MSU has one of the largest Hostel Campus in western India with 12 Boys' and 4 Girls' Hostels with all modern amenities. Hostel admission is an online process from application to allotment of room to the students. The University has a magnificent union pavilion overlooking a large ground which has an athletic track, a cricket ground, hockey and football fields, two tennis courts, two basketball courts, four volleyball courts, two Kabaddi grounds, malkhamb,a kho-kho ground and a handball courtandswimming pool.

The University has developed student digital life-cycle under MOU with MKCL. The University has adopted Online Admission Application System and all faculties are brought under MSU Examination Portal (MEP) system.

Career and Counselling Centre and Placement Cell looks after the placement and also imparts training to students for facing interviews, coordinating with the agencies for arranging the placements drive. The Faculty of Social work and Faculty of Management Studies have achieved 100% placement and average 65% placement is the normal trend of placement on and off campus. The Directorate of Students' Welfare disburses scholarships to the students belonging to economically weaker sections.

An Incubation Centre and Start Up Centre has been set up at the campus to encourage the spirit of innovation that provides a platform to the youth for exploration and implementation of innovation ideas and their conversion into start-up ventures. Institute of Leadership and Governance primarily focuses on training and trans-disciplinary aspects of leadership and on good studies of Governance Structures, practices and processes which are highly essential today.

FACULTY OF FAMILY AND COMMUNITY SCIENCES

The Former Baroda State Government created on the 17th December, 1948 a Women's Education Trust Fund to establish a Home Science College in Baroda. The Trustees handed over this Educational Fund to the newly established Maharaja Sayajirao University for constructing a building for the Faculty of Home Science.

The University started a Nursery School (Chetan Balwadi) in June, 1949 and on 3rd July, 1950 established the Faculty of Home Science. Home Science is a unique field of knowledge with its major thrust on strengthening family life. Its inter-disciplinary approach in synthesizing knowledge drawn from Physical, Biological, Social Sciences and Arts and humanities has enriched its educational Programmes which prepare an individual in improving the standard of living. It is the body of knowledge which focuses on family life as its core and nucleus.The Faculty has made rapid progress by introducing new courses, modifying the syllabus content and by instituting Programmes of study leading to Master's Degree and Doctoral Degrees.

DEPARTMENT OF CLOTHING AND TEXTILES

The Department of Clothing and Textiles, Faculty of Family and Community Sciences, The Maharaja Sayajirao University of Baroda, Gujarat, India was established in 1957 with a B.Sc. program. Four years later a Post-Graduate programme was introduced followed by a Doctoral and an M.Phil programme. In 2004, a vocational degree programme in Fashion Designing has been introduced.

The department's vision is to create a pre-eminent center of learning and research in the field of textiles, design development, garment construction and technology. The mission is to create an environment of exclusive professional excellence which is conductive to learning, fostering a desire to experiment with new ideas, exploiting state of art technologies in developing new fabrics and designs while retaining the traditional and indigenous textile arts and techniques.

The salient features of the department are on job training and internship at both UG and Pg level; Field Placement for UG students; Weekly seminars at UG and PG level; Organizing and conducting seminars and workshops; Undertaking research projects; Departments fashion show 'Creations' and exhibitions 'Kalakruti'; Staff interaction with UGC, various professional associations, government and non- government organizations.

INSTITUTE OF FASHION TECHNOLOGY

The Faculty of Family and Community Sciences has evolved into a premier institute encompassing dynamic fields of studies. Spanning over a period of six decades the faculty has made conscious efforts towards redefining and broadening its view in response to the rapidly changing national and global scenario. It offers a professional culture, vibrant teaching learning ethos, engagement with the issues of social relevance, team work and intrinsic motivation to better the best. The inception of The Institute of Fashion Technology in the year 2013 under the umbrella of Faculty of Family and Community Sciences is the outcome of the above.

The Institute of Fashion technology is the first of its kind in Baroda which includes multi disciplines under the same roof mainly to create educational, social and business opportunities for the fashion and technology industries. The Institute was created with the vision that fashion education needs to remain competitive and provide employment in the rapidly changing fashion industry. The various programs offered by the institute will run under the aegis of the premier departments in the field of Family and Community Sciences i.e Clothing and Textiles & Extension Communications. The Institute is offering three degree and one post graduate diploma programme:

1. Textiles and Apparel Design
2. Garment Technology
3. Fashion Communication
4. Fashion Retailing and Merchandising (P.G.Diploma)

To achieve the goal of transmitting a broader range of competencies, the institute created its innovative curriculum that addresses the needs of fashion industry. The courses develop the creativity in students while also teaching key technical skills needed to succeed in this competitive industry. These programmes encourage and facilitate innovative design and production through creative exploration, applied research and collaborative enterprise. Our courses are developed to reflect current industry practices, extend students' market knowledge and explore enterprise opportunities. Students will thus be developing a clear understanding of the collaborative and holistic nature of design projects. The Institute also aims to impart professional education to students who are looking out for new specializations and emerging professions within the fashion field such as Image Consultants, Fashion Stylists, Fashion Photographers, Fashion merchandisers, Exhibition Designers, Fashion Designers.

Greetings Messages..

Acharya Devvrat

Governor

सत्यमेव जयते

आचार्य देवव्रत
राज्यपाल, गुजरात
गांधीनगर-३८२०२१
11 SEP 2019

Message

I am delighted to know that the 5th International Textile and Costume Congress — ITCC is organised by the Department of Clothing and Textiles, the Maharaja Sayajirao University of Vadodara. The theme of the Conference is "Indigenous Textile Crafts : Global Markets and Trends."

I hope this congress will provide multi dimensional platform for designers, artisans and users and will be the ideal medium for designers and local craft people to introduce themselves and their indigenous craft globally.

I appreciate the efforts to organize such a congress. I wish your endeavors a great success.

(Acharya Devvrat)

Governor, Gujarat
Gandhinagar-382021

Raj Bhavan, Gandhinagar – 382 020. Phone No. 079-232 43171-72-73, Fax No. 079-232 31121

Message

"Work on good prose has three steps: a musical stage when it is composed, an architectonic one when it is built, and a textile one when it is woven."

-Walter Benjamin

Textile Industry can be treated one of the oldest among allonthis earth. It started and evolved with the first dress the pre-historic human made from leaves to the most elegant textile production being in trend in this era. Today, the requirement of the industry is to focus on being environment friendly, which in turn make this planet healthier.

I am pleased to learn that the **Department of Clothing and Textiles**, of **The Maharaja Sayajirao University** ishosting the**"5th International Textile and Costume congress, India"** during **3rd to 5th October 2018** at Vadodara. I am sure that the theme of the event **"Indigenous Textile Crafts: Global Markets and Trends"** will not only be pondered upon, but will be acted upon in near future by the textile fraternity for a balanced environment and growth of the industry. I extend my heartiest best wishes to the organizers and all the participants.

Vijay Rupani

Chief Minister
Gujarat State

3rd floor, Swarnim Sankul – 1,New Sachivalay, Sector 10,Gandhinagar,Gujarat, India.
Phone No. : +91 79 23250073 / +91 79 23250074

Rajmata Shubhanginiraje Gaekwad

Chancellor

Estd. 1949
Accredited Grade "A" by NAAC

The Maharaja Sayajirao University of Baroda

Message

It is indeed hearting to know the Department of Clothing and Textiles, Faculty of Family and Community Sciences, The Maharaja Sayajirao University of Baroda, India is hosting the 5th International Textile and Costume Congress 2019, with the theme 'Indigenous Textile Crafts: Global Markets and Trends'. I wish to congratulate the congress organizers for having thought of such a relevant theme for the conference, in the time of global focus on sustainability and our Prime Minister's vision about empowerment through 'Make in India'.

It is noteworthy that conference will sensitize the global academia, youth and budding designers to patronize indigenous textiles crafts through research in design and market trends.

The forum will also roll out opportunities for exchange of ideas between the industry, design, academic, government and non-government organizations. I wish that this little step helps each participant to realize the huge potential of indigenous textile. India's rich natural resource of making and decorating textile are unrivalled. It is this wealth and mastery of bright and lasting natural dyes that perhaps best distinguishes India's textile traditions. It is indeed the need of the hour to safeguard our rich Textile heritage.

I glad that the Department of Clothing and Textilesis living up to its vision of being a premier centre of education in its field and has the foresight for organizing academic programmes of currents relevance. Indigenous textiles are symbol of pride for every nation and in India they have consistently received patronage from the royal families too.

I extend my best wishes to the entire organizing committee and participants and wishes them a grand success for the event.

Rajmata Shubhanginiraje Gaekwad

Chancellor
The Maharaja Sayajirao University of Baroda

Prof. Parimal Vyas

Vice Chancellor

Estd. 1949
Accredited Grade "A" by NAAC

The Maharaja Sayajirao University of Baroda

Message

I am pleased to learn that the Department of Clothing and Textiles, Faculty of Family and Community Sciences, is organizing an International Textile and Costume Congress (ITCC) on 3-5 October2019.

In today's changing global scenario, researches addressing society's complex needs have become essential for not only innovation but also to improve the quality of life of people. The history of indigenous craft and design is the most important in the world with the design of many indigenous objects virtually has remain unchanged for thousands of years. The rich culture heritage and exquisite craft forms across the globe have always been a continual source of inspiration for designers worldwide. But today most of this treasure is lost to time and to the development in technology. The theme of the congress is very unique and contemporary one because it aims to bring local craft and the relationship between humans and their environment within their historical, cultural and social contexts.

Department of Clothing and Textiles have been actively involved in taking up needs based researches having socio-economic implication. It has natured and trained students and researchers who have displayed a highly effective combination of technical know-how, a flair for designs and innovation and clear understanding of various concepts of Clothing, Fashion, Textiles and Design.

We are confident that this International Congress would bring together academics, artisans, designers, local craft people and research scholars on a common platform so that effective partnership between artisans and designers would take place.

We welcome participants from different places to this cultural capital of the vibrant state of Gujarat.

(Professor Parimal H Vyas)

Date : 20-09-2019

Vice Chancellor
The Maharaja Sayajirao University of Baroda

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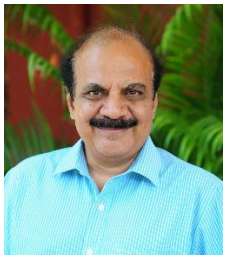
Residence: D-71, Sundaram Society, B/H. Vrajdham Temple, Manjalpur, Vadodara-390011.

N. K. Ojha
REGISTRAR (I/c.)



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The Maharaja Sayajirao University of Baroda

Message

It is indeed a matter of pride that the Department of Clothing and Textiles, Faculty of Family and Community Sciences, has been conferred the honour of hosting the 5th International Textile and Costume Congress, under the aegis of The Maharaja Sayajirao University of Baroda, Vadodara, which is the main heritage learning centre in the western India. The theme 'Indigenous Textile Crafts: Global Markets and Trends' is a pertinent one, considering the millennium development goals and their focus on sustainability in all aspects of human life.

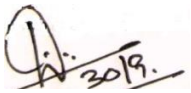
Skills such as weaving, forging and soldering are in danger of being lost as demand for them falls in the digital age, some traditional crafts are now "in the hands of an ageing population" and at risk of fading away in the next five years.

The government's '***Make in India'*** initiative is giving a new lease of life to some relatively-unknown varieties of indigenous fabrics such as *Ikats* and *Uppada* silks are being adopted and revived, as are the more popular Banarasi and khadi varieties.

Furthermore, textile industry consumes large amount of potable water and the effluent water from textile industries is a challenging job to treat and this effluent water is polluting surface and sub-surface water. I wish the conference also looks into this aspect too, which is directly related to water conservation and efficiency.

I congratulate the conference organisers for having thought of a theme of utmost relevance and wish all the delegates representing their Indigenous cultures, three successful days of deliberations.

I take this opportunity to extend all support from the administrative body of the University to ensure smooth execution of the event. Hoping you enjoy the Indian Hospitality.



N.K.Ojha
Registrar

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Phone: (+91-265) 2795521Fax: 0265-2792277/2793693E-Mail: registrar@msubaroda.ac.in

Prof. Anjali Karolia

Dean

Estd. 1949
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The Maharaja Sayajirao University of Baroda

Message

Chairperson – ITCC 2019

It is indeed an honor and a privilege for the Department of Clothing and Textiles, Faculty of Family and Community Sciences, The Maharaja Sayajirao University of Baroda to host the **INTERNATIONAL TEXTILE AND COSTUME CONGRESS ITCC 2019 INDIA** on the theme**:** Indigenous Textile Crafts: Global Markets and Trends.

The Department of Clothing and Textiles started in 1957, has been the founder institute in this field. The thrust of our researches since 1963 which is the year of inception of the M.Sc. program has always been in the study of traditional Indian textiles and costumes apart from other related areas. There have been over 80 Masters' and doctoral dissertations that have documented and studied various hand crafted textiles of all parts of the country. From 1990's the research thrust started shifting to design intervention for upliftment and sustainability of these traditional textile crafts for better market acceptability.

The world over, traditional crafts are undergoing resurgence in the context of sustainable design and social innovation. The theme chosen for the Conference with its focus on local crafts and the relationship between humans and their environment within their historical, cultural and social contexts, effective partnerships between artisans and designers to sustain and take the craft sector ahead and also expansion of the market potential of indigenous craft is extremely relevant and worthy of praise.

This Congress would serve as a platform for knowledge exchange with regard to the importance of textile crafts and their histories and ideas to make them more visible. It would also throw light in recognizing the intertwined relationships between textiles, textile crafts, people and cultural heritage.

I wish that the three days of scholarly presentations, interactions and deliberations are stimulating and enriching for all the stakeholders and inspire them to keep our textile heritage alive.

Prof. Anjali Karolia
Dean, Faculty of Family and Community Sciences
Former Head, Department of Clothing and Textiles
The Maharaja Sayajirao University of Baroda

Prof. Madhu Sharan

Head

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The Maharaja Sayajirao University of Baroda

Message

Director – ITCC 2019

International Textiles and Costume Congress (ITCC), owes its origins to the combined efforts of Ars Textrina. International Committee members of ITCC represent UK, The USA, Turkey, Taiwan, China, Belgium, Austria and India, including the designer's concept, the artisan's capacity and the user's desire. It is indeed a great honour and pleasure that Department of Clothing and Textiles, Faculty of Family and Community Sciences of The Maharaja Sayajirao University of Baroda was selected to host the 5th International Textiles and Costume Congress in India.

With the vision "To be a pre eminent centre of learning and research in the field of textiles, design development, garment construction and technology" and mission to "Create an environment of exclusive professional experience which is conductive to learning, fostering a desire to experiment with new ideas, exploiting state of art technologies in developing new fabrics and designs while retaining the traditional and indigenous textile arts and techniques", Department is always working towards contributing to the society with values.

In any sphere of life foundation plays a very important role in building of structure and hence it needs to be respected. Today, India is known for its intricate valuable crafts all over the globe where indigenous craft has played a vital role. To promote these indigenous craft this congress is all about '**Indigenous Textile Crafts - Global Markets & Trends'.** Along with the presentations (oral and poster) and expert deliberation the congress will also hold 30 artisans who are working with the indigenous crafts of India. This will provide them and delegate attending the congress to interact, understand and take the legacy further with the inputs to cope up and flourish in the present environment.

International and nationwide enrollment for the conference will enable the deliberations and presentation to build strong linkages across the globe. Exposure at the congress will help the budding scientists and designers to gain knowledge to work on larger platforms.

Madhu S.

Prof. Madhu Sharan
Head, Department of Clothing and Textiles
The Maharaja Sayajirao University of Baroda

Professor M. A. Hann

Chair of Design Theory

University of Leeds (UK)

Message

President of ITCC 2019

It is a great pleasure and privilege to be given the opportunity to join this important congress. Such events are of great importance to individuals, institutions and industries. Without these gatherings, and the necessary networking opportunities offered, academia in general, as well as institutions and associated industries remain stagnant. This gathering offers the opportunity to sound-out future innovation, changes or developments.

The International Textiles and Costume Congress (ITCC) was founded through the joint endeavours of Ars Textrina (a UK based organisation with roots at the University of Manitoba, Winnipeg, Canada) and the Costume Culture Association (CCA) of Korea. The congress was hosted by institutions in Indonesia (2011), Thailand (2013), Turkey (2015) and Indonesia (2017).

Here, academics and producers can become aware of what is available technologically and whether it may be suited to their needs. This is also the opportunity to establish academic contacts and to meet up-and-coming students, who are of course the leaders of the future.

Further to this I am delighted to be given the opportunity to welcome all participants to this fine congress. Also, I am pleased to acknowledge and thank the Committee members of the ITCC for their kind invitation to be here today, and to the generous sponsors who through their generosity have allowed the event to take place.

Professor M. A. Hann
Director of ULITA- An Archive of International Textiles,
President of Ars Textrina
President of The International Textiles of Costumes Congress (ITCC)

University of Leeds, Faculty of Performance, Visual Arts and Communications, UK
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Laila Tyabji
Chairperson-Dastkar

Dastkar
A Society for Crafts and Craftspeople

Message
Chief Guest

Textiles are the warp and weft of India. Their threads bind us together and give us a history and identity. Examining these strands - each region and community having its own distinctive weaving, wearing, and motif tradition - helps us better understand ourselves and our past, present, and future.

I wish the International Textile & Costume Congress all success, and look forward greatly to being part of it.

Laila Tyabji,
Chairperson- Dastkar.

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Smt. Kasturi Gupta Menon
IAS (Retd.)
Hon. President

THE CRAFTS COUNCIL OF INDIA (Regd.)
AFFILIATED TO THE WORLD CRAFTS COUNCIL

Message

The indigenous Textile Crafts: Global Markets and Trends conference promises to be a forum for generating a scantling round of discussion between artisans, designers and marketing units. it is very unusual for trade bodies to get an opportunity to listen to the problems of artisans, as also for designers to get access to artisans' practices and traditional skills which have been passed down through generations.

I am particularly sorry to be missing the talks from the international delegates from Turkey, China, Belgium and Australia, and of course the U.K. and U.S.A. The discussion on Khadi also promises to be thought-provoking.

I congratulate the Department of Clothing and Textiles for bringing about a meeting point between artisans and designers, and hope this conference will help to expend their reach for bridging together traditional artisans with contemporary markets.

From my part, I wish the organizer, the delegates and all participants an enjoyable session.

Menon 23.9.19.
Kasturi Gupta Menon.

Hon. President
Crafts Council of India

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2019 ITCC

Indigenous Textile Crafts: Global Markets and Trends

3rd Oct – 5th Oct 2019

Conference Schedule

Day 1: Thursday - 3rd October 2019	
8.00am - 9.00am	Registration
9.00 am - 11.00 am	Inaugural Function
11.00 am - 11.30 am	High Tea
11.30 am - 1.00 pm	Panel Discussion I
1.00 pm - 1.30 pm	Lunch
1.30 pm - 4.00 pm	Parallel Session
4.00 pm - 5.00 pm	Display of Posters
5.00pm - 5.30pm	Tea
Day 2: Friday – 4th October 2019	
8.30am - 9.30am	Registration
9.30am - 10.00am	Tea
10.00 am - 11.30 am	Panel Discussion II
11.30am - 11.40am	IFHE Presentation
11.40am - 12.45pm	Poster Presentation
12.45 am - 1.30 pm	Lunch
1.30 pm - 3.00pm	Workshops/Department visit
3.00 pm - 5.50pm	Visit to *Bodhi* printing workshop/Exhibition
4.00pm - 4.15pm	Tea
6.30 pm onwards	Ramp Show followed by Dinner
Day 3: Saturday – 5th October 2019	
9.00am - 9.30am	Tea
9.30 am - 11.00 am	Panel Discussion III
11.00 am - 12.00noon	Valedictory
12.00noon - 1.00 pm	Lunch
1.00 pm onwards	Visit to Lukshmi Vilas Palace, Baroda

Note: 1) 2nd October, Inauguration of Exhibition
2) Request participants to wear conference badge throughout the conference.

2019 ITCC

Congress and Exhibition Schedule Summary

Programme Schedule

Department of Clothing and Textiles
Faculty of Family and Community Sciences
The Maharaja Sayajirao University of Baroda, Vadodara

PRE CONFERENCE MEETING - 2nd OCTOBER 2019			
7:00 pm	ITCC Committee		
8:00 pm	Dinner		
DAY :1 THURSDAY - 3rd OCTOBER 2019			
8:00 am -9:00 am	Registration		
INAUGURATION			
9:00 am - 9:05 am	Dr. Falguni Patel – Master of Ceremony		
9:05 am - 9:15 am	Prayer and Lighting of Lamp		
9:15 am - 9:20 am	Felicitation of Guests		
9:20 am - 9:25 am	University Song		
9:25 am - 9:30 am	Prof. (Dr.) Anjali Karolia, Dean –Welcome Address		
9:30 am - 9:35 am	Prof. Michael Hann, ITCC President - Welcome Address		
9:35am - 9:40 am	Prof. Parimal Vyas, Hon. Vice - Chancellor-Presidential Address		
9:40 am - 9:50 am	Rajmata Shubhanginiraje Gaekwad, Hon. Chancellor – Inaugural Address		
9:50 am - 9:55am	Prof.(Dr.) Madhu Sharan, Congress Director - Theme of the Conference		
9:55am - 10:35am	Ms. Laila Tyabji ,Chief Guest –Key note Address		
10:35am -10:40am	Dr. Reena Bhatia, Vote of Thanks		
10:40am - 10:45am	National Anthem		
11:00 AM –11:30 AM HIGH TEA			
11:30 am-1:00 pm	**Panel Discussion - I**		
Theme : Design and Innovation	**Chairperson : Prof. Cigdem Cini**		
	Sr. No.	**Expert**	**Topic**
	1	Dr. Kate Wells Programme Leader, M.A. Fashion and Textiles, Derby University, UK	Craft sustainability through Design Intervention and Product Development
	2	Ms. Shilpa Sharma Co-Founder and Head, Jaypore	Craft: A tool for luxury and Design Collaboration
	3	Ms. Mala Sinha Co-Founder, Bodhi	Design Innovation for Sustainability
	4	Mr. Lokesh Ghai Textile Artist and Academician, Somaiya Kala Vidya	Participatory Design for Craft Education

1:00 PM – 1: 30 PM LUNCH			
PARALLEL SESSION			
1:30pm – 4:00 pm	**Oral Presentation**		
	Theme:1 Design and Innovation (Ball room, The Grand Mercure)		
	Theme:2 Crafts Economics (Ball room, The Grand Mercure)		
	Theme:3 Technology and Trends (Ball room, The Grand Mercure)		
4:00 pm – 5:00 pm	**Display of Posters** (Ball room Lounge, The Grand Mercure)		
5:00 pm – 5:30 pm	**Tea**		
DAY :2 FRIDAY - 4th OCTOBER 2019			
8.30 am – 9.30am	Registration		
9:30 AM –10:00 AM TEA BREAK			
10:00 am – 11:30 am	Panel Discussion II		
11:30 am – 11:40 am	International Federation of Home Economics (IFHE)		
	Chair Person: Prof.(Dr.) Anajali Karolia		
Theme: Craft Economics	**Sr. No.**	**Expert**	**Topic**
	1	Ms. Iti Tyagi Founder, Craft Village	Craft Preneure: An Insight into start-ups and Business models
	2	Dr. Khafiati Khader Lecturer, Institut Technologi Bandung, Indonesia	Craft Promotion and Branding
	3	Mr. Iytha Mallikarajuna Managing Director, F – Tec Skill Development, President- Fair- Trade Forum, India	Fair trade practices for Marketing Gateways
	4	Ms. Judy Frater Founder, Somaiya Kala Vidya	Success stories in Craft
	5	Mr. Ranvir Sisodia Director, Dharohar Foundation CEO and Founder, SAHAJ	Global Market for Craft
11:40 am-12:45 pm	**POSTER PRESENTATION**		
2:45 PM – 1:30 PM LUNCH			
1:30 pm Onwards	**WORKSHOPS / VISIT TO THE DEPARTMENT**		
Hunar: Craft skills Exhibition	**Sr. No.**	**Crafts**	
	1	Phad Painting	
	2	Rogan Art	
	3	Gond Painting	
	4	Applique Work	
	5	Pichhwai Painting	

3:00 pm – 5:50	**Visit to Bodhi Printing workshop / Exhibition**		
4:00 PM – 4:15 PM TEA BREAK			
6:30 pm Onwards	Ramp Show Followed by Dinner (Ball room) Parikrama : The Eternal - Showcasing Indigenous Textile Collections		
DAY : 3 SATURDAY - 5TH OCTOBER 2019			
9:00 AM – 9:30 AM TEA			
9:30 am-11:00 am	Panel Discussion III		
Theme : Technology & Trend	Chair Person: Prof. Michael Hann		
	Sr. No.	**Expert**	**Topic**
	1	Mr. Himanshu Wardhan Managing Director, Etsy.com, India	Trend research and Technovation in Craft
	2	Prof. Kusum Chopra Former Professor and Chairperson of Fashion Design Department, NIFT, Delhi	Approaches for Economic Growth in craft sector
	3	Ms. Alka Sharma Founder, Aavaran: Echoes of Rural, India	Connecting the Disconnected
	4	Prof. Sharmila Dua Dean(Academics) NIFT, Delhi	Vision 2025: Goals and Strategies
Valedictory			
11:15am-11:20am	Dr. Falguni Patel – Master of Ceremony		
11:20am-11:25am	Felicitation of Guests		
11:25am-11:30am	University Song		
11:30am-11:45am	Smt. Ranjanben Bhatt, MP Vadodara Loksabha, Gujarat-Chief Guest Address		
11:45am-12:15pm	Prof. Madhu Sharan, Congress Director – Reports of different Sessions		
12:15pm-12:30pm	Dr. Kusum Chopra, Professor and Chairperson (Fashion Design), NIFT, Delhi – Valedictory Message		
12:30pm-1:00pm	Prof. Michael Hann, ITCC President – Closing Remarks		
1:00pm -1:05pm	Dr. Reena Bhatia, Vote of Thanks		
1:05 pm	National Anthem		
1:05 pm– 2:00 pm Lunch			
2:00 pm	Visit to Palace (Lukshmi Vilas Palace)		

LIST OF CONTENTS
Oral and Poster Papers

Craft Economics (Oral)

CO-01

TRANSFORMING LANGUISHING CRAFTS INTO EMERGING MARKET TRENDS BY EXPLORING THE UNEXPLORED: A CASE STUDY OF A BUSINESS MODEL

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Abstract

Hand crafted techniques have been a way of life of Indian civilian since ancient time. To fulfill various requirements ranging from royal patronage to daily utility or to suffice socio-cultural purposes, practices, processes and products of handmade crafts have undergone many fold transformations. Commercialization and economic sustenance through craft is often dependent on factors including scope of mending the craft according to market requirement, entrepreneurial know how amongst the artisans and their family members as well as vicinity of the craft cluster from the markets and for the customers. The crafts practiced in far distance areas, or craft and artisans limitations to mould the particular craft in the directions of customer demand gradually led to become un-noticeable by the prospective urban clientele which eventually results in extinction of the craft. In such scenario it becomes crucial to intervene at individual level. Present paper unveils the results of the case study of an individual's initiative, a journey of an academician cum researcher who had taken up an initiative out of her passion to travel and explore the un- explored or lesser known crafts clusters. The first foot step from central India in November 2015, till date seven states and 20 crafts have been covered. An efforts have been put up to explain in detail about the trail of the success of an initiative from its inception, challenges faced, strategies planned, statistics about the crafts and artisans covered, interventions at various levels, beneficiaries' view points and future plans. It is believed that the outcomes of the research conducted through telephonic interview and personal visit will serve as pathways to any budding craft enthusiast to turn passion into a viable business model.

Key words: Intervention, Social media, Marketing strategy, Saree, Handloom

I. Introduction

Today's consumer live more of a virtual life than actual for the matter of fact, it directly connects us with the globe. Unfortunately, similar to all the developments this too has advantages as well as disadvantages. Accessibility to global trends and online ordering and delivery systems, one can avail the products around the world. In order to fulfill the wish to possess imported products, we certainly miss to balance regional and global product utilization ratio. On the other side, especially in India which is a country possessing long handicrafts traditions, those crafts, techniques and artisans are always not mould able to meet the current technological advancements resulting into the extinction of all such crafts.

Recently this phenomenon has been a matter of concern, researchers and organizations are putting efforts to identify and strategize tools for survivals and marketing of the craft products. Majority of them are focusing on the e- marketing especially social media marketing and marketing through web portals. Developing connections and having face-to- face interactions with potential buyers leading towards business development, artisans also opined the same during their research. Suggested changes included monthly content updates (Ife Bell, 2015). (Fabile F. et al, 2012) said that majority of the artisans in Malaysia was lacking the knowledge about recent marketing and retailing concepts, however handicraft of Malaysia possessed the potential to attract the foreign consumers. Digital technology play phenomenal role in transforming business models. Internet (Kumar and Rajeev, 2013) in today's era of e-commerce was playing vital role in each business leading to win-win situation because of its comparative inexpensiveness yet effectively and easily disseminating information capabilities to the large number of customers at the same time. It has been stated as a must for handicraft industry to provide an opportunity for the small producer with minimal investment.

In India constant efforts by government and individuals have been made to uplift the crafts through research and interventions. Chamikutty (2013) detailed the obstacles including lack of organized sector's awareness and benefits resulting in increased individual artisans, lack of raw material due to breakdown of traditional barter systems, forcing the linkage developments with the traders and acceptance of the raw materials provided by them. Fragmented supply chain led to the inability to capture the local and international markets, even though demand for contemporary craft products was increased by linking stories with them. Limited efforts were made to reposition the image of the certain crafts and their cultural and historic importance to make them appreciable amongst customers. Majority of the artisans lacked basic education let to inability to potential market identification and finalizing correct pricing. In the global scenario- artisans' familiarization to the customers' socio-cultural context and customers' awareness to the crafts technicality was not being possible which has affected the design evolution negatively, to resolve these issues Development Commissioner of Handloom and handicrafts have announced the facilitation of the e commerce to the handloom cluster in India as one of the important initiatives declared on the 1st National Handloom day (7). IIT Guwahati (2016) strategized branding for the north-east Indian crafts. Activity based outcome included designing an eye catchy logo, to connect to global consumer with local (golcal) essence. Even though they launched a webpage for online

retailing purpose, the portal was promoted on Facebook by uploading the workshops' outcome and stories highlighting artisans.

Story telling is known to be the best marketing tool now days. It creates a different level of connect with the audiences for the brands. Numbers of Indian brands are selling handcrafted products through online marketing; few of them also use the mode of story- telling to market the products. '*Gaatha'* (Dholakia K, 2018) an online portal was founded as a result of team's academic research experiences. It aimed to bring far distant crafts into the light. Their inventory included research and archival, direct sourcing and co-creation with artisans as well as products sourcing from the designer brands. The portal they had covered around 300 crafts under one roof. Learning outcome of Gaatha had inculcated to explore similar brands which were serving as a mode of craft economy upliftment. Hence, inclination was developed to study the journey of *'JhiniChadariya'*; therefore the study was conducted with the purpose to learn the insights of brand and to put the challenges faced and solutions devised in forefront. Curated case would be helpful to the students, craft enthusiast, communicators and craft related business aspirants.

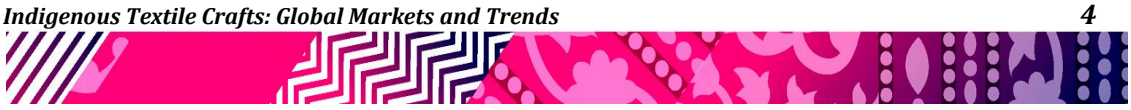
II. Objectives

- To study the motivation behind inception of an initiative, challenges faced during the journey from passion to profession and strategies planned to overcome the challenges.
- To learn about interventions of a brand to convert the crafts into market oriented products.
- To learn about crafts and artisans included till date and benefits borne.

III. Methodology

Being follower of the social media page of *'JhiniChadariya'* since the time of launch helped the researcher to understand the broad background. Related review was collected through online data surfing engines. Considering the long distance, interview was conducted by administering semi structured interview schedule through video call, which contained open ended and close ended questions. For the comfortability and ensured right information dissemination, prior to the interview, the schedule was mailed to the owner of the brand. To ensure data collection all-inclusive as well as keeping in mind the convenience of the researcher and the respondent, the interview schedule was completed in six video calls, each conversation persisted for 1 to 1-1/2 hours; in each conversation one aspect of interview schedule was covered. Responses of the owner was compiled and sent to her through e-mail to confirm the correct understanding and seeking modifications if any.

Four artisans who were associated with the brand since two years at least and residing in Gujarat were interviewed personally using purposive sampling method. Plan of visit to the artisans were finalized under the brand owner's information. On request brand owner communicated to each weaver about researcher's visit with its purpose. This helped the researcher in gaining confidence from the brand owner as well as from the artisans. Collected data was analyzed and presented in descriptive as well as in a tabular format. Wherever required respondents' quoted dialogues have been maintained.



IV. Findings and Discussion

Passion turned into inception

Dr. Archana Jain who has been an academician possessed rich experience in teaching and research in clothing and textiles was passionate about rich textile heritage of India. After her retirement she came in contact with saree enthusiasts through social media community. On the other side to fulfill the desire to witness the Indian crafts practices, and utilizing the free time she had after the retirement, she started exploring the craft clusters in vicinity. Initially clusters in Tarapur (*jawariya Dana*, *borseli* and *nandana* prints), Bagh and Kukshi (hand- block print) were visited. It was followed by a visit to Kutch- a craft rich district of Gujarat. After coming back from the tours she felt to share an experiences and observations with the people.

Considering the quick data sharing and spreading potential, social media was found as the best platform to share the story which would be entirely dependent on her feelings, thoughts and observations. Bagh printing was the first craft selected to post the story. Her connections with other community groups sprayed the story to large number of people led to receiving requests from the friends to purchase the sarees from the cluster. During the visits, artisans wished and encouraged her to purchase the products. As a bridge between customers and artisans, she added minimal amount of profit to sell those sarees. Consequently on each next story posted, inquiries from people were increased. It was indicative that they were attracted by the style and the content of the writing as well as peoples' increasing interest towards appreciation and possession of the craft based products, which were otherwise absent in the market. Requirement to wider visibility and efforts her daughter suggested to create a social media page with unique name. Dr. Jain seriously gave a thought to carry this journey forward and felt a strong need of branding. She had following points in mind while branding was being thought upon.

- To write first hand experiences of craft clusters and artisans' survival
- Artisans wanted her to buy products as buying was the only way to help the artisans.
- To help the artisans on a larger scale, a strong platform was needed.
- Her teaching experience played phenomenal role in exercising brand name and a logo. While pondering up on the thought that the brand name and logo should be unique and have a high recall value- Hymn of saint Kabir came to her mind and from which the brand was named as *'JhiniChadariya'*. It was found most suitable considering following characteristics and significance.
- The term Jhini - signifies intricate/fine/shear/thin and Chadariya - signifies the purpose of covering therefore it can be related to saree - a product which she wished to start with.
- Saint Kabir himself was a weaver.

While contemplating upon design of a logo, elements of the crafts were kept in mind. Two traditional paisley motifs were selected and placed in such a way that it was stylistically forming the letters 'J' and 'C', initials of the brand name. With this logo and brand name a page was launched on social media. It was a platform for the crafts to survive and to flourish, the fact which was unknown then even to Dr. Jain. A conscious decision was taken by Dr. Jain to select sarees as a product keeping in mind its varieties across the countries and wide scope of explorations within the layout, serving the purpose

of product by itself thus no need to invest in construction workshops and cost as well as decreased efforts to identify target customers for other products if included.

The first story posted on the page was of weaving of Maheswar, however this time it was accompanied by products. The first story and the product line on *'JhiniChadariya'* were successful. These encouraged her to visit more such clusters. Next was Kosa silk cluster in Chattisgad, story of Kosa silk and the products received a good response from the craft enthusiast. This success led to registration of brand name and logo to obtain it as a trademark.

V. Lack of business skill leads to the challenges

Gradually it was realized that this may be the high potential business as well as great way to help the craft and artisans by bringing them in light. Though having a theoretical knowledge, lack of practical insights for running a business resulted in the challenges.

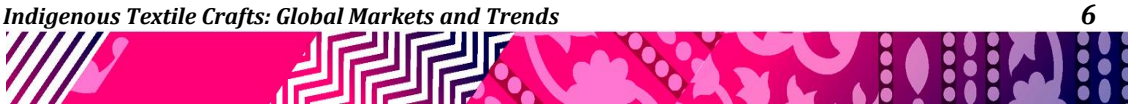
- Pricing did not cover all the expenses incurred
- Overheads, travelling expenses were not taken into consideration
- In enthusiasm and excitement products were often dispatched as soon as client's confirmation was received, without receiving a payment, sometimes resulted in losses. Though, on the positive note she built-up trust and goodwill amongst the buyers through this action.
- Book keeping and finances was difficult due to lack of experience to business management.
- Diving deep into pricing issue, later on it was realised that recruitment of personnel for a particular task such as record keeping, photo shoot, building up a website, setting up an office and a warehouse etc. would lead to additional investment and expenses.
- Since margins were low on sales of the products, investments could not be recovered until 100 percent stock was sold, thus each unsold piece added to the loss.
- By the time business model was conceptualised, developed and thoughtful decisions were taken, large number of players had splurged into the market offering competitive prices and designs however, authenticity and sanctity of handlooms was being compromised.

  "By the time we realized these factors, our customers habituated to the low prices we offered, paused a threat of losing the customers or losing their trust, which could affect the brand and the business negatively", quote Dr.Jain.

VI. Strategies devised

Over and above the challenges, she was firm to maintain the authenticity and trust with the craft, artisans and clients. To overcome pricing related issue, she devised a specific pricing strategy which took care of product related criteria, such as availability and functionality of the products, exclusivity and art value of the craft. She was sure that if played 'slow and steady' she will definitely win the game.

Parallel to the careful pricing, she also resolved clients' queries regarding price differences amongst her products and offered by other competitors, in this process, as ancillary outcome- product value was built up for each crafted product in the bucket. This



was instrumental in consolidating her business and its growth. However, maintaining uniqueness in products and design became the key factors for sustainability in the market.

VII. Design intervention

Initially, products made by artisans according to their design sensibility were handpicked. Gradually in order to sustain in the market, minimal but calculative steps was taken including experimenting with color combinations, motif placements, etc. "It was easily understandable by the artisans, yet no additional efforts were required."- said Dr. Jain.

Once the artisans were comfortable with applying innovative color combinations, motif placement and layout of the prints were changed. She had purposively not indulged into modifying technicality of the crafts. "One should always keep in mind while working with the artisans that he is not only practicing the craft, but he is an observer and imbiber of the past practices and experiments in true sense, therefore any artisan has better technical knowledge of his craft", "it is his craft, invented and built up by his ancestors, as a visitor or appreciator, it becomes our prime duty to understand his sensibility towards the craft and put in efforts to match with it"- recited by Archana.

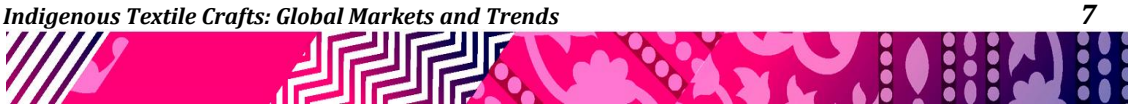
Along with these minuscule experiments, she continued to adding more crafts into the list, in order to provide variety to the customers. Heading on towards the journey, Dr. Jain visited the weaving cluster in Delhi known as Nandnagar - Sundarnagar (so the name of the saree was given as *Nandsundari*), where she thought to experiment with the weavers who were weaving bed covers on handloom. The weavers did not have any idea about saree as a product. "Initially, It was asked to make sarees using 60s cotton yarns. Weavers' expertise in weaving Bed cover led the end results into thick sarees that weighed 900gm to over one Kg. Gradually, with instructions and practice it was possible to weave a saree with the weight of 600gm.Fortunately all the episodes of the experiments were shared on the social media page. People came forward to fund the project but Dr. Jain, to avoid administrative complications in future, decided to self-fund the project. However, through story sharing, her customers came forward and supported her by purchasing the sarees in spite of sarees being heavy in weight.

Challenges faced in the Nandsundari project

- With several interventions regarding raw materials, Weavers were not used to weave fine fabrics, they had to change their weaving skills
- Since pre loom activities take time and effort adding to the cost, loom was prepared for a minimum of 20sarees. Hence incorrect/improper warping would lead to 20 defective sarees.
- The looms were technically not fit for weaving fabric of higher count, modifications would not only require finances but sourcing and willingness of the weavers as well.
- Delhi and nearby weaving clusters traditionally produce low count thick bedsheets, thus high count yarns were unavailable in the market.

With several interventions regarding raw materials, changes in the looms and weaving skills of the weavers it was possible to bring weight of the sarees to around 500gm.

The weavers were not able to provide neat finish to the saree. Selvedge of the saree length was uneven and baring protruding loops of the yarns at the edges. "In the spirit to motivate the weavers we purchased all the sarees which resulted in a dead stock. Never the less, the story and pictures of the better ones in the stock were shared on the page, there were customers who were ready to purchase and invest in these rugged and



raw sarees" Pleasantly shared by Dr. Jain. She also added that "there was a threat of losing the reputation earned through hardwork; also this was not a sustainable solution which would last for a longer period and make sarees a viable product for these weavers." It showed her developed sense to identify the vain of the market by then.

Her solution oriented mind had initiated the thought process, in her case the saying "where there is a will- there is a way" was proved to be correct. She came in contact with the organization named "Action for ability development and inclusion" (AADI). The non- government organization working towards benefit of mentally and physically challenged people as well as providing skill development training. Initially, one girl expressed interest to learn embroidery. She was given on job training in hand embroidery skills with stipend + conveyance allowance during the six-month training period. Later, payments were made on job work basis. Till the time of data collection three girls from the organization were involved who worked on *Nandsundari* sarees. It was important to note that two of the three girls were suffering from neurological disorders and one was physically challenged.

"For one year from the cluster intervention we accepted all of the production including defective sarees from the Nandnagar – Sundernagar cluster. It was a long duration but still the sarees were not perfect. Irregularities in selvedge and color patterns were two of the major concerns." Lucidly shared by Archana by continuing the story of the weaving cluster. "It was a point of realization that our motive to help them was directing them in producing defective and inferior quality products. To curb this, we took a tough decision to stop production for some time." Firmly added by her.

The master weaver was asked to

- Observe other handloom sectors to meet weavers who were making handloom sarees.
- Procure better and more suitable yarn for the sarees, if possible a higher count
- Change the colour patterns
- Make the necessary changes required on loom

"We are pleasantly surprised with the results of our decision. Recently, the weavers have sourced Kala cotton from Kutch and wove sarees using it as filling yarn. These Kala cotton yarns of 20s thickness with warp of 2/40 regular yarn have resulted in much lighter and better finished sarees." Happily shared by Dr. Jain. "In our next collection we are planning to use 2/60 mill made colored yarn with the same 2/40 weft, we wish to experiment with hand spun yarns and other natural fiber yarns as well in future."

IX. Customers' profile

Till date over 11,000 followers are there on Face book and 2000 on Instagram. Out of these 1000 of them have turned to buyers, of which around 100 are regular customers. "My clients are from the age group of 30s to 50s".Proudly shared by Dr. Jain. She further added that her brand has been noticed by people across the country and globe with customer ratio of 85 %- 15 % respectively. In India the clients are located in the Metropolitan cities such as Delhi, Mumbai, Kolkata, Hyderabad, Chennai, Bangalore (maximum clients), Kochi as well as cities in northeast. "Interestingly, recently customers from smaller cities like Merut and Katani have also been added in the list", Dr. Archana responded with the bling in her eyes. This was evident of the dense penetration of her venture into the smaller towns of India as well. Globally she had customers located in United States, United Kingdom, Singapore,

Netherlands, Malaysia and Middle-East countries. Though majority of the clients were female, till today around 5 males have also purchased sarees through her page. This could be interpreted as product clarity through visual communication.

Customers were practicing esteemed professions such as doctors (majority), HR professionals, teachers, NGO founders and social workers. All the customers purchased these sarees to be used as office wear. She frequently received inquiries for gifting related purchases. Products' design language, material used and the price range offered may be the responsible factor here.

Social media was the only tool used for marketing until two years from the time of venture. In recent past, *'JhiniChadariya'* participated in a very reputed 'Dastkarmela', "We have received great response from the visitors of the exhibition, it was a grand success"- Dr. Jain expressed with the winning smile.

X. Artisans involved and benefitted

Table-1 describes that in total 80 artisans were benefited till the time of data collection through this venture. Out of which 30 were direct beneficiary, those were the artisans who were contacted by Dr. Jain for product development and sourcing. Those artisans have made the products involving more artisans which are mentioned as indirect beneficiaries. Since the time of inception, 129 artisans were benefitted in total till date.

Analysis of the interview with the artisans deduced the facts that all the direct and indirect beneficiaries were receiving the regular orders from *'JhiniChadariya'* since the time they have been associated with the brand. Secondly all the artisans' living standards have been elevated due to their increased income by one and half time. They have experimented and used finer yarns and also started using combination of yarns in warps and wefts. The *Ikkat* artisan shared his experience that when he had posted his products on social media and other communicating applications, he could not receive such a great response which he received through *'JhiniChadariya'*s' platform. Whereas *Tangaliya* artisan was aware about various modes of marketing and selling the products and to produce varieties accordingly, in spite of the knowledge he confessed that "since the time I have joined hands with *'JhiniChadariya'* my work and the profit has been increased significantly. I know that she is catering to elite market which I would have never been able to capture. Additionally, my craft story and videos have been uploaded on various platforms but the order and customization direction received from her is always unique, which motivates me to experiment in stylizing and lay outing of traditional motifs." All the artisans shared the facts that the products which they manufacture for her they do not supply to any other client, he also added that "even if I supply, it will not be sold there". These findings were evident of *Jhinni'Chadariya's* success.

Table-1 Details of the Beneficiaries Covered By *'JhiniChadariya'* Across the Country

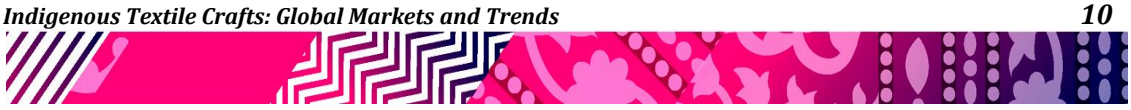
State	Villages/Town	Textile craft	Direct beneficiaries	Indirect beneficiaries
Madhya Pradesh	Tarapur	Mud resist Hand block printing, indigo and alizarin dyeing, *nandana*, *jawariya dana*, *borseli* and other tribal prints	03	12
	Maheshwar	Handloom Weaving Maheshwari sarees	02	05
	Sasur	All kinds of handloom weaving	01	02
	Bhairongadh	Batik printing	02	10

	Dindori	*Gond* art	06	10
Rajasthan	Akola/Bagru/ Sanganer	Handblock printing, mud resist *dabu* prints, indigo and alizarin dyeing	02	05
Gujarat	Dedadra, Dudhrej	Single *ikatcotton patola*, *silk patola*, *Tangaliya*	02	12
	Sarli	Ajrakh printing, shibori tie- dye, Bhujodi sarees	01	03
	Bhujpur	Batik printing and dyeing	01	02
	Ridrol,	*Ashavali*	01	00
	Patan	*Patola*	01	00
	Ahmedabad	*Matanipachedi*	02	00
	Bharuch	*Sujni*quilts	01	05
Maharashtra	Bhandara, Mohadi,	*Karvatitussar* sarees	01	04
Chattisgadh	CHAAMPA	Kosa handloom sarees	03	10
Telangana	Putapakka	*Gadwal* sarees, *Teliarumal*	01	08
Delhi	Delhi	*Nandsundari* sarees	01	10
Total			31	98
Grand total-129				

XI. Future plans

Recently she has added *Sujani quilts*, a different product from the saree, it was indicative of the growth of the brand. Her future plans included, own manufacturing workshop, manufacturing of constructed products utilizing traditional methods of constructions, adding more crafts and more products to the basket. This will transform the business model from retailer to manufacturer.**XII. Summary, Conclusion and Implications**

Through her teaching experience, excellent explanatory skills, transparency in content, Dr. Jain has taken along the viewers. Increased followers and buyers from regions across the globe indicated the viewers' developing interest and desire to possess the handcrafted products; leading toward emerging trend. The model which was just based on retailing, has converted into intervention and design development based, with slow and sturdy but calculative steps. Her tactic to intervene and to add more crafts in the list have played significant role in optimizing viewership. Her solution oriented skill sets have helped in handling the obstacles in the way. By putting the less explored crafts into the front as well as by taping the segment for such crafts, she has been a bridge in between the crafts and appreciators. Decision to create social media page has not only been beneficial to her but also the craft persons who would have never catered to the clients, right now '*JhiniChadariya'* is catering to. Artisans' responses were evident of the fact. In line with referred review, with her ability to narrate the story and resolving customers' queries, Dr. Jain had shown the path for the craft survival to the artisans which would not have been found out by artisans. However, implementing researcher's learning at *'Gaatha'*, it is strongly suggested that stream lining the sourcing and introducing new story and product line at a specific intervals, considering the culture and festivity while introducing new product line, providing the entire thread of the craft story along with each new collection launched, building a data base through free e-newsletter subscription and sending the e- newsletter periodically, Uploading artisans' voices, conducting online discussions may increase the followers which may eventually turned into customers. Production of zero waste garments may be included in the future plans bucket. Interpretations and outcome of the study can be utilized by the craft business enthusiast. Her social media page may be a good source of information for the craft learners.



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CO-03

A STUDY ON PRESENT DAY AVAILABILITY OF TRADITIONAL EMBROIDERED TEXTILES IN DELHI/NCR

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Abstract

Handcrafted indigenous traditional textiles possess distinctive characteristics of beauty, elegance, aesthetics, sophistication, and sustainability. Like other traditional Indian textiles, embroidered crafts are products of harmony and grace made with judicious selection of materials, colours, and designs. Irrespective of their variations in origin from folk, court, religious or trade, the kaleidoscope of Indian embroidery is very vast. Common observation reveals that usage of products adorned with traditional embroidery, executed with high standards in craftsmanship, is on a steady decline amongst sizable urban Indian consumers. For any change to occur in the society there is a multitude of factors responsible. The same applies to indigenous traditional Indian embroidered textiles. This paper shares the findings to the question of present-day availability of traditional Indian embroidered textiles and its diversified products. The researcher adopted a two-pronged approach viz., in-depth review of literature and survey of the availability of traditional Indian embroidered textiles. Findings revealed substantial non-existence of products decorated with certain varieties of traditional Indian embroideries in the present market scenario. The existence of a few traditional embroideries was predominantly occupied by machine-made imitations of the original products. It was observed that traditional embroideries that have been able to adapt by product diversification and design interventions are popular amongst a niche segment of consumers who have craft consciousness. It suggests that there is a need to popularize the other traditional embroideries as well so that equal shelf space may be shared by all. There is a need to raise the status of traditional Indian embroideries from mere "craft for few to craft for many". There is a need to bring craft sensitization in consumers, especially urban youth and to carry structured programmes to popularize traditional Indian embroidered textiles. It will ensure that the reminiscent beauty of the past is not lost in the times of fast-changing fashion.

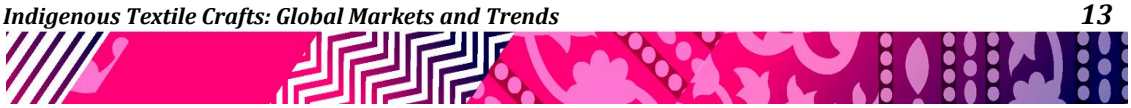
Keywords: Traditional Indian Textiles, Product Development, Design Interventions, Craft Sensitivity, Consciousness

1. Introduction

Beautification of craft products for personal usage and home has been evident since centuries in Indian traditional textiles (Das,1992). According to Craft Cluster Documentation and Diagnostic study by National Institute of Fashion Technology, Chennai, 2017 "The term traditional is defined as continuing more than a hundred years. Even if the initial technique or skill from a hundred years ago has not been kept perfectly the same but there has been any improvement or development, it is considered "traditional" as long as features peculiar to the craft products are kept unchanged". Traditional textiles are carriers of traditions and culture of the place of its origin (Deepshikha, Yammiyavar&Nath,2018). India has been known worldwide as a melting pot of traditional textiles, produced profusely in most creative forms (Gillow and Barnard, 1991). Enrichment of textiles in the form of embroidery, weaving, painting, printing, tying and dying has been followed since ages. The materials, techniques, designs and colours used in producing traditional textiles serve as social barometer (Das, 1992). Traditional textiles reflect the traditional and cultural ethos of respective region (Bhatnagar, 2005)Creating, exchanging and display of traditional textiles provide cues in terms of their symbolism and significance in social life of the people (Deepshikha, Yammiyavar&Nath, 2018).

History of Indian embroideries: The art of embroidery was known in India since Indus valley civilization. Discovery of bronze and copper needles at Mohenjo-Daro and Harappa prehistoric sites is the evidence for the same (CBSE, 2014). Unlike Egypt and Chinese Turkestan, where the tradition of embalming of dead bodies prevailed, the custom of burial was almost unknown among the Hindus, or was practiced in certain religions only which emerged later in India. Hence, excavation of embroidered samples dating back to very early civilizations has not been possible for the archeologist in India. The responsibility of historical evidences to prove the antiquity of the art thus remains on literary and historical records. One such early reference of embroidery exists in the Vedas and the great Epics of India that add to the chronicle of this traditional craft (Dongerkery, 1951). There is evidence in Vedic hymns that the needle has been in use in India for centuries. A Rigveda hymn states, "With a never breaking needle, may she sew her work; give her a son most worthy and praiseworthy" (Sharma, 2019). Mention of embroidered textiles has been found in travelogues of people from far way foreign lands. It has been mentioned in the literary records that in India the art of embroidery began with gold and silver thread (Dongerkery, 1951). Megasthenes, a Greek traveler, during the Mauryan period in 4th century BC has referred to elaborate gold patterning on robes of royalty, possibly using embroidery as a technique for fabric decoration. Another traveler from the 13th century, Marco Polo has described the intricate embroidered textiles from Eastern and Western India (CBSE, 2014). After the woven fragments found in Al Fustat in Egypt, the earliest datable Indian textile that have been found are Jain temple embroideries on silk from 15th century (Sardar, 1996). Other than this, the oldest existing embroidered pieces that are available for reference are from the 16th century AD, which include textiles exported to Europe or articles prepared for royalty during Mughal Empire (CBSE, 2014).

Trading of Indian Embroideries: India has always been rich in terms of practicing art of embellishing textiles with embroidery skills, than any other continent in the world.



With establishment of Mughal Empire, Indian embroideries reached its pinnacle and stories of its opulence were carried to the West by the traders. After chintz, embroideries from India became the most sought after trade commodity. Europeans established their trading posts on India's ports. Indian embroideries were taken to Europe by Portuguese in 1522. In 1612 the British East India Company with permission of the Mughals established a port at Surat in Gujarat. They struggled with Portuguese, Dutch and French who too were exporting embroidered coverlets in sixteenth and seventeenth centuries from India. During the seventeenth century the East India Company shipped relatively small quantities of textile goods to England (Introduction to Indian Textiles 2016, Victoria and Albert Museum). By 1720, British gained control over Indian goods traded out of India. These were considered much more than mere fashion commodity in the west and stayed away from falling prey to fast pace fashion changes. These were kept as stable, classic, heirloom possessions by its users. However, by the eighteenth century popularity of Indian embroideries was on decline in the Europe (Sardar Z., 1996). This could be attributed to the beginning of industrial revolution in eighteenth century by British that competed with Indian textiles. (Gillow and Barnard, 1991).

Types of Indian Embroideries: Each state of India has a legacy of unique traditional embroidery. The Indian embroidery has been considered as richest in design and most varied in its stitches (Sharma S. n.d.). Trade with countries like Persia, China, Arab, Iran, etc. influenced Indian embroidery to certain extent and neighboring states too had an impact (Naik, 1996). According to Sardar Z. trade with the foreign markets might have influenced the embroidery stitches of India in the form of either adopting a few or adapting its own to suit the tastes. The skill of decorating handmade textiles with embroidery was practiced on products for personal usage, religious usage, on articles used during rituals, commercial purposes or for creating opulent textiles for the courts of emperors. Various types of embroideries practiced in India may be classified as:

Folk embroidery:Embroidery done with love and passion on personal articles for gratification of one's creative instinct developed as folk embroidery. It was widely practiced in various regions of India by girls and women. The skill of practicing embroidery marked a girl's path into womanhood as well as conveyed rank and social standing (Kaurand Kaur 2018).It was done using easily accessible indigenous materials. However, with changing times it gradually evolved for commercial usage. Examples include Phulkari from Punjab, Kantha from West Bengal, Kutch and Kathiawar Embroideries from Gujarat (Chattopadhyay, 1975).

Commercial Embroidery: Certain types of embroideries flourished under merchants, courts and landowners for truly commercial purposes. The best of the works was produced under court's patronage in late 19th and 20th centuries. However, with decline of courtly powers and diminishing wealth of patrons, this embroidery style began to disappear (Sardar, 1996). Examples of commercial embroidery include Mochi bharat, Chinai embroidery.

Tribal Embroidery: Existence of embroideries practiced among banjara tribes is also felt in India. Banjaras were baggage carter in Mughal Emporer Aurangzeb's time. They moved to Deccan plateau in 17th century. Banjara embroidery is characterized by cowrie shells, beads, coins, tassels and mirrorwork. This type of embroidery is well

spread across various regions of India. Other example of tribal embroidery includes Kasuti embroidery practiced in Karnataka and Maharashtra, done by tribes who spoke Kannada language (Sardar, 1996).

Court Embroidery: These embroideries were practiced profusely in the West as well as throughout India and have its origins in Mughal courts. Mughal were fond of intricate embroidery and were true admirers of unmatched hand worked skills of craftsmen. Examples of court embroidery includes *Zardozi*, Kashmiri embroidered woolen shawls, Chikankari from Uttar Pradesh, Chambarumals from Himachal Pradesh.

With such a rich variety of Indian traditional embroidered textiles that once adorned articles of personal and household use, noone could remain untouched with their glory. However, presently due to the increasing influence of western culture, traditions, industrialization and globalization, a drastic change has been observed in the presence of embroidered textiles in urban markets and hence the wardrobes. Formerly, this impact was gradual, indeed almost imperceptible and was limited to very small, specific circles of the elite and well to do members of the country. But, with growing means of communication and social media and fast changing consumer tastes, this process seems to be ever increasing showing apparent variations and transformations in market demand. There exists dissimilarity between presence of traditional embroideries in the urban market for consumers- some extensively visible, certain have bleak availability while few have died slow deaths.

Thus, a need was felt to investigate the present day market scenario with respect to the shelf space shared by various traditional embroideries. Findings from such study were expected to help the researcher expose the embroideries that still hold their roots deep in consumer acceptance and the ones that have been wiped away either partially or completely from the urban market places. Such study was expected to ignite the concern about future of these splendid traditional textiles of our country.

Hence, the study was planned with the following objectives:

1. To trace the journey of traditional embroidered Indian textiles from birth to present day
2. To investigate the present day urban market scenario of traditional embroideries with respect to apparel and accessories

2. Methodology

Despite the versatility, elegance, aesthetics and sustainability of embroidered textiles produced in India, the equal presence of all varieties is endangered. In this paper present day market availability of various types of traditional Indian textiles has been presented. A two-prong strategy was adopted by the researcher viz. in-depth review of literature and market survey (Fig.1).

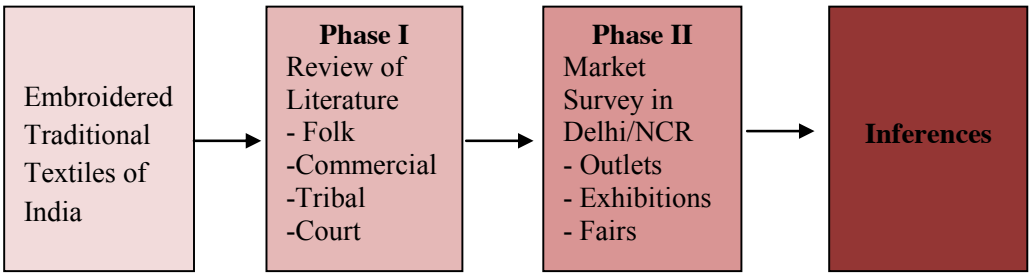


Figure 1: Research Design

Extensive review of literature was done by referring to secondary sources to understand the birth of traditional embroidered Indian textiles and the classification system followed in various published and unpublished works. Various newspapers, popular magazines, articles, journals, and research papers were studied and databases were visited to gather the requisite information. Based on the review a checklist of traditional embroidered Indian textiles was prepared. In the second phase of the study, an exhaustive list of forty outlets and fairs/exhibitions in Delhi/NCR known for selling traditional Indian textiles based apparel and products was prepared. Based upon purposive sampling, the outlets were chosen for the survey. These included set of government state emporia, which were established since 1960 with a view to encourage India's traditional crafts; the annual craft fair being held since 1987, known globally for preserving the languishing arts & crafts of India; and similar such outlets and exhibitions set up for giving platform to craftsmen for having direct interface with the consumers. A market survey was conducted to gauge the present situation regarding availability of traditional textiles by visiting the selected outlets. Using observation technique presence of all varieties of embroidered textiles was saliently studied. Statistical analysis of the data was done to find out the percentagesof market availability of various varieties of traditional embroidered textiles in form of apparel and accessories.

3. Findings

Findings revealed the journey of traditional embroidered Indian textiles from the early years of Indus Valley Civilization and their importance as trading commodity which grew with the Mughal empire and British establishments. It was found that embroideries were categorisedon the regional basis, as folk, court, tribal and commercial embroideries. Embroideries were also classified on the account of the nature of the base material and by the relationship of stitch placement to the fabric. The major categories were free or surface embroidery, counted embroidery, and needlepoint embroidery.

An extensive survey of the selected outlets/fairs/exhibitions known to be associated with selling hand worked traditional embroidered textiles since decades revealed the status of market share of our age old craft traditions. An unequal market presence of tradition embroidered textiles was revealed during the survey. Presence of certain traditional textiles more than their counterparts was observed by the researcher. Amongst the embroideries that were once identified as folk embroideries, *Kantha* (West Bengal) and *Abhala work* (Gujarat); commercial embroideries Mochi*bharat*(Gujarat); *Amlikar* woolen shawls (Kashmir),*Chikankari* (Uttar Pradesh) belonging to court embroideries were profusely present. However, the researcher failed to find embroidered samples of *ChambaRumal* (Himachal Pradesh), Dhaka embroidery (West Bengal), *Kashida* (Bihar), *Kasuti* and Coorg (Karnataka), *Pugur and Toda embroideries* (Tamil Nadu), *Sindhi Taropa* (Gujarat),

Andhra Pradesh embroidery (Jangaon) and authentic *Phulkari* (Punjab) (Fig.2). It was found that certain varieties had imitations of authentic embroideries occupying shelf space such as printed *Phulkari* or even machine embroidered imitations of handcrafted traditional embroideries were observed. Moreover, it was seen that the present day traditional hand embroideries had lost intricacy in the work.

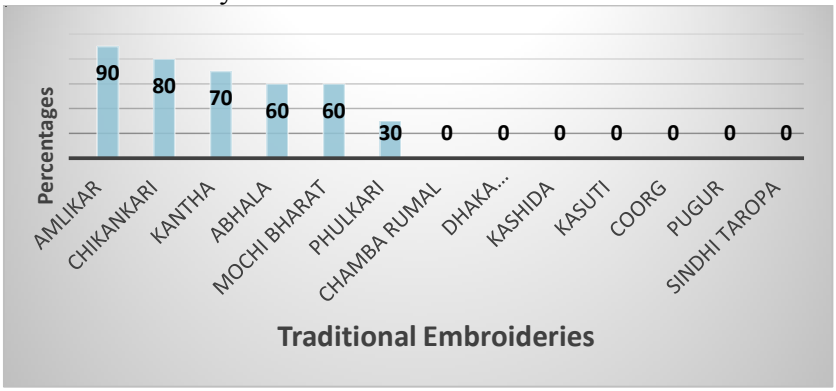


Figure 2: Present day Market Availability of Traditional Embroidered Textiles

Survey of exhibitions revealed that these were held for showcasing designer garments crafted out of traditional textiles. Researcher found high end exclusive apparel products delicately adorned by intricate hand embroidery or other traditional techniques of surface ornamentation. These articles were reported to be created for niche market, catering to handful of customers who could appreciate the efforts of craftsmen. During the market research, traditional embroidered textiles in form of yardages, *saris* and various other apparel products were found.

4. Conclusion

Despite the versatility and eco-friendly production process, many Indian works of embroidery are vanishing and are proceeding towards slow deaths. The presence of genuine embroidered Indian textiles at the places that have been established for selling traditional textiles has diminished and these are increasingly being replaced by either imitations or mechanized versions of the same. The outlets/fairs/exhibitions once established to promote the skilled craftsmen and save our cultural heritage from extinction due to the cheaper machine-made imitations were found to be themselves falling prey to the latter. As per the report of Ministry of Textiles such advancements in technology and globalization has severely affected textile craft sector of India. These findings are in line with the research conducted by Rana N. in this area. The early works carried technical accomplishment and high standard of craftsmanship that are rarely attained in present times. The same has been reported by Kaur R. and Kaur J. Also, it is difficult to find a complete set of different regional Indian embroideries in the market. This has resulted in restricted awareness amongst the consumers to what is found with ease and there awareness is thus about art forms that are shown available. Moreover, a change in consumer's perspective, who are always looking for cheaper alternatives, has led the craftsmen to give away shelf space of their handcrafted products to the machine-made imitations of the same. No appreciation and lesser understanding about the hand skill of craftsmen amongst present consumer set have decreased demand for such

products. It has further worsened the situation by discouraging craftsmen to pass on their age old traditional knowledge to their coming generations. Such a scenario fears a steady downfall in the proportion of market share of our traditional embroidered textiles. Thus, there is a need to generate awareness about traditional Indian textiles amongst young potential consumers and sensitize them towards "Made in India" traditional embroidered textiles. The art of embroidery cannot be provided new lease of life until a steady future market for embroidered goods is ensured by its appreciators. Through awareness a message has to be spread that tremendously increasing mechanised production processes cannot replace intricate pieces of excellence in craftsmanship produced in India. Losing our handcrafted embroidered traditional textiles would lead to losing warmth of our traditions and a part of us.

At the other end, traditional artisans too need to be made aware of emergent consumer markets so that they can adapt their highly skilled handcrafted techniques to produce diversified products other than only the traditional products made by their older generations. Creating user-centered fashion products and the adoption of strong communication strategies also need to be emphasized to establish a connection/bond between the artisan and the consumer.

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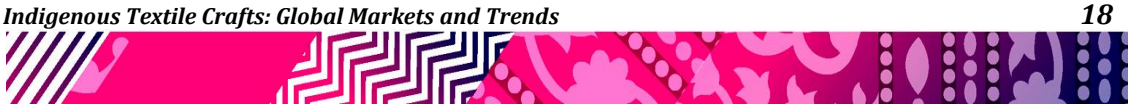

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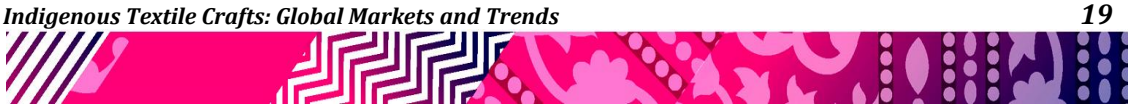

CO-04

CRAFT CULTURE AND CREATIVITY

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Abstract

Concepts of K G Subramanian written In his book "The Magic of making" inspired me to explore on how practicing craft could be helpful to enhance creativity of a community. The process of knowing must have started ages ago, perhaps with age of apes. We have come much ahead of ape age, they had very few tools, which became tools out of necessity, but in the present time we are dependent on different types of tools, which are more complex yet very resourceful. Subramanian says "a way of doing leads us to way of seeing, a way of seeing to a way of doing", this concept keeps on rolling in our everyday life, what we see and do in our daily life, our cognitive ability improve accordingly, and that makes an impact on our creative approach. The very basis of any discovery starts from doodling of ideas. The concept drawn in the paper put forward a point of research that crafting is very basis of creativity. The argument represents that how craft cultures are synonyms of creativity, communities involved in the craft activities generate individuals having more creative loom than others. The paper argues and tries to establish the fact with the help of secondary research that the craft oriented communities have shown remarkable understanding of creativity and aesthetics; hence craft education can improve cognition ability of human being.

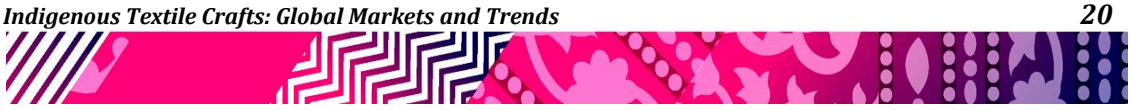
Keywords: Craft, Culture, Cognition, Creativity, Community.

I. Introduction

Now a day's concept of creativity is being stressed upon in almost all over the world, predominantly in developed countries. After industrial revolution the counties have seen immense growth in terms of manufacturing services, and now it is being outsourced from different countries. In the present scenario every county is brainstorming on the reduction of environmental loses which has taken place over the year, due to exploitation of all kind of resources, now there is a need for people who should think creatively and minimize the loses which have taken place, therefore each one of us are concerned of creative thinking ability of human beings (Aud Berggraf Saebo, 2007).

Many researchers, all across the world have considered creativity as a point of emphasis in the education system (Craft A. , 2005), (Craft A. J., 2001), (Fisher & Williams, 2004; Wilson, 2005). As per the report of NACCCE British report published in 1999, without integrating creativity and valuing it in the education system, no system could become world class (NACCCE, National Advisory Committee on Creative and Cultural Education., 1999). UNESCO is dedicated to the promotion of Art & Craft in Education. It has proclaimed that "Creativity is our hope"(Aud Berggraf Saebo, 2007).

What are the relations between craft cultures and creativity? Can practicing craft enhance the creative sensibility? If yes, how, what are the factors which get stimulated



through craft cultures? By the investigation into ethnographic studies and literature, these questions have been answered in this paper. The first sections of the paper explain literature review that how crafts have been the main source of inspiration for humans since ages, and the second part of the paper will throw light on researchers which have shown prominent effects of craft on human brains and how the practice of craft enhances the cognitive learning in human.

II. Cognition and Craft Cultures

A growing body of research suggests that the craft and culture manifest by individual tastes (Lizardo 2006), many different frames of cognition (McLean 1998), and the views of the world (Vaisey and Lizardo 2010). These can have a prominent effect on the composition of personal networks (Arkes, 2004). Some methods link cultural cognition and help in growing social structure with an active participation of communities (Cerulo, Culture in Mind: Towards a Sociology of Cultutre and Cognition., 2002), (Cerulo, "Mining the Intersections of Culture and Cognitive Science.", 2010). As per insights of cognitive psychology - by the collaboration of more consciousness, thinking and feeling has widened their ranges and serves and helps the sociological setups (Cerulo, Deciphering Violence: The Cognitive Structure of Right and Wrong, 1988). Craft is a collective act and the pattern of collaborative work approach establishes artisans as a part of the community and this sense of being a part of an organized group develops a sense of relaxation.

People from primitive time ornate their articles of daily use, like garments, weapons and their own surroundings. The uneven walls of their mud houses often used as canvasses of their imaginations, everyday tools like water pots of different sizes and shapes, animal trappings were developed and ornamented very strategically by the designs from their own surroundings, nature-inspired designs.

The concept of craft originated from the understanding of where humans were creating something beautiful for their daily usage, expressed certain purpose of being, not only for commercial aspect. Many cultural groups excelled and developed mastery in their workmanship and created marvelous, things. The joy of making a beautiful product with concentration and infinite patience along with perfection brought the beauty of wealth and creativity in their life (Chattopadhyay, 1999). In Kamaladevi's words, that the crafts occupy the country's life:

We are constantly reminded of this amazing fact that a single unbroken thread seems to have come down through the craftsmen's hand over several thousand years. Subsequently, so many of the old forms seem to persist and continue to exercise the same influence, one may well ask why? Obviously, because they fulfill the recurring needs of one kind or another in the lives of our people, from the archaic clay objects to the refined and highly sophisticated bronze Dancing Shiva. They still provide the same inspiration and sense of elevation and continue to be current and meaningful, even in this fast-changing world.

Art and craft pieces have been a source of inspiration in every culture; the human being has always admired these artifacts to enhance their creativity, which has given shapes to their imaginations.

The very basic activity in civilizations have always been craftsmanship, the activity of craft is considered much more cohesive and impregnate in the relationships of human, even more than language. The growth of craft communities was considered a sign

of sensitivity and togetherness; it has always acted as an emotive and mellowing medium of humanism (Chattopadhyay, 1999). Therefore, it gives an understanding that craft practices develop a sense of cognition ability in the community.

III. Concept of creativity

According to Jeffrey and Craft (2001), the meaning of creativity has four different understanding since 1950's until present time with its own emphasis. Around 1950's it was associated with one's personality created on its own terms of genius and giftedness, but the trend of 1960's creative ability was referred as cognition. With time emphasis shifted to the imagination and creative stimulation of thoughts around 1970's. The researchers of 1980's were more focused on environmental taming and social theories, in order to understand creativity (Aud Berggraf Saebo, 2007). Along with the concept of social theories, researchers went on focusing more on creativity for common people, and they started shifting their view from positivist to aiming the large-scale understanding of measuring creativity by the means of ethnographic and qualitative research approaches, which broadly represent the picture of creativity in practice.

According to Fisher Creativity is a mental process, quite difficult to describe, generally, people think that an elaborate definition of creativity may give much better understanding, and give clarity on why some things are creative and some are not. Any clear definition was not given by him, but he underpinned certain traits like it's an evolutionary process which goes along with life, includes productive thoughts develops while creating something and moves on with generations. Creativity contains new and original and does not repeat itself (Fisher, 2004). Pope writes about creativity in his book, *Creativity - Theory, History, Practice,* "Creativity is an extraordinary, original and fitting, full filling, inventive, co-operative, un/conscious, female, re....creation"(Pope, 2005). He never mentioned one definition of creativity rather tried unlocking the phenomenon from many different perspectives; Inspired by Bertolt Brecht quotes "A person with one theory is lost; we need several of them or lots, we should stuff them in our pocket like newspapers" (Aud Berggraf Saebo, 2007).

Creativity is an imaginative ability of brain which gives scope to exploration invaluable forms. As per Lucas: Creativity is a state of mind in which all of our intelligence is working together. `It involves seeing, thinking and innovating. Although it is often found in the creative arts, Creativity can be demonstrated in any subject at school or in any aspect of life (Lucas, 2001).

As defined, creativity is a state of mind, it allows our intelligence to work in cognition, and creativity can be found in all kind of activities performed in our daily life. Fisher says that degrees of creativity could be seen at three levels: Individual, Social and Universal

Later he also mentioned the qualities of creative people that they could connect with ideas have a brilliant taste of aesthetics, inquisitive and eager to know, flexible and unorthodox. The interpretation of above mentioned concept has the ability to question established norm of doing any work with a fresh point of view. Hence creativity is an evolutionary process and could be enhanced through continuous cognitive learning.

IV. Creativity and Craft Practices

The practices which have added elegance and grace in cultures, found naturally in the expression of crafts, harshness and drabness of society have found its way to happiness and togetherness in the process of making utility products, which developed faith and made them realize the real meaning of life. The concept of making brought the transformation of mere utilitarian objects into aesthetically beautiful valuable items, this approach of having visual beauty in daily objects instigated the sense of creativity in many cultures (Chattopadhyay, 1999).

The "India report" presented by Charles and Ray Eames in 1958 for the Government of India, New Delhi, before the set up of National Institute of Design at Ahmadabad, Gujarat, they mentioned about "*Lota*" a multifunctional round shaped Indian vessel, which was used in almost all the societies of India from ancient time. They said, 'It is one of the most creative craft pieces, they have ever seen'. This statement of world-renowned designers presents an indulgent creativity of crafts cultures. Crafts are not merely the cultural heritage of a country, rather it is a beautiful experiential learning, where we live with them, feel them with our sensorial extensions and we develop intimate communion with these creative pieces.

Indian culture has an ancient history of crafts and creativity, the peninsula asserts the excellence of extraordinary craftsmanship in the materials like metals, pottery, muslins, shawls, carpets and ivory carvings. It has always reflected the vibrant rhythm of body, mind and emotions. The action and experience of the body is highly responsible for the state of mind and vice-versa.

V. Case studies to explore craft cognition

Making new product by hand involves emotional, sensorial, cognitive and social factors. Many researchers represent the envelope of embodiment of brain systems is deepening sympathetic foundation, skill learning and relevant social interaction to craft and design (Hari, 2009). The two experimental case studies based on pragmatic facts highlights the cognitive learning in the process of making. An artisan has strong visual ability that helps him/her to perceive how the 2D drawing would shape in 3D. The hand skill of craft conception is amalgamation of various senses which involves tactile and non tactile activity encountered innumerable times.

Jill Riley argues during a research done on the group of weavers, making creative textiles with the help of hand, similar to other handicrafts, requires certain level of skill set. These skill set can only be learned through regular practice and experience (Riley, 2011). Sense of physical and mental well being is a result of excitement and satisfaction of a creative work (Fidler, 1978). Hand loom weavers are closely connected to their passion and a creative process leading to well constructed cloth piece. This process of making creative pieces involve pleasure and enjoyment which comes from the rhythm of working on loom and give them intense level of satisfaction, and bliss. This sense of continuity provides sense of being to the weavers and adds strength and provides harmony of mind along with body. This complete process led to creative and rhythmical end result which enhances the creativity of an individual.

Another case study is based on research done on written narratives of 59 female textile craft makers undertaken by Sinikka Pollanen (2015). The research says that craft as

a leisure activity had a very positive and exceptional effects on the physical and mental cognitive skills of the craft makers (Pollanen, 2015). During the research female textile craft makers, who were practicing this craft from several years were engaged to write their experiences in the form of narratives. The participants were given sufficient time to interpret their past, needs, wishes and interest. These written narratives were used as data and helped researcher to analyze the narratives through critical reading. The result described how learning of new techniques, making craft products and its variations induced the improvement of physical and cognitive skills of craft makers. The narratives discovered that how making of craft is an entertainment and most of them were referring to a self- expressive creative activity. They also reflected a sense of values in terms of sustainability and responsibility for actions.

VI. Conclusion

Crafting involves multifaceted problem solving practice which is primarily creative in nature apply mind and body together in the conceptualization of idea to designing of material artifacts. In all the creative process like art, craft and designing includes rigorous physical action, essentially the use of domain based knowledge. The finding suggests that the craft culture helped to assemble feelings and thoughts, it provides space to self expression, and develop physical and mental cognitive skills. Such intuitive learning helps people in personal growth and gives meaning to their life.

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CO-05

BUSINESS MODELS FOR CREATING SUSTAINABILITY OF UNCELEBRATED CRAFTS

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Abstract

Crafts have been inherent to all cultures. They tend to create the identity of the products, artisans, place and even the material used. However, several traditional crafts lose their relevance over a period of time. Sustainability is, therefore, about retaining relevance and markets for such crafts in changing times. This paper dwells on transition of Tangaliya, a unique but lesser known craft from India which was dying. After various interventions during the past ten years, this craft has revived and craft products have moved from being community goods to commercial products. At this point, it seems to be at an inflection point. Tangaliya is an exquisite craft that holds the distinction of using a very unique weaving technique, but has no known documented records of its history and evolution. The traditional product, a wraparound for women was only for community exchange, had limited consumer base and negligible commercial value. It was produced and exchanged amongst members of a small community. Design and product interventions through a program undertaken by NIFT Gandhinagar led to a new range of products and designs, which gradually got acceptance among buyers. With further efforts Tangaliya was granted its GI, this also gave it some exposure at the national level. However, these interventions have not been able to generate substantial value for the craft. Consequently, the artisans are not able to fetch attractive income. It is felt that, unless required strategies are developed for providing recognition and respectable wages to the artisans, this art will die like many others. In the handloom sector cluster based approach is commonly proposed for reviving crafts. However, we feel that Tangaliya is unique and different approach may be sought. Tangaliya revolves around various limitations, it is rare and very few artisans practice this weaving. The *dana-making* process is intricate, therefore limited scope of developing new artisans quickly. The production cycle too is long and requires more working capital for holding inventory and paying wages, therefore, only limited production is possible. This paper attempts to suggest a business model for Tangaliya that could be suitable for mainstreaming uncelebrated crafts.

Key words: uncelebrated crafts, craftsmanship, luxury, innovation, business models, Sustainable.

I. Introduction

Declining trends in the hand crafted products have been an issue of worry and concern. Various government schemes such as Ambedkar HastshilpYojana (AHVY), Integrated Handloom Cluster Development Scheme (IHCDS), Scheme of Fund for Regeneration of Traditional Industries (SFURTI) etc., have given new impetus to the craft sector though it requires continuous follow through. Cluster development programs have addressed various issues of the craft sector essentially the unorganized structure, challenges of quality and consistency of craft products, potential to exploit the USP of the hand crafting technique, introducing innovations and ensuring high skill and motivation level of the artisans. Catering to the need of easy availability of quality raw material, advance tool kits and infrastructure needs have also been successfully addressed to a great extent in many handicraft clusters, thereby assuring decent wages and additional income for the artisans.

Nugraha, (2010) explains that to preserve the craft tradition and sustain skills is about creating new products to fulfill contemporary market needs and create attractive opportunities for the artisans to generate revenues.

In the Indian context sustainability in crafts has to do with preservation of culture, tradition, skills and practice ensuring employment, income generation and decent wages to the artisans. However there are many craft which remain neglected and the crafts persons struggle to earn decent income from the craft activity as also predominantly fail in bringing their next generation to continue with the handicraft activity as their main source of livelihood.

One such craft is Tangaliya, which in spite of being a unique and exquisite weaving technique and not known to exist in any part of the world has merely been able to survive. Classified as a languishing craft, during 1990's, various interventions have been attempted during the last 10-15 years bringing it back from the brink of being extinct, However it's still nowhere close to the celebrated status it deserves.

In this paper an attempt has been made to suggest a business model suitable for ensuring sustainability of uncelebrated crafts like Tangaliya. The paper is based on the learning from the interventions carried out over the last 15 years. It describes the approach followed, learning from the results and goes on to suggest a framework for a business model for developing uncelebrated crafts into pride possessions by the connoisseurs and lovers of handloom and artisanal products

II. Tangaliya Craft

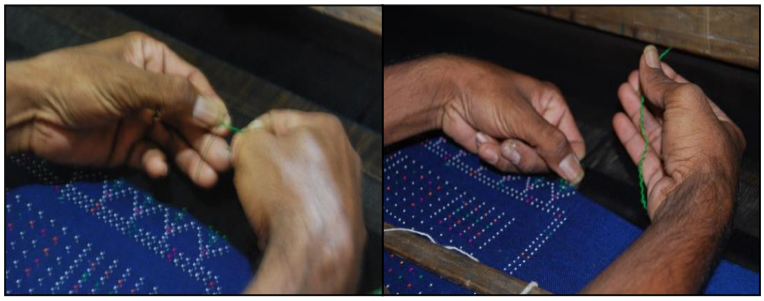
The craft of Tangaliya weaving is unique to the state of Gujarat in India. A Tangaliya shawl is worn as a wraparound drape from the waist over the leg i.e. *Tang* in Hindi and thus the term Tangaliyo. It is the identity of the Bharwad women a community that keeps sheep and goat. The shawl is woven by only the Dangasia community who weave for the Bharwad. It used to be the only clothing that the Bharwad women.

Traditional Tangaliya
Pic by Mr. Ravi Joshi, Faculty NIFT Gandhinagar

(Seth. 2017, P. 65) Tangaliya shawl has had limited use even though the weaving technique has been unique.

Tangaliya has been a coarse woolen shawl woven using raw sheep wool. It is 10' X 4' in size where two pieces of 10' X 2' pieces are hand-stitched to create a 10' X 4' shawl. The process of creating *Danas* is technically simpler and less time consuming when woolen yarn is used since the felting property of wool secures the *Danas* with minimal effort. The motifs developed are also visually clear and beautiful. On the other hand, to create *danas* in other material like cotton and silk material is a more tedious process, though unique and helps in creating refined products. (Seth. 2017, P.75)

The uniqueness of Tangaliya lies in the weaving technique of *dana*weaving (Jaitely, 1990). D*ana* weaving required small bits of fibers to be wound around the warp (the length wise yarns on the loom) yarns. A cluster of *Danas* arranged in an organized manner create different motifs, designs and patterns.



III. Tangaliya Weaving

Tangaliya has been used only for community exchange. As the need for the traditional Tangaliya shawl declined there and the lifestyles of consumer changed, it was considered a Languishing craft. There was a need to provide alternate employment opportunities to the weavers and as also to preserve the craft from dying (Seth, 2017).

IV. Objectives of the Study

The study has been undertaken with the objective to look at the characteristics of uncelebrated crafts, bring out the challenges an uncelebrated craft and its artisans face. Based on the interventions undertaken in the craft cluster and experiences thereof, develop and suggest a Business Model for development and sustainability for Tangaliya and similar other uncelebrated crafts.

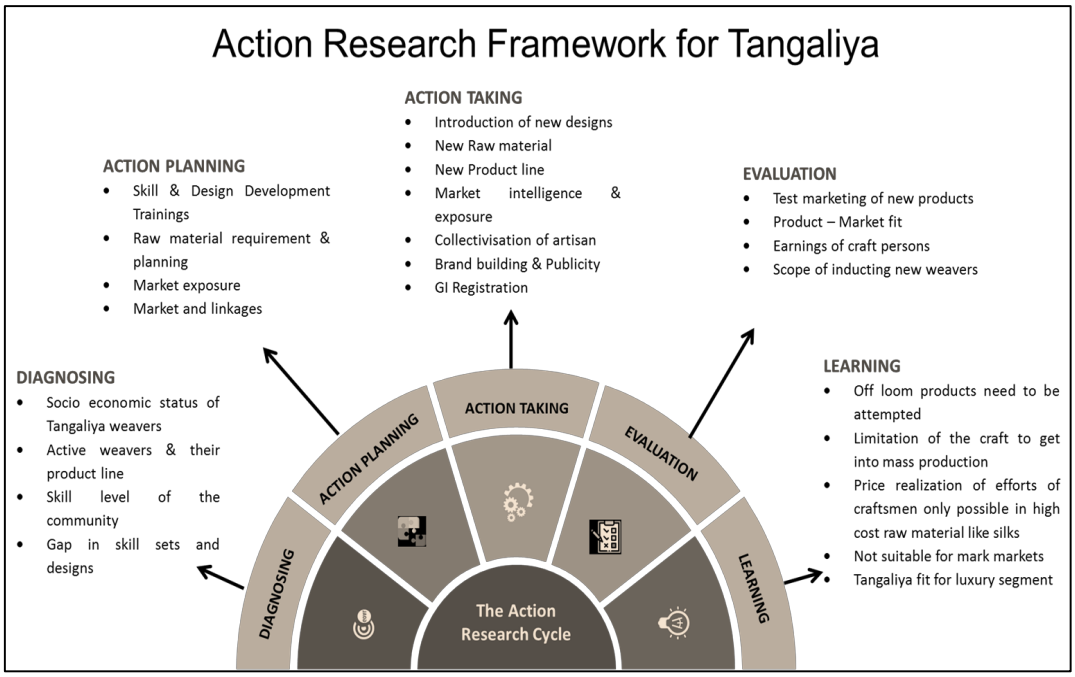
V. Methodology

The study uses action research as a qualitative research method. Qualitative research integrates the methods and techniques of observing, documenting, analyzing, and interpreting characteristics, patterns, attributes, and meanings of human phenomena under study (Gillis & Jackson, 2002). It describes and understands rather than predicting and controlling and in the process the respondents' feelings, views, and patterns are revealed without control or manipulation from the researcher (Leininger, 1985). Therefore it has the power to bring about multiple realities based on subjective experience and

circumstance. Further, it permits information sharing between the researcher and participant, creating an iterative learning process

Action research integrates research and action in a series of flexible cycles involving historically rather than as separate steps the collection of data, analysis if interpretation, planning and introduction of interventions and evaluation of changes through further collection and analysis of data.(Somekh, B, 2005). The action research method involves collaboration between the researchers and the participants and intervention by the researcher(s) in the situation being studied (Susman, G.I., 1983). It has a cyclic nature and includes the steps as Planning – Action – Reflection. Action research is considered democratic, equitable, liberating, and life-enhancing and which remains distinct from other qualitative methodologies, particularly concerning the roles played by the researcher and the participants (Gibson, 2002)

The study has followed an action research cycle framework adapted from Baskerville (2001)



Two of the authors have been working with this craft and artisans for the last fifteen years. They have been actively engaged with Tangaliya artisans attempting to understand, identify and experiment with various interventions and ways to promote this craft. The learning from these experiments was utilized to help the craft in terms of design and product development, as well as improving the design sense of the artisans. The experiments and interventions yielded some positive results, paving the way for this craft to be taken to the next level. It became increasingly evident that this craft has to be treated differently in terms of positioning, business model and marketing strategy.

VI. Findings of the Action Research

1. Context

Tangaliya is a craft practiced by the Dangasia community of Surendranagar and Kutch of Gujarat. Another community of this region, the Bharwads are into rearing livestock, particularly sheep, the wool of the sheep that they rear is used to weave woolen Tangaliyas. The Bharwadsuse woolen products due their migration patterns and changes in the day and night temperatures. The Bharwads provide wool to the Dangasia weaving community; Weaving has been the only source of income of the Dangasia weavers. They meet the clothing needs of the Bharwad community and are paid in cash as well as kind. The presence of one weaver is recorded in Chitarwada village of Anand district also, who weave Traditional Tangaliyas only on order basis. In Saurashtra region a large number of families weave contemporary products as a result of Swarsn Gayanti Gram Sworazgar Yojana (SGSY) cluster intervention program from 2005-2010. Similarly, in the Kutch region some weaver families weave contemporary Tangaliya products with support of Khamir, an NGO.

During 1990, Tangaliya was spotted as a craft which had potential to be scaled up, Some design development initiatives were carried by the Weaver Service Centre, Ahmedabad. Thereafter Tangaliya was taken up as one of the crafts to be promoted under a Special SGSY project supported by Ministry of rural development. This project applied the cluster development approach for promoting Tangaliya and four other crafts of Surenderanagar.

Tangaliya also suffers from low visibility in markets as well as in documented form. Minimal urban presence and development and negligible documentation has created the uncelebrated status. Traditional Tangaliya shawls were woven in various villages of Saurashtra region in Gujarat for local consumption (Jaitely, J. (1990). There is mention of traditional Tangaliya weaving in Chitarwada village of Anand in the Handicrafts Survey of Woolen Textiles of Gujarat (Census of India 1981, Pg 15). There are records of unique woolen shawls in bold weaves being woven in the Kutch region not resembling any other weaving technique. This could possibly point towards these being Tangaliya shawls. (Dhamija, J. 1985).

2. Interventions & Outcomes

In the initiation stage of the project, field team could hardly find a Tangaliya weaver practicing this craft. Their looms had been packed up and they had moved to weaving plain fabric or were engaged in farming related activities. It was challenging to get the Tangaliya weavers into weaving of Tangaliya again.

To begin with they were given simple design to weave, the motifs remained traditional. In the next level, experimentations with various yarns were attempted. They were asked to use mulberry silk, Eri silk, Marino wool and various counts of cotton in varied combination. Product diversification was also deployed and products such as stoles, scarves, duppatta, cushion covers, bags, engineered garments etc. was developed in Tangaliya.

There have been some documentation by NIFT faculty and students but these remain repetitive and hardly recycled. Registration of Tangaliya craft under Geographical Indications (GI) gave it some visibility in the form of news items in the print media Tangaliya. It is almost non-existent in the online media. Design developments undertaken under various projects and by the designers also remain confined to documentation vaults and libraries. As a result, despite interventions by various agencies on Tangaliya, the craft lacks the visibility it deserves.

These New range of products developed using different raw material, traditional and contemporary motifs were showcased at state and national level exhibitions and buyers-seller meets and also for market testing and also for sales at the Rajiv Gandhi Handicrafts Bhawan, Garvi-Gurjari Showrooms, NIFT Gandhinagar Design Studio etc. But these attempts were grossly inadequate; as the sales remained dismally low. After 2010, attempts were made by independent designers and a non-profit – SAATH in product diversification and marketing. Tangaliya products gained acceptance when shawls, stoles and mufflers were produced. A major breakthrough came when Tangaliya work was attempted on Sarees. This within no time became best-seller and several artisans took up weaving Tangaliya on Saree on their own. Weavers Service Centre, Ahmedabad, Gujarat did undertake further skill training and design development interventions in Tangaliya both in Surendranagar and Kutch. Gradually Tangaliya sarees and stoles gained some popularity and were picked up at good price by the customers. This gave Tangaliya artisans much need confidence and belief that this craft can be practiced full time and relied upon as a dependable livelihood option.

3. **Learning -Tangaliya Craft Not Suitable for Mass Market**

In absence of awareness on the intricacy and special skill that goes into making of this craft items among the customers, the marketability of this craft remains limited. Also the present product range and market segment to which this craft is being presented does not provide for the economic returns to compensate the Tangaliya weavers for their skill and efforts as well as their aspirational income.

Earlier attempts to sell products of this crafts like any other premium products have not yielded the desired results. Products were developed and places at leading handloom and ethnic product stores. However, there was hardly an off take as it was being sold in a very undifferentiated manner like any other handloom product. Lack of awareness among the customers as well as salesperson accentuated the problem. There are several factors that limit its scaling up include:

a. **Limited number of artisans:** This craft has handful of artisans, the maximum number of artisans that can be said to practice this craft are less than 50. Those who can do intricate work is hardly ten percent of these. Therefore, producing in bulk to cater to stores with multiple outlets or selling in bulk cannot be achieved.
b. **Long production cycle:** Dana making work in Tangaliya is a time consuming process, the weaving becomes very slow, there for the production cycle of making a Tangaliya product is very long. This again in a limiting factor for producing in bulk.
c. **Ability to produce only off-loom products:** Typically off looms products are produced in Tangaliya, though engineered garments such as Kurtis, Jackets etc have been attempted but lack of proper garmenting facility and limited scope for producing in various standard sizes is a major limiting factors.
d. **High aspirational income:** Artisans of this craft are handful and they understand that the effort and technique that goes into the craft is intense, they also tent to compare their earnings with equally intricate and established crafts like Patola, Banarasi Brocades etc. But they are unable to fetch such returns from their crafts hence they tent to price their products at a considerably high level which does not go well with most of the customer.

e. **Disjointed back-end:** Artisans procure raw materials and get the other process done through different sources as per their convenience and contacts; this is primarily because the procurement is small and intermittent. This directly impacts the cost, quality and availability of the required products and services.

Cluster based approach not suitable due to less number of artisans therefore inability to justify the cost of common facility or infrastructure, moreover there is not much that can be achieved by introducing technological interventions. Design development related facility, i.e. computer and designing software, raw material bank are two interventions that can be of use for Tangaliya artisans. Therefore, Tangaliya does not seem to be suitable for mass marketing as well as quick scale up.

VII. Tangaliya as a Luxury Product

Vickers and Renand (2003) has characterized luxury based on functionalism, experiential symbolism, and symbolic interaction: functionalism represents the idea that luxury goods should include the function of solving the consumers' problems; experiential symbolism represents the idea that luxury goods provide sensory pleasure; and symbolic interaction represents the idea that luxury goods should satisfy consumers' needs for self-enhancement. Luxury is also explained as a sociological phenomenon on two broad dimensions of Exclusivity, stemming from rarity, uniqueness and that requiring significant resources to acquire and social mystique created through signification by socially sanctioned elites such as cultural icons or recognized experts. The former ensure the functional and experiential aspects of luxury, the latter endows luxury with the symbolic aspect of luxury. (Pierre B, Pitt L, Michael M, Berthon JP, 2009). Based on the above studies six dimensions can be used to determine the route to qualification of Tangaliya as a luxury product.

1. **Exquisite-** The exquisiteness of the Tangaliya products lies in its fine making and visual appeal. It is a visual delight and a special experience to see a Tangaliya product. Its simplicity lies in the making of a small *Dana* or dot which is created in weaving process. Its specialty lies in using multiple such *Danas* to create elaborate and complex designs.
2. **Craftsmanship-** Tangaliya though less heard of and seen, its craftsmanship has existed for hundreds of years. Limited number of artisans possesses the *Dana* making skill to produce Tangaliya products. The refinement and skill required to produce Tangaliya in specialized materials is rare among the artisans. Technically the process of weaving is slow and the hand and mind co-ordination of very high order is required to weave Tangaliya. Large products which hold promises for effective revenue generation are even more tedious to execute as one *Dana* missed is an obvious mistake.
3. **Exclusive-** Exclusivity of Tangaliya lies in its technique. The making technique does not resemble any other weaving technique and outcome. Tangaliya products can only be produced in small numbers. It is one of its kind products and cannot be replicated by any other embroidery or weaving process. The technique was traditionally used to weave shawls in raw wool. Studies and interventions have led to Tangaliya products being woven in cotton and silk using the traditional technique.

4. **Heritage-** The craft has a unique heritage and identity. Only the Dangasia community weaves Tangaliya, but is worn by Bharwad women, every Bharwad women owns at least one Tangaliya as her praised possession received during her wedding. No other community weaves Tangaliya and no other community has been able to adopt this intricate weaving skill. It has been a heritage craft and continues to being practiced in the area of its origin. The skills have been handed over from one generation to the other. It has heritage importance; the technique of weaving is untouched till date.

VIII. Summary, Conclusion and Implications

Tangaliya is craft practiced by a community which is not large. It has craftsmanship in terms of its very unique and intricate weaving technique. The products too are inimitable and exquisite, have heritage and stories of its own. But on the other hand business model is not scalable due to limited supply and high cost as Tangaliya products can be produced in limited numbers only and the costs are high due to the intricacies and long duration and efforts that go into weaving of Tangaliya. Given these characteristics typical cluster development model is unlikely to work in case of Tangaliya and other crafts which have similar characteristics. Specific customized models are required for sustenance and growth of such luxury crafts. A typical cluster development program does not seem to fit well in this case.

For such crafts to evolve and sustain, ensuring remunerative income for the artisans is of prime importance. This can be assured when the product is sold at a high price. During the intervention period at Tangaliya cluster, traction towards higher prices being accepted was witnessed and it became increasingly evident that with right product backed with luxury products marketing techniques, Tangaliya can be sold at very high prices. The need would be to have a good Tangaliya product to offer, create a mystique around it and position it as a luxury product which is highly aspirational and priceless. Tangaliya craft product has all ingredients for making of a luxury product i.e. excellent quality, high transaction value, distinctiveness, exclusivity and craftsmanship, with concentrated effort and engagement with the artisans all these elements can be derived or built into a Tangaliya product, thereby making it a classic case of luxury product.

There are many other such uncelebrated but exquisite crafts practiced by handful of highly skilful and accomplished artisans. Future researches may be undertaken to test this model; luxury crafts which have similar characteristics and potential may be picked up and experimented with to test the framework. This model if established with various crafts can serve as guiding tool for formulating a different schemes and interventions for such crafts, a much desired step particularly when one size fits all approach is being advocated and schemes built around cluster development model for all handicraft clusters.

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CO-07

MADHUBANI PAINTING- LOCAL CRAFTS AND THE RELATIONSHIP BETWEEN HUMAN AND THEIR ENVIRONMENT WITHIN THEIR HISTORICAL, CULTURAL AND SOCIAL CONTEXT

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Abstract

Indian art history has given a rich history of traditional painting in India sub-continent from pre-history to present time. The style of painting differs from region to region and period to period. There is a living tradition is the art field of Bihar that is called madhubani painting, which is cultural identity of Bihar and the styles has been changing from generation to generation. The designers intending to mitigate vulnerability in livelihood of craftspeople have to design not towards a pre-determined set of desirable economics outcomes, but include social and cultural outcomes. The overview papers describe the relevance of sustainability, governance to traditional craft communities in developing economies. It highlights the importance of this work, both as a livelihood and as way of life for millions of people. It is also deals with use of raw materials, motifs and style of paintings.

Key word- Sub-continent, vulnerability, sustainability, economics

I. Introduction

Ram Bindeshwaris said to be that Madhubani is a town and a municipality in Madhubani district in the Indianstate of Bihar .The word "Madhubani" means "forest of honey" .As expected of any ancient civilization, Bihar has a very rich tradition of folk art and craft which feature as an extremely rich tradition of artistry and innovation. The handicrafts of Bihar are appreciated all over the world because of their great aesthetic value and their adherence to tradition. In Bihar, Madhubani District is one of the thirty-eight districts of Bihar State, India**.** Madhubani art is one of the finest art form in India's rich artistic culture. This art pattern has its roots in the Mithila region and surrounding villages in Madhubani district of Bihar. It is practiced in the region since ages and has gained attention of artists, art lovers and historians across the world. It is believed that Madhubani art originated since the times of Ramayana. The paintings generally depict the figures of deities, Gods, elements in nature, humans and animals as well as some geometrical shapes. Usually some mythological events like birth of Lord Krishna, Ram-Sita marriage, Lord Ram's departure to forest, etc. are described in the form of painting in Madhubani art. According to caste influence these painting are basically four types:

Bharni Paintings: -Sita Devi, a Mahapatra Brahmin, was the pioneer in developing the Bharni style of colour painting. The Bharni style of painting lavishly deals with rich variety of colors. The exposure of Brahmin painters to rich Hindu iconography and mythology helped them to develop forms and subjects very easily. The common subjects were Vishnu, Kaali, Durga, Shri Krishna and all other gods and goddesses.

Katchni Paintings: - In the beginning when Mithila paintings were being done on paper only a few Brahmin women took the opportunity to practice this art form. However, a decade later, some women from the Kayastha community, attracted by the name, fame and money the art brought with it, came forward with a new style, locally known as line paintings. The unique feature of the Kayastha tradition was the use of monochrome or just two colors. These paintings were also famous as Katchni paintings since all the forms which were drawn were filled with different types of rendering instead of filling colors.
Godna Painting: -These are symbolic paintings that are done with black and the use of few colors**.** After seeing the success of higher caste women, and on the initiations of outsiders like Bhasker, Kulkarni and German anthropologist Erica Moser, Dalit women could not resist their inner urge to supplement the household income and started painting on paper.
Geru painting: -: This is practiced by the harizans (lower class) of the society. They wash the paper with cow dung and paintings are done using earth colors. If any empty space is left after painting the main theme, it is filled up with the motifs of flowers, animals and birds or geometric designs. Initially Madhubani paintings were done on the traditional base of freshly plastered mud wall of huts.

II. Objectives

The objectives of survey are generated detailed information to understand the core issue related to-

- Raw materials at different stages of manufacturing
- Surface design, motifs and style of painting
- Socio economic status of manufacturer

III. Methodology

- Questionnaire and interviews survey of owners of a sample of manufacturing units.
- Self-observation and analysis.
- This study was carried out in Jitwarpur village at Madhubani district of Bihar.
- A multistage purposive cum random sampling method was followed. There are three hundred respondents (300) were selected for the study keeping in view the due coverage of the area.
- Categorizing strategies take the data in their segmented form, they label them with discrete codes or in terms of particular themes. These data are then grouped by category, examined and compared both within and between categories. The most prevalent categorizing strategy in qualitative data analysis is coding (Maxwell & Miller, 2001).

IV. Results

Raw materials- The majority of the artisans used brightnatural color from flowers, leaves, stems, fruits, roots, vegetables, soil and rocks, which is found in nature dyes to paint their homes, walls, handmade papers and fabrics to express themselves. According to Harsh Gupta (2012) and Nibedita Das (2013), Harizans cast used mud's, soil and rocks powder. Few of the artisan's use of synthetic colour and modern round brushes are replacing the cotton tipped bamboo sticks and stiff twigs that used to serve as brushes still a few years back. The bright, vibrant colors give hope and help to look at the brighter side of life.

Till date the artisan of Madhubani paintings are used colors directly from nature. Lamp soot served as a source of black, White from powdered rice, green was made from the leaves of the apple tree and Tilcoat, blue from the seeds of Sikkot and indigo, yellow was drawn from the parts of singar flower or Jasmine flower, bark of peepal was to be boiled to make a part of saffron colour, red was made from kusum flower and red sandal wood.

Table-1 Distribution of the respondent according to sources of colors

Sources of Colors	Frequency	Percentage
Plants	87	29
Flowers	63	21
Animals	111	37
Others	39	13
Total	300	100

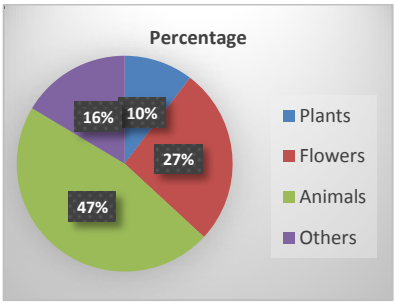

Fig -1

To make the painting last long as well as take brightness they mixed gum with colour. Apart from using cow dung coat, tea leaf, Tilkor leaf, bark of banyan tree, harda solutions can also be used to gain different shades of handmade paper. The demand for natural colors is more from the foreign buyers than Indian consumers. Interesting it was mentioned the cost of natural and non-natural paintings is almost the same.

V. Common Madhubani design and motifs

Design is intended, praiseful, contextual which is aimed to create advantage, distinct and futuristic outcome to the existing scenario. Design being a systematic and holistic in nature helps in generating more creative, higher impact and sustainable solutions. Design intervention in business is to create value addition to exiting products and services. The traditional artist was not adopting at promotion of their work. They also lacked entrepreneurship. They did not capitalize on the commercial potential of these crafts for a long time. Some of the common traditional themes made by the artist are on depicting mythological narratives from Ramayana and Mahabharata or religious context of Hindu Gods and Goddess such as Ram & Sita, Shiva & Parvathi, Hanuman, Lanka nares, Radha Krishna with sakkis, Ganesha, Laxmi, Sun, Buddha, Draupadi cheer haran etc.

Traditional kohbar motifs or marriage rituals such as swayamanera doli ka har, Arpan are commonly made apart from figurative representation of animals such as elephant, horses, tiger, deer, cow, tortoise, snake, peacocks, fishes, tree, flowers, petals, leaf etc. Majority of the artisans believes that continuity of painting at home helps in the conservation of traditional design and Parveen (2016) also believed that it is traditional art form and it will be found each and every house.

Table-2 Distribution of the respondent according to the sources of design/ pattern/ motifs-

Motifs	Frequency	Percentage
Historical	86	28.6
Religion	118	39.3
Natural	60	20
Others	36	12
Total	300	100

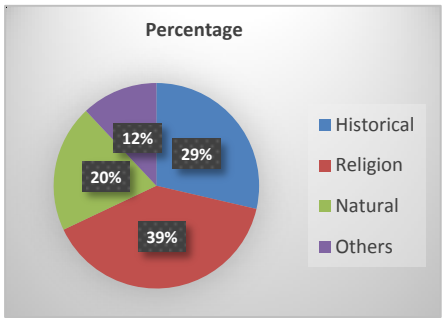

Fig-2

A double line border with simple geometric designs or with ornate floral patterns on it. Symbols, lines and patterns supporting the main theme and Abstract-like figures, of deities or human. Madhubani painting is an emblematic expression of day-to-day experiences and beliefs. As such, symbolism, simplicity and beauty hold them together in a single school of traditional art. The symbols that these Maithili painters use have their specific meanings as, for instance, fish symbolize fertility, procreation and good luck, peacocks are associated with romantic love and religion, and serpents are the divine protectors. Characterized by vibrant use of colour, underlying symbolism and traditional geometric patterns supporting the main theme, the Indian folk art form of Madhubani succeeded in creating a place for itself in the international house of fame and is now recognized worldwide. The Government of India is also paying its tribute by starting training programs educating people on Madhubani paintings.

VI. Socio economic status of madhubani printers

Most of the units do not have any marketing arrangement for direct sale of their painting/products and relatively less customer interface due to the bottleneck of marketing. Most are unaware of changing scenario and trends few wait between October to February for state organized retail exhibition/meals during winters.

Table-3 Distribution of Respondent according to their Family Income: -

Family income/month	Frequency	Percentage
Below Rs.2000	80	26.6%
Rs.2001 to 4000	20	6.6%
Rs.4001 to 6000	60	20%
Rs.6001 to 8000	100	33.3%
Rs.8001 to 15000	28	9.3%
Rs.15001 & above	12	4.3%
Total	300	100%

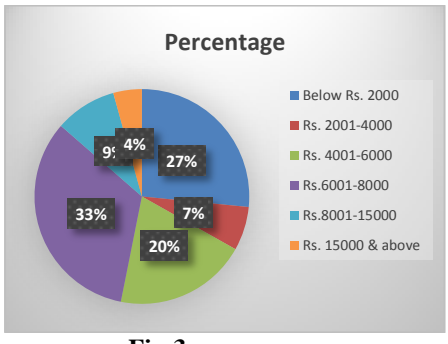

Fig-3

Majority of them sell from their units through the local traders/inter-mediators at a very low price who visit them and purchase. Many do not get chance to participate in exhibition and

send their products through few of the others who are fortunate to go. Very few painters get regular flow of market orders. The orders are mostly placed by the middlemen traders than the direct customer. Orders are mostly on small size handmade painting or on Tassar fabric such as sarees, dupattas, wall hanging, cushion covers. The margin of profit is very low. Most of the artisans agreeing that printing at home supplements the family income and Harsh Gupta (2012) also believed that, madhubani is a source of income.

VII. Conclusions

In past few decades, the value of traditional culture has been underestimated or ignored in many countries under the process of western centric modernization. Many traditional crafts have practices have disappeared continuously from daily life and been kept as heritage items or norms. The form of art has come a long way from rural India to the commercial streets of the country where people buy the painting to decorate their homes. The traditional made motifs and design have changed to an extent in the manner of execution but the themes have not varied for a long time and painters are skill using them. Need design training on selection of motifs, color matching to expand the range of shades and nurturing the creative thinking process. Require working capital to develop and diversify with more value added sample products which can be different compared to others products. Due to absence of innovative product range with hand painted Madhubani fails to attract and increase its buyers and customer base and the painter often faces rejection. Proposed value added product range. There is scope to diversify products (medium for executing the Madhubani painting) with application on different materials such as glass, ceramic, metal sheets, sun mica, fabrics, papier-mâché, wood (pen stands), cotton and felt (ladies' purses), lack ornaments, leather etc. These materials can be used to develop range of interior and life style products, home furnishing, garments, gift and accessories in different price range.

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CO-09

WOOD BLOCK MAKING CRAFT OF PETHAPUR

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Abstract

The country India is an amalgamation of different culture and tradition. Every region in India having its own distinct food habits, lifestyle, costumes, language and various craft. Crafts are not just a means of employment for the rural people. They are also a creative expression of each community's distinct culture and identity, through which utilitarian objects are transformed into art forms. One such indigenous craft is the wood block making craft of Pethapur, Gujarat. Pethapur is situated 10 km away from the capital of Gujarat, Gandhinagar. It is famous for its finely carved wooden blocks all over the world. The renowned Saudagiri trade has made Pethapur a Block Making Hub. The trade was spanned for hundred years and after Second World War it was diminished. The Saudagiri blocks made at Pethapur and the printing of fabrics was done at Ahmedabad and exported via Surat port to Siam (Present day: Thailand). There were around 3000 block makers who were practicing this craft but at present handful of craftsmen are engaged in this craft. The craft gradually started diminishing after the Second World War and the later on due to technological development. The main tool of hand block printing is a wooden block. It is made up of seasoned teak and sesame wood. It is finely carved stamp by skilled craftsmen. A descriptive research design was planned along with the personal interview, observation and case study method. An informed consent was taken from the master craftsman Mr. Maneklal Trikamlal Gajjar to be a unit of analysis for the proposed study. The data was collected from the archival records of the master craftsman, direct observation, and participant observation.The details of the craft such as raw materials, tools and process were documented and supported with illustrations and photographs. The study reveals that presently there is handful of craftsmen engaged with this craft and the craft documentation will help in future references and for further research needs to be done on craft development.

Key Words: Wood block making craft, documentation, preservation

Introduction

Each region in India has its own distinct culture and heritage. This diversity has been seen on different objects and material like wall, floor, paper, wood, metal, glass, textiles, clay and many more. They are inspired from the surroundings and the resources available from that particular region and that is the identity, beauty and skill of that particular craft and also the craftsmen.

India has a rich heritage of traditional woven, embroidered, dyed, printed and painted textiles. The manufacturing of sophisticated textiles in India is as ancient as its civilization. The discovery of dyed cotton fabric dates back to the Indus Valley civilization. The art of dyeing with the use of mordant was well known to Indian dyers

some 5,000 years ago. This form of dyeing which reveals mastery in the chemistry of dyeing was responsible for making India famous all over the world for its dyed and printed fabrics. India has since ancient times, enjoyed a monopoly of cotton and in particular of printed goods.

Considering to the great antiquity of India's skill of dyeing, its expertise in printing cloth with dyes and pigments probably matured quite early. The exact era when printing started is still to be ascertained but a cotton material dyed in vegetable colours found at Mohenjo-Daro reveals that the dyeing and printing in India was known from earlier times. The oldest known patterned fabrics from India are from Gujarat. They are resist-dyed and printed cotton excavated at Fostat. The fragments first identified were coming from Gujarat and dated from as early as the 17th century.

Wood printing stamps and hand carved wooden print blocks have been used to print everything from newspapers, flyers, and match boxes to traditional clothing, bedspreads and fabrics. Nearly a lost art, this handcraft work will soon be lost because of modern technology such as automated web presses and silk screening that is replacing handmade, hand carved wood print blocks used in hand printing fabrics and textiles.

Wood block is the main tool of hand block printing. It is finely carved wood piece made up of seasoned teak wood. It requires skill and precision. Pethapur situated near the Capital of Gujarat, is famous for its finely carved wood blocks all over the globe. The renowned *Saudagiri* trade has made a Pethapur a wood block making hub. It was a hundred years of trade. The blocks were made at Pethapuer and printed at Ahmedabad. The printed fabrics were then exported to Siam (Present day Thailand) via Surat port.

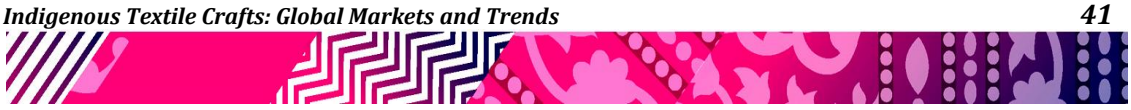
The craft was developed and practiced by the *Suthar* artisans who were traditionally carpenters. Most of the craftsmen engaged in this work belonged to the - *Suthar* castes who believe that their ancestors settled in Pethapur some 200 years ago. The caste believes it is the progeny of Vishvakarma, the architect of the flying chariots and all the weapons of the gods. At present since last three decades *prajapatis* – potter community started practicing the craft only few *Gajjars* are left.

The wood block making process is requires skill, patience and concentration. It takes almost a year to learn this craft. The tools used at each stage of block making are also of different types. There were only few craftsmen practicing this craft as the technological development. Thus the interesting process of wood block making which is not the end product though being an important tool for hand block printing and as it is at the verge of diminishing due to technological up gradation led the researcher to undertake a study of documenting tools and process of wood block making craft.

The specific objective of the study was to document the raw materials, tools used and process of block making craft.

Methodology

Keeping in mind the objective of the study the descriptive research design was formulated. To collect detailed information of the craft a semi structured interview schedule was prepared based on preliminary visits and related review articles. The master craftsmen Shri Maneklal Gajjar was selected as a sample for the data collection as he was a most experienced craftsmen and a National Award winner. He was at the age of 83 and he had lost his vision thus the researcher has taken assistance from the other craftsmen



Shri Dahyabhai Prajapti and Maneklal's cousin Shri Kanubhai Gajjar. The semi structured interview schedule for the master craftsman was prepared to gain the information on craft details supported with photographs. The observation method was also used. The collected and generated data from the field and desk research was qualitative and the data gathered was analyzed and presented in the form of documents, photographs, videos, notes of verbal responses, and observation notes was done to draw inferences for the specific objectives. The accounts of Pethapur wood block craft was presented as illustrations, and photographs.

Results and Discussion

The results have been discussed under the following sub-heads.

Documentation of the Wood Block Craft

Wood block craft as the name suggests is a design block made by the use of wood. Hence, the major raw materials used were wood and oil. The design on the wood block was carved following specific steps. Each of these steps involved precise use of several tools and equipment.

A. Raw material used

a) Wood

Wood was an essential raw material required in block making. In block making of Pethapur mainly seasoned teak (*Sag*) wood was used. It was a kind of wood that was hard. The practice of using teak wood was still continued owing to its important characteristics of durability, strength, anti-shrink properties and long shelf life. It also resisted damage under variable conditions and season. (Plate-1)

Plate-1: Teak wood (Horizontal Section) *(Source: Captured a shot from Video of Bristol Polytechnic, 1991)*

b) Oil

Oil was the other raw material used; only after the block was completely ready. The blocks were immersed in oil to make them water repellent. The surface would become smooth as oil formed a protective layer and prevented water related damage. Block thus made, it increased the shelf life even after several wash with water. Generally, cooking oil was used for the finishing because it was practical and easily available.

B) Tools and equipments used

At each stage of block making different tool was required that varied in size and function based on design to be carved. Most of the tools were made of iron with wooden handles.

It was observed that some of the tools were same as general tools used for carpentry; but many variations in tools were observed to make them fit for specific use in wood block making. Researcher has provided common names of these tools for greater clarity, but in some cases such relationship could not be established and hence local names as used by Pethapur block makers were included. These tools are presented as photograph along with a diagrammatic sketch. Thus, the tools were classified by the researcher as per it use in different stages in block making. (Figure:1)

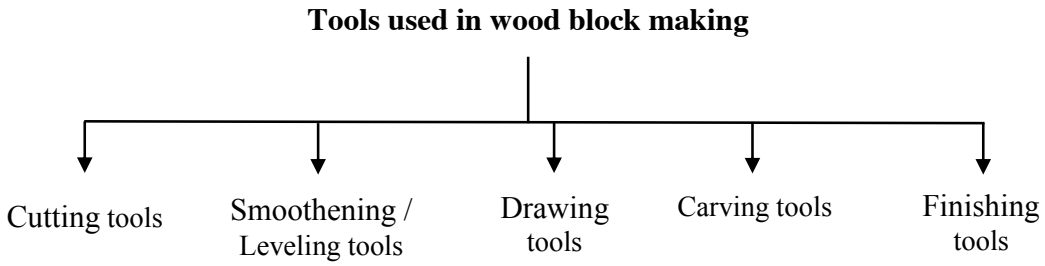


Figure-1: Classification of tools

i)Cutting Tools:

Table: 1 Cutting tools

No.	Name of the tool	Local name	Function/use	Picture
1	Adage	*Vanslo*	To cut the wood into small pieces	
2	Gauge	*Farsu*	To tear the wood into required thickness	
3	Vice	*Bhido or benso*	To hold the wood piece in fixed position, so that it would not shift during its cutting process	
4	Hand saw	*Aari/Karvati*	To cut the wood piece into desired sizes of the block	

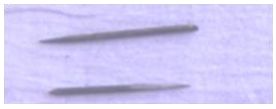
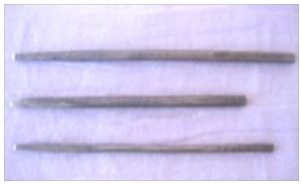
ii) Smoothening /Leveling Tools

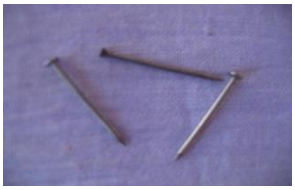
Table: 2 Smoothening /Leveling tools

No.	Name of the tool	Local name	Function /use	Picture
1	Small hand saw	*Masharvani aari*	Used to scrap the wood piece to remove soft wood from the surface	
2	Carpenter's plane	*Randho*	It was also used to remove the soft wood from the wood piece and make its surface even.	
3	Flat file	*Chapti kanas*	Used to file the wood piece to make even and smooth surface	
4	Rough Stone	*Kakro patthar*	Polishing of wood piece	
5	Smooth Stone	*Liso patthar*	Final polishing of wood piece so that the veins of wood clearly visible	
6	Chalk	*Khaddi*	Used to make a white base for drawing or tracing of design.	

iii) Drawing Tools

Table:3 Drawing Tools

No.	Name of the tool	Local name	Function/use	Picture
1	Table	*Tarbaiyo*	It formed a stable base for carving which would not shift with a slightest jerk.	
2	Scale	*Footpatti*	Used for measurements and drawing straight lines, and checking evenness of surface of wood.	
3	Liner	*Gonchiyun*	To mark straight lines onto the wood piece with the help of scale	
4	Compass	*Prakar*	Used as a measuring tool to measure width and length of the design accurately. Proportion and balance of the design also could be measured with compass.	
5	Pins	*Menkana*	Used to fix the tracing paper on the wood.	
6	Chisel	*Tinchaniyu*	Used to transfer the design from paper to the wood piece	

7	Mallet	*Thapadi*	Used to tap chisel to mark design onto wood piece	
8	Nails	*Khilli*	Nails were fixed at all four corner of the block and they were known as the joining / registration points. It was fixed slantly and deeper than the depth of carving. The top of the nail was removed after fixing.	
9	Hammer	*Hathodi*	Used for fixing the nails, that served as registration marks.	

iv) Carving tools

Table: 4 carving tools

No	**Name of the tool/ equipment**	**Local name**	**Function/use**	**Picture**
1	Hand drill	*Hath sardi*	Used to remove the negative part of the design before actual carving. Drilling tool was used with the other tool named kamthi and champanu (head). The holes were drilled at the required depth only.	
a.	Medium hand drill	*Vachali havad/sardi*	Medium holes were made through this tool	

b.	Small hand drill	*Nani or tuvan ni havad/sardi*	To make holes where the space between the two shapes was very less.	
2	Head	*Chanpanu / mathu*	Used to hold the hand drill.	
3		*Kamathi*	it is used with the rope and then only drilling could be possible.	
4	Blunt chisel	*Thassa*	After drilling the holes into wood piece the holes were broken down by this tool. So the carving became easier and time was saved.	
5	Gouge	*Farasi*	It was used to make shallow cuts according to the space between the motifs.	
a.	Firmer chisel	*Chorsi*	It was used to carve the straight lines.	
b.	Outside ground gouge	*Gol Tankana/kunthiya*	It was used to carve curved shapes / lines	

c.	'V' shaped chisel	*Polada*	It was used to carve curves or "V" shapes.	
d.	Solid chisels/dies	*Edi*	It was used to carve repetitive patterns such as geometric designs and mirrored patterns.	
e.	Hollowed chisel	*Bhungali*	Used to refine the different shapes had been carved.	
f.	'v'- shaped chisel	*Nakhiyu*	It was used to sharpen the zig zag pattern or small spaces between patterns so that wood does not break.	
g.	Twigged chisel	*Balakhi*	It was used to carve multiple concentric patterns.	
h.	Hollowed chisel	*Bhammar*	Mainly used to refine circular boundaries. Its sawed edge helped to smoothen the surface after removing wooden scrap.	

(v) Finishing Tools

Table 5: Finishing Tools

No.	Name of the tool	Local name	Function/use	Picture
1	Oil stone	*Pathari*	To sharpen the edges of tools such as chisels, files, etc.	

2	Hand saw	*Sandhavani Aari*	To repair broken / damaged block.	
3	Brush	*Brush*	To clean the blocks after carving by removing saw dust.	
4a	Bigger Hand Drill	*Pavan sardi*	To make air holes on the sides of the block and to fix handle of the block	
4b	Rope/ thread	Netaru/ *Dordu*	Used with hand drill to wrap around so that by twisting it necessary torque could be provided for drilling.	
5	Screw driver	*feravanu*	Used to fix the screws for handle of the block.	
6	Impression tool	*Ghasaniyu*	Used to rub on paper so that impression of the block could be obtained.	
7	Colour pad	*Rang ni potali*	Used to apply colour evenly on the block while taking impression.	

C) Process of wood block making

The process of block making was time consuming and required trained workers. The wooden block should be handled with care throughout the process of block making. The process of block making began from the buying of wood to the finishing of a wood block.

Purchasing the wood

↓

Cutting of wood in desired size

↓

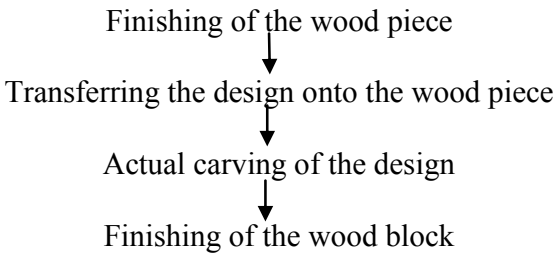


Figure-2: Sequential process of block making

a) Purchasing of wood:

In Pethapur, only seasoned teak *(sag*) wood was used for block making because of its anti shrink properties and long shell life. It was purchased from the forests of Navagam, Jankhva, Umarpada, Songadh and Silvassa of South Gujarat. The block makers were buying teak wood at negotiable price as they had an active block making co-operative society called the "*Bibawala Sahakari Mandali"*. The representative of the co-operative society of Pethapur inspected the wood qualities and made appropriate selection. The agent would decide the cost. The vendors would auction wood, and sell it to the highest bidder and the payment was made at the time of the delivery at Pethapur. The purchased wood was displayed on the street of Pethapur and it was cut into pieces by the wood cutters, locally known as *veraniyas*. The purchased wood was distributed among all the members

b) Cutting of wood into desired size

The loft long wood was first cut into horizontal pieces having three inches thickness with a saw. Small pieces were cut from the 10 feet long wood. It was made even from all sides using a cutting tool *farso*/gouge. The wood pieces were then cut into the desired sizes such as 6"x7", 5" x 6" and border blocks were cut in size 2"x6. (Fig: 3)

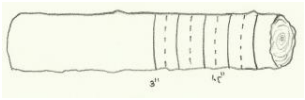


Fig-3: Cutting of wood from the 10ft long wood

c) Finishing of the wood piece:

The sliced wood piece was finished to render it a smooth and even surface which was a pre-requisite to make a wood block. (Plate: 2, Plate:3 and Plate :4)

Plate 2-: Leveling of wood piece

Plate-3: Rubbed on a rough stone

Plate-4: Finished wood piece

d) Creating a base for tracing of design

Khaddi was fine white clay used as a base before tracing of the design onto the block. It formed a white layer on the top surface of wood block which served as a contrast to design traced, thus making it clearly visible. (Plate: 5)

Plate-5: Creating a base for transferring a design on to wood by applying *khaddi* (chalk).

e) Transferring and drawing the design on wood piece:

Taking measurement correctly was an important step since the balance of the whole design was dependent upon it. The design drawn on paper was first measured into the length and width with the help of a ruler. According to the measurement, first line was drawn on to the block using a liner, i.e. a sharp metal stylus (*gonchiyun)*. The measured length was taken by compass and points were marked on both sides of the block. The same process was followed for measuring width. And this was repeated to make a parallel line at the opposite sides too, and finally a square was made. This way the grid was formed. The design was tapped through the paper with a kind of chisel having blunt edge and hammered along the lines of the design at close interval with a mallet (*thapdi*). Thus, the design would appear in form of small broken lines on the wood block (Plate: 6)

Plate-6: Drawing the design on the wood piece by making grid and taking measurement by metal stylus (Compass)

f) Carving Process

First step of carving was to remove the negative part of the design by using hand drill (*shardi*). All the holes drilled on the surface of the block were then broken down using a straight blunt chisel (*thasso*) and a mallet i.e. *thapdi*. The ground surface was cleaned. Then a *farsi* was used to remove the excess wood from the outer sides of the block as well as from the inside. The carving was an important stage in block making. The most important tool used for carving was a chisel. They were available different shapes and sizes thus the carving would be much better and easier. There was different method for carving an outline and relative block. After breaking the holes, 'v'-shaped chisel (*nakhiyun*) was used where the sharpened or pointed shapes to be carved. Thus, no breakage would be occurred during carving. (Plate: 7)

Traced design | Holes were drilled in the negative part of the design using different sizes of drills (Refer table) | Carved design using different chisels | An outline block completely carved

Plate-7: Steps of carving process

g) Making of handle of the block:

The outline block was three inch thick so the handle was made out from the block itself.

A line of 15 inches was drawn at the back side of the block in the center. Wood was scrapped horizontally by keeping distance of 0.75 inches on both the sides from center line and then scrapped in a slant from the top side of the handle to give it a shape and excess wood was removed using *farsi*/gouge.(Fig:4)

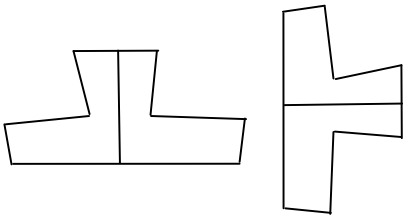


Fig.4: Process of making handle of the block

h) Making air holes (P*avansar*)

It is necessary to make air holes in outline block. The holes were made thriughout the block from sideto side and face to back.

(Plate: 8)

Plate-8: Process of making air holes

i) Finishing Process:

It includes applying oil to the block to smoothened the edges as well as to make it water repallent and taking an imprint on paper to check the level and repeat.The imprint were made in two copy as one for their record and the otherfor the refrence for the printer. (Plate:9)

Plate-9: Application of oil and taking impression

Conclusion

The wood block making craft requires skilled craftsmen, precision and concentration. It is time consuming. The tools required are diffrerent at every stage and also vary according to the design and type of the block. Thus the documentation willl help to preserve such an indigenous craft which is surviving till today with handful of artisans. As the process of wood block making is time consuming furtther research needs to be done to introduce technology as it will help in reducing time, energy and increse the production. The process of drawing of design is required mathematical skill and perfection. Thus imparting knowledge of computer for designing will improvise the work. This will help in development of the craft.

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PURPOSE ECONOMY AND TEXTILE CRAFT SOCIAL ENTERPRISES

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Abstract

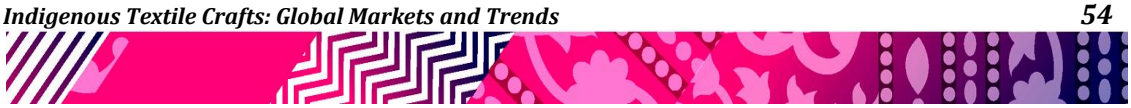
Social enterprises based on textile crafts are working with artisans to provide economic empowerment with a purpose and developing sustainable communities across India. A social enterprise is a business set up to accomplish social or environmental goals through business. It is a social organization for profit. An assessment of a social enterprise Maati sangathan that is working with handmade textiles from India is done for this study. The traditional skills of women are utilized to create handmade products, which are helping to improve the lives of women and build communities while establishing a global business. The social enterprise selected for this paper works primarily with women. This paper aims to analyze the elements that are considered integral for measuring success by these organizations. An analysis of the enterprise is done in this paper to understand the factors, which are considered to be parameters of success. The organization views success not merely through the framework of economic gains but focuses on elements such as community support, self-respect, quality of life and education of children. The concept of a purpose economy as defined by Hurst reiterates this, "A new view of success based on relationships, impact, and growth is spreading across the globe, and individuals and organizations that embrace that view have emerged as the leaders of the new economy." Referring to the contemporary craft economy continuum defined by Luck man the data has been qualitatively examined and uses the experience and knowledge of the author in the craft sector.

Key words: purpose economy; social enterprise; empowerment.

"A new view of success based on relationships, impact, and growth is spreading across the globe, and individuals and organizations that embrace that view have emerged as the leaders of the new economy." (Hurst, 2016)

I. Introduction

The Indian crafts according to Stella Kramrisch had the spiritual and holiness expressed by the craftsperson and Pupul Jayakar recognized role of craft in Indian economy by stating that "craft is an economic activity before it is a cultural activity" (Chatterjee, 2014). The cultural heritage of the "Silpa- or the art and craft, in the country encompassing the science of the art and craft, skill, labor, ingenuity, site, and ritual form and creation"- a living tradition of 5000 years, stands worryingly threatened today. "According to the United Nations, over the past 30 years, the number of Indian artisans has decreased by 30%, indicating the need to re-invest in artisans to safeguard history, culture and an important source of livelihood."(Kapur and Mittar, 2014)



A number of Governments, national institutions and craft organizations in the private sector are working on strategies for the development of the artisans and the craft sector. These have different objectives and as an illustration, the broad objectives of the National Handicraft Policy (AIACA, 2017) proposed by AIACA are detailed here:

- Focus on improving the livelihoods and socioeconomic condition of the practitioners of handicrafts;
- Facilitate growth of crafts-based businesses and to make them economically viable;
- Create necessary and greater opportunities toward capacity development and excellence, business growth, market promotion and welfare support for the artisans;
- Develop effective models of financial and administrative structures to facilitate ease of doing business and to create and support handicrafts-based business development and growth over the long term;
- Create a differentiation for genuine handcrafted premium products;
- Focus on documentation and conservation of traditional knowledge and skills.

The approach of these objectives and others has mostly been a top down model where the Designer/Institution/Organization aims to address issues related to continuity of craft, market sustainability, design interventions etc.

This papers approach to craft practice looks at alternative frameworks to understand artisan motivation aspirations and cultural sustainability. (Moisin, 2019). Successful organizations where artisans are seen to continue craft practice could help us to understand these alternative frame work sand this paper analyses Maati Sanghatan, a woman's group from Munsiyari, Uttrakhand for this purpose.

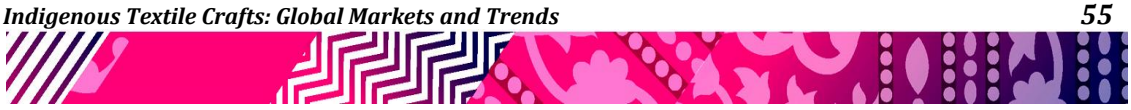
II. Objectives

The paper studies the textile craft practice of the Shauka community of the Munsiyari region of Pithoragarh district in Uttrakhand. Through the study of this organization it aims to analyze the value of community with the continuity of craft practice and the concept of purpose economy. Some authors like Luck man view craft practice through the lens of the western world and note, "craft practice as 'institutionalized individualization'. "The unavoidable reality that micro-enterprise, and home-based self-employment in particular, are clearly practices of 'institutionalized individualization' which, as Beck and Beck-Gernsheim (2002) among others argue, represent an enforced sense of personal responsibility for one's own success or failure in life in the face of the withdrawal of social-welfare safety nets and the rise of precarious employment markets."(Luckman, 2015).The practice of craft being different in India results on the other hand in a social impact, which supports community building.

This paper discusses that artisans are engaged with textile craft communities because this adds meaning and purpose to their life both economically and socially. It gives them a strong sense of identity and empowerment as they can have strong individual voices and strength as a community.

III. Methodology

The social enterprise selected for this study is Maati Sangathan. The study uses a combination of research approaches. Semi structured interviews were conducted in person and telephonically and were recorded by hand and through electronic devices.



The paper approaches the understanding of craft practice through archival, ethnographic and visual methods. Purposive sampling was carried out for studying the crafts practiced in the region and for understanding the motivation and aspiration of women engaged with the community. The women interviewed were practicing the textile craft and the selection criterion was that the artisans should have a good understanding of the community, expertise in craft, should be well known among the community and considered to be a leader amongst them.

The questions asked related to two aspects. The first was about the textile craft practice. This was detailed through questions on fibers, yarns, weaving and knitting techniques, marketing etc. The second aspect relates to the purpose which textile craft practice adds to the lives of these women. The women's aspirations, motivation to continue, advantages of working in a community, problems faced by them were discussed.

Secondary data was obtained from review of literature and the philosophy of 'Purpose Economy' was studied through books and articles published by Aaron Hurst. (Hurst, 2016).These ideas are further validated by trends being observed at the workplace, which are discussed in different writings.

IV. Findings and Discussions

The data has been examined qualitatively and analyzed through the lens of the three types of purposes as proposed by Hurst in his concept of purpose economy and the discussion is done under two main headings:

1. Textile craft practiced by the Shauka community in Munsiyari.
2. Relationship between Craft Practice and Purpose economy as evidenced through a study of Maati Sangathan.

1. Textile craft practiced by the Shauka community in Munsiyari.

The Shauka community of northern Uttrakhand have a long and rich engagement of working with wool. The Shauka tribe which live in Uttrakashi, Chamoli and Pithoragarh district traded with Tibet until the Indo –China war in 1962. The finest wool/goat hair was brought from Tibet and spun and traded across the country. The wool varieties being used in the region today are Hershil, Belchi and these may also be blended with Australian merino wool. The work on spinning, weaving and knitting is done by skilled artisans throughout the year and women are involved in all aspects of the crafts which include rearing sheep and angora rabbits, shearing of the wool/fur. They also excel in carding, spinning and dyeing with natural dyes obtained from walnut tree leaves, fruits and roots obtained from the local plants.

Weaving carpets, shawls and knitting is largely done in the winter months for trade and self consumption. During the summer and the rainy season, women spend more time on agriculture, raising their livestock, collecting wood and herbs, from the forests. They carry basic amenities up the hill, build and repair their houses and provide hospitality to tourists in their home stays.

The fibre is carded traditionally by hand using wooden paddles having a card cloth made of steel teeth.Spinning of the carded yarn is done on drop spindles and treadle spinning wheels. 'The drop spindle, takli, is the oldest spinning tool still in use. It swings from the yarn while it rotates spinning and pulling in the yarn that is being twisted between the spinner hands. (Gahlot, 2018). The Bageshwari Charkha is a treadle-operated

spindle. It was designed as a collapse and portable spindle for the transhumant Shauka tribes. The wheel has never fully replaced the drop spindle though. Older generation continue to walk about with talkies.' (Gahlot, 2018)

The spun yarn is used for knitting caps, sweaters, gloves, socks and mufflers and for weaving different sizes and types of carpets. Some of the common products made in the region are chutka (a woolen blanket with a shaggy pile weave in creamy white and black wool); thumla (a lighter and softer woolen blanket woven on the pit-loom or frame loom which is brushed for warmth) and carpets known as Dan and asan in wool.

Various types of looms are used for weaving different products. Back strap loom, vertical loom and pit loom were traditionally used for weaving and Horizontal looms are commonly used today.

2. Relationship between Craft Practice and Purpose economy as evidenced through a study of Maati Sangathan.

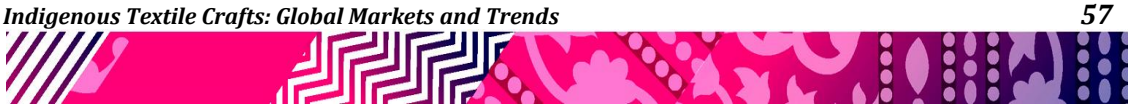
"Maati sangathan" was started during mid 90's and included a small group of women from the villages of Uttarakhand. These women engage with different occupations based on their skills, interests and concerns towards the welfare of the society. Some of the work includes spinning, weaving, knitting, forest preservation and maintenance of water bodies. "Mesar kund", a water body near Munsiyari is a great example of endurance of Maati women. Maati, is a "Swayam sevi sangathan", which means they are a self-sustaining and a non-profit organization and has a flat structure with 8 core members. They are Bina, Pushpa, Kamala, Kamala, Basanti, Rekha, Kanchan and Malika. They work with women artisans in 12 -13 villages nearby and assist them to find markets for selling their crafted products and utilize a major part of their earnings for social benefits. Under "Himalayan Ark" they run home-stays, which is the main source of income for them.

"There are two key sources of purpose people seek: a sense of community and the opportunity for self expression and personal growth. The three types of purpose defined under purpose economy are: personal, social and societal purpose."(Hurst, 2014) These are discussed with reference to the motivations and lives of women of the Maati sanghathan. According to Andrews (1996), "women find their power through co-operation, compassion, community and competence. The development of social cohesion was a strong step towards collective empowerment of the craftswomen. Working together gave them more energy and ability for diverse thinking."

i. Personal purpose

Each woman in the group was proud of her individual accomplishments and her role in the group. From sourcing material from the forests for natural dyeing, expertise in wool recognition, weaving excellence, knowledge of quality and other accomplishments like guide for mountain trekking, guide for birders; the individuals knowledge gave them confidence in themselves and made them happier. "The craft tradition is the identity of the practicing community. The understanding and referencing of this identity with an opportunity to be inspired is very important for the craftsperson." (Kalra, 2018)

Women have come into leadership roles, e.g. Rekha is part of the village panchayat, (personal interview, 2019). They articulate their needs and are active citizens. Their confidence in themselves has grown because as elected representatives they are speaking not only for themselves but representing other women of the region.



Bina a member of the Sangathan elucidates, "Joining the organization in 2010 gave me an equal status and voice in my family. The respect and identity it gave is very valuable to."(Paraphrased from personal interview, 2019). Bina is responsible for quality control of woven and knitted products, managing inventory and coordination with women artisans of 12-13 villages. She works closely with 50 -60 artisans and also women who produce agricultural products.

"We find purpose when we are doing things we love, attempt new challenges and express our voice to the world". (Hurst, 2016). This is reiterated by Judy Fraters in her work on artisan education, "Success is having a voice," they (artisans) said. "It is using your creativity, decision making power, achieving goals, and taking responsibility." Strikingly, not one artisan spoke of success in terms of money. "My early goal was money," Dayabhai explained. *Now, it is to be my own person. It's not about just money*."(Fraters, 2014)

ii. Social purpose

The women came together to form this community primarily for a 'life without violence'. Being part of a community has a positive effect on the emotional well being, gives a sense of belonging and social connectedness. It also offers an added meaning and purpose in life. Several women in the group emphasized the power and positivity that grew when they worked together. They felt empowered through their group strength and express that this supports them through good and bad times in all spheres of life.

Through the sangathan the "individual struggles are handled together to work towards overall well being of which one part is economic well being". (Malika, 2019)They have a collective approach for marketing their products and because of this can maintain quality and price control.

The aspirations of the women become more realizable as expressed by a member, "the more we collaborate, the better are our chances of achieving our aspirations because each of has a support system in place."(Personal interview, 2019)

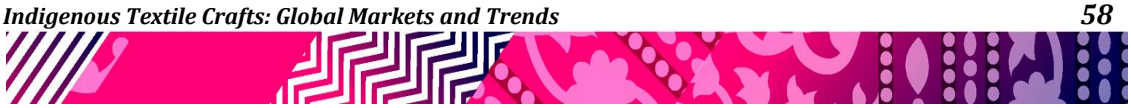
The training opportunities for enhancing skill also become more accessible to them. Some women join programs offered by the government as individuals. There are also programs, which are organized by the sangathan through local bodies/governments on weaving, mountain guiding, natural history etc.

"The connection between us brings the greatest joy, the highest passion and most authentic satisfaction in our frequently impassive, impersonal and impatient world. It was the ability to share that work with the people she loved that made it truly meaningful and gave her a strong sense of purpose." (Hurst, 2016).

iii. Societal purpose

The women feel great pride in having knowledge of larger issues in the world. They work towards issues such as deforestation through plantation drives and work on water conservation. As some of them are elected representatives their voices carry power outside their immediate circles.

"Purpose comes when we know we have done something that we believe matters to others, to society and to ourselves. From the small and mundane daily choices we make to systemic and historic impact, we strive to contribute to the well being of the world around us."(Hurst, 2016).



The main aspects that the artisans articulated revolved around well-being and improved life experiences. A sense of community, flexible hours of work and personal growth were the leading positive factors for the women. These are all considered to be important and discussed by authors such as Luck man. (Luck man, 2015)

V. Summary and Conclusions

The women of Maati sangathan came together to raise their voices for a life free from violence. To support their voices they have explored sources of livelihood. The overall well being is the end goal and the status in home and society is raised. The association with the sangathan provides them with a personal identity. It also gives them a role of recognition in larger society – through their participation in local politics and being a local representative supported by women. The reach of the group is more because they operate as a community. The marketing platform provides fair and equitable income to all and they are able to fix quality and price. They get support from individuals and organizations for education of children in schools/colleges and also priority on projects such as solar lights in houses or streets.

"Being a part of the community thus gives women an added meaning in life. It elevates their social status, gives a sense identity, pride and livelihood opportunities. In a society where women dared not move out of the house to participate in public meetings and speak their minds, Maati has succeeded in opening up a new world for them by offering them space to explore their political and creative potential, develop a deeper and wider understanding of issues and given them the confidence to take on leadership roles in the community." (Sruti, 2019)

The ultimate success of the story of Indian crafts lies in whether the artisans own life is enriched by the practice. The lives of the women have changed so radically that once they had no status within their own community, now they hold a privileged position in society.

"The quest for purpose and self expression in life is reshaping the workplace – and the world". (Salenga, 2019) and this is seen in the work of the artisan groups in Munsiyari which are associated with Maati sangathan.

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CO-16

COSTUME NARRATIVES OF A WANDERING TRIBE: THE LAMBANIS

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Abstract

The Lambanis (a.k.a. Lambadis, Romanis, Banjaras) are the nomadic tribes of India. They go from place to place in search of a livelihood. They are said to be the descendants of the Arya Roma Gypsies of Europe, who migrated through the Central Asia and Afghanistan before arriving in the deserts of Rajasthan. Trading in salt and grains facilitated their move to states such as Maharashtra, Karnataka, Telangana. They have their own language, culture and a unique social structure. The wandering gypsies or the Banjaras in their elaborate and colourful costumes have always been very intriguing and full of speculation. Profound mystery shrouds their existence in terms of their costumes, hair style, jewellery, occupation and cuisine. Conspicuous everywhere they travel, they carry with them narratives of their existence and sojourn. Today, the tribe may live on the fringes of society, but, historically, they played a very important role everywhere they went. Their elaborate costume embodies myriad embroidery stitches and colours. This costume has withstood the changes forced upon by modernization and the urge for social acceptance. Today the Lambanis are leading a semi-nomadic life. Settled in small hamlets called Tandas, they now temporarily migrate to different places for economic lucrativeness. The paper focuses on Lambani Community from the viewpoint of effect of modernization on their identity, tradition, and culture. It also examines the impending issues related to young generation drifting away from the tradition and culture of its community as young generations feel uncomfortable to work in the heavy traditional dress thus they have adapted to casual dress, which is slowly detaching them from their traditions and culture. Moreover the craft of Lambani embroidery is not a sustainable source of income for them and hence there is a pressing need for reintroduction and revival of this mesmerizing craft.

Keywords: Lambani, Banjaras, Tradition, Modernization, Tanda.

Introduction

India, a country with diversified cultural heritage, spread widely with myriad cultures, traditions, castes based on their respective professions. Numerous tribes across India continue to wander from place to place for satisfying their biogenic needs of food, clothing and shelter, which they attempt to fulfill through hunting, agriculture, herding, etc. They, therefore, are commonly known as 'nomadic tribes'. The nature of nomadic

tribes in India and the causes of their nomadism, however, are different. It is rather difficult to determine the origin of the various nomadic tribes. Ancient Indian scriptures contain certain references to these tribes. With the changing times, however, the causes of their nomadism too have changed. (Ghatage , 2006)

Many of these cultures are broadly classified as tribal, and they have remained intellectually isolated in an endogenous environment in spite of connections with all the trappings of modern civilisation. For example, they sell their goods at modern Indian markets and use other trappings of modern life, such as mobile phones very comfortably, but culturally and in daily life, they consciously keep themselves isolated from other communities and from urban people, and they try to preserve as many aspects of their ancient lifestyles as they can against the onslaught of modernity**.**(Vahia et al, 2014**)**

Banjara community is one among the twenty seven primitive tribes found in India, which is classified as a nomadic tribe and most colourful tribes.(Rathod, 2014)**.** The Banjara occupy a special place among the tribal population of India. They have preserved cultural and folk arts for three thousand years. They have retained their dialect and also preserved their distinct culture, customs, age old traditions and their colourful costumes and embroidery. But, after the independence of India, gradually many changes have taken place in Banjara's living styles. They have reformed in their age-old traditions and costumes and started taking up education and economic activities due to governments' special facilities and privileges. Enormous changes brought about by various interventions and influences of modernity are also seemingly contributing yet posing formidable challenges to its costume based identity formations. Conversely, most of the traditional aspects are vanishing and shedding their traditional costumes fast.(Nagaveni, 2016)

Lambani: the Etimology

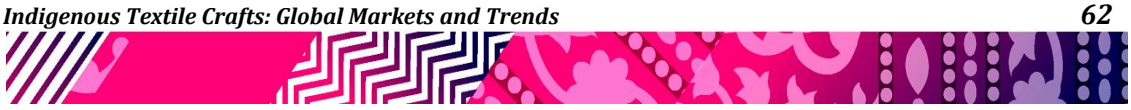
The origin and history of Lambadas or Lambanis is very vague and ambiguous. Their unclear explanations have further complicated the understanding of the historical transition. Despite it, it may be argued that this community has experienced rough weather all through the concomitant processes of migration and transition. Banjara community retains its influence down the centuries to shape and reshape the course of political history in India.
(Nagaveni, 2015)

The Lambanis are a Pan-Indian tribe who are found in almost every part of the country with a descent traced to both their Dravidian and Aryan origins. Lambanis are also popularly known as Banjara who are an ethnic group, involved in the sale of spicy food articles. With a view to meet the needs of the larger rural community these Lambanis are said to have moved from village to village selling these products. The settlement predominantly occupied by this community is known as a "Tanda". (Naik and Narendra, 2001)

The word Laman is derived from the Sanskrit word 'Lavana' meaning salt. The people who transported the salt on Bullocks came to be called laman or lamani. This word then gave rise to Lambani, Lambadi, Laban and labhan etc. (Ramalingareddy, 2018).
The Lambanis were wanderers a long time back, but later on, they were asked to settle down by the Government. They are residing in many areas all around India now, mainly Andhra Pradesh, Karnataka, Tamil Nadu, Maharashtra, Kerala, Goa and of course Rajasthan.

Costume of the Lambanis : an Identity

Costume is a term that bears a silent language which is a bundle of cultural symbols conveying messages at different social and psychological levels. One of the most distinctive



and highly visible features of the Lambani community is their dress. This is more so in respect of the dress used by their women folk. Till very recently they were continuing to weartheir traditional dresses without any exception. No other ethnic community in India follows such a typical dress code like what the Lambanis do.

The dress worn by the Lambani women is generally red in colour and sometimes it is mixed with yellow, greenand other colours. It is mostly a patchwork of different cloth pieces. These dresses are also bedecked with small mirrors and shells and they are nicely crafted through their craftwork. Preparing such dresses needs considerable patience. Artistic sense and tradition go in the slow work of preparing the apparels. It is estimated that it takes a minimum of 4-5 months to prepare a pair of dress. It is interesting to learn about the reasons as to why such a type of dress has been in use among them. It is said that the cloth with mirror work was used to protect them from being attacked by wild animal, when they used to go into jungles or forests for collection of firewood), and to minimize the impact of excess heat on the body. (Ramalingareddy, 2018)

The important constituents of the Lambani costumes are :

The Blouse (Kanchali), Skirt (Phetiya) and Veil or Covering cloth (Chantia).

The Lambani Costume

Phetiya: The Skirt (Source: Sabala Handicraft, Bijapur)

Kanchli: The Blouse
(Source: Sabala Handicraft, Bijapur)

Chantia: The Covering Cloth
Source: Lakshmi Bai, Mariamannahalli

Tradition vs modernity

As the most prominent visual marker of Banjara culture, a women's choice of clothing thus became a contested territory. The choice announced tensions between individual and group identity and between traditional modern values. For traditionalists, to adopt alternate modes of dress such as a sari was to give in to Sanskritization: that is

to adopt the dress and manner of the Hindu majority and to betray the essential qualities of strength and independence that made Banjara special.(Kwon and McLaughlin, 2016)

Many feared that by following this path they would weaken, loose their sense of identity and eventually fade away. For those who hoped to join, mainstream society however, traditional dress marked them as backwards and brought about discrimination and prejudice. Moving beyond tribal identity prepared them to take part in the modern world, with its promise of education, employment and a better quality of life. Renunciation of tribal values was a mechanism to ascend to higher status,(Kwon and McLaughlin, 2016)

There are, however , groups who successfully navigated the strong currents of tradition and modernity and even instances of groups re-articulating in modern setting, a preference for traditional techniques. Maker have become family's primary wage earners, Economic advancement redefines a pride in education and quality of life that comes with secure employment. Such groups decide for themselves under what conditions they will adopt traditional dress and how much of it they will maintain. The key point here is that clothing continues to make cultural distinction because they have value- the clothing is a component of a living tradition.(Kwon and McLaughlin, 2016)

With the passage of time and the impact of globalization, an immense change is observed in the Lambada community. This can be visualized through the habitat, dressing patterns, food, dancing and life style. Most of the Lambadas are still found to be living as groups in huts along with their families. The families live together in their own settlements at a distance from the town or city. These settlements, as already mentioned are recognized as Tandas. This geographical location in which the community lives has become synonymous with Lambadas. At present the situation is slowly changing. Mainly after India becoming an independent nation. The then government started off by giving special privileges and passing polices for the betterment and future development of the scheduled tribes, in which the Lambada tribe is one among them. The basic and much needed policy was reservation policy for the scheduled tribes which has driven them to get jobs, education, loans for business by banks. This seems to have led the community to give up their traditional homes (huts) and settle in well constructed brick houses along with the main stream society.(Vadthy,2016)

These clothes were designed especially for the protection from harsh climate in deserts , forests and to distinguish them from others. With the Lambadas becoming more prone to the societal affairs and the globalization impact seem to have brought a major change on the dress codes, which are greatly altered. In the present times, most of the Lambada women are found to be draped in sarees. Men are found wearing shirts, trousers, jeans and T shirts. Lambadas are said to be having a rich traditional dress which is almost into non usage. A traditional recognition of the community is vanishing.(Vadthy,2016)

Methodology

The present paper is based on data collected from the primary and secondary data sources. Information was collected from primary sources by visiting Sandur and Bijapur in Karnataka, which are inhabited by the Lambanis . Snowball Technique was used to identify the various regions, contact persons and tandas. The tools included Survey,

Interview, field observation , focussed group discussion, regulated note taking, digital photos and video recording.

The data was collected from interviews with elders of the Lambani Community and the NGOS visited i.e Sandur Kushala Kala Kendra and Sabala Handicrafts. Present status of embroidery, efforts towards facilitating, preservation , promotion and dissemination of the costume along with its embroidery for its sustainability was studied using Purposive Sampling Technique and tools such as Interviews, Field observations, Video recordings, Case studies. Secondary sources were also incorporated for the study which included reference books and research journals.

Findings and discussion

A pilot study was done by the researcher to understand the traditional costume and the beautiful craft of embroidery. along with the current status of the craft from the perspective of its sustainability. The researcher contacted Mr Praveen Naik from Sandur Kushala Kala Kendra (SKKK), an NGO at Sandur, Bellary District Karnataka and scheduled a visit to SKKK with the anticipation of meeting the Lambani women in their traditional attire.

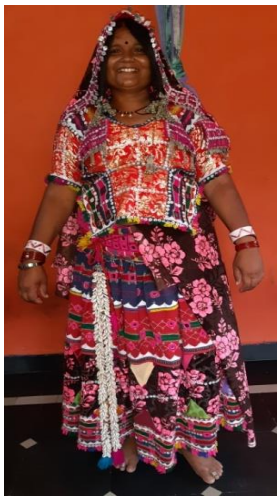
Traditional attire

The traditional costume of Lambanis which is still worn by the older generation The visit to SKKK was very fruitful as it was a composite unit which did spinning, weaving , dyeing, printing ,embroidery and stitching. They had diversified to various products immaculately and deftly embroidered by the 500 Lambani women from 8 Tandas who are associated with SKKK. From the visit it was found that the Lambani women were wearing saris instead of their traditional garb. The corridors of SKKK were filled with Lambani women immersed in their embroidery with just five old Lambani women wearing their traditional wear. The rest of the artisans who were working there wore saris.

Mr Praveen Nayak opined that the traditional attire of the Lambanis has vanished due to the pressing need for social conformity, education , modernization and less seriousness towards the craft. The older generation is still valuing their costume and craft but the newer generations are drifting from their traditions due the above mentioned reasons

Women engaged in embroidery at Sandur Kushala Kala

The Lambanis are a close knit community who reside in small hamlets at the outskirts of the city. The journey continued and a visit was made to the house of Lakshmi Bai at Mariammanahalli Tanda , near Hospet in Bellary District. Mariammanahalli Tanda had 2000 houses but only 100 Lambani women associated themselves with SKKK. A few women engaged themselves in embroidering articles and chose selling them on the streets of the closeby cities.



Lakshmi Bai in a saree and in her traditional costume

Lakshmi Bai has been engaged in embroidery since past 30 years and has had many visits to Delhi, Mumbai, Singapore and United States of America promoting their costumes and embroidery. She also stated that it takes almost one year to embroider and prepare the traditional attire. Hence most of the women own only one set of traditional attire which is usually worn during festivals, dances and exhibitions.

The researcher also visited Bijapur to Sabala Handicrafts which worked with the Lambani women residing in the nearby tandas such as Aainapur tanda, Madabhavi tanda, Minchnna Tanda and Aheri tanda. An interview was conducted with the owner of Sabala Handicrafts Mrs Mallamma Yalawar who is a connoisseur in Lambani costumes and embroidery. She had an excellent collection of Lambani costumes which she had procured over the years from the Lambani women. The retail store at Sabala catered to other handicrafts too as the Lambani embroidered products could not sustain its existence.

Mrs Mallamma Yalawar opined that she was very upset regarding the fact that the Lambanis themselves are now falling prey to modernization and are no more valuing their traditional costume. Their lifestyle has changed they are semi nomads now and settled in tandas with seasonal migrations tracing more lucrative jobs such as sugar cane cutting which fetches them 2-3 lakh rupess in 6 months whereas as the craft of embroidery which their deft fingers have skilled over the years no more fetches them enough to sustain. She also concluded that as the traditional attire is very heavy and cannot be washed on a daily basis . Also they now find it a social stigma to wear their traditional costume as it makes them conspicuous in a crowd and the need to conform to the society and gel with the local people have taken a toll on their costumes.

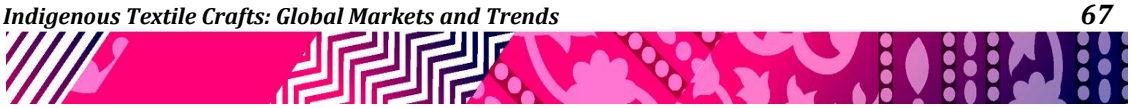
Conclusion

India's rich and innumerable traditional textile crafts are deeply embedded in our culture. Over the past decades due to commercialization and mass production, the hand made products have taken congnisance which has led to a major downfall. Today as the world of fashion is moving in a big way towards retracing and reviving its roots in a war against fast fashion the onus lies on us for reviving a diminishing craft and vanquish the factors that have led to their withdrawal.

The beautiful costume and the craft of embroidery of the Lambanis which is an integral part of their costume has survived the waves of time, transitions in form of migrations and social stigma related to their conspicuous presence due to their costumes.

Also Kwon and McLaughlin stated that ultimately the world will change and so will the Lambanis. The real question is how the Banjara will define who they are and what value they will take with them into future. Perhaps they will make a path for themselves through the taught terrain of cultural identity- just as they always have. Perhaps traditional dress for women will not be cast aside as a marker of backwardness but neither will its absence be viewed as a betrayal.

Finally it can be concluded that the craft and the costume both can be revived through generating awareness and belongingness to the craft amongst the present generation so that they value and treasure their rich heritage. Moreover developing successful business models for them would help them in earning a better income from the craft rather than drifting away to other potential lucrative jobs.



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CO-06

VOCATIONAL EDUCATION: AN APPROACH TO ECONOMIC GROWTH

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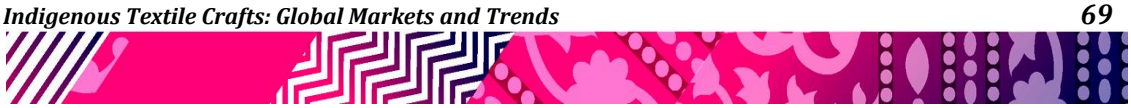
Abstract

Vocational education is inherent in the Indian Philosophy in general and educational process in particular. The concept of " work" is deep routed in Indian culture and aptly described in ancient sculpture as " Yogah Karmasu Kaushalam " meaning that skill in work is yoga. As for educational process, the learning in the Gurukal system took place in a vocational and work environment. The skill training (vocational/technical) is still imparted by the father to son as a family tradition in rural India. Historically, the concept of vocationalization had been used even during the ancient Vedic period in which technical knowledge was transferred from one generation to the next generation. Historically, technical and vocational education and training was viewed as a way of developing manpower for industry, then as a means to improve the creation of human capital and increase productivity and employment. Recently it has been considered as a tool to enhance human development by creating capabilities and putting them to use, for further human development and sustainable growth. Different commissions and committees recommended vocational education at different level of education from time to time. Vocational education has been implemented at school level and Higher education under NSQF. Vocational education has been implemented broadly in major six areas which are as follows: Electronic and telecommunication, Business and Commerce, Agriculture and Animal Husbandry, Home Science and Hospitality Management, Health and Paramedical, Humanities Science and Education. Presently vocational courses under NSQF is implemented through various job roles under different sectors of economy. The sectors related to Home Science are: Apparel, Made-ups and Home Furnishing, Handicrafts and Carpets, Textiles and Handloom, Tourism and Hospitality, Food Processing, Beauty and Wellness. Each sector offers different job roles. For example Apparel, Made-ups and Home Furnishing sector offers 45 job roles i.e. Sewing Machine Operator, Hand Embroiderer, Hand Embroiderer (Addawala), Inline Checker, Fabric Checker, Self Employed Tailor, Specialized Sewing Machine Operator etc. each job role has vertical mobility for higher education, also provides opportunity for wage and self employment.

Key words: vocational education, NSQF, job role, home scien



CO-08

PATKU WEAVING: NARRATIVE OF DIMINISHING CRAFT OF SOUTH GUJARAT

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Abstract

Tribal people form a foremost part of the world population. India has a large number of tribal communities nearly 432, and each tribe has its unique style of weaving and design, which is inspired from nature, social and cultural traditions. In Gujarat there are twenty-eight tribes, majorly Bhil, Garasais, Rathava and Chaudhri. One of the textiles which is worn by Chaudhri tribe is *Patku*. It was made using single Ikat technique and produced by both Hindu and Muslim Khatris weaver. The main characteristic is bold and striped edges. This textile is fading, as the weavers have been shifting to other occupation since the tribal people (Chaudhri) have adopted the contemporary clothing and are leaving behind their traditional *Patku* textile. Moreover, a cheaper (machine made) alternative of *Patku* textile is available in the market. The main objective was to document the existing craft and study the cultural anthropology of the producer and users which would help in understanding the community and their requirements; further help in building strategies for the survival of this woven textile

Keywords: Tribal, Need assessment, Revival strategies.

CO-12

CHALLENGES TOWARDS THE BEGINNING OF NEW ERA OF INDIAN CRAFTSMANSHIP

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Abstract

Indian textile crafts have been integral part of our heritage. Craftsmanship of our artisan is backbone of India's nonfarm rural economy. Artisan's uses indigenous methods of making, traditional skills and technique to make a handmade products which is widely popular in Indian as well as in international markets. The uses and knowledge of traditional skills and techniques is incomparable with any other occupation. In the era of digitization and quick production, hand craftsmanship is getting dissolved as it demands more time and money. The involvement of artisan in making a product is way high than

the wages they get in return which leads their involvement in other occupation to earn their livelihood. During a visit to cluster areas of Barmer, Rajasthan artisan working in the area of appliqué craft shared their story of not teaching the craftsmanship to their younger generation. As per the artisan it is getting difficult to earn for their livelihood only by doing crafts. They are preferring to give regular education to their children's and make them involve in some other occupation because that provide continuous and regular incomes. Reason behind this may be competition of market, globalization and also due to deteriorating socioeconomic condition of master craftsman/ artisan, that's why skills are not being pursued by young generation. So what is lacking behind is the biggest question. This paper will be focusing on the challenges and issues faced by artisan in the field to maintain their heritage and skills.

CO-14

EDUCATION FOR ARTISANS: BEGINNING A SUSTAINABLE FUTURE FOR CRAFT TRADITIONS

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Abstract

In India today, craft is perceived as an inferior form of manufacturing and artisans are perceived as skilled laborers. The introduction of design as "intervention," contributed to this perception. With little to no opportunity for creativity or recognition, artisans are leaving craft. After many years of studying and working with artisans of Kutch, a desert region in western India, the author began a program of education for artisans. The course teaches traditional artisans design, and enables them to gain respect and income. Underlying this concept are the beliefs that craft is cultural heritage, and money is not the ultimate goal. Fourteen years have demonstrated graduate artisans' success in the market. Moreover, artisan designers embody the ideal expressed in Klamer et al's Creative Craft Culture. They articulate goals of recognition, preserving tradition, and community. Traditionally, Kutch artisans created within a community-based horizontal social structure, in which artisans were economically and socially equal. However, as craft is pushed into the world of cash economy and industrialized scaled-up production, the structure of artisan societies inevitably changes from horizontal to vertical. The author invites us to address the next frontier of Creative Craft Culture: to cultivate commensurate artisan-oriented markets.

CO-17

ROYAL ELEGANCE OF KACHCHH: UNVEILING THE HISTORY & EXPLORING THE MYSTERY

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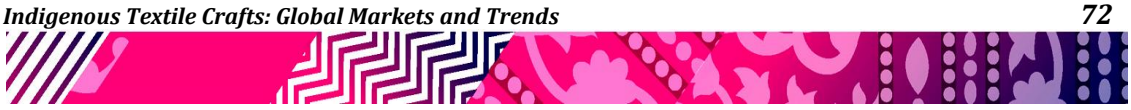
Abstract

Regal costumes of different states have always been a part of the individual's curiosity. The uniqueness, the elegancy of costumes and textiles has always attracted humans. The present paper aims towards the popularization of the costume heritage of Kachchh Royalty. As the moving images are always noticeable, a sincere effort has been made for an animated documentary of the traditional royal costumes of Kachchh and the craft patronized with royalty. The animated documentary has captured the attention of populace and it assists them in understanding the know-how of the costumes of royalty. The technological advancement helps to create an interactive learning aid too which could be also used as an educational resource and it would serve as instrument for studying the costumes of Kachchh royalty with great interest. Further the digitization of the crafts practiced in Royal Court of Kachchh would preserve the rare regal textiles and costumes. The artisans who served at Court of Kachchh would come to light and get a proper market for their efforts. The appropriate use of technology for "Unveiling the history and exploring the mystery" was the focus behind the whole.

Keywords: Animated documentary, Costume Heritage, Digitization, Kachchh, Popularization, Technology.



Craft Economics (Poster)

CP -02

THE TRADITIONAL GARMENTS PRESERVED IN THE TEXTILE ART MUSEUM, THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA, VADODARA

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Abstract

Indian traditional costumes are truly fascinating. It is incredible how ancient practices and traditions have continued since time immemorial. It is necessary for cultural heritage information, in all its forms to be preserved. Valued and conveyed for the reference of the future generations and it cannot advance without consistent and reliable access to information sources. This study was an endeavour to document unique characteristic features with in terms of origin, articles, fabric, fabric colour, surface ornamentation, seams, stitching, present condition and description. The descriptive and analytical research design was planned to accomplish formulated objectives. The relevant data was procured through secondary sources. The documentation of the traditional garment's artifacts was done through preparation of the catalogue supplemented with photographs. This study provides a long term compact and easy access, which can be a valuable reference and research tool for researcher, further designer and connoisseur of this field.

Keywords: Traditional, Garments, Museum, Historical costume

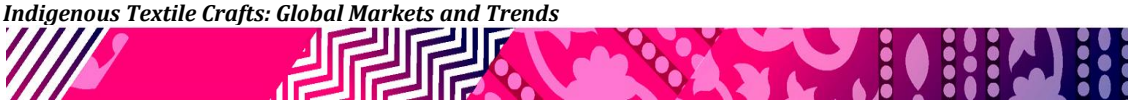
1. Introduction

Clothes are natural to men and their proper decoration on his unclothed body is not ugly, on the contrary it is beautiful and pleasing. History testifies that man has throughout been inventing and creating for their fulfilment. It is, therefore that his essential love of nature has been manifest directly or indirectly in all such creations. His needs, his socio-geographical environment, his economic status is all fully represented therein. Particularly, among these, his costumes show the utmost influence of the social life, the seasons and his field of work. (Bhatnagar, 2004)

Textiles have been produced in India since antiquity. However, very few of the old textiles still exist. One reason is that cloth has long been regarded solely as an article of consumption, rather than as an art form, and designs are lost through everyday wear and tear.

The Indian village of now bears little resemblance to its predecessor of about four thousand years ago. Yet the bulk of early styles of costumes, such as embroidered, painted, dyed and printed textiles, may be described as genuine traditional art in the original sense of the term.

Another factor, which played an equally important role in the development of traditional Indian textiles and costumes over several thousand years, is the country's



geography. In the cultural and historical sense, India constitutes a vast subcontinent of strongly contrasting physical features and corresponding variations in climate. (Bhatnagar, 2004)

From the earliest period of Indian proto history, the Harappa culture, the evidence about textiles and dresses is scant but not unimportant. The survival of an actual fragment of cotton cloth, and the upper garment draped around the body like a shawl.

The earliest clothes were made of vegetable bark and animal skins and subsequently of felted fibers and woven yarns. Most ancient peoples living in hot climates wore lengths of cloth draped over the body. The Egyptian mantle, the Abyssinian, Syrian and African shama, the Jordanian loin-cloth, the Greek himation, the may be called "core" garments whose shapes and silhouettes developed regionally along Roman toga and the Indian dhoti and sari are all unstitched lengths of fabric wrapped around the body in different ways. Fabrics were also stitched together to produce what may be called “core” garments whose shape and silhouette developed regionally along the same instinctive lines as the unstitched cloth. The tunic, skirt, and trouser which were originally designed for purely functional purposes evolved into more sophisticated and decorative items of clothing.

What a person wears are often indicative of his or her personal and social identity, marital status, occupation and sometimes even religion. The flavor of Indian costume is sensed through movement, drape and detail. No less important is the association of the colour of apparel with custom and ritual. (Kumar, 1999)

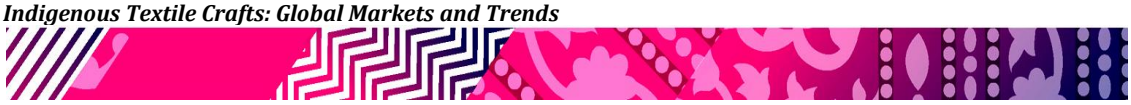
2. Purpose of the Study

India has a treasure of traditional garments, which can be adapted to bring individuality glamour and style to modern fashions. India has record of unbroken living vibrant traditional garments which needs to be preserved. There is no doubt that every effort to be taken to revive the traditional styles, for that paper patterns and drafting instructions were needed to preserve it. Keeping artifact in the museum is one way of preserving it.

The Department of Clothing and Textiles has very valuable collection of traditional garments. The main purpose of the proposed research was to document the identifying features and development of drafting instruction and paper pattern of the traditional garments’ artifact preserved here.

The researcher was interested in carrying out a study in the aspects of database by using reliable and economic means of modern technology. The researcher had made a catalogue which would provide other researchers and students information about traditional garments. A museum cannot display all the artifact all the time. So, making a catalogue of these was providing a long term compact and easily accessible product which can be invaluable reference and research tool.

This research was an endeavour to make the traditional garments known to even common man with respect to its characteristic details, original name, identifying features such as its origin, fabric, fabric colour, stitching, seams, surface ornamentation, closures, present condition and other description.



3. Objectives of the Study

- To study and analyse the traditional garments from the collection present in the Textile Art Museum.
- To develop the drafting instructions and paper patterns of the blouses.

4. Method of Procedure

The main objective of the research was the documentation of the traditional garments which are preserved in the "Textile Art Museum" of the Department of Clothing and Textiles, Faculty of Family and Community Sciences, The Maharaja Sayajirao University of the Baroda, Vadodara. The type of research was descriptive as well as analytical.

Museum's traditional garment artifacts were cultural resources for the nation, which provides base line information about the lives and history of people and groups throughout the nation. To obtain the relevant literature, the investigator visited the libraries and museums of Gujarat.

The investigator browsed websites with the help of search engine to collect the review of literature. Various books, brochures, leaflets, articles published in magazines and unpublished dissertation were mainly referred which served the purpose for identifying, understanding and studying the artifact in the collection.

The researcher did a thorough study of all the traditional garments from the secondary source. Historical details, origin, significance etc. was also done. Based on the knowledge obtained through the secondary data, the researcher then analyzed the artifacts present in the Textile Art Museum in terms of catalogue no., artifact, origin, fabric, fabric colour, stitching, seams, surface ornamentation, closure, present condition, description and measurement of the garment.

Total 63 garments were selected for analyzing from the traditional garments of the 'Textile Art Museum'. For this research paper 11 traditional garments were taken. The garments were classified on basis of gender i.e. male and female.

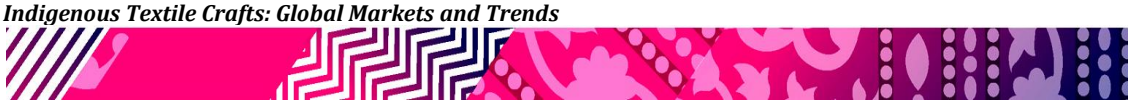
Relevant data was collected through primary as well as secondary sources. Primary data collected through observation method was applied to documentation of the traditional garments of the "Textile Art museum" of the Departments of the Clothing and Textiles. The photography was captured through Nikon D1300 18 to 50 Mega pixels. The photography was done in proper light. The artifact was placed on the mannequins or flat on the table. The front and back of each artifact were photographed.

Data through the secondary source was collected from the books, journals, dissertation, thesis, magazines and through various websites. After observation and taking measurements of the actual traditional garments, drafting instructions were developed and converted into paper patterns for only blouses.

5. Result and Discussion

In the study garments were broadly classified according to the gender they belonged to. Then the collection of relevant data which would aid the researcher with the information required. Throughout analysis and description of each artifact was carried out by the researcher.

The researcher did a thorough study of all the traditional garments from the secondary source. Historical details, origin, significance etc. was also done. Based on the knowledge obtained through the secondary data, the researcher then analyzed the artifacts



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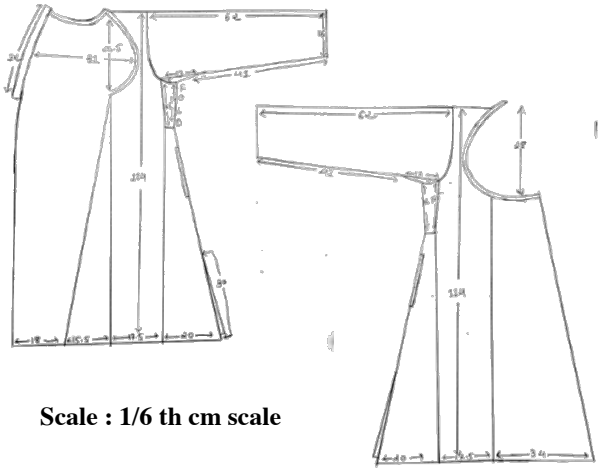
5.1 Male Garments

Sr. No. 1



Scale : 1/6 th cm scale

Plate 1: Angarkha's front and back with its illustration

- **Catalogue No:** G 68
- **Artifact:**Angarkha
- **Origin:** Uttar Pradesh
- **Fabric:** Tissue
- **Fabric colour:** Golden, Peach, Silver
- **Fabric construction:** Plain woven brocade fabric
- **Stitching:** Machine Stitch
- **Seams:** Flat & fell seam
- **Surface ornamentation:** Golden lace
- **Closures:** String, Potali buttons
- **Present Condition:** Torn & hole observed.
- **Description:**Angarkha had A-line silhouette with side slits. It was double breasted garment with full front opening. It was kalidarangarkha and had side seam pocket on both the side. There was a gusset attached with sleeves and side

seams and sleeves were full length sleeves. It had golden lace and peach coloured piping all over the garment.

Sr. No. 2

Scale : 1/6 th cm scale

Plate 2: Angarkha's front and back with its illustration

- **Catalogue No:** G 100
- **Artifact:**Angarkha
- **Origin:** Rajasthan
- **Fabric:** Muslin
- **Fabric colour:** Off white
- **Fabric construction:** Plain woven fabric
- **Stitching:** Machine Stitch
- **Seams:** Plain seam with neat edge machining.
- **Surface ornamentation:** ---
- **Closures:** Tie strings
- **Present Condition:** Good
- **Description:** Angarkha reached till the floor length and was double breasted garment. It had patch pocket on left side of the front. Angarkha had full front opening with tie string on centre front line. Gusset was attached with sleeves and side seams also. It was high necked garment with 2.5 cm bias piping on the neckline, centre frontline, sleeve hemline and Angarkha hemline. The sleeve was set-in sleeve of full length. The lower portion below the chest had numerous kalis and those kalis had 1 cm wide several knife pleats.

Sr. No. 3

Scale : 1/6 th cm scale

Plate 3: Jamo's front and back and its illustration

- **Catalogue No:** G41
- **Artifact:**Jamo
- **Origin:** Gujarat
- **Fabric:** Mulmul
- **Fabric colour:** White
- **Fabric construction:** Plain woven fabric
- **Stitching:** Machine Stitch
- **Seams:** Plain seam
- **Surface ornamentation:** ---
- **Closures:** Tie Flap & strings
- **Present Condition:** Stain observed
- **Description:** Jamo was worn by the Parsi priest which was double-breasted floor-length garment. It was high necked garment with stand collar. Jamo had full front opening. The sleeves of Jamo was full length sleeves. The lower portion from the waist had five kalies and those kalies had gathers.

Sr. No. 4

Scale : 1/6 th cm scale

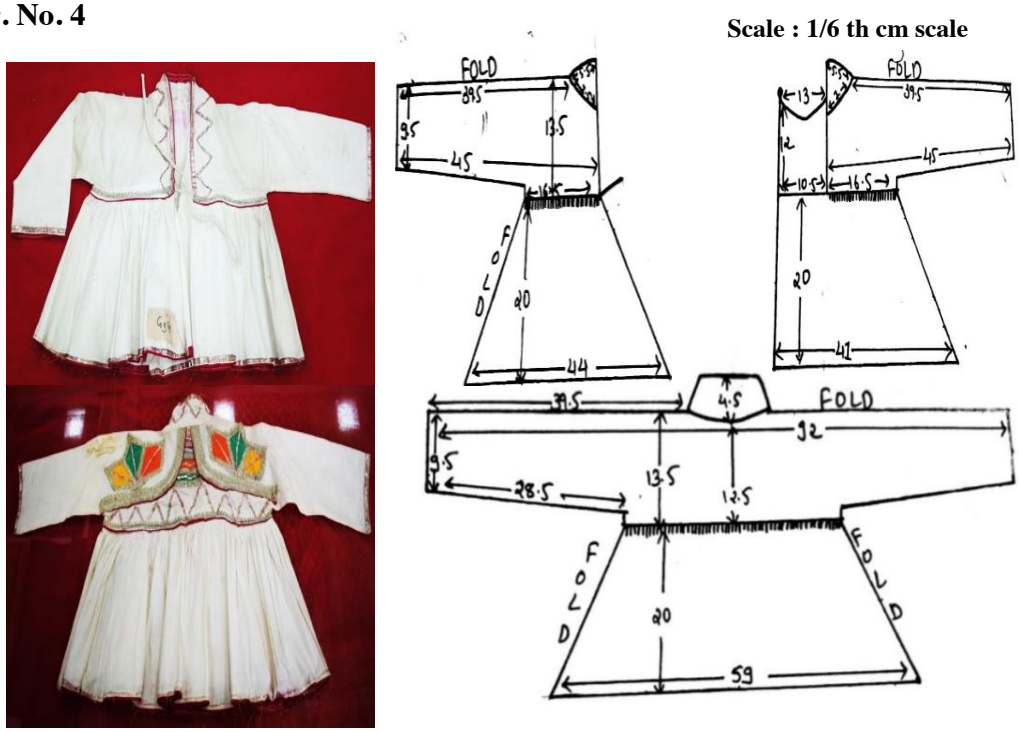


Plate 4: Kediyu's front and back and its illustration

- **Catalogue No:** G2, G3
- **Artifact:**Kediyu
- **Origin:** Gujarat
- **Fabric:** Clip spot, Cotton
- **Fabric colour:** Green, White, Red
- **Fabric construction:** Plain woven and dobby woven fabric

- **Stitching:** Machine Stitch
- **Seams:** Plain seam
- **Surface ornamentation:** Golden lace, Patch work at back side
- **Closures:** Tie string
- **Present Condition:** stain observed
- **Description:** It was a double breasted 'Kediyu' in green coloured dobby woven fabric. This 'Kediya' reached above the waist. It had a yoke, just below the armhole and there were gathers. It had a golden ribbon and a red coloured piping. It had a shawl collar till the yoke. The 'Kediya' had a cotton lining in the yoke only.

Sr. No. 5

Scale : 1/6 th cm scale

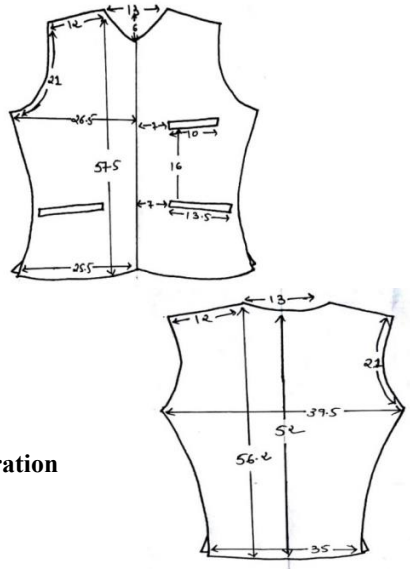


Plate 5: Jacket's front and back and its illustration

- **Catalogue No:** G 42
- **Artifact:** Jacket
- **Origin:** Rajasthan
- **Fabric:** Brocade
- **Fabric colour:** Light pink & Golden
- **Fabric construction:** Jacquard woven fabric
- **Stitching:** Machine Stitch
- **Seams:** Reversible
- **Surface ornamentation:** ----
- **Closures:** Buttons
- **Present Condition:** Torn at side seam
- **Description:** This was a sleeveless jacket in brocade. It had full front opening and the neckline was round which was loose fitted. It had a welt pocket on the left side of the chest. It also had two welt pockets on the lower side of the jacket considerably above the hemline

Sr. No. 6

Scale : 1/6 th cm scale

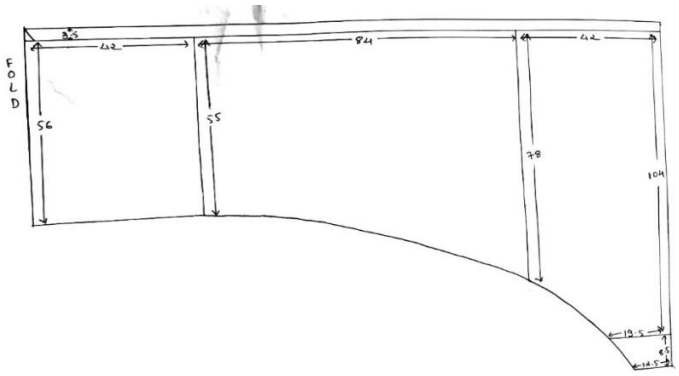


Plate 6: Chovano's Front and Back and its illustration

- **Catalogue No:** G83
- **Artifact:** Choyno
- **Origin:** Gujarat
- **Fabric:** Cotton Polyester
- **Fabric colour:** White
- **Fabric construction:** Plain woven fabric
- **Stitching:** Machine Stitch
- **Seams:** Plain seam
- **Surface ornamentation:** -----
- **Closures:** String, buttons
- **Present Condition:** Stain observed.
- **Description:**Choyno was worn by the men of ahir community. It had casing at the waist to pass the string. It had 8 panels, joined with plain seam. Mori was a continuous part of it which was finished with a facing. Mori was closed with the help of button and handmade loop of cotton yarn.

Sr. No. 7

Scale : 1/6 th cm scale

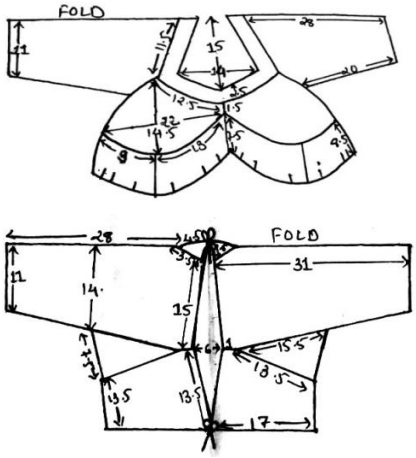


Plate 7: Blouse's Front and Back and its illustration

- **Catalogue No:** G6
- **Artifact:** Blouse
- **Origin:** Gujarat
- **Fabric:**Jacquard woven satin fabric
- **Fabric colour:** Green, Yellow, Red
- **Fabric construction:** Jacquard woven fabric
- **Stitching:** Machine Stitch
- **Seams:** Plain seam
- **Surface ornamentation:** Golden ribbon
- **Closures:** Tie string
- **Present Condition:** Good
- **Description:** This was a katori Blouse with golden ribbon stitched all alone the shape of the katori. The neckline was in plain yellow satin fabric on a true bias grain. The hemline if the sleeve had a golden ribbon attached to it. The hemline of the Blouse had a 0.5 cm bias piping in black collar. The Blouse was backless. The lower portion of the katori had form 1cm wide knife pleat on one side

Sr. No. 8

Scale : 1/6 th cm scale

Plate 8: Blouse's Front and Back and its illustration

- **Catalogue No:** G66
- **Artifact:** Blouse
- **Origin:** Uttar Pradesh
- **Fabric:** Organza
- **Fabric colour:** Golden and Green
- **Fabric construction:** Rib Woven fabric
- **Stitching:** Machine Stitch
- **Seams:** French seam
- **Surface ornamentation:** Machine embroidery, Fabric buttons
- **Closures:** Buttons
- **Present Condition:** Perspiration stains and holes observed
- **Description:** It has pleated puff sleeve. Three pleats at the centre front on both the side with front opening. Cotton lining was used. There was a welt pocket in the front on right side. Single waist dart at the back and front. Piping on neckline

and sleeve hemline. The Blouse had machine embroidery along the neckline, centre front and hemline of the sleeve.

Sr. No. 9

Scale : 1/6 th cm scale

Plate 9: Kapdu's Front and Back and its illustration

- **Catalogue No:** E66
- **Artifact:**Kapdu
- **Origin:** Gujarat
- **Fabric:** Satin, polyester
- **Fabric colour:** Red, Green, Orange, Pink
- **Fabric construction:** Plain woven, Twill woven and jacquard woven fabric
- **Stitching:** Machine Stitch
- **Seams:** Plain seam
- **Surface ornamentation:** Embroidery and rick rack
- **Closures:** Tie string
- **Present Condition:** Abrasion and Perspiration Stain observed.
- **Description:** Kapdu was a straight cut garment. The front of is shorter than the back. The front was full embroidered by hand. It had a yoke. The sleeves had 2-inch-wide Flap with a gusset. Kapdu had 9.5 inches long back opening. The side seams had slits and right slit had inside pocket on front. The neckline was V-shape. White rickrack and lace were used as surface ornamentation.

Sr. No. 10

Scale : 1/6 th cm scale

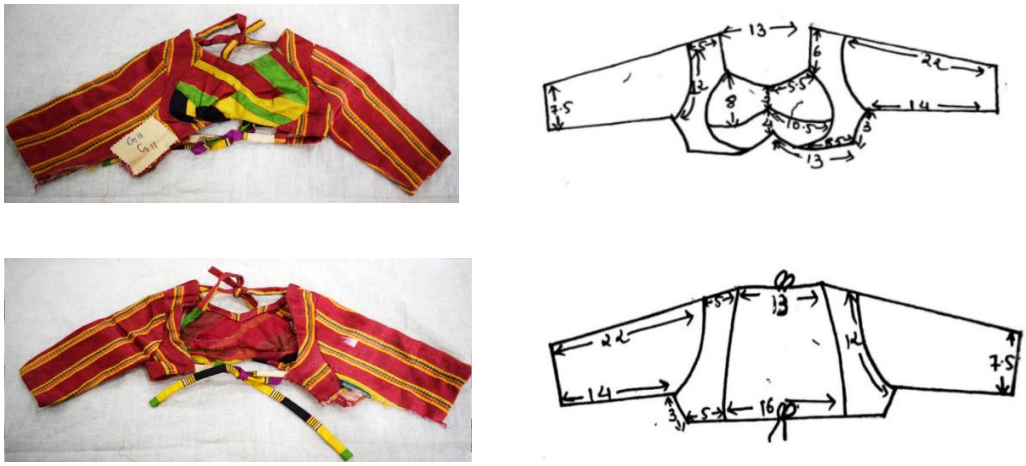


Plate 10: Blouse's Front and Back and its illustration

- **Catalogue No:** G 11
- **Artifact:** Blouse
- **Origin:** Gujarat
- **Fabric:** Striped Mashroo
- **Fabric colour:** Maroon, yellow, green, black
- **Fabric construction:** Satin woven fabric
- **Stitching:** Machine
- **Seams:** Plain seam
- **Surface ornamentation:** -
- **Closures:** Tie String
- **Present Condition:** Unstitched
- **Description:** These was a katori Blouse and had a bask. The sleeve was set in sleeve and the length was till the elbow. The Blouse back was backless. It had back opening with the tie string as a closure.

Sr. No. 11

Scale : 1/6 th cm scale

Plate 11: Ghagra's Front and Back and its illustration

- **Catalogue No:** G 107, G 108
- **Artifact:** Ghaghara
- **Origin:** Rajasthan
- **Fabric:** Cotton printed
- **Fabric colour:** Green, Red, Cream
- **Fabric construction:** Plain woven fabric
- **Stitching:** Machine Stitch
- **Seams:** Plain seam
- **Surface ornamentation:** ----
- **Closures:** The string
- **Present Condition:** Good

- **Description:** The Green, Red, Cream Ghaghara was an eight kalis Ghaghara with two pleats per kali at the waist. There was a waist Flap at the waist. The hemline of the Ghaghara had a wide bias folding with a narrow plain red coloured bias piping.

6. Conclusion

India is a land of rich traditional costume which needs to be preserved. Documentation and digitization of these costumes will provide long term easy access to the data and will also serve as ready reference as this tradition will deteriorate over the period of the time and museum cannot display all the artifacts. Today making a catalogue of these will provide a long term compact and easily accessible product which can be invaluable reference and research tool. This computerized documentation will facilitate the museum to managerial as well as curative work and also research, publication and proper public access to the collection. The research would provide educational resource both within the university and beyond. This documentation and digitization would make available the comprehensive information with images and 1/6th cm scale flat pattern of each garments in the Textile Art Museum, The Maharaja Sayajirao University of Baroda, Vadodara. The development of drafting instruction and paper pattern for the preservation of its originality in terms of flat pattern were also developed during this study.

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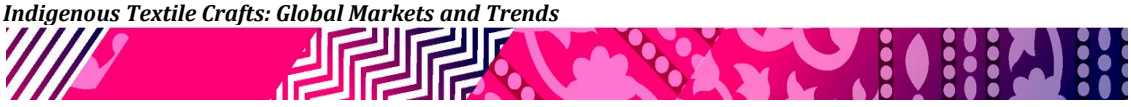

CP-03

EMPLOYMENT AND WOMEN EMPOWERMENT – A CASE STUDY ON CRAFT SKILL EDUCATION

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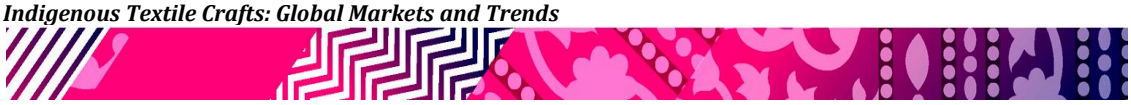
Abstract

Skill development is a key to success which improves productivity, employability and earning opportunities. Skill may be defined an ability to carry out a task within a given amount of time, energy, or both. In general there are two types of Skills – first, General Skill which includes time management, teamwork and leadership, self-motivation etc. Second, Specific Skills which represents specific job abilities like – gardening, tailoring, beautician, cooking, craft making etc. Skill development acts as an instrument to improve the overall effectiveness and empowers an individual to work with more efficiency. Today, skill development is considered as an important and indispensable tool for women empowerment. Women Empowerment is a dynamic growth process, which includes awareness, skill development, education, participation etc. Education is a process of acquisition of knowledge, skills, values, belief and habits. There is a close relationship between education and skill development, education and economic development, education and social development and education and human development. India has always known as the land of portrayed cultural and traditional vibrancy through its conventional arts and crafts. In present time, Indian craft especially to folk and tribal craft work are very like in Indian market and also to in global market, because of its traditional aesthetic sensibility and authenticity. So the present paper, entitled "***Employment and Women Empowerment – A Case Study on Craft Skill Education***" discuses on relationship between education, skill development and employment of women through the case study on those girls, who takes training in the field of craft development through various workshops and training programs and makes opportunity for earning and employment.

Key words: Skill, Education, Employment, Empowerment

I. Introduction:

Education of women in India is influenced by several factors and forces such as social class, caste, area of residence, job opportunities, awareness structure, family environment etc. and there is a close relationship between education and development. Formal and Non formal both education systems universally recognized as a central component of human capital and provide employment to the workforce at various levels and sectors such as Banking, Medical, Engineering, Agriculture, Handicraft, Handloom, Food Industry, Media Industry, Garment industry etc. Non formal education is an alternative to the formal education system which is viable, forwarded looking, feasible and cost effective. Women are an integral and important component of the total workforce of any country. Due to modernization, urbanization, globalization and



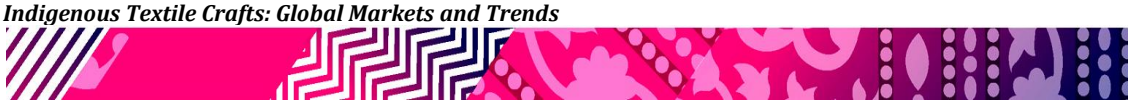
uplifting of educational facilities women are also more aware and career oriented for employment in various new fields**.** No doubt from the last few decades, the employment status of women has gone through a remarkable change. Now they are willing to take risk for establishment of different dimensions of employment. In general Employment means monetary payment or rewards for the work in exchange.

According to censes of 2011-12, around 28.5% women are enrolled in engineering /Technology, 40.2% in IT and computer, 35.6% in management and 32.0% in law and 3.85% in medical field. Over all 45.9% women are enrolled in undergraduate programs while 42.3% women are enrolled in post graduation programs and 40.5% women are enrolled in research programs. Thus be may concluded that, enrollment of women in different education program has continue increases in comparative to past decades. Now a day's women are also choosing non formal education system for better career and employment such as vocational education, skill education, craft education and ITIs. Today, craft skill education is considered as an important and indispensable tool for women empowerment because craft skill education is a key to success which improves productivity, employability and earning opportunities. Skill development acts as an instrument to improve the overall effectiveness and empowers an individual to work with more efficiency. A research by ***Mayoux (1998)*** shows that, perception of educated women and their contribution in household income and family welfare. ***Golla (2011)*** mention in their article "women's economic empowerment" is that, empowerment is measuring through economic growth, poverty reduction, health, education and welfare. Women Empowerment mean, freedom of work, freedom of decision power, respect their personality, respect and support their job in society and equal rights. In other words, Women empowerment means women to take their own decisions without any pressure and limitations. Women Empowerment is a dynamic growth process, which includes awareness, skill development, education, participation etc. For the socio-economic development of any society, women empowerment is essential. Education is a process of acquisition of knowledge, skills, values, belief and habits.

There is a close relationship between education and skill education, education and economic development, education and social development and education and human. India has always known as the land of portrayed cultural and traditional vibrancy through its conventional arts and crafts. In present time, Indian craft especially to folk and tribal craft work are very like in Indian market and also to in global market, because of its traditional aesthetic sensibility and authenticity. So the present paper, entitled "***Employment and Women Empowerment – A Case Study on Craft Skill Education***" discuses on relationship between education, craft skill development and employment of women through the case study on those girls, who takes training in the field of craft development through various workshops and training programs and makes opportunity for earning and employment.

II. Review of Literature:

Today, skill development is considered as an important and indispensable tool for women empowerment. ***Ahamad T. & Sinha A. (2016):*** shows in their article "women empowerment through skills development & vocational education" that, skill is the bridge between job and workforce. Skill development is a key to improving household productivity, employability and income earning opportunities for women and enhancing sustainable development and livelihoods. ***Fatima N. & Sharma E. (2017):*** concluded in



their article "Empowerment of rural women through skill oriented training" that, skill development through short term training programs is an effective strategy for improving the socio economic status of rural women. ***Purwar S. & Devodiya S. (2018):*** highlighted in their article "Women Empowerment and Skill Education" that Skill development program works as a multi tasking skill action, because it helps to increase confidence level; productivity, positive thinking. ***Shetty S. & Hans B. (2019)*** concluded in their study that, skill development has to be an integral part of education.

III. Objectives:

The objectives of the paper are:

- To highlight craft skill education and its linkage with the employability
- To highlight craft development activities and earning opportunity
- To highlight relationship between skill education and women empowerment
- To highlight no. of enrolled girls students in Diploma program of Fashion Design in the Centre of Fashion Design & Technology, UoA, Prayagraj
- To highlight enrolled girls students in Diploma program of Fashion Design in Home Science department, Vasant Kanya Mahavidhyalaya, Varanasi

IV. Methodology:

The paper is based on case study. Information were collected from the secondary data from the Center of Fashion Design & Technology, University of Allahabad, Prayagraj and Home Science Department, Vasant Kanya Mahavidhyala, Varanasi

V. About the Centre of Fashion Design & Technology, University of Allahabad, Prayagraj

Centre of Fashion Design & Technology is a part of Institute of Professional studies, university of Allahabad, started in 2002. Presently this centre is running different professional programs in the field of Fashion Design & Technology for the girls students such as: Diploma program, UG program and PG program

VI. About the Home Science Department, Vasant kanya Mahavidyalya, Varanasi:

Vasant Kanya Mahavidhyalya, Kamachha, Varanasi, affiliated to Banaras Hindu University was established in 1954. Presently 14 subjects are running in UG level and 5 subjects in PG level and PhD program. Department of Home Science is also running one year diploma course in fashion designing, sponsored by UGC.

VII. Tabulation and Analysis

Table: 1 Showing data of enrolled girl students in diploma program of Fashion Design

Educational institutes → / Year ↓	Centre of Fashion Design & Technology , University of Allahabad	Home science Department, VKM, Varanasi
2013	40	26
2014	39	25
2015	38	28
2016	36	27
2017	35	26

Source: CFDT, University of Allahabad and HomeSci. Department, VKM, Varanasi

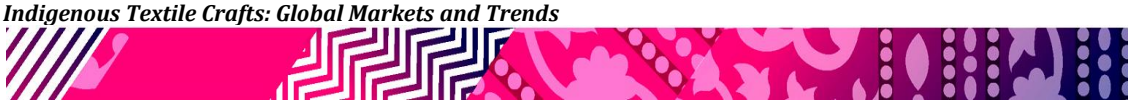


Table no. 1 is showing enrolled no. of students in diploma program of Fashion design in both educational institutes

Table: 2 Showing participation of girl students in Craft Skill Training Programs, conducted by the Centre of Fashion Design & Technology (CFDT), University of Allahabad,				
Year	Name of craft skill training program and no. of participated girls students			
2013	Folk Art	Bead work	Macramé work	Block print
	32	30	32	31
2014	Tie & dye	Folk art	Macramé work	Appliqué work
	30	31	30	25
2015	Folk art	Emb.	Crochet	Ribbon craft
	32	32	30	28
2016	Jewelry	Folk art	Smocking	Mirror work
	26	27	25	25
2017	Clay art	Folk art	Emb.	Patwa work
	22	25	28	25

Source: CFDT, University of Allahabad

Table 2 is showing details of training programs conducted by the centre of fashion design & technology for the students of diploma program in different years.

Table: 3 Showing data of total selling of the product in annual exhibition of the Centre of Fashion Design & Technology, University of Allahabad,			
SR.no.	Year	Selling of the product (in Rs)	Profit margin (in %)
1	2013	1,67,845	45%
2	2014	1,55, 630	42%
3	2015	1,52, 710	40%
4	2016	1,56,800	43%
5	2017	1,48, 830	41%

Source: CFDT, University of Allahabad

Table: 3 showing data of total selling of the product (in Rs.) through annual exhibition, conducted by the CFDT, UoA in different years. Table is also showing per yr profit margin in percentage.

Table: 4 Showing participation of girl students in Craft Skill Training Programs, conducted by the Home Science Department, Vasant Kanya Mahavidhyalaya, Varanasi				
Year	Name of craft skill training program and no. of participated girls students			
2013	Dyeing	Block printing	Bead work	Embroidery
	25	25	25	25
2014	Madhubani art	Macramé work	Clay work	Mirror work
	23	23	23	23
2015	Patwa work	Embroidery	Warli painting	Ribbon craft
	27	27	27	27
2016	Jewelry making	Saura art	Smocking	Mandana art
	25	25	25	25
2017	Bead work	Flower making	Jewelry making	Patwa work
	24	24	24	24

Source: Home Science Department, VKM, Varanasi

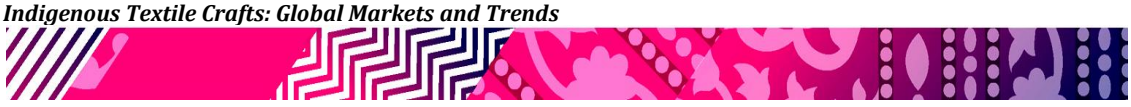


Table 4 is showing details of training programs conducted by the Home Science Department, Vasant Kanya Mahavidhyalaya, and Varanasi centre for the students of diploma program in different years.

Source: Home Science Department, VKM, Varanasi

Table: 5 showing data of total selling of the product (in Rs.) through annual exhibition, conducted by the Home Science Department, VKM, Varanasi in different years. Table is also showing per yr profit margin in percentage.

VIII. Finding and Conclusion

Rich Knowledge base skill act as the driving force for the economic growth and social development of any country. Skill development program works as a multi tasking skill action, because it helps to increase confidence level; productivity, positive thinking, management skills, employability skills, personality skills and behavioral skills. Youth energy may be defined as the driving force for social and economic development of any country, especially in the case of girls. Educating girls is one of the most powerful tools for women's empowerment. Education provides women with the knowledge, skills and self confidence. They need to seek out economic opportunities. So, skill education program helps the youth to get employment and increase their entrepreneurship in the current world. Today, India moves towards the 'knowledge economy' and women's participation can be increased by the well focused training programs. So, it is important for it to focus on the advancement of the skills. In this direction Indian government already started many policies such as **"National Policy on Skills (2009)",** with the objectives of:

- To establish industrial training institutes (ITI's), vocational schools, technical schools, polytechnics and professional colleges in all over country and
- To facilitate adult learning programs, apprenticeships, sector-specific skill development program, e-learning and self employment training programs.

In this direction, present government had started many skill development schemes at national level and state level like – Craftsmen training scheme, Green skill development program, Kaushal Vikas Yojana, One District One Product (ODOP) and many more.

Empowering women are socially, economically, educationally, politically and legally important for socio-economic development. Many times it has been proved that, women are capable to manage opportunity. Through Skill education more opportunities can be produced for women's employment. In the context of future vision, both educational institute (CFDT and VKM) conducting fruitful and promoting craft skill training/workshop programs, for the students of fashion design and provide market linkage opportunities from last few years. These programs may be helpful in getting better opportunities to youth women.

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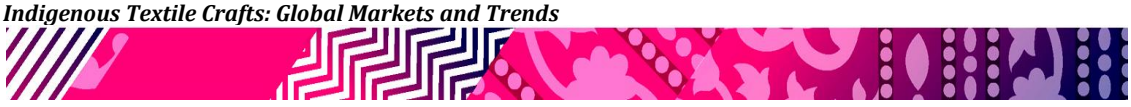

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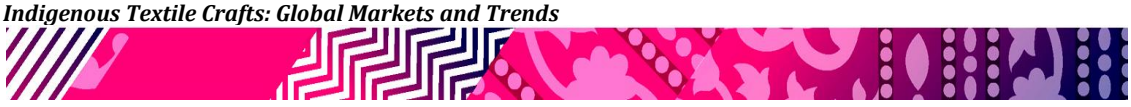

CP-09

CHALLENGES FACED BY NON-REGISTERED *ZARI* EMBROIDERY UNITS IN UTTAR PRADESH

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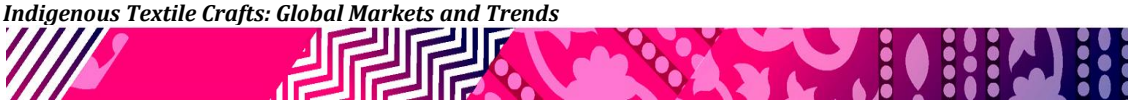
Abstract

The tendency to wear Indian *zari* embroidery products among Indian and western women is increasing. There is strong domestic market as well as growing export market. Also there is good scope of product diversification according to fashion dynamics. Bareilly (Uttar Pradesh) is one of the noted places for *zari* embroidery work performed mainly in tiny scale unit operating at artisans' household. A survey was conducted in different clusters of Bareilly district using interview schedule. It was found that the major population engaged in this craft is Muslim. As per the data collected from MSME Bareilly district, there were total 212 *zari* work units located in different areas of Bareilly. Besides, there were also noticeable numbers of non-registered (work-from-home) *zari* units working in different areas of the city. These units were not registered under any Government organizations therefore, were not eligible to get benefits offered through any government scheme and policy.These units were facing number of threats and challenges like no labeling of product, no quality checking of raw material and finished goods, no innovation in designs and production techniques, no extent to market information, workers were getting paid as per the individual product, wages were low as the profit distributed among number of workers engaged in the work equally, high state of decentralization, lack of access to credit, lack of empowerment, inadequate infrastructure and technology, competition from machine made products etc. As the art of *zari* has been known from Vedic times and associated with the rich and glorious history of India therefore it is important to restraint this craft from extinction. The issues and challenges facing by the units can be tacked through appropriate policies measures and developmental activities through planning awareness drives and trainings for such units to draw them into mainstream of handicraft sector.

Keywords: cluster, embroidery, work-from-home, *zari*.

I. Introduction

The costumes of Mughals in India were crafted with the most exquisite fabrics which was ornamented with precious stones and hand worked gold and silver embroidery. In the same way during the reign of Shahjahan also there was greater emphasis on dress ornamentation with gold and silver threads. Costumes of the women royalty of Jahangir such as *odhni* or a Shawl consists of heavy metal work embroidery. Changes of costumes of men and women took place gradually but metal embroidery remains indivisible part of it **(Shah, *et.al*., 2012)**. Metal embroidery by its grace



represents opulence, pioneer and dignity and hence brings new character and dimensions to any article. By the advent of machine embroidery, hand embroidery has faced strong competition and demand immediate action to sustain and further improve this traditional craft. **(Ojha and Kashyap, 2014)**.

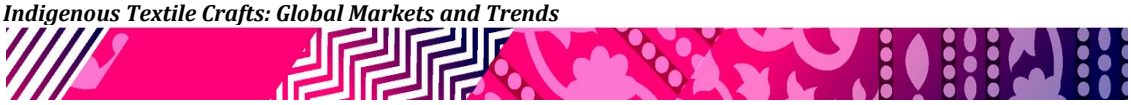
As stated by **Rawat (2017)**, that workers are the indispensable asset and key element for any organization. Training provided to the SME's workers helps in the development of employee's capacity and enhancing the performance, affects the employee's performance and organizational effectiveness, enhances skill, knowledge and competence ability. It was mentioned in the article of **Agarwal (2014)**, that Bareilly was once known by '*Zari Nagri'* owing to its famous *zari karigari* (embroidery). This local trade, which was once in great demand across the world is now however struggling for survival. The demand of zari may be soaring in the international markets, but local manufacturers are struggling to make ends meet. **Shefali (2018)** reported that, Bareilly, which was considered as a hub for *zari-zardosi* work is into shackles. Workers used to earn ₹400-500/day earlier, now it has been reduced to ₹250-200/day. GST on the raw material and on the finished product is 18% which has led to drastic decrease in the number of orders of *zari-zardosi* products and consequently also eroded livelihood base of hundreds of artisan families. Earlier, when work was in plenty, women participation was also higher, but nowadays involvement of women in the work too has reduced due to less orders. The condition of *zari-zardosi* workers and even this handicraft art itself is slowly decline as there is hardly any support on a sustainable basis to protect it.

Zari work of India has a lot of potential but there is an utter lack of organized effort to establish this industry into a profitable organization. There are various types of problems faced by the manufacturers like marketing, lack of cooperative societies, finance, and supply of raw material, skilled labor, employment opportunities and competition. Similarly there are many problems faced by the workers also like the problem of low wages, job insecurity, irregular/casual work load, unsuitable working conditions, no provision of pension, exploitation, lack of incentives, and lack of funds/credit to start their own independent units lack of medical facilities etc. **(Modgal, 1989)**.

As reported by the data collected from MSME, Bareilly, there were total 212 registered *zari* work units. Other than these units, there were also a noticeable number of non-registered (work-from-home) units working in different areas of the city. These units were not eligible to get benefits of any scheme and policies implemented by the government. The objectives of the study were tp explored the present profile, challenges and problems faced by non-registered units with objectives to get an idea about profile of *zari* unit, area for government assistance and problems faced by the artisans and the unit.

II. Materials And Methods

An exploratory research was conducted to collect detailed information related to non-registered *zari* units of Bareilly district, Uttar Pradesh. The snowball sampling technique was used for selection of non-registered *zari* units since no data was available in government offices in this regard. Hence, the researcher moves from one unit to next on the basis of reference given by the previous unit. Six units were selected from each five areas selected for data collection thus total 30 units comprised sample for the study. One artisan of each selected unit or one focused group was taken as respondent for data



collection. The interview schedule consisted of close ended question to collect the desired information on various aspect namely,

- demographic profile of workers and the unit
- prevalent *zari* work and design
- prevailing motifs, frame, needles, fabric, *zari* materials, tools and techniques used
- working conditions and problems faced by artisans and the unit

The data was organized, tabulated and analyzed to draw meaningful inferences pertaining to parameters of the study.

III. Findings and Discussion

The units which were selected for the study were work-from-home type units that were not registered under any government organizations. There were no labeling of product, no quality checking, no extent to market information, had very less innovation in designs and production techniques. The workers were being paid as per number of units of products prepared by them rather than type of design and its innovation. Orders were received from the agents along with the base material and the *zari* was applied to the fabric by the traditional means of application i.e. '*aari*' which means needle. Zari work was done on the wooden frame, commonly known as *karchob*, *adda*, *dhadha*, *khatia*or*khatla*. A variety of accessories were also used to create innumerable work such as *fatila*, *kauri*, a wooden hammer with a dabber, scissors, clips, *gaddi*, inch tape, carbon paper, etc. The results of field investigation are given below.

IV. General Information of the unit

The year of establishment of *zari* units were taken for the study. The data gathered through survey was tabulated and analyzed in Table -1.

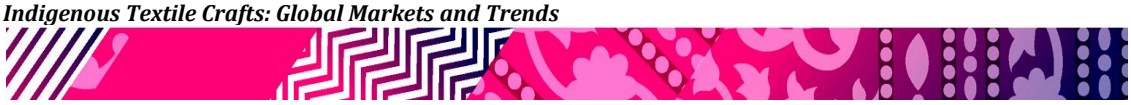
Table-1 Year of establishment of the units

Parameter	Variables	Frequency	Percent
Year of establishment	1971-1980	01	3.34
	1981-1990	04	13.33
	1991-2000	15	50.00
	2001-2010	06	20.00
	2011 and above	04	13.33

It can be seen from Table-1 that the year of establishment of the units ranged between 1974 to 2011. The result showed that the maximal number of units belonged to the 1991-2000 year. There was only one unit which belongs to the year 1971-1980. It was the oldest unit yet not registered under any government organizations. This might be due to the fact that primary source of income was not the *zari* work, it was carried due to interest of owner.

V. General information of workers

The information about workers such as number of workers, age, gender, level of skill, their work experience, educational level, remuneration provided to them (if any),

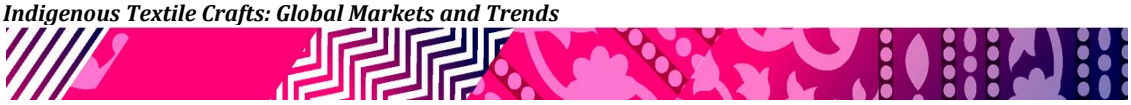


source of skill acquired, nature and duration of rest period provided to them is shown below in Table-2.

As shown in Table-2, both male and female members were engaged in this Entrepreneurial activity. The data further revealed that the maximum number of workers

Workers' information	Variables	Frequency	Percent
No. of workers	0-2	04	13.33
	3-5	25	83.33
	6 and above	01	3.30
Gender	Male	78	82.98
	Female	16	17.02
Age group	Less than 25 years	14	14.90
	26-35 years	44	46.80
	36-45 years	33	35.10
	46 years and above	03	0.03
Years of experience	Less than 5 years	14	14.90
	5-10 years	56	59.57
	More than 10 years	24	25.53
Level of skill	Skilled	84	89.36
	semi-skilled	10	10.63
Source of Skill acquired	Parents	57	60.64
	Siblings	06	06.38
	Relatives	02	02.12
	Zari unit	11	11.70
	Polytechnic/ITI	00	00
	Ustads (Private Skill Centres)	24	25.56
Educational level	Literate	26	26.65
	Illiterate	68	72.34

were Muslims of Indian nationality and were owner of their respective units. The average number of workers ranged between 2 to 6 and the age ranged between 19 to 46. Majority of the workers were in the age group of 26-35 years of age. Maximum numbers of workers (59.57%) were having experience of 5-10 years; 14.90% of workers were having experience of less than 5 years and 25.53% of workers having more than 10 years of experience in this field. The workers who can perform intricate work and possessed the ability to execute the distinct *zari* work on the fabric in minimal time were categorized as skilled workers whereas the workers who can only do simple stitches and chiefly involved in finishing the product were categorized as semi-skilled workers. Further it was found that 60.64% of total workers acquired this art from their parents, 25.56% workers acquired from their *ustads*, 11% of workers from *zari* units and rest of the workers acquired this skill from their relatives and siblings. The literacy level of the workers was varied from no education (can write name only) to graduate degree; 26.65% of workers



were uneducated (can sign only) and 72.34% of workers were having education up to the level secondary school education and graduation.

Table-3 Rest period profile followed in the unit

Rest period	Variables	Frequency	Percent
	1	11	36.66
Frequency	2	17	56.67
	3	02	6.67
Nature	Lunch break	30	100
	Tea break	07	23.33
	Namaz break	16	53.33
Duration	10 minutes	00	00
	15 minutes	00	00
	Half an hour	05	16.66
	More than half an hour	25	83.33

*Multiple response

The data given in Table-3 depicts that the frequency of rest period were 1 to 3 times in a day which comprised of lunch, tea break and *Namaz*. Duration of rest period was from half an hour to one hour. By the reason of maximal workers being Muslims *namaz* break was also provided to the workers in some of the units. Therefore in 83.33% of units the duration of rest period was more than half an hour.

VI. Infrastructure Information

Table-4 reflects on the information regarding the size of the unit, number of floors in which the work was being carried out; different facilities provided to the workers like cooling facility, lighting, ventilation and various amenities and medical facilities. Also the warehouse facilities of the unit for storage and packaging of goods and work station has been discussed in this section.

Table-4 Physical infrastructure of the units

Parameter	Variables	Frequency	Percent
Size of the unit	200-500 sq. ft.	09	30.00
	501-600sq. Ft.	20	66.67
	601 and above	01	3.330
No. of floors	1	28	93.00
	2	02	6.67

The units were operated within the household. There were separate rooms to pursue the work. The size of the room was variable among different units. Most of the units were having area in between 501-600 sq. ft. There was only one unit whose area was more than 600 sq. ft. In 93% of the units the work was done within one floor whereas in 6.67% of the units the work was performed at 2 floors (Table-4).

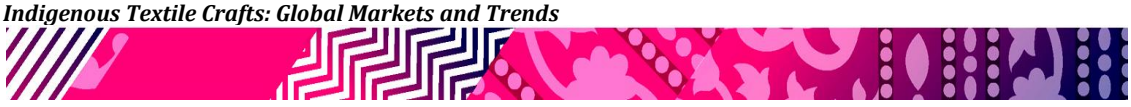


Table-5 Source of lighting

Sources	Variables	Frequency	Percent
Tube light	0-2	23	76.67
	3 and above	07	23.33
CFL	0-2	03	10.00
	3 and above	01	0.03
Bulbs	0-2	06	20.00
	3 and above	00	0.00

*Multiple responses

From the above Table-5, it can be envisaged that 76.67% of the units were having 2 or less than 2 tube lights and 23.33 were having 3 or more than 2 tube lights. Also 10% of units were having 2 or less than 2 CFL and only 1 unit was having 3 or more than 3 CFL. 20% of the units were having bulbs less than or equal to 2 and there were no units which were having 3 or more bulbs.

Table-6 Source of ventilation

Sources	Variables	Frequency	Percent
Door	0-2	30	100.00
	3 and above	00	0.00
Window	0-2	30	100.00
	3 and above	00	0.00
Ventilator	0-2	10	33.30
	3 and above	00	0.00

*Multiple responses

As per the above Table-6,all the units (100%) were having 2 or less than 2 doors and windows. Only 33.30% of the units were having ventilators less than or equal to 2 and rest of the units were having no ventilation.

Table-7 Source of cooling

Sources	Variables	Frequency	Percent
Ceiling fan	0-2	28	93.33
	3 and above	02	0.06
Table fan	0-2	01	0.03
	3 and above	00	0.00
Cooler	0-2	01	0.03
	3 and above	00	0.00

*Multiple response

From the Table-7, it can be derived that 93.33% of the units were having 2 or less than 2 ceiling fan and 0.06% were having 3 or more than 3 ceiling fan. . There was only 1 unit which was having 2 or less than 2 table fan and no unit were having 3 or more than 3 table fan. There was only 1 unit which had 2 coolers and rests of the units were lacking the cooling system.

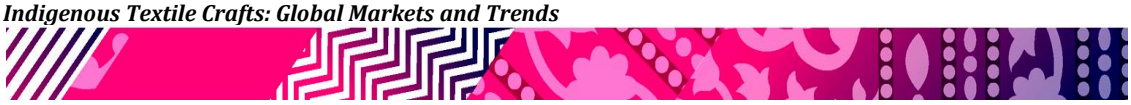


Table-8 Amenities provided to the workers in the unit

Facilities	Variables	Frequency	Percent
General amenities	Drinking water	30	100.00
	Toilet	30	100.00
	TV	01	0.03
	Refreshment	00	0.00
	Rest area	00	0.00
Medical facility	Yes	06	20.00
	No	24	80.00

*Multiple responses

It is clear from data given in Table-8 that all the units were having drinking water and toilet facilities. There was only 1 unit which had TV facility. There were no refreshment and separate rest area facility for workers. 20% of the units were having medical facilities for their workers. The data given in Tables 5 to 7 shows that there were minimal amenities and infrastructural facilities available to workers. This might be due to irregular work order and very small size of units.

Table-9 Tools used for storing materials and supplies in the unit

Tools	Materials and supplies	Frequency	Percent
Packets (PE/PET)	Zari	30	100.00
	Base material	30	100.00
	Finished goods	30	100.00
Bags (Nonwoven/ Fabric)	Zari	00	0.00
	Base material	30	100.00
	Finished goods	30	100.00
Box	Zari	01	0.03
	Base material	00	0.00

*Multiple response

As shown in the above Table-9, packets (PE/PET) were used to store *zari* material, base material and finished goods. Bags were used only for base material and finished goods and not *zari* material. There was only 1 unit in which boxes were used for storage of *zari* material.

It can be inferred from Table-9 that basic storage media were used in unit to prevent staining and physical damage to the *zari* and fabric materials as well as ready products. This might be because the units were not in retailing, these were only working for advance order to which raw materials were supplied and ready products were picked from them

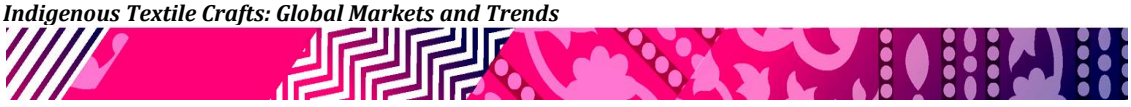


Table-10 Raw materials used in the unit

Raw materials	Variables	Frequency	Percent
Fabric base	Silk	30	100.00
	Satin	30	100.00
	Georgette	30	100.00
	Velvet	29	100.00
	Crepe	30	96.67
	Kat dana	30	100.00
Zari materials	*Tikki*	30	100.00
	Katori	30	100.00
	Patrey	30	100.00
	Kasab	30	100.00
	Sequins	29	96.67
	Beads	29	96.67
	Crystals	29	96.67
	Stones	29	96.67
	Metallic wires	30	100.00

*Multiple response

The data inTable-10 reveals that all the units were working on silk, satin, georgette and velvet whereas crepe was used by 96.67% of the units. Zari materials like *kat dana*, *tikka*, *katori*, *patrey*, *kasab*, metallic wires were used by all of the units while sequins, beads, crystals and stones were used by 96.67% of the units. This clearly indicates that although the production was irregular but these units were into production of zari work of different quality on variety of fabric base.

Table-11 Work station information of the unit

Work station's	Variables	Frequency	Percent
Shape	Circular	23	76.67
	Rectangle	30	100
Number	02	13	
	3 and above	17	

*Multiple response

From the data in Table-11 it can be envisaged that all the units were having rectangular work stations. There were 76.67% of the units which were also having circular work stations as well. Besides this, 43.33% of unit's were having 2 or less than 2 workstations and 56.67% of the units were having 3 or more than 3work stations. It can be inferred that different type of materials and the design needs variable workstations for checking any damage to the material as well as to achieve superior quality in *zari* work & its finishing.

VII. Problems faced by workers and the owner of the unit

The different problems faced by the units are presented in Table-12. These problems were related to infrastructure, manpower, marketing, manufacturing, material, social problems and economic problems. Whereas, the problem faced by the workers were categorized as physical, psychological and ergonomics related problems.

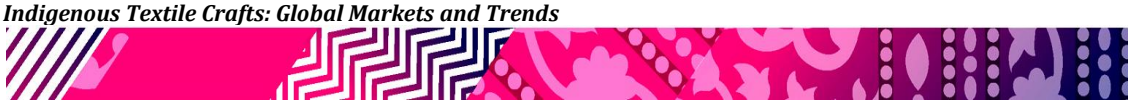


Table-12 Problems faced by the workers in the unit

Table-12 presents the different problems faced by the units that are categorized under following heads

Physical health hazards			Psychological problems			Ergonomic		
Problems	Frequency	Percent	Problems	Frequency	Percent	Stress area	Frequency	Percent
Lack of personal protective equipment	00	0.00	Long continuous working hours	00	0.00	Eyes	30	100.00
Cuts	18	60.00	Work not according to interest	00	0.00	Hand	23	76.67
Rashes by continuous friction	00	0.00	Repetitive work	00	0.00	Wrist	00	0.00
Piercing by metal wires	21	70.00	Lack of medical facility	60	20.00	Lower arm	00	0.00
Body ache	06	20.00	Low wages	30	100.00	Upper arm	21	70.00
Headache	00	0.00	Irregular wages	21	70.00	Lower back	02	6.67
Irritation in eyes	20	66.67	Worker-worker relationship	00	0.00	Upper back	00	0.00
Burning sensation in fingers	00	0.00	Worker-supervisor relationship	00	0.00	Hip	25	83.33
Numbness in fingers	00	0.00				Knees	02	6.67
						Forearm	00	0.00
						Calf	00	0.00
						Shoulder	28	93.33

*Multiple response

VIII. Physical health hazards

Problems of cuts and piercing by metal wires during the work were noted by 60% and 70% of the workers, respectively. Also 20% of the workers reported body ache while working and 66.67% of workers were having irritation in eyes by the continuous intricate work.

IX. Psychological problems

Lack of medical facilities caused problems to 20% of the workers. Low wages was the most common problem faced by all the workers of different units and 70% of them was also mentioned the problem of irregular wages.

X. Ergonomic problems

The steady intricate work profile of workers resulted in stress on their body parts. Eyes were the most common stress area reported by all the workers, 76.67% of the workers faced stress on hands, 70% of workers on upper arm and 6.67% of workers had stress on lower back. Besides this, 6.67% of workers also mentioned knees where stress area. 83.33% of workers reported stress at hips and 93.33% of workers reported because of maintaining same posture for long time they felt stressed at shoulder as their stress area.

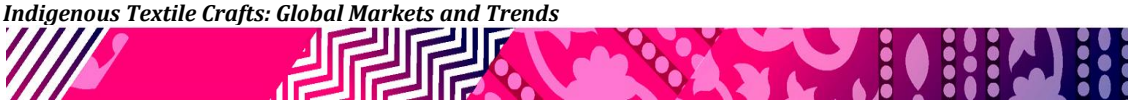


Table-13 Problems faced by owner the unit

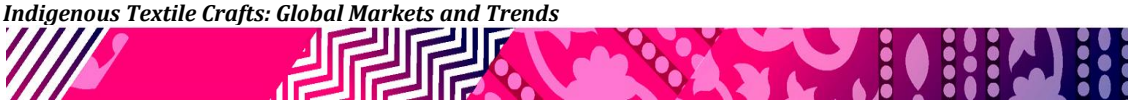
Problems	Variables	Frequency	Percent
Social	Man power availability	23	76.67
	Worker – worker relationship	00	0.00
	Worker-supervisor relationship	00	0.00
Man power	Absentees	17	56.67
	Level of skill (training)	00	0.00
	Loyalty of worker (attrition rate)	00	0.00
Economic	Infrastructure subsidy	19	16.33
	GST	00	0.00
	Demonetization	00	0.00
Marketing	Poor marketing information	26	86.67
	Lack of government support	00	0.00
	Monopoly of middle man	15	50.00
	Promotion	27	90.00
	Machine embroidery	28	98.33
Manufacturing problem	Tools and machines	00	0.00
	Limited *zari* designs	00	0.00
	Limited product range	00	0.00
	Lack of certification	29	96.67

*Multiple responses

Table-13 reveals about the problems faced by the workers of the unit that are categorized under different heads. It was submitted by unit owners that they were facing the problems related to manpower availability (76.67). workers absenteeism(56.67%),lack of infrastructure subsidy(16.33%), poor marketing information (86.67), monopoly of middle man (50%), no promotion (90%), establishment of machine embroideries (98.33%)and lack of certification (96.67%).

XI. Summary and Conclusion

The literature suggested the presence of gold embroidered garments since the Vedic age. Several references suggested its use in the ancient, medieval and colonial period too. The work which was exclusive to the royal clientele has now evolved as a major item of trade. Traditionally the craft was done with hands by *karigars* but with globalization hand work is facing high competition as embroidery machines produce diversified designs in lesser time. The units which were taken for study were not registered under any government organization therefore, unaware of the benefits provided by the government under different schemes and policies. In the absence of promotion of such units, there were very less work or sometimes no work for the workers for this reason workers were leaning towards different work field for the sustainability of their livelihood. Thus, to conclude, with industrialization, the traditional *zari* embroidery is trailing its prominence. Proper guidance and support may contribute in the solution of the problems facing by the units and the workers. There is need to generate awareness among non-registered units about the benefits that could be availed for consistent running of *zari* units.



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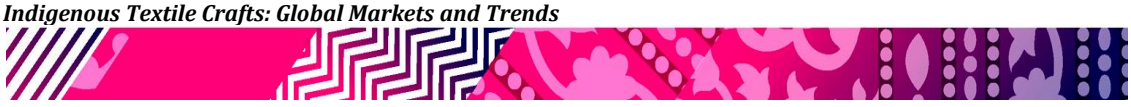

CP-18

TO ANALYSE THE GAP BETWEEN STANDARD TIME AND ACTUAL TIME IN SYNCHRONIZED PRODUCTION OF L-SIZE SHIRT FOR PRODUCTIVITY IMPROVEMENT IN SMALL-SCALE APPAREL MANUFACTURING UNITS

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Abstract

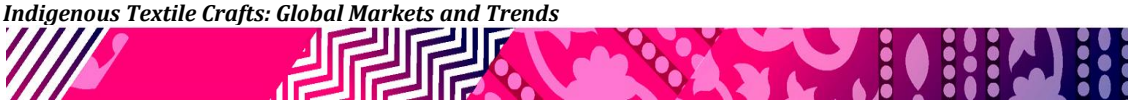
The study shows that there are many benefits to be obtained by implementing productivity improvement efforts in small scale ready-made garment manufacturing units. With the help of these measures, small scale industries can educate and understand the value of time for increasing productivity, job efficiency, quality improvement, reduce operation time per part, compete in local market and fulfilling market demand. On the basis of these productivity improvement practices, every readymade garment manufacturing industry develops their self formulated methods, to insure their procedure as per standard time parameters. The objective of the research is- to study the L-size shirt manufacturing process, find out the difference between per operation ST & AT in production department of small scale industry and to identify the effect of time calculation method on productivity ratio of small scale industry in Indore. Secondary data was collected from previous researches, books, magazines, whereas primary data was collected by time study stop watch recording and observation method in the production section of readymade garment manufacturing units, these industries are already manufacturing their goods for domestic market. Eleven small scale man's shirt manufacturing units were selected as sample size, after time study and process analysis it is found that there are significant gap between per operation ST & AT in production department of small scale industries in Indore. That affects the production ratio of the industry and the production capacity of the factory, this study would help, to draw up plans for an appropriate target output, suitable range of divided labor and optimum production (scheduling, personnel planning or equipment planning).

Key words

ST & AT standard time and actual time, Productivity improvement, Time measurement.

Introduction

Readymade garment manufacturing industry is recognizing as buyer-driven industry. In Indore, most of the garment manufacturers are micro, small, medium scale industries and some of them are large scale industries also situated in nearby areas. The overall readymade garment industries use number of processes with different operations under some prescribed systems, for manufacturing their goods. They divide several operations to convert materials into finished garment. For completion of these operations such as cutting, sewing, finishing, packing or packaging of a garment they require skilled workers of high performance rate. For the accurate production methods and processes, proper training and supervision are essential for the manufacturing units to achieve the optimum improvements on productivity.



The study measured the difference between AT & ST of L size long sleeve shirt. This SMV data will help the management to improve line sewing efficiency through line balancing. Based on the practical experiment conducted, it can be seen that SMV and such like other tools can be effectively applied to apparels industry for better production efficiently. Productivity is evaluated by achievement of goals based on relationship between inputs and outputs of the industry.

Objectives of the study

- To study the L-size shirt manufacturing process of small scale industry of Indore region.
- To find out the difference between per operation ST & AT in production department of small scale industry in Indore.
- To identify the effect of study on productivity of small scale industry in Indore.

Review of literature

The research published in an International Journal on Textile Engineering and processes "Enhancing efficiency and productivity of garment industry by using different technique" written by Dhanshree Rajput , Madhuri Kakde and Pranjali Chandurkar (2018) stated that – garment industry started thinking of application of modernization, various engineering tools and techniques in garment manufacturing for increasing the productivity & efficiency. Operator took much more time to cuff folding operation, Operator waste his production time to collect the thread waste and the sequence of machine operation in such a way that cuff joint and sleeve attach having two and three machines respectively but for next operations like bottom attach and tucking operation have single machine in line therefore it reduced operation efficiency. By implementing following corrective actions, the efficiency significantly raised by 8.07%. In a research paper "Improving Ready-made garment productivity by changing worker attitude" by Md. Monirul Islam and ATM Adnan in European scientific journal (2016) found that –When the workers were told to completely check each body before passing to next process operator, they opposed & complained this will reduce the production. In this case, time study was performed for each & every worker to show they are capable of fulfilling the set target along with checking the garments. The production report of previous two months for the same quality shirt as well as the existing productivity of the same shirt in the line was taken into consideration as the basis. The average production for the product was 58 pcs/ hr with an average of 45 sewing operators working in the line. Below is the result of the experiment. The line produces 100 Pcs of extra shirts/day with 8 hour regular work. The CM for 100 Pcs of shirts was extra profit for the owner since no extra investment was needed to achieve that. In a research " SMV and Lead time for T-shirt manufacturing" (2018) by Mohammad Mobarak Hossain, Shadman Ahmed Khan, Soyod Saiful Islam, Jawwadul Fattah, Mustafizur Rahman Bipul found that –It is observed that the time required in cutting and packing section is 7% and 29% of the time that is required in sewing section. Hence, production planning department can add this time during the estimation of lead time to ensure the delivery on time. In the same way, if it applied for the all styles running in the production floor the planning department will be more efficiently determine the lead time of their industry. Research based on the topic "Productivity improvement through motion and time study" by Mohd Razali Muhamad1 & Wan Hasrulnizzam Wan Mahmood (2016) stated that – The main success factors in implementation of motion and time study is top management commitment (4.80), followed by interdepartmental cooperation (4.70), good planning and control system (4.40), company technical capability (4.40), effective training (4.40), experienced work forces (4.30), steady fund inflow (4.30) and clear product strategy (4.00). A research on the topic "Effective way to estimate the standard minute value (SMV) of a U3 shirt by using time study technique" by Hanan O.A and Seedahmed A.I stated that – Delivering high quality garment at low cost in shorter lead times are

the major challenges faced by the apparel manufacturers. It is clear that a standard can be maintained in the garment sector to get the maximum production by using the time properly. To set a standard target for different product time and motion study is mandatory.

Methodology

To identify the problem of industry and develop it as a research topic, researcher visited eleven small scale industries of shirt manufacturing in Indore. it is identified that although they have enough machines and man power still they are getting less production, to identify the reason of less productivity, some knowledge or information that is needed has gathered from industry. Keeping those points in mind researcher worked on the topic –To identify L- size shirt manufacturing process, difference between per operation ST & AT and their effect on productivity of small scale industry in Indore.

Clearly Defined Terms and Concepts

AT- The actual time to produce one part. ST- It stands for Standard Time.
SMV – It means Standard Minute Value.
Allowance - It includes –1. Machine allowances 2. Relaxation allowance 3. Interference allowance 4. Process allowance 5. Special allowance
Productivity - Productivity can be defined as the ratio of output in a period of time to the input in the same period time. Productivity can thus be measured as:
Productivity = Output (In period of time)
Input (is the same time)

Research design

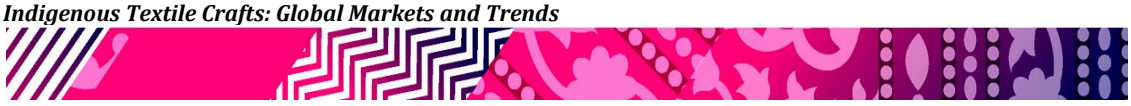
This Research paper, focus on a specific group of eleven industries that is small scale industries- Operation breakdown of L-size shirt in manufacturing department so that process and manpower required for each could be established. The comparison would involve the following- Manpower requirement and machinery required in the styles. Operation productivity comparison chart. Time required for each operation. Implementation and suggestions. In this study a target production line of 15 pieces of Large size Shirt is selected for time study using stop watch tools to take the time required for each operation in sewing section. Time is taken for each operation and Actual time and Standard time is calculated according to the following formula for each piece of garments.
Actual time – sum of all operation / no. of operations Rating – Standard time x 100 / actual time
Basic minute – cycle time x performance rating
Standard time– Basic minute + (basic minute x machine allowances)
In standard time formula, the allowances were taken 20% which includes machine allowance

Collection of Data

For the collection of secondary data, news paper, journals, magazines, case studies and previous projects and internet were the source of information where as for the collection of primary data, is done through direct observation time and method study of the different operations to manufacture a L-size shirt of sewing department practically on the floor.

Limitations

Only L Size shirt style of garments is considered in this study. The assumption is derived from the actual time required in the production floor. This study has been done only in



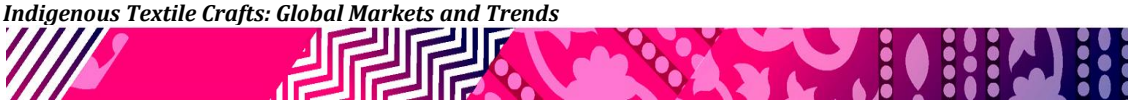
Indore region of apparel industry. Only sewing section is considered in this study which does not represent the actual lead time Methods for analysis - Comparison with standard time and Time study.

Results and Discussion

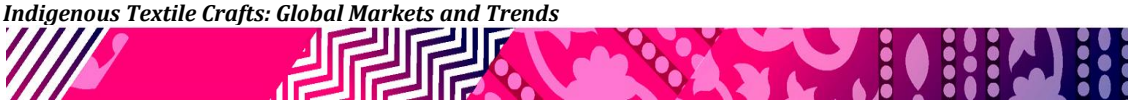
Result related to first objective-"To study the L-size shirt manufacturing process of small scale industry of Indore region" In a small-scale readymade garment manufacturing unit, the production of Large size shirt manufactured under chain working or synchronized way. In this system, some processes, were used to assembling of a shirt. The processes time of these operations were recorded by the method of time study to find out the difference between Actual time and Standard time. For time study, stop watch were used, for measuring standard time, 100 repetitions of one operation were measured and their average were considered as standard time of one operation. For actual time 15 repetitions of one operation were measured and their average were considered as actual time for the operation.

L-size shirt manufacturing processes of small scale industry of Indore region

S.no	Name of the operation	M/C type	AT (sec)	ST (sec)	Diff. Between AT & ST
FUSING OPERATIONS					
1	Collar and band fusing	Hashima HP 450ms	69	41.4	28
2	Eye placket fusing	Hashima HP 450ms	135	81	54
3	Cuff fusing	Hashima HP 450ms	69	41.4	28
4	Pocket Fusing	Hashima HP 450ms	45	27	18
POCKET SECTION OPERATIONS					
5	Crease pocket	Iron	19	11	8
6	Trim pocket	Manual	14	8	6
7	Pocket mouth iron	Iron	12	7	5
8	Pocket mouth hem	SNLS- Jack F4	7	4	3
FRONT SECTION OPERATIONS					
9	Mark front for pocket position	Manual	6	4	2
10	Form b/h placket	Manual	28	17	11
11	Crease b/h placket (single fol	Iron and manual	28	17	11
12	Top stitch b/h placket	SNLS- Jack F4	82	49	33
13	Sew button placket	SNLS- Jack F4	82	49	33
14	Attach pocket (one pocket)	SNLS- Jack F4	36	22	14
BACK SECTION OPERATIONS					
15	Join upper yoke	SNLS- Jack F4	19	11	8
16	Attach under yoke with back body	SNLS- Jack F4	36	22	14
17	Sew label at yoke	SNLS- Jack F4	42	25	17
18	Back yoke top stitch	SNLS- Jack F4	10	6	4
19	Shoulder attach	SNLS- Jack F4	43	26	17



20	Shoulder top stitch	SNLS- Jack F4	9	5	4
SLEEVE SECTION OPERATIONS					
21	Cut sleeve slit at placket position	Manual	5	3	2
22	Attach placket	SNLS- Jack F4	11	7	4
23	Notch placket	Manual	4	2	2
24	Close lower placket	SNLS- Jack F4	19	11	8
25	Close upper placket and mak diamond	SNLS- Jack F4 and manual	48	29	19
26	Sleeve attachment	SNLS- Jack F4	63	38	25
27	Top stitch armhole	SNLS- Jack F4	30	18	12
28	Side seam	Juki-MS-19	177	106	71
COLLAR SECTION OPERATIONS					
29	Mark lining	Manual	16	10	6
30	Collar run stitch	SNLS- Jack F4	8	5	3
31	Collar turn	Manual	16	10	6
33	Collar band hem	SNLS- Jack F4	8	5	3
34	Collar attach to band lining	SNLS- Jack F4	29	17	12
35	Collar trim, marking, notching turning	Manual	10	6	4
36	Set front & back & mark neck and make cut for collar	Manual	102	61	41
37	Collar attach	SNLS- Jack F4	55	33	22
38	Collar close and top stich	SNLS- Jack F4	34	20	14
CUFF SECTION OPERATIONS					
39	Cuff hem	SNLS- Jack F4	21	12	9
40	Run stitch cuff	SNLS- Jack F4	26	16	10
41	Turn cuff	Manual	17	10	7
42	Top stitch cuff	SNLS- Jack F4	59	35	24
43	Cuff attach and close	SNLS- Jack F4	173	104	69
44	Top stitch on cuff	SNLS- Jack F4	59	35	24
45	Bottom hem	SNLS- Jack F4	59	35	24



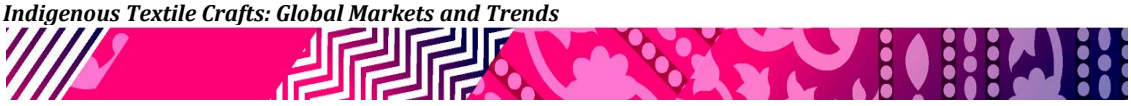
46	Make buttonholes on shirt	Juki LBH 1790	35	21	14
47	Mark button	Manual	32	19	13
48	Button attachment	Jack 1377	47	28	19
49	Final thread cutting	Manual	177	106	71
50	Final finishing	Iron and manual	258	154	104
	Total		2397 sec or 39.95min	1435sec or 23.91min	963sec or 16.05min

Difference between AT and ST

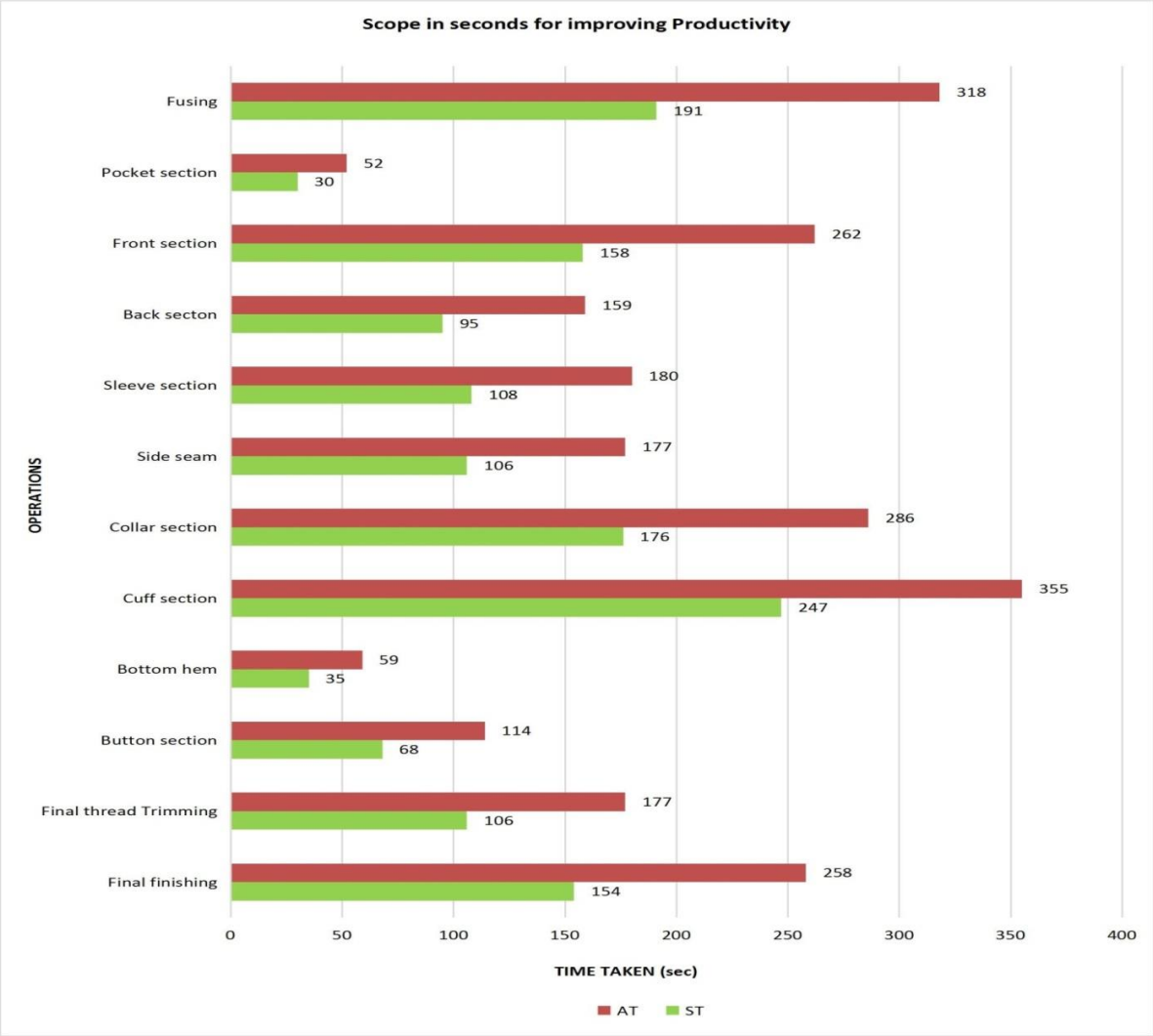
Sl. no.	**Particular**	**AT**	**ST**	DIFFERENCE
Total	Total time consumed for making of A L- size Shirt in industry.	2397 sec or 39.95 min	1435 sec or 23.91 min	**963 sec or 16.05 min**

To fulfill the requirement of results related to objective, researcher calculated the total time of manufacturing of a L-size shirt and made a graph to find the scope of productivity in sewing section of each and every operations, for this researcher has mark on cut pieces of shirt and follow the marked pieces, one operation to another operation till the shirt is completely finished and have prepared everyday record of production. Approximately they made a L-size shirt in 40 min, where as this shirt has to made around 24 min. (as per industry efficiency). So the difference found in between 16 min. It has been observed that in this study, that the sew inseam consume more time during preparation of garment. This can be reduced by giving training to the workers. That can, not only will reduce the time but also will improve the quality of the product. In overall performance it was observed that the time consumed for the operation was increased because of three reasons – Improper work distribution between workers in line, workers of different ratings, are working in a line, these workers are skilled, semi- skilled etc , which causes WIP during the making of shirts, Allowances taken by the workers are high, these workers occupied themselves by changing songs on their phone, or going to washroom, talking etc.

According to the graph, some of the sections shown more time than the other, so the management need to focus on those particular places where worker is consuming extra time. The objective to find out average time taken to complete each process of garment manufacturing, to analyze the difference between and actual time taken and standard time of each process of garment manufacturing and to recommendations for improving production rate based on analysis today's customers around the globe demand product at the best possible price., researcher study about working process of shirt manufacturing in a small scale industries minutely and reached to the discussion that the working process of that industry were not organized, worker or labor were group of skilled, semi skilled and unskilled. They were not distributed work according to their capacity or skill oriented. So



without a standard target it is impossible to reach the goal. To set a standard target timestudy is mandatory. In simple terms productivity is the quantitative relationship between what we produce (output) and the resources (inputs) which we used.



Actual time taken to complete a L-size Shirt = 2397 seconds (39.95 minutes)
Time taken by standard time to complete a L-size Shirt = 1435 seconds (23.91 mintues)
Time difference between AT &ST = 963 seconds (16.5 minutes)
The total difference between AT and ST of a L-size Shirt =963 seconds (16.5 minutes)

This gap can be filled if the proper measure is taken by the industry and if proper awareness is spread by the industry, also the cooperation of the worker is also necessary to fill this major gap of AT and ST. After observing we have found that the least line efficiency results found due to –Operator took much more time in Fusing, Front section, Cuff section, Collar section and finishing section operations. Operator waste his production time to collect the thread waste. Some of the work here are manual. As a result,

labor productivity has a huge impact on the overall productivity. Training received by the employees is inadequate. A huge number of employees are unable to work in multiple sections. This becomes a concerning problems when absenteeism occurs in large number. Lack of technical knowledge and inexperience of the employees are associated with most of the vital defects. By implementing following corrective actions, the productivity is significantly raised.

Conclusion

It is challenging work to find out the thrust areas in garment unit which affect the garment quality and productivity. This research paper deals with shop floor problems based on the practical experimental result performed. During study it is observed time and motion study, By better utilization of man, machine, material and method shows high production rate. By adopting proper quality tools, it is possible to point out the current status and subsequently analyze to achieve better target. Higher value of line efficiency indicates that the line have the approximately equal cycle time between operators along the line.

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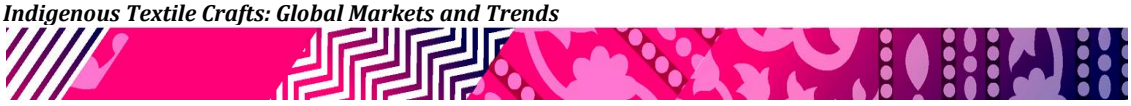
Books: Juki sewing operation work.



CP-10

CHALLENGES FOR SUSTAINABILITY IN TEXTILE CRAFT: A REVIEW

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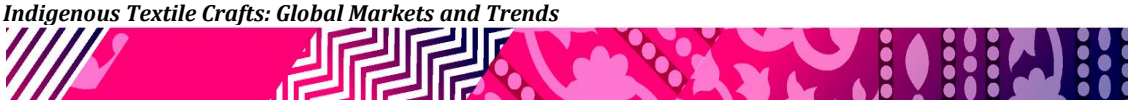
Abstract

India is very well known globally for their rich heritage of textiles and handcrafts. But consistently decreasing number of artisans indicates need to revive the craft of artisans as an important source of livelihood. In the age of this global competition when the world has become a small trading community, handicraft artisans constantly compete with machine made products and struggle for the sustenance of their age old traditional industries. Vast availability of cheap, low-quality clothing allows fast fashion, conspicuous consumption and premature disposal of fashion products. The new concept of fast fashion plays an important role in this advanced market to consume and purchase new and cheap clothing without any specific requirement. Therefore, production of sustainable traditional modes of fashion design in affordable price is a challenge. Changing functional requirements and aesthetics orientation of modern customers are pressing artisans to modify certain traditional features of the crafts and innovate according to market demand. In addition to this, unrestricted flow of imported metal items also offers tough competition to the indigenous sector. Artisans complying with existing needs of customers, comparatively, do well in economic terms than those producing age-old products. As noticed, artisans also seem to continue the craft in future and encourage their kith and kin to undertake the occupation, since they find it a reliable income source. This review paper thus aims to highlight the present scenario of the industry and its future scope for sustainability by taking into consideration the Textiles craft artisans and market viewpoint. The paper also includes the challenges and problems faced by textile craft artisans in this era of fast fashion.

Keywords: Challenges, Sustainability, Textile, Craft



CP-11

REDISCOVERING THE TOOLS AND THE TECHNIQUES OF STUMP WORK EMBROIDERY

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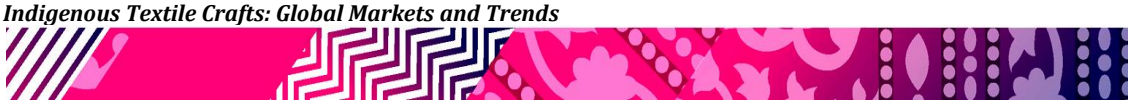
Abstract

Clothing and textiles contribute in making a unique identity of an individual. It reflects the social cultural traditions of a country or a community. The symbolism and depiction of motifs refer to a deeper meaning, reflecting upon the rich pedigree and a legacy of artisanal traditions involved in making of a textile masterpiece. Stump Work embroidery is one such art from the land of United Kingdom's. The embroidery involves stamping of numerous three dimensional miniature figurines to on a background fabric. The narrative usually revolves around significant biblical epics and everyday humdrum life .This raised form of embroidery lasted for a relatively short period of time from 1640 -1680. The embroidery formed an essential part of a bride's trousseau and was generally practised by young girls. The motifs are not in a relative proportion in a single sample as each of the element is worked upon separately. The embroidered pieces were most commonly used for making, cabinets, book covers, mirror frames etc. The use of stump work on clothes were restricted to corsets and elaborate gowns and petticoats. A study was undertaken to identify and explore the tools techniques and stitches of the stump work embroidery and seek its revival by combining it with free hand painting. An array of articles were made such as apparels, furnishing items and fashion accessories and evaluation of products was done by 30 respondents including 10 Staff members, 10 students of Home Science College SHIATS, Allahabad and 10 housewives from the city. The acceptability of the products was adjudged on the basis of appropriateness of design, design arrangement, colour combination, neatness, overall appearance and cost effectiveness. A rank was assigned between the ranges of 1 to 5, where '1 is for poor and 5 is for excellent.The top no I and Capri pants I were the top scores in category of apparels with an average acceptability score of 4.7 and 4.6 respectively. In the second category of furnishing items the Dining table set no .III score a total of 4.63 and Sofa Back Set No. III scored an average acceptability score of 4.61. In the third category Jewellery Box 1 and Bag II were highly acceptable with a score of 3.85 and 4.63.



CP-13

SUJANI WEAVING OF BHARUCH (GUJARAT): IT'S PRESENT SCENARIO

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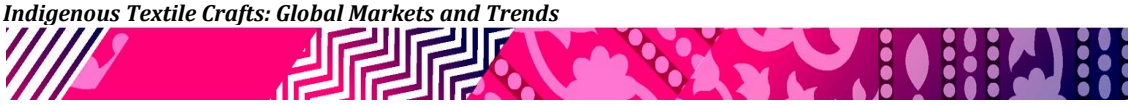
Abstract

Traditional fabrics of Gujarat are not only known in the country, but have received the fame globally. These traditional fabrics include hand woven fabrics, resist fabrics, printed cloth, and embroidered fabrics. Sujani of Bharuch is one such traditional craft in the category of hand-woven fabric of Gujarat. Sujani, with its technique, yarns and colour combination is a unique woven textile in the form of quilts. This is a double sided padded quilt made using double cloth principle creating squares. Cotton floss is inserted into each square made by the interlacement of warp and weft yarns to give a quilt effect. During the past two decades it was flourishing with around 50 handlooms working to produce this indigenous textile of Sujani. But at present it is done only on 3 looms. Sujani weaving, though a rare and indigenous style of weaving is facing its downfall gradually. This research was planned to study the factors leading to the decline in popularity and production of Sujani textiles. A systematic survey was planned and after interviewing the weavers' data was gathered. On analysis of the data gathered through field work it was found that; the fabric does not have a steady demand in the market because of its

i. Limited use to quilts only.
ii. In a state like Gujarat, where winters are mild, quilts are not used much.
iii. It is not a product for which a consumer would prefer to possess multiples due to its limited design availability.

The weavers and their younger generation are showing very less interest in taking the craft forward as they are not getting enough orders to sustain themselves. Technique being complicated and time consuming the products are costlier. With the drastic decline in number of specialized weavers the production has gone down. Since the earning from the Sujani weaving is not fetching the enough money to feed the family, the weavers have switched over to other jobs such as diamond cutting, machine embroidery, etc where they can earn a good amount to support their families. Thus this traditional craft requires design intervention to survive otherwise it will decline in coming years.

Keywords: Sustainability, Weaver's Demographics, Woven Fabric



CP-15

DESIGN AND SUSTAINABILITY: ITS CHALLENGES AND SIGNIFICANCE

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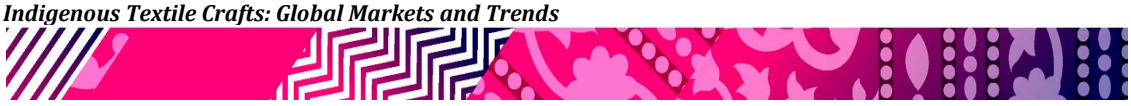
Abstract

There is an increasing global awareness for the need of sustainable practice to be adopted which has lead to paradigm shift from business in fashion to business with responsibility. The fashion business is becoming more holistic to optimization of human resources which includes their skills and employment. India is rich in varied traditional hand crafted products. Number of people is skilled in hand stitching. These skills are imbibed by succeeding generations through a cultural tradition and legacy but are not able to compete with the machines and so are losing on employment. There need to be conscious balance between the consumer worldwide and traditional skills. Hand stitching is one of the oldest construction techniques and continues to be superior for finishing high – value and bespoke items. There is a need to support this skill by good design. The hand stitched techniques explored to construct garment will allow the designer and skilled people to experiment with a range of materials from conventional to cutting – edge designs. The present paper deals with the exploration of hand stitches for its specific use as done in past. It was found that backstitch was used for strong joints, running stitch allowing stretch and movement, slip stitch for concealing the thread within a hem and blanket stitch for stopping raw edges from fraying on thicker materials. The above results used for co-creation with designers and skilled workers will help in creating innovative sustainable deigns and also employing many people.

Key words: Sustainable, Co- creation, Skills, Innovation Abstract



CP-17

THE HANDLOOM CRAFT OF INDIA: NEED TO BE PROTECTED

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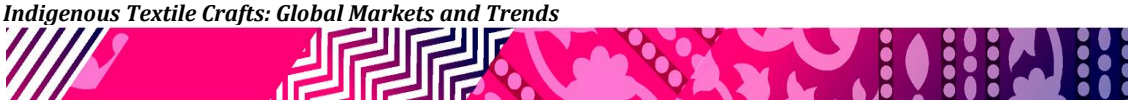
Abstract

India is the only country that still creates textiles coming from the genius of its master weavers. The world has lost the hand-weaving and loom process, along with all natural and organic processes of creating textiles. Mill-made fabrics and synthetics largely dominate fashion markets, with China as the main example. India's handloom industry is not the basket case it is made out to be. Its market for both saris and woven fabrics is largely the Indian subcontinent. There is no country that still has an indigenous fashion like India. When the history of India's crafts and textiles is written, it will speak of treasures that once occupied a pride of place in the lives of royalty. These are today lost in the annals of time, fighting to survive the dynamics of the contemporary marketplace. In any society it is the arts that need protection, and governments need to act with sensitivity on this.

Key words: Master Weaver, Organic, Handloom Industry, Protection



CP-19

STORY OF A DYING WEAVING CENTER AND BIRTH OF NANDSUNDARI

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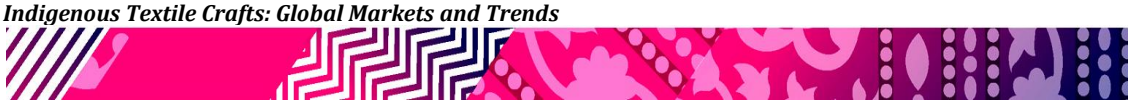
Problems of the handloom sector are well known and these are more or less same across the world and number of handloom weavers is declining at an alarming rate in-spite of a surge in demand for authentic handlooms. Out of the several weaving clusters in India, Delhi is a small and practically non-existent amongst the better-known handloom centers of India. A news article led us to visit the area where these weavers are located and the conditions were found to be very discouraging. The weaving community comprised of fringe weavers who were on the verge of quitting this profession, many of them had already moved on to other more lucrative jobs or were found sitting idle. The product that they were making-bed covers, was not very good quality in terms of material or craftsmanship to sustain in the market full of similar better-quality products. The prices and quality were too low for sustenance. A weaver addressed as labour was paid as low as inr65 per piece. It was felt that the solution could be in providing these fringe weavers an opportunity to get into the mainstream business. We felt this could be done by helping them develop a new product range which would require minimal change in their weaving skills and cater to a wider range of customer base. Saree was the product which suited the purpose perfectly. Hence, the journey of Nandsundari sarees started. Over two years in production the nandsundari sarees have undergone massive change for the better and continue to hold their presence in the saree wearing community.
Nandsundari project is one such initiative which was started to provide a new product range for the weaving community residing in Nandnagari and Sundernagari area of Delhi. The success story of development of the product, funding and marketing is an interesting story that needs to be shared. Nandsundari is still work in progress till it gains enough popularity to identify the center as a saree producing one.

Keywords: product development, initiative, project, funding, marketing



Design & Innovation (Oral)

DO-01

CLASHING TRADITION TEXTILE PATTERN DESIGN BASED ON TARTAN PROPORTIONS

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Abstract

Tartan, the woven checked wool textile considered to be originally from Scotland, is common to many cultures and historical periods. The checked feature is due to the assembly of different coloured threads at 90 degrees in both warp and weft directions (known as the 'sett'). Originally (at least in the late-eighteenth and nineteenth centuries), the colour of the set was associated with different families, clans or geographical regions. Although tartan-type textiles have attained popularity the world over, it has also been a predicted fashion wish for various fashion seasons (at least as suggested by exhibitors at a recent Première Vision' in Paris). Forthcoming fashionable designs may include 'deconstructed tartans', 'textured checks', 'patched checks' and 'geometric printed checks' etc. This paper aims to explore the proportions exhibited by tartan setts, their underlying grid structures and how these grids can be distorted for novel textile pattern design uses. A refreshing insight into textile pattern design methodology is thus provided.

Key words: tartans, checks, textiles, grids, pattern design.

Introduction

Tartan-type textiles have been a predicted fashion trend for various fashion seasons (at least, as suggested by exhibitors at a recent 'Première Vision', in Paris). Forthcoming fashionable designs may include 'deconstructed tartans', 'textured checks', 'patched checks' and 'geometric printed checks' etc. This paper explores geometric presentations (grid structures) based on the numerical proportions found in tartan setts, and how these can be distorted for novel textile pattern design uses. The origin of tartan and its production methods are reviewed first. Grid distortion possibilities are then identified. Examples are presented at the end of this paper, fulfilling colour trends for future fashion seasons (predicted on dezeen.com and fashionunited.uk); the paper illustrates how traditional textile artefacts can contribute to the design future of the textile industry.

Research hypothesis

'Tartan' as a name was derived from French 'tiretaine' and used in Scotland since 1530 (Coltman, 2010, p. 183). It was once used to describe a type of textile material (Coltman, 2010, p. 183;Dickens, 1873, p.178). 'A twilled stuff alike on both sides' (Dickens, 1873, p.178), or a slightly more up-to-date definition of tartan as a 'pattern or distribution of colour of a plaid/garment (Dickens, 1873, p.178). More modern still, is: 'a traditional art form based on the regular interweaving of warp and weft stripes to form repeated pattern blocks or squares.' (Grossman and Boykin, 1988, p.15). The majority of

tartan designs are more than 100 years old, many are over 150 years old and some are over 200 years old, an observation made over fifty years ago (Stewart, 1950, p.37).

Tartan has a long affection among Scottish people, both highlanders and lowlanders, and can be considered to have a multitude of social, cultural, political and economic aspects (Coltman, 2010, p.190; Stewart, 1950, p.1). Tartan has a strong link with families and clans in Scotland (Stewart, 1950, p.16; Dickens, 1873, p.177; Grossman and Boykin, 1988, p.15). The first evidence that tartan linked with a local clan can be dated back to 1578 (Stewart, 1950, p.9). A greater number of tartans produced in middle of 18th century and later was found to represent only a few leading families in the highlands (Stewart, 1950, p.22). The highlanders usually wear the tartans of their leaders (Stewart, 1950, p.26). Furthermore, social ranks can be indicated by the brightness of colour and the complexity of pattern (Stewart, 1950, p.8). Therefore, group significance was strongly attached to tartan (Stewart, 1950, p.2). Tartan was once regarded as associated with Scottish nationalism as much as a uniform in times of war (Stewart, 1950, p.2; Dickens, 1873, p.179). This also increased the popularity of wearing tartan (Stewart, 1950, p.2). The British government realised the power of tartan plaid in 1746 (Coltman, 2010, p. 183) and published an act to prohibit people from wearing tartans apart from the military (Dickens, 1873, p.178; Coltman, 2010, p.182). The community use of tartan was lost and this remined so even after the government's prohibition was removed (Stewart, 1950, p.15, Dickens, 1873, p.180).

Tartan is a calculated means of dressing up (Coltman, 2010, p. 185). The presentation of tartan depends on the numerical proportion of setts (Stewart, 1950, p.4). The 'cloth sett' (or simply 'sett') of a tartan gives the planned colour order and number of warp threads and weft threads per unit length (inch or centimetre) (Urquhart, 2000, p.14). Therefore, a tartan plaid can be woven larger or smaller by adding or removing the threads in the setts proportionally (Grossman and Boykin, 1988, p.15). 'The full sett is the sequence of colours read from right to left, turned about the pivot, and repeated left to right' (Urquhart, 2000, p.14). The pivot point thus acts as a point of reflection symmetry (Fig. -1), and the warp and weft setts are identical (Grossman and Boykin, 1988, p.15, Stewart, 1950, p.23). In the waving process, the warp and weft setts intersect at 90 degrees, Therefore, repetition of square pattern blocks provides visual order (Grossman and Boykin, 1988, p.15).

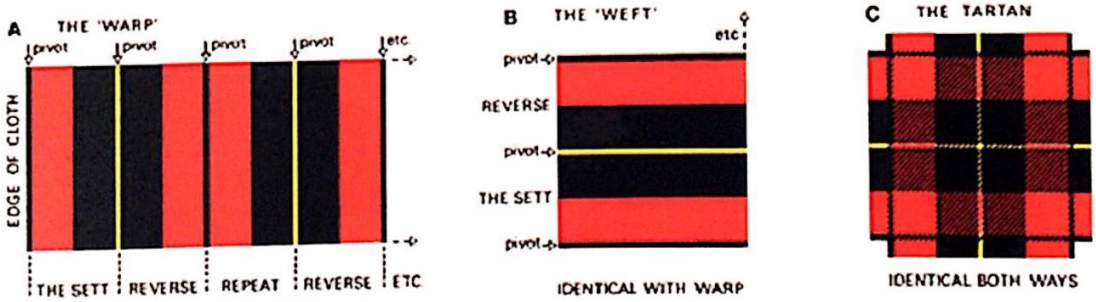

Fig. -1 Example of Scottish tartan construction showing pivot points
Source: Shin, 2011: 128

For example, a MacKeane tartan has warp threads ordered as follows: 4yellow, 2 black, 24 red, 16 black, 8 red, 16 black and 8/red (considered at the 'sett' or, occasionally, with symmetrical tartans, as the 'half sett') which is reversed or reflected to continue in

reverse order as 16 black, 8 red, 16 black, 24 red and 2 black; reflection occurs therefore at each of the two pivots (4/yellow and 8/red), and the yarns at each pivot are not themselves reflected (Stewart, 1974). In shortened form this order of threads (in both warp and weft directions) can be represented as 4/Y, 2 Bk, 24 R, 16 Bk, 8R, 16Bk, 8/R which is reversed at either of the two pivots (each shown as an oblique stroke) to produce a 'symmetrical' arrangement of twelve bundles of yarn which repeat in the same colour sequence in both warp and weft directions' (Hann and Wang, 2016, p.167).

Although most tartans today are symmetrical, some asymmetrical tartan can be found in the record. For example, according to Stewart (1950, p.18), Buchanan tartan is the most striking asymmetrical tartan, and the sett numbers are 2 black, 18 white, 8 crimson, 4 white, 8 crimson and 4 white (Stewart, 1950, p.47). Buchanan tartan is the most striking asymmetrical tartan, and the sett numbers are 2 black, 18 white, 8 crimson, 4 white, 8 crimson and 4 white (Stewart, 1950, p.47). In this case, there are no pivots, and the sett or order of threads will simply repeat across and down the cloth (Hann and Wang, 2016, p.167).

In previous research Hann and Wang (2016) selected twenty-five tartan setts, noting the colours and yarn numbers for each. From these twenty-five, ten tartan sequences were chosen, with the underlying grid structure used to create novel textile pattern design structures. A further development oif this outlook is provided below.

Methodology

Grid structure has long been applied in design practice in multiple disciplines. Evidence can be found in textile fabric pattern design (Qayum and Naseer, 2016; Shaw, 2010; Adams, 1989; Guilmain, 1985 and 1987; Liu and Zhang, 2009; Adanur and Vakalapudi, 2013), computer image recognition (Lu, Mok, Jin, 2017; Ma, Baciu, Hu and Zhang, 2010, Zhang and Xin, 2016; Hu, Luo, Ding, Guo, Jie, Zheng, Cai, 2017; Wang, Yang, Huang, Jin, 2012, Liu, Mok, Jin, 2014;), material study (Hausding , Lorenz , Ortlepp , Lundahl and Cherif, 2011; Rybicki, 2018; Böhm, Hufnagl, Kupfer, Engler, Hausding, Cherif, Hufenbach, 2013), biology (Damyanovich, 2018; Arad, 1997), mathematics (Azarenok, 2003), geography (Myklestad ,Birks, 1993; Crawford, 1983; Davies, 1974; Mackay, 1969), chemistry (Michl , Magnera, 2002), art (Johnson, Martin, 1998; Peden, 2004 and 2012;) and architecture (Collins, 1962, Jacobson, 1986). Grids can provide proportions in design practice. Grid subdivision and grid distortion are the common methods to create visual effects.

In textile pattern design, grids (without distortion) are used commonly in pattern design to provide units and invariably function as an underlying structure (Qayum and Naseer, 2016, p.62; Shaw, 2010, p.315), often to hold a design (or a motif) of some kind; the design may occupy one of more grid units and repeat along the entire fabric in both horizontal and vertical directions (Qayum and Naseer, 2016, p.62; Shaw, 2010, p.315). Examples can be found in garments, rugs, wall hangings and canopies (Shaw, 2010, p.316). In the handmade textile crafts in west Africa, often the symmetry provided by underlying grids can allow a piece of work to be made by a few people while still retaining an aesthetic order (regularity) (Adams, 1989, p.42).

Patterns with underlying grid structures can be manipulated in several ways including by 'superposition', 'nesting', 'combination' and 'parameter variations'. Also, the type and quantity of design patterns may increased (Liu and Zhang, 2009, p.1080);

these patterns are called 'quasi-regular patterns'(Liu and Zhang, 2009, p.1080). Fig.-2 shows examples of four quasi-regular patterns.

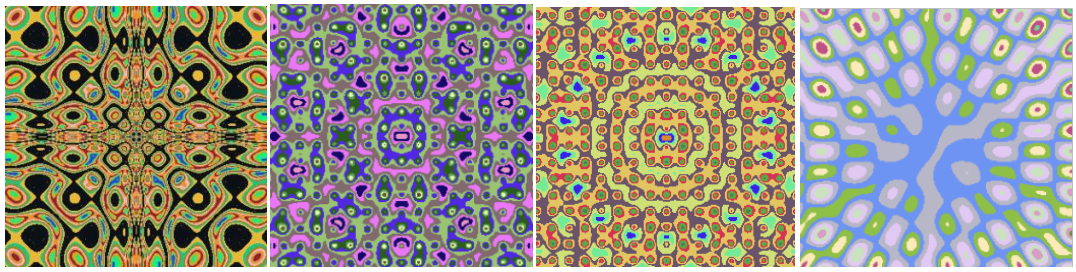

Fig.-2 Example of quasi-regular patterns
Source: Liu and Zhang, 2009, p.1081-1082

Lu, Mok, Jin (2014) distorted a pattern by changing its functions, and according to them, the set of pattern functions including patterns with titles such as 'time-line', 'comb', 'wavy', 'circular time-line', 'vortex', 'stylus' and 'ripple' (Lu, Mok, Jin 2014, p.127). Examples are shown in Fig. -3.

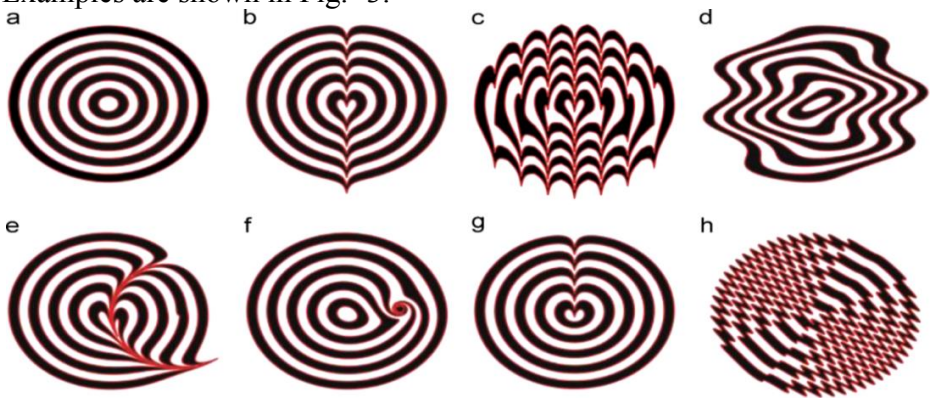

Fig. -3 (a) An initial state, (b)time-line result on the initial state, (c) comb result on the initial state, (d) wavy result on the initial state, (e) circular time-line result on the initial state, (f) vortex result on the initial state, (g) stylus result on the initial state, and(h) ripple result on the initial state
Source: Lu, Mok, Jin, 2014, p.127

By combining the adjustment in different pattern functions, a grid-like pattern was created from distorting concentric circles (Lu, Mok, Jin 2014, p.129), which is shown in Fig. -4. Marbling effects can be created according to this pattern-distorting method with colour filled in (Fig. -5), which can be used in textile patterns (Lu, Mok, Jin, 2014, p.124).

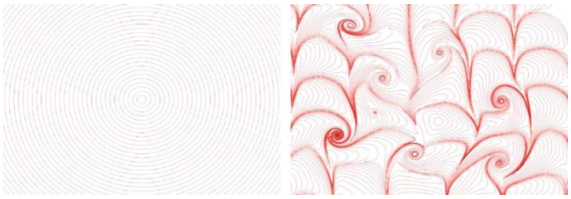

Fig. -4 Pattern distortion by changing pattern functions
Source: Lu, Mok, Jin 2014, p.127

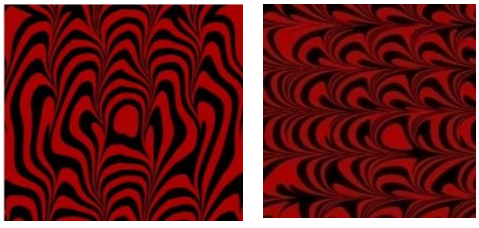

Fig. -5 Marbling effect
Source: Lu, Mok, Jin 2014, p.130

Another application of grid distortion in a textile design can be through mapping two-dimensional patterns onto three-dimensional models (Lu, Mok, Jin, 2017, p.38). As

almost all the textile patterns are designs on two-dimensional basis, and human body is three-dimensional, it is inevitable to have a pattern distortion followed the body curves in the real wearing effect (Lu, Mok, Jin, 2017, p.36). Designers then can use grid system to calculate the exact distortion rate between the textile pattern and the real wearing effect. Firstly, grids were drawn on a piece of two-dimensional pattern, and then the same grids were distorted over a three-dimensional surface (as shown in Fig. -6), by comparing the positions of the grids vertex on both textile pattern and the three-dimensional model, the distortion rate can be calculated (Lu, Mok, Jin, 2017, p.39).

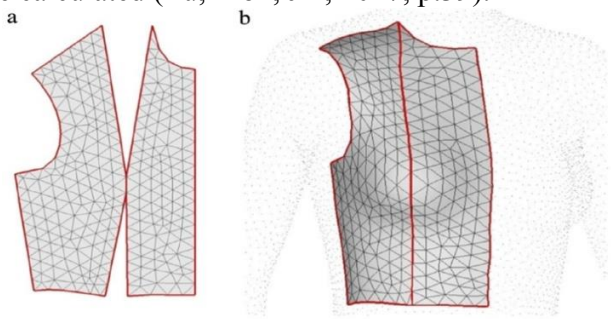

Fig. -6 Two-dimensional pattern distorted on three-dimensional model
Source: Lu, Mok, Jin, 2017, p.39

Map systems usually use distorted grids to accurately reflect distribution patterns in a particular area. For example, Myklestad and Birks (1993, p.9) used a grid-based map to study the species distribution of the floristic regions in Europe. This is shown in Fig. -7. The map with shaded grids is also used in census survey (Davies, 1974, p.232). In terms of areas with irregular boundaries, the grid-based data usually has a limitation of accuracy, in which with the smaller cells on a map the more accurate data its reflected (Davies, 1974, p.233).

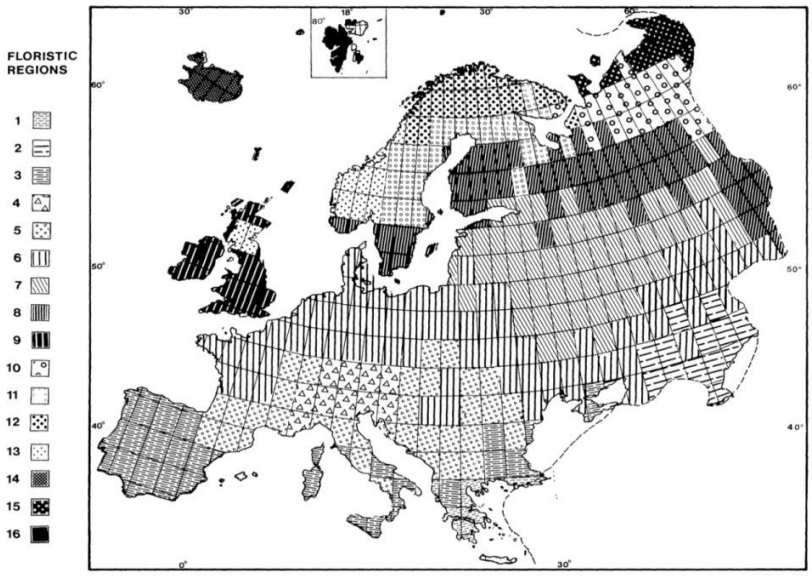

Fig. -7 Grid-based map systems
Source: Myklestad and Birks, 1993, p.9

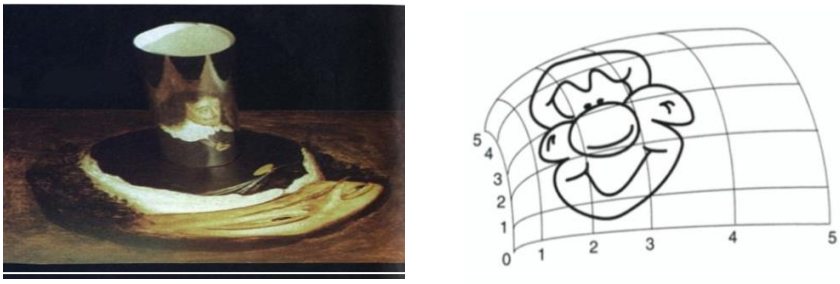

Fig. -8 The anamorphic art work (a) and the drawing grid (b)
Source: Johnson, Martin, 1998, p.24 and p.26

The application of grid distortion can be found in creative art works. The anamorphic art style (Johnson, Martin, 1998, p.24) and the wave space art (Peden, 2004, p.377) all contains distorted grids as underlying guidelines. Anamorphic art is a type of '…artwork that is indistinct when viewed from a normal perspective but becomes recognizable when the image is viewed from a different perspective or reflection' (Fig. 8 a) (Johnson, Martin, 1998, p.24). In the creation process, an anamorphic grid was used as guidelines by European artists (Johnson, Martin, 1998, p.24)(Fig. -8 b). Peden (2004) made the wave pattern effect based on the twisted square modular grids (Peden, 2004, p.377) (Fig. -9).

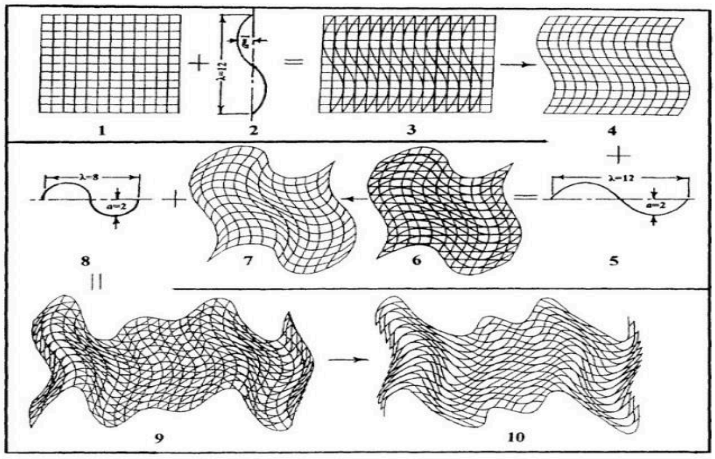

Fig. -9 Wave pattern effect made of square modular grid
Source: Peden, 2004, p.377

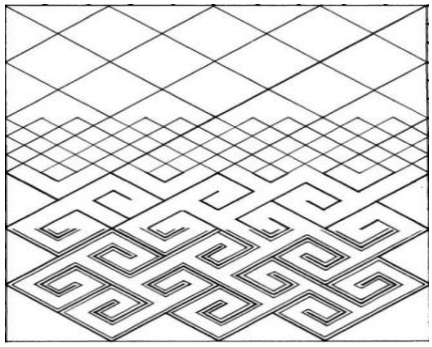

Fig. -10 The sub-division of grid units
Source: Drawn from Guilmain, 1987, p.36

The division or sub-division of grids as design methods are widely used in carpet design, due to the nature of the technique of weaving, the thickness of the band may be sub-divided to suit certain pattern designs. Therefore, the original guide grids need to be sub-divided accordingly. Fig. -10 shows an example, which illustrates the sub-division of grid units to suit pattern design (Guilmain, 1987, p.36).

Findings and Discussion

'The dominant aesthetic characteristic of tartans is their checked appearance, based on warp threads in a given order of colours interlacing at right angles with weft threads in the same order.'(Hann and Wang, 2016, p.880), proportional relationships exist between the number of threads (or setts) in each colour. Frameworks were generated based on 10 tartan numerical setts numbers provided by Stewart (1974), including Baird (with thread counts: 6, 2, 2, 16, 16, 16, 4, 6); MacPherson (Thread count: 2, 2, 16, 2, 2, 2, 16, 2, 2); Abercrombie (Thread count: 28, 2, 14, 14, 4, 4, 4, 4, 14); Balmoral (Thread

count: 4, 2, 16, 4, 4, 2, 2, 2, 8, 4, 2, 2, 2); Davidson (Thread count: 2, 12, 6, 12, 2); MacCallum (Thread count: 2, 12, 12, 8, 2, 4, 16); MacLeod (Thread count: 6,4, 30, 20, 40, 4, 4); Macrae: Hunting (Thread count: 6, 2, 30, 28, 8, 4, 8, 4, 28); Montgomerie (Thread count: 8, 10, 8, 56, 8, 10, 8); Stewart of Galloway (Thread count: 6, 48, 8, 2, 4, 2, 8, 12, 6, 2, 4, 2); then these grids-like frameworks got distorted in PhotoShop by modifying 10 different settings: Freehand; Mirror; Waves; Two-points; Poke; Pinch; Growth; Circuit; Shutter and Pages. Then the patterns are filled with colours including: Neo mint; Banana Sorbet; Black Forest Gateau; Cactus Green; These are womenswear colours anticipated for Spring/Summer 2020 season (https://www.dezeen.com ;https://fashionunited.uk/). Similar colours or complementary colours of the above colours were also added in some of the pattern designs.

Fig. -11 illustrates the pattern design combined with the 'waves' distortion method, using an Abercrombie tartan grid as a guide to proportion, applied with a range of blue colours including those predicted as fashion trend colours by fashionunited.uk.

Fig. -12 shows the freehand style applied to Baird tartan grids, with colour application including Neo mint, Cantaloupe and Solar Orange.

Fig. -13 shows the two-points twist on Balmoral tartan, which has been further induced to a pattern design by applying multiple fashion trend colours.

The Davidson tartan has a balanced underlying grid (Fig. -14). However, when distortion was applied (using the 'poke' method) to the grid, an asymmetrical pattern was then produced. This pattern can be duplicated for further textile pattern design.

The pinch method can twist images in a radial way; Fig. -15 shows its application on a MacCallum tartan.

Fig. -16 illustrates the application of 'growth' method on a MacLeod tartan. The resultant pattern was coloured by 'purist blue' and 'Alice blue' both predicted fashion colours.

The design on MacPherson used a 'mirror' method (Fig. -17), which give a symmetrical appearance of the pattern unit. This design was coloured in a range of greens.

The 'circuit' method will distort pattern lines by 90 degrees; this method was applied to a Macrae (Hunting) tartan (Fig. -18). Patterns are coloured by complementary colours.

A Montgomerie tartan (Fig. -19) has a balanced structure. After applying 'shutter' distortion, the new pattern unit grid remains symmetrical. This pattern was coloured by a range of similar colours.

The layout of the Stewart of Galloway tartan (Fig. -20) showed complications compared to other tartans; the 'pages' method was applied together with the addition of complementary colours to make an appropriate textile design effect.

A range of appropriate patterns is shown in garment formå in Fig. -21.

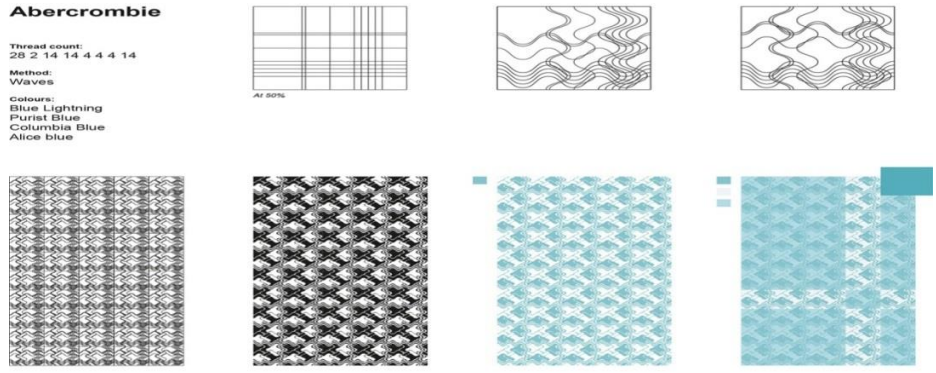

Fig. -11 Textile pattern design based on Tartan proportions (No.1)

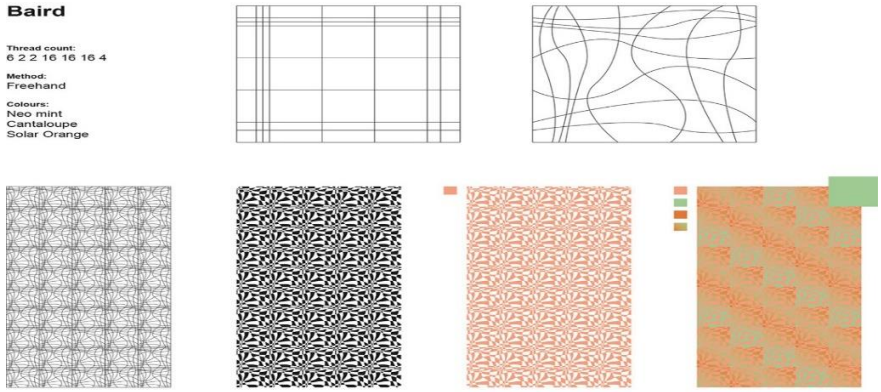

Fig. -12 Textile pattern design based on Tartan proportions (No.2)

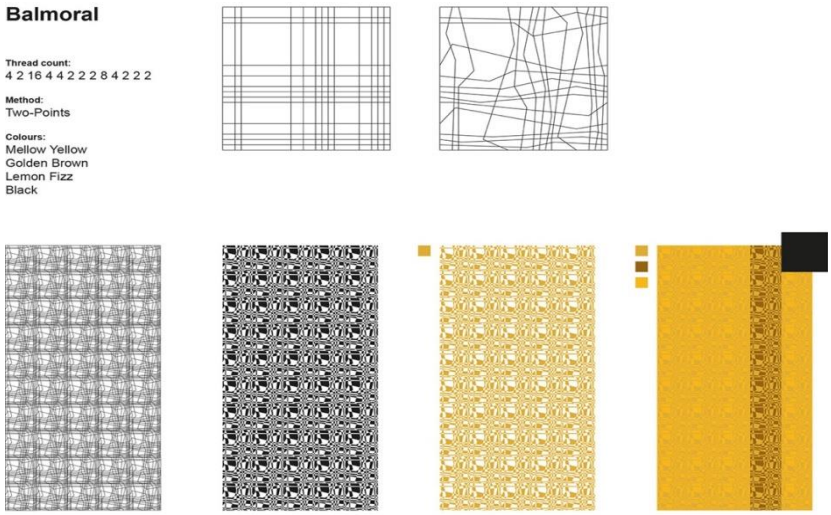

Fig. -13 Textile pattern design based on Tartan proportions (No.3)

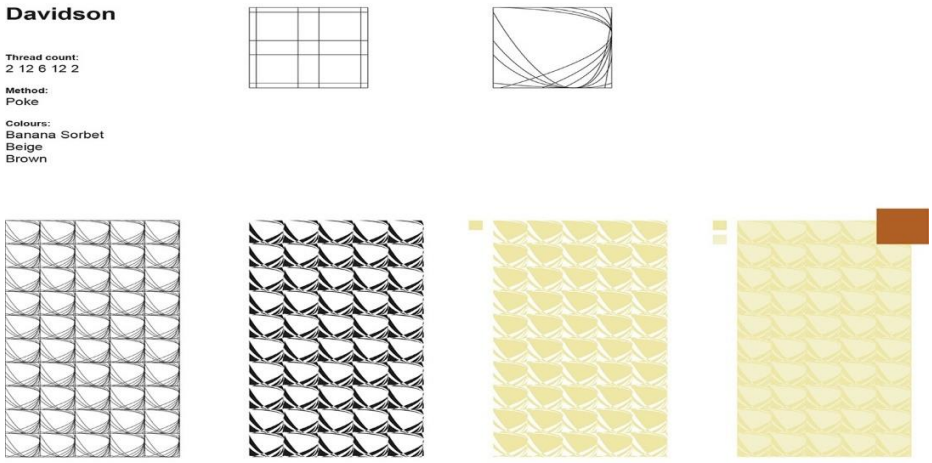

Fig. -14 Textile pattern design based on Tartan proportions (No.4)

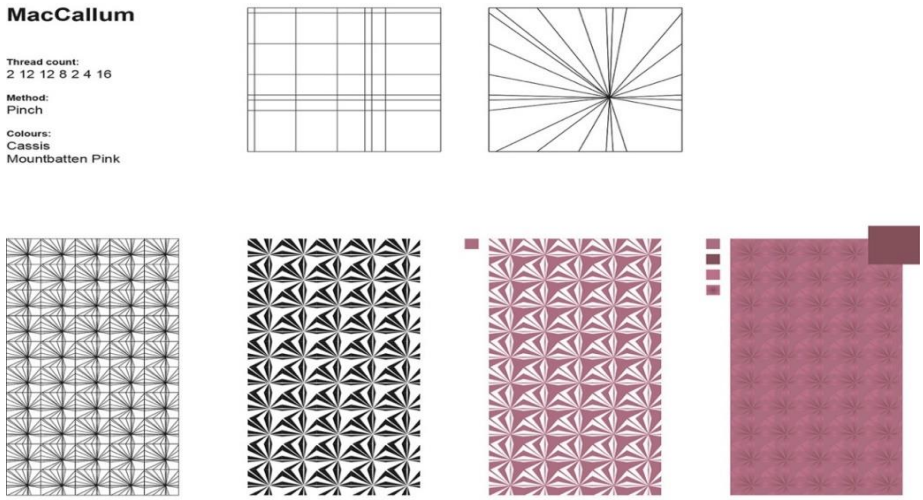

Fig. -15 Textile pattern design based on Tartan proportions (No.5)

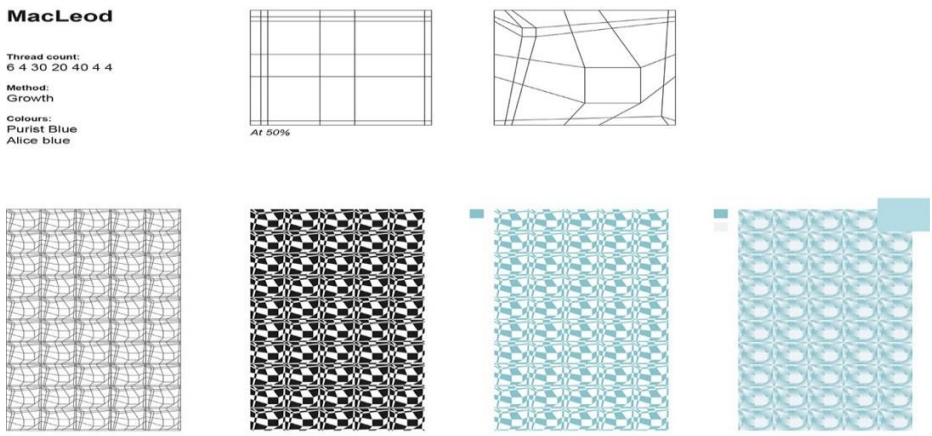

Fig. -16 Textile pattern design based on Tartan proportions (No.6)

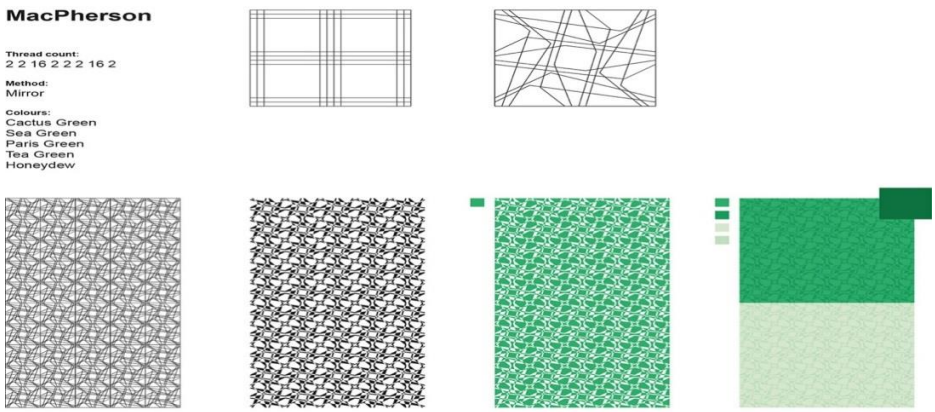

Fig. -17 Textile pattern design based on Tartan proportions (No.7)

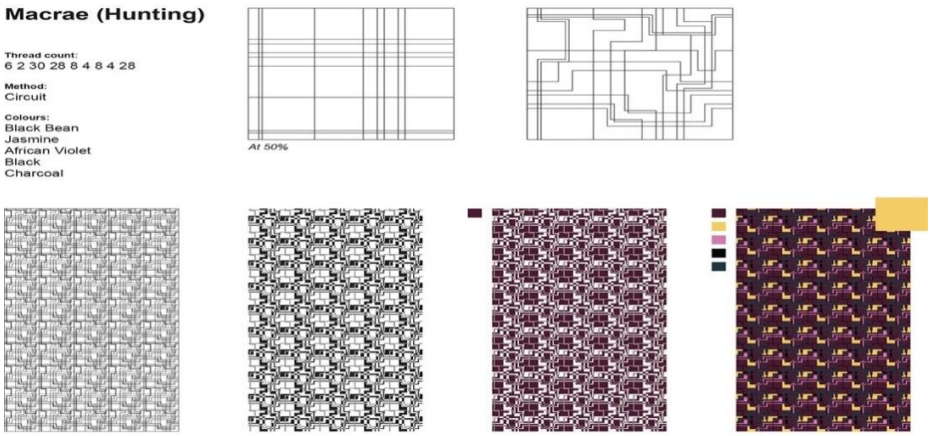

Fig. -18 Textile pattern design based on Tartan proportions (No.8)

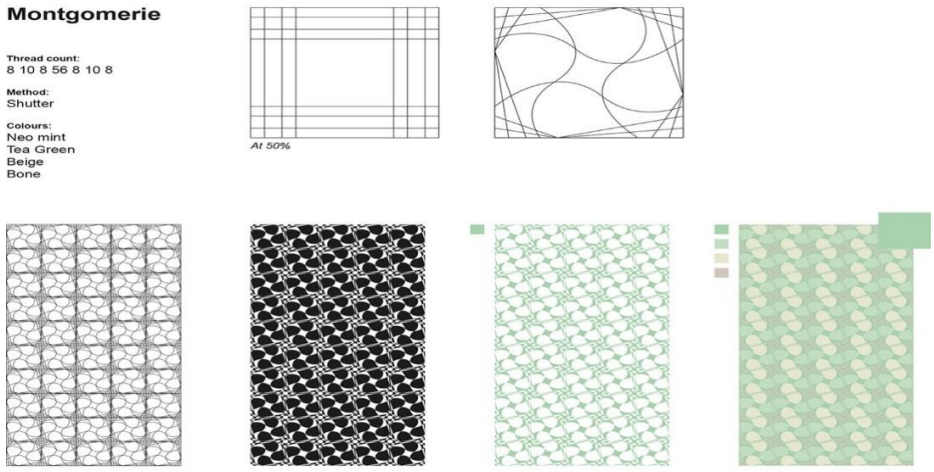

Fig. -19 Textile pattern design based on Tartan proportions (No.9)

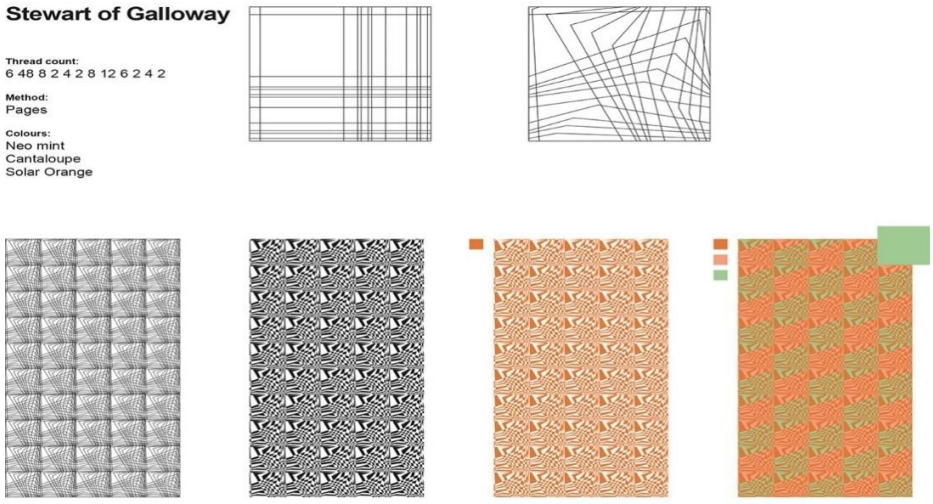

Fig. -20 Textile pattern design based on Tartan proportions (No.10)

Fig. -21 Overall textile pattern design presentation based on Tartan proportions

Summary, Conclusion and Implications

Tartan has a long existence as a textile pattern, with its checked features probably the most famous; derived types have been shown here which accommodate anticipated fashion trends for the 2019/20 season. Grid and grid distortion is a common method in art and design practice. This paper provids a methodology for textile pattern design by distorting tartan's underlying grid structure in 10 different ways via Photoshop. In this paper, the origin and nature of tartan was firstly reviewed. Grid distortions application in art and design were then identified. The possibility of grid distortion of underlying structures in ten tartans were discussed and illustrated in detail; it is believed thst this procedure will benefit future development of textile pattern design, computer graphics, and creative thinking in general.

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DO-02

SLOW FASHION APPROACH TO SUSTAINABLE AND CIRCULAR DESIGN INNOVATION

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Abstract

Asian countries have a rich legacy of craft traditions. Over the centuries India has served as melting pot for varied craft techniques and influences from far off lands ; via trade routes, travelers, explorers and invaders. These crafts influenced the sartorial practices and the way of life of the community that practiced the craft in the particular region, utilizing the local resources. The adverse effects of the long colonial rule and rapid industrialization that followed in the twentieth century led to mindless consumption of clothes produced faster and cheaper in the twenty first century. The fast fashion industry has been responsible for polluting the environment, propagating many unethical practices causing health and safety hazards to the makers and consumers alike; violating minimum wage norms and promoting consumerism and capitalism. Calls made by community of manufacturers and consumers concern a wide spectrum of choices amongst clothing material and symbolic associations. This in turn impacts wellbeing, health and functional requirements of the wearers and of clothing product lifecycle from cradle to grave. This paper attempts to study the barriers that challenge the slow fashion stakeholder communities in concurrent times. Slow fashion addresses many global challenges which include ecologically sustainable livelihoods for indigenous communities and their craft practices and provides circular design innovations. The slow fashion tribes are strong subscribers for co-creating cohesive socio-economic groups which are defined by values of responsible fashion. This paper intends to highlight case studies of co-creation practices adopted by these growing communities in Asian countries. Resultantly, fusion fashion, which creates unique statements by including local craft, textile and costume practices of ethnic communities in a contemporary context. This leads to sustaining ethnic cultural heritage, identity and diversity as well as liberates the mindless imitation of leading trends germinating from fashion epicenters. Slow fashion is circular design innovation and stands for glo-cal, which includes the supply-chain, communication stories and imagery to break free from barriers of near perfect, unrealistic portrayal of people; rather celebrate the diversity, natural and humane side which constitute responsible indigenous craft friendly communities for better future.

Keywords: Responsible fashion, Fusion style, communities, sustainable livelihoods, transparency.

Introduction

The global challenges posed by rapid industrialization and globalization, with numerous issues to address, including health and better living.The fast fashion industry has been responsible for polluting the environment, propagating many unethical practices causing health and safety hazards to the makers and consumers alike, violating minimum

wage norms and promoting consumerism and capitalism.The world's most polluting industry in the world, second only to oil, since that fateful day of the devastating Rana Plaza disaster in 2013, the hits just kept coming. Two things are happening simultaneously across fashion landscape. Global fast fashion brands like H&M and Zara continue to capture market share, against the backdrop of the slow but steady rise of independent, ethical fashion labels. Whether it's an enterprise that's using banana fibre to make jeans, an indie label that's turning the plastic in our oceans into swimwear, brands that are up-cycling textiles for the runway or ones that are creating cruelty-free / vegan leather products, designers are shouldering the responsibility of making fashion sustainable together and strategies for circular design innovation.

The new world order calls for questioning the mindless consumption of fashion. There is a need to pay due attention to the dire consequences of this mindlessness. Pause for fashion to take notice of how we impact and how our choices influence relationships with environment, culture and people. Redefining contexts and the core values we connect with while adopting lifestyles of conscious consumption and creating new system of standards & values for bringing circular design innovation to grow the slow fashion community.

Pause for slow fashion

"Slow Fashion represents all things "eco", "ethical" and "green" in one unified movement. It was first coined by Kate Fletcher, from the Centre for Sustainable Fashion, when fashion was compared to the Slow Food experience. Carl Honoré, author of "In Praise of Slowness", says that the 'slow approach' intervenes as a revolutionary process in the contemporary world because it encourages taking time to ensure quality production, to give value to the product, and contemplate the connection with the environment.

Slow fashion is about consuming and creating fashion consciously and with integrity. It connects social and environmental awareness and responsibility with the pleasure of wearing beautiful, well-made, and lasting clothing (as compared to the immediate gratification of fast fashion).

Slow fashion is the intersection of ethical, eco, and lasting fashion. A piece of clothing or a brand doesn't necessarily need to check off all three boxes to be considered "slow", but the more an item or a brand encompasses these three things, the closer it comes to a true embodiment of slow fashion. **Ethical Fashion** concerns human and animal rights. **Eco Fashion** concerns the impact of clothing production on the environment. **Lasting Fashion** concerns the garment itself and slowing down the clothing consumption rate. This category is also about keeping traditional methods of clothing making and craft techniques alive that provide meaning and value to the clothing people wear.

Kay Dory comments in her blog, that the fast-fashion habit is expensive. More than US$500 billion; each year due to under-utilized clothes and lack of recycling there is massive loss in billions. There is a need to educate consumers about Circular fashion: emphasis to buy less clothing and also to make sure to choose that is more sustainable and higher quality. There needs to be demand for transparent sourcing…..It will take time for the fast-fashion industry to slow down. The trends already set in motion by the Make Fashion Circular initiative and others are starting to gather steam. But to stop stretching our planet, we all need to play our part.Consume consciously and responsibly by reading

the labels before purchasing. Authentic natural and organic fibers, non-toxic dyes, take-back programs, and ethical production.

Calls made by community of manufacturers and consumers concern a wide spectrum of choices amongst clothing material and symbolic associations. According to 2018 Mckinsey report environmental consciousness is increasing amongst fashion consumers worldwide. They expect ecologically unobjectionable fabrics, a conservation-minded use of resources, reduced emission of pollutants, greater social commitment, and fair treatment of employees in production facilities. In many countries, legislators are requiring companies to create more sustainable products, such as by prohibiting certain harmful dyestuffs. Yet unfortunately, only the fewest customers are willing to pay more for these greener products. One pioneer of this trend is Stella McCartney, who forgoes using leather in her shoes and handbags. A clear commitment to sustainability is also considered good style in the industry, with online fashion retailers like Yooxproviding sustainability reports.

This has vast implications for apparel companies across the whole value chain. Core functions need to be adapted to make and market more sustainable products. Environment friendly products require the right commodities like organic cotton, which is in scarce supply, or a complete overhaul of the manufacturing processes to reduce the huge amount of water typically used for apparel. Ethical products require appropriate working conditions and a fair share of profits across the supply chain. In short, it entails a complete rethinking of functions and processes. This in turn impacts wellbeing, health and functional requirements of the wearers and also the lifespan of clothing itself: the entire product lifecycle from cradle to grave.

Slow fashion stakeholder communities

Nobel Laureate and philosopher, Bertrand's *definition* of *community*, "Community is a functionally related aggregate of people who live in a particular geographical locality at a particular time, show a common culture, are arranged in a social structure, exhibit an awareness of their uniqueness and separate identity as a group".

This paper attempts to study the barriers that challenge the slow fashion stakeholder communities in concurrent times. Good quality clothes require patience as it takes time. The natural cotton fiber grown by the hard working farmers, spun by hand or machine into a magical length of yarn, which is further hand or machine woven into a splendid fabric by the accomplished weavers, dyed or printed in blissful hues. Subsequently pattern cut, draped and sewn by dexterous hands and eyes; to translate the two dimensional fabric to the real three dimensional garment. After the garment which is created by collective efforts of so many people and multiple resources, when no longer useful it is disposed; it is either reused which then gets bio- degraded; worse if made of synthetic fabrics does not even get bio-degraded and adds to the landfill. Immaculate design intervention at every stage from farm to grave is essential to make the lifecycle of the clothes circular and meaningful to all people who make it and wear it and cause minimal adverse impact on environment for sustainable future while enjoying the current fashion responsibly.

Therefore slow fashion community consists of many tribes of producers (farmers, spinners, weavers, craftsperson's, designers, manufacturers/ factories / workshops)and consumers, local residents; together they form a cohesive socio groups who define and are defined by values and tensions concerning slow fashion .Seeking to improve and solve the problems created by earlier generations to overcome barriers that challenge the slow fashion stakeholder communities' issues to address, including health and better

living and create a robust community.Drawing attention to the core value of our society moving closer towards advocating environmental causes. The impact of global warming, health and wellness. Consumer behavioral patterns have been a great area of interest not only for economists, but for designers and global fashion brands over the past few years. Demand for Sustainable and ethically produced clothing is growing. Sustainable fashion aims to respect environmental limits and support positive social impact by safeguarding people's health and wellbeing. A great motto coined by Vivienne Westwood dictates, "Buy less. Choose Well. Make it Last." At the core of this entire movement is transparency and the pivotal moment in which transparency became a selling point. Westwood's point is about trading in passive consumerism for a more holistic approach that respects people at every step in the supply chain. It can even be useful to think about a sustainable purchase in terms of an investment in people and the planet. The next time we are shopping we need to pause, there is a chance for every person to make positive change and do good. In order for sustainability in all realms to be sustainable itself we must train ourselves and condition our attitudes to understand why something like sustainable fashion are vital in the long run.

In an interview with Madelokal, the educationist and activist Brown mentions many avenues for learning about sustainability and great content from webzines, blogs, websites, magazines, academic journals, books, trade shows, online resources and the designers themselves that are making change. There are some important authors in this space such as Timo Rissanden, Elizabeth Cline, Kate Fletcher, Sandy Black, Alison Gwittand Sass Brown. There are great websites, blogs and eZines like Coco Eco magazine, Ecouterre, Eco Fashion Talk,Magnifeco. And artisan networks such as the Ethical Fashion Initiative, The Alliance of Artisan Enterprise and trade and public shows like the Santa Fe Folk Art Market and New York Now. All are great resources for more information and tons of inspirational work.

The barriers to slow fashion can be overcome by collaboration, spreading the need for change and active engagement with all stakeholders of the slow fashion community for building robust and sustainable circular design innovations.

Slow fashion community & circular design innovation

Slow fashion addresses many global challenges which include ecologically sustainable livelihoods for indigenous communities and their craft. The new dimensions/paradigms of luxury are facilitated when innovations are brought forth by key drivers of change the designers as well as consumers towards slow responsible circular design innovations. This encourages green connect for social design to improve fashion chains, social responsibility towards craft sustenance, economic viability for the crafts persons and designers for robust and ethical fashion system.

The slow fashion tribes are strong subscribers for co-creating cohesive socio-economic groups which are defined by values of responsible fashion. This paper intends to highlight case studies of encouraging practices adopted by these growing communities in Asian countries. Resultantly, fusion fashion, which creates unique statements by including local craft, textile and costume practices of ethnic communities in a contemporary context

During her stay in the middle-east Asia, Sass Brown observes a connection to tradition, history and craft that is quite tangible in the Arab countries and that makes for an easy spring board. The Silk Road circled this region, and as a result there is still an

incredible breadth and depth of traditional techniques and crafts. That connection has been lost in so many other regions of the world, but they still exist here, and that she finds exciting. She thinks that the future of luxury is in great part going to come out of 'non-traditional' fashion capitals, and reason behind it is the traditions they have maintained, and their unique sense of aesthetic. Luxury in its purest sense is handmade and crafted, connected to the traditions and culture of the regions of the world it comes from. Organizations like Fashion Revolution have taken on massive significance since their inception, as well as governmental bodies like the UN that have made a greater focus on the creative economy and the economic affects that supporting women and traditional craft has on developing nations. One of the things we know is that it takes a village of diverse, invested individuals and groups to move this forward, and we all have a role too in this slow fashion community.

The researcher of this study has integrated her work experience as an educationist and slow fashion designer to engage with the slow fashion communities. Sensitizing design learners towards the responsible design process and fashion systems; engaging them in craft study projects to find contemporary design solutions at system level and product development for circular design innovation. This has led tone learners' inclusion to the slow fashion community. There are other noteworthy educationist and influencers who are relentless working towards this cause.

As slow fashion design practitioner the author shares the process of co-creation and slow fashion values with a larger community, beyond learners at the design school and academia. Working with various craft clusters across India, and empathised with the challenges faced by the craftsperson and also the immense opportunities that lie ahead. Observing evolving relationships of the people with their clothes and changing expressions of fashion. This resonated with her design sensibilities of slow fashion, mindful consumption and Indian heritage weaves, translated in fusion fashion lines for the contemporary women. The label "Vaibbhavi P" stands for all this; working with craft clusters in various parts of India and develop textiles for the collection and then the detailed garment development happens in the studio. Every design collection is based on the core slow fashion philosophy. Artisanal luxury and minimalism are the aesthetic directions in the designs. The Label works with Indian organic cotton, hand spun yarns and hand-loom weavers, Khadi fabric, natural dyeing, all earth friendly process and endeavours to incorporate circular design innovations, as mentioned below:

1. Making slow clothes that are kind to the maker, wearer and the earth and made with love. Craft and cultural sustainability through sustainable livelihoods for the rural artisans.
2. Committed to sustainable livelihoods without displacing the rural artisans. Safe working environment and fair wages which helps support a dignified living. No child labour is involved and proper medical facilities are available for the people and their families. If there are working mothers ensuring crèche facility for young children and flexible working hours.
3. Each collection is based on something that has lasting impact on the principal designer, finds resonance with traditional textile technique and the most frugal usage of material resources.Encouraging mindful consumption, frugal approach, up-cycling and re-using.

4. The author has worked closely with the Gudimudi Khadi Project, of Women Weave, Maheshwar. With the objective to ensure sustainable income and better lives for local weavers they have linked indigenous cotton farmers with women weavers who create unique and contemporary Khadi textiles for fashion products and home furnishings. The fabrics from this project are hand-spun, hand-woven, and naturally-dyed with earth-friendly processes.
5. The author's AW 19 20 collection Rhezzo- the herbal hues, is co -created with the Malkha Weavers in Telangana . Experimenting with indigenous handloom cotton fabric, yarn-dyed in earthy hues using herbal dyes like indigo, madder, pomegranate rind, catechu etc. the handloom weavers are paid fair wages and the marketing office ensure a steady work flow and training for design innovation.
6. Upcycling the loom off cut yarns (post weaving) in tassel details, these are yarn dyed with natural dyes .
7. Recognizing every piece of fabric (post garment production pieces) precious; as numerous hours of painstaking process involved in making fabrics so it is upcycled it to create beautiful textures of the weave and stitch.
8. Opportunity to value add in the design process, by up-skilling people, reducing wastage while keeping up the fashion quotient. Up-skilling workshop for urban women (Chakala, Mumbai) to enhance their livelihoods, old sari borders (reuse) applique' in boat motifs for SS 18 Rheeva collection.
9. The silhouettes are developed to reduce wastage, and often up-cycled for a frugal approach to resource utilization and trans-seasonal styles.
10. Earth friendly processes, mindful and frugal use of resources, water, soil, air ,energy. Supporting organic cotton farming, exploring neweco friendlyregenerated man-made fibers in forthcoming collections with weaving clusters. Switching to renewable resources and effluent treatment,to reduce the carbon footprint. Communication with the consumers about eco-friendly washing solutions, herbal and home washing, reduce dry cleaning for eco sustainability.
11. Committed to sharing the story behind the collection concept, the processes involved and how the clothes are made for each collection.
    Involving circular design innovation strategies at each stage and connecting with the community of slow fashion consumers. The story behind," Who made your clothes. Do you know how many human hands have touched the garment before it reaches you? Farmers, spinners, Weavers, dyers, embroiders, pattern makers, tailors, ironing, packaging, retail staff etc."
12. They are communicated the value of the process involved in hand spun, hand woven, and meticulously stitched garments with fine design detailing and take good care of the clothes, and often repeat them by styling differently. Endorsing the appreciation for artisanal luxury, good quality , buy less buy good.
13. Committed to create Glocal designs, everyday clothes for mindful slow getters.
14. Proper care and styling instructions are provided to the clients, who pause for fashion. The clothes are second skin and the label helps in responsible self-expression and make a difference each day, in handmade clothes.
15. The appreciation for cultural sustainability by respecting, nurturing and preserving culture and passing down tangible and intangible cultural expressions to future generations for makers and wearers.

Figure 1: Vaibbhavi P Slow Fashion Graphic Pictograms

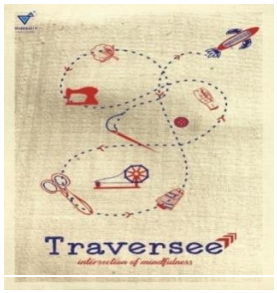

Figure 2: Slow fashion process graphic for SS 19 Travesee collection

Figure 3: Upskilling workshop for urban women (Chakala, Mumbai) to enhance their livelihoods, old sari borders applique' in boat motifs for our SS 18 Rheeva collection

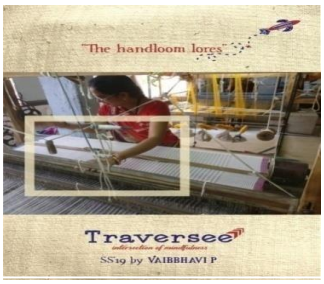

Figure 4: Handloom lores: Craft sustenance without displacing Indian crafts persons and sustainable livelihoods in the native villages (Women weave, GudiMudi, Maheshwar , MP) .

Figure 5: Natural Indigo vat dyed yarns

Figure 6: Garment construction in well ventilated workshop

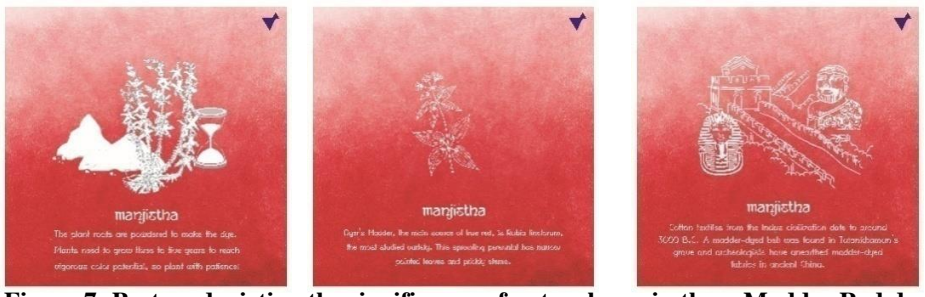

Figure 7: Posters depicting the significance of natural manjestha – Madder Red dye

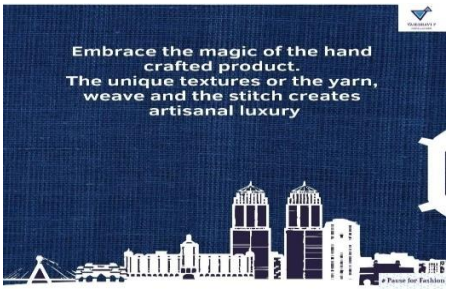

Figure 7a: Graphic poster Appreciation of the handmade stitch and weave

Figure 8: Every piece of fabric is precious as numerous hours of painstaking process are involved in making fabrics, further upcycled to create beautiful textures of the weave and stitch

Figure 9: Granite Crop top from AW18 Kshitij collection is upcycled from post production scrap

Figure 11: Beautiful and minimal tonal contrast of the weave and stitch with minimal waste pattern cutting approach.

Figure 10: Upcycling the loom off cut yarns (post weaving) in tassel details, these are yarn dyed with natural dyes

(Figure 1-11 are copyrighted images of label Vaibbhavi P)

Artisan design schools in different corners of India like The Handloom School Project in Maheshwar, Kalaraksha Vidhyalaya & Somaiya Kala Vidhya in Kutch, The Kalhath Institute, Lucknow etc. and various NGO's like Dastakar, SEWA, Women Weave etc. are working relentlessly to sustain the artisans' belief in their hereditary profession and growing their skill capital by providing education and training to younger generation.Responsible and fair partnerships between craftpersons and Indian fashion industry has tremendous potentialof bespoke handcrafted fashion garments. The

paradigm shift toward potential circular design innovations is desirable rather than on sad stories of deprivation and decline in craft traditions. Craft person and designer become partners in exploring all the different options available and in finalizing designs that work for everyone; support sustainable livelihoods, craft and cultural sustenance.

The beginning of mainstream conversation around the need for sustainable fashion in India is result of the ongoing revolution. In addition to the emergence of mindful design houses, brands and labels, and a new generation of conscious consumers. The Lakme Fashion Week has been dedicating a day to the celebration and showcase of slow fashion during its annual five day-long event. Summer Resort 2018 Sustainable Fashion Day was a remarkable display of how North East India is catalyzing sustainable fashion in collaboration with United Nations, India. Titled #NORTHEASTMOJO, the show presented five designers who spun local craft traditions into stunning sartorial creations, along with the proficient artisans of these crafts. Despite having a rich textile heritage, this was perhaps the first time that the usually under-represented Seven Sister States were put exclusively on the national fashion radar.

These six conscientious designers from the North-East.

I. Daniel Syiem Ethnic Fashion House (DSEFH), Meghalaya

This label by Daniel Syiem from Shillong stresses on high quality, rare fabrics, classic styles and mindful consumption. Primarily using fabrics like Ryndia (a heritage textile that is hand-woven by the local weavers of Meghalaya), the fashion house aims at preserving the endangered hand-weaving traditions of North East India's native tribes.

II. Kuzu, Sikkim

Karma Sonam (founder of Kuzu), works with the women weavers trained in village, many of them can't leave home. So the Gangtok-based brand provides training and equipment so that they can work from home. Uses warm colours and design elements inspired by the bountiful flora and fauna of Sikkim and is made in yarns that are 100% natural and eco-friendly.

III. JenjumGadi and Exotic Echo Society, Nagaland

This collaboration with the goal of creating sustainable employment for the rural poor, primarily working with women lion loom weavers (Back strap loom), to create home furnishings, accessories, shawls and beaded jewellery.

Image Credit: Sagar Ahuja via Vogue

IV. Khumanthem, Manipur

Imphal based RichanaKhumanthem strives to form a long lasting relationship with their customers, by not only crafting high-quality, unique, statement pieces but also cherishing and sharing the story behind each handloom creation. In true slow fashion-style Khumanthem strives to contextualize and highlight the intrinsic value of their designs in the new world's commercially driven markets. Contemporary twists to age-old heritage crafts, the aesthetic is evocative of serenity in an over-fraught fashion industry.

V. Tilla,Tripura

Tilla's values stem from the handmade and self-reliant nature of village crafts and their ability to adapt in infinite, creative ways. Varman uses hand woven Indian textiles like khadi, jamdani and kanjeevaram to create clothing that is wearable, elegant and fuss-free. With an identity that's rooted in addingcontemporary twists to age-old heritage crafts, the aesthetic is evocative of serenity in an over-fraught fashion industry.

VI. Sanskar, Assam

Dominated by the use of recycled vintage fabrics and indigenous silks, Sanskar is an ethical fashion label created by Sonam Dubal.The craftsmanship of the region is an ecological treasure that needs to be highlighted and preserved. Committed to this cause, he works on Indo-Asian silhouettes made in vibrant, native fabrics. His latest collection, that celebrates the textiles of Assam, uses Eri silk, also known as Ahimsa silk;it has the incredible property of keeping you cool in summer and warm in winter.



Image Credit: Sagar Ahuja via Vogue
Image Credit: Sanskar by Sonam Dubal

This leads to sustaining ethnic cultural heritage, identity and diversity as well as liberates the mindless imitation of leading trends germinating from fashion epicenters. Stepping away from the practice of tokenism, having larger dialogues about the preservation of artisanal traditions and implementing the development of the collaborative work will give them; the crafts and craftsmen international acclaim and recognition.

Zeitgeist of the Slow Fashion community

Fashion literally means **zeitgeist** "the spirit of the times". It is time that we find new interpretation to the spirit of our time, which needs to slow down the pace of demand for fashion, in turn the need of faster, quicker production only to be discarded and dumped, to pollute the environment and exploit the people to make these.

For understanding the Zeitgeist a persona mapping of the slow fashion consumer community was done, and it revealed many interesting perspectives. The pre-requisite for their inclusion for this research was that they willingly gave up fast fashion at least 2 years ago and were open to sharing their views on an online interview. The age group of the respondents was 20- 35 years, and working or studying in domains of media, design and art. 25 personas were profiled, 6 male and 19 female. The qualitative findings for the study were:

- The average response regarding time of giving up fast fashion was that they were introduced to the concept in high school, the tried move away fast fashion during their student year, however due to affordability , the major shift happened after they started working. Many have personally quit shopping at any fast fashion store, admit it was really hard initially. Fast fashion make pieces that *look* very similar to luxury designs yet sell at low prices, which lured people to walk in and buy quantity, not quality.
- Major reasons sighted for switching to slow fashion, this change occurred over the years. The Rana Plaza tragedy and unethical practices triggered the consciousness. Homogeneity in fashion triggered it for some and they started rejecting trends. Some hated synthetics and cheap quality of the clothes,few were uncomfortable with an old perception about fashion being frivolous. They moved away from such stereotypes and started to learn about the craft, fabrics, color theory for the love of story and purpose.The chief reason behind most cheap clothes being discarded and adding to the landfill and contaminating the earth, therefore many quit for good.
- Slow fashion brought an awareness about the process and helped them to recognize personal style, comfort and originality. This switch in turn affected their personal style shunning trends and adopting unique individual style expression. Mix and match wardrobe. Preferring to repeat clothes and wore them for longer time span, season-less fashion.
- They sourced clothes from thrift and consignment stores; some buy few timeless basics from fast fashion brands and wear them often. They buy from ethical brands and designers too as the quality are good. Many also preferred tailored clothes because it is affordable, customized fit and endorse local textiles and tailors, support local crafts too.
- The ‘fast fashion’ conversation is different in the Indian context as its relatively unknown to masses, it was catching up. Though the awareness regarding environmental damage and exploitation needs to improve most of them agreed. They also indicated that appreciation for Indian Craft and textiles waslikely to improve.
- Most genuinely believed that almost anyone in India can make the switch to slow fashion, affordability was not an issue due to availability of local resources like tailors, textiles, they support local talent with fair price. Emphasis on quality over quantity of cheap clothes. When people realize that fashion is a celebration of individuality, an expression; their outlook towards fast fashion begins to change.
- A 2016 study by Philip Mak**,** Huffington post states that, forward-thinking brands who truly want to stay relevant to millennial generation need to look no further than their oft-reported propensity for social good. About 70 per cent of millennial

generation have said they would be willing to spend more on brands that support causes. As internet access and social media makes millennials increasingly aware of fashion's wasteful supply chain, positive prediction that a growing wave of consumers will drop fast fashion for ethical fashion "Millennials have a very high level of environmental responsibility, sustainability and giving back to the community".

Many fashion houses are attempting to slow down the pace and pressure of creating faster lines, forsaking traditional retail schedules and creating staples made to last and, often times, available year-round.

A mindful life is worth the effort, conscious choices about fashion statements we choose to make and business we choose to support in everyday life. Mindful consumption, rather than outsourcing materials for cheaper costs, slow fashion designers support local companies by utilizing local materials and resources as much as possible in their processes. In turn, this supports the growth and development of local businesses and provides a higher opportunity for young people hoping to get involved in the fashion industry.

Slow fashionstands for glo-cal, which includes the supply-chain, co-working spaces in rural locations, artisans' schools, digital revolutions, exposure and market growth beyond the community bound by geographic proximity. Communication stories and imagery to break free from barriers of near perfect, unrealistic portrayal of people; rather celebrate the diversity, natural and humane side which constitute responsible, inclusive community for arobust and sustainable circular design solutions for a better future.

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FROM TEXTILE CRAFT TO CONTEMPORARY TEXTILE ART

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Abstract

Textiles have been a fundamental part of human life since the beginning of civilization. The history of textile is very rich and complex and traditions exhibit a wide variety of crafts such as weaving, tapestry making, fabric dyeing, and embroidery, knitting or quilting in every culture around the world. Although these practices emerged first from a necessity, they also served for decorative purposes and held an important place in traditions and customs of cultures. Before the 19th century, all the production was made by hand from the spinning to the actual craft and end product. Various textile and fiber arts and crafts such as sewing, weaving, embroidery or quilting, was carried as average household activities mainly made by women. As often part-time and casual activities made at home, these crafts were identified with domesticity and women's creativity. The bigger and more intricate ones were made by male professionals just like large scale metallic thread embroideries in Ottoman Turkey. The Industrial revolution in the 19th century Europe brought a revolution of textile technology; the production mechanized and the materials expanded. As textiles could be produced more quickly and cheaply, they became available to a large portion of society. The reintroduction of textiles and fiber in "high art" began with the Feminist movement in the 1960s and 1970s. Pioneers of this movement have reclaimed this realm to include artistic practices that had traditionally been relegated to the lower status of "women's work". Leading artists of the time adopted and interpreted tapestry weaving to works of textile and fiber art. In the following years, textile arts have been developing new forms and language involving many creative's along the way. Influenced by postmodernist ideas, textile and fiber work has become more and more conceptual. Various creative's are still experimenting with techniques, materials and concepts, completely pushing the limits of the medium. These re-born practices such as embroidery art, weaving, quilting, crochet and many others have been taken to another level with an interdisciplinary approach with many textile artists. They form the basis of artistic installations, objects or surfaces. Many contemporary textile artists experimenting and adopting the techniques, materials and concepts that present a vast range of possibilities. This paper explores the evolution of textile and fiber art practices originating from textile crafts and how artists adopt textile crafts in creating textile art works either two dimensional or three dimensional including installations indoors or outdoors accompanied by visual examples.

Key words: Textile craft, textile art, interdisciplinary, creativity, hand-skill

Introduction

Textiles have been a fundamental part of human life since the beginning of civilization. The history of textiles is very rich and complex and cultural traditions exhibit a wide variety of crafts such as weaving, stitching, crocheting, fabric dyeing, embroidery, felting, knitting, patchwork and quilting in every region around the world.

These textile crafts have been mainly practiced for constructional, functional or decorative purposes. By the mid 20th century, leading artists such as Magdalena Abakanowicz, Anni Albers and Gunta Stölz played an important role in elevating the status of textile crafts such as tapestry weaving for the start to a higher level-fine art by adopting and interpreting it in their textile art pieces. These examples from the beginning of a new era of the reintroduction of fibers and textiles in high art which included many other artists and techniques till today.

Before the 19th century, all the production was made by hand from the spinning to the actual craft and end product. Various textile and fiber arts and crafts such as sewing, weaving, embroidery or quilting, was carried as average household activities mainly made by women. As often part-time and casual activities made at home, these crafts were identified with domesticity and women's creativity. Only the bigger and more intricate ones were made by male professionals in some cultures. The Industrial revolution in the 19th century Europe brought a revolution of textile technology; the production mechanized and the materials expanded. As textiles could be produced more quickly and cheaply, they became available to a large portion of society. But the aesthetic quality deteriorated. The Arts and Crafts Movement in England in the late 19th century emphasized the importance of crafts and took action for the survival of atelier work. The *Wiener Werkstätte* (Viennese Workshops) was another movement in 1903 by Koloman Moser and Josef Hoffman embracing similar philosophy with Arts and Crafts. Later in the mid-20th century, Bauhaus, the artistic movement and design academy founded by Walter Gropius in Weimar formed the philosophy and concept of good, intuitive design based on an education with atelier practices. Its approach to teaching, and to the relationship between art, society, and technology, had a major impact both in Europe and in the United States. Anni Albers and Gunta Stölz from Bauhaus are two of the well known names whom credited with blurring the lines between traditional craft and art.

"Along with cave paintings, threads were among the earliest transmitters of meaning," Anni Albers. The reintroduction of textiles and fiber in "high art" began in the 1960s. Pioneers of this movement have reclaimed this realm to include artistic practices that had traditionally been relegated to the lower status of "women's work". Leading artists of the time approached crafts from a different perspective. Lausanne and its tapestry Biennial eventually became the meeting point for these new trends and for a decade the most interesting hub of a wall tapestry revolution, which for centuries had been characterized by pictorial tapestries intended to decorate interiors. New terms were sought. The English-speaking countries came up with 'Art Fabric' or '**Fiber Art**', an appropriate designation of what artists created with and without a loom, with textile materials and at times with paper and horse-hair. In Europe the term '**textile art**' seemed to be agreed upon. One of the main points of this new approach was that the new weavers no longer created designs for the purpose of later manufacture. This new handicraft-artistic movement emerged both in Europe and USA. In 1964 the first exhibition from the USA featuring Lenore Tawney, Sheila Hicks and Claire Zeisler at the Kunstgewerbemuseum in Zurich Gewebte Formen (Woven Forms) was opened in Europe. During this period quilts were perceived as an art form for the first time in the USA.

These leading textile artists themselves wove their creations in sometimes small, even tiny ateliers. They acquired all the techniques of the textile craft, expressed not only in the weave itself but also in the many opportunities offered by weaving. They

themselves dyed the thread they used. They searched for expressive materials suitable for their textile craft. Sisal topped the list, followed by cord and string, animal hair, even materials over the years that originally had nothing to do with textile art, such as paper, rubber and leather. They handled these materials like textile artists, subjecting them to the laws of textile works. They let themselves be inspired by them in the creative process.

Two women artists played a major role in the infancy of contemporary textile art; Lenore Tawney in New York and Magdalena Abakanowicz in Warsaw. The two artists did part of their training in sculptors' ateliers which allowed them to introduce their knowledge and experience of volume and their three-dimensional perception of space to textile art. Magdalena Abakanowicz went on to become one of the main personalities at the Lausanne Biennial which was and important platform in these terms. She turned wall tapestry into a sisal relief using slit weaving, also woven but by no means a wall tapestry in the traditional sense but in a completely new way. Her works were no longer a wall tapestry; now it was a plastic form spreading out, invading the space around it which was made for the first time Fig.-1. Later, her plastic talent lead her on to new forms of expression with new materials. Lenore Tawney's works were transparent weaves in light, sculptural character in space Fig.-2. She is one of the few artists who has succeeded in finding a way from weaving to free art.

Fig.-1'Abakan', 1969 by Magdalena Abakanowicz

Fig.-2 'The Queen', 1962 by Lenore Tawney

These textile experiments continued in 1960s and 70s with the inclusion of other artists from Poland, Yugoslavia, Czechoslovakia and Hungary, and became a new movement. Two of the first weavers to gain international fame in USA were Sheila Hicks and the Chicago artist Claire Zeisler. Both took an interest in researching and experimenting with old techniques.

Lausanne Biennial was an important ground for artists all over the world during the sixties and seventies, it was the meeting point and the melting pot of textile art. The first few Lausanne Biennials were dominated by the central and eastern European countries Poland, Yugoslavia and Czechoslovakia. Wool and sisal were triumphant. The material and the technique became a new form of expression which eventually form a movement. Gradually, a whole generation of textile artists' works took direction in the usage of free material and technical approach; various techniques and materials could be combined during experimenting with textile craft techniques to discover their plastic effectiveness in the search of finding one's own new art form from old techniques. The final textile art works could be two dimensional, three dimensional sculptural pieces, indoor or outdoor installations.

Japanese artists also discovered this new trend, they gave another boost to textile art with their new approach. As an example, the fiber sculpture works of Masakazu and

Naomi Kobayashi exhibit unique aesthetic beauty with dyed threads. Kay Sekimachi is another name well known with fiber art works Fig.-3.

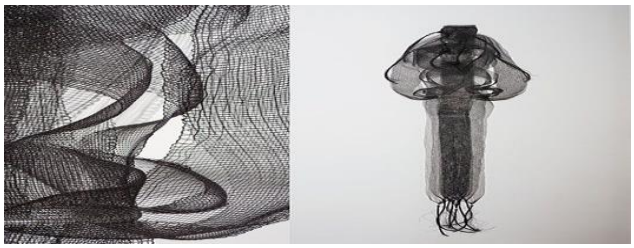

Fig.-3 Untitled, mid-70s by Kay Sekimachi

Fig.-4 'Keeping Up Appearances' 2014, crochet doilies installation by Ashley V. Blalock

Although the first examples of textile/fiber art mostly exhibit the reinvention of weaving techniques to a different level, other craft techniques such as crocheting, knitting, felting, embroidery and many others was experimented with textile artists in time as textile/fiber art movement being spread to many regions in Europe, Fig.-4-Fig.-9. The techniques, medium and the materials were not used conventionally in these practices but rather creatively in an unusual way. So, the textile crafts traditionally considered as women's domestic activity or production for functional endues had been lifted to a higher status and took its place in plastic arts. The hierarchy of so-called 'low-craft' and 'high-art 'was broken down.

Fig.-6 'Vessels' by Julie Brennan, felt

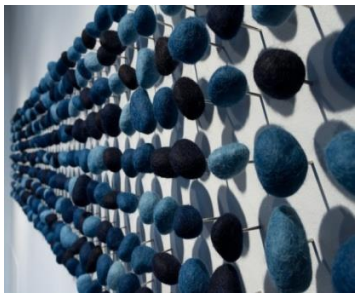

Fig.-7 Fields of Indigo 2012 by Rowland Ricketts

Fig.-8 Fiber Art by Ellis Road

Fig.-10 'Bleached Coral' underwater landscapes by Vanessa Barragao

Fig.-10 Botanical tapestry at Heathrow airport by Vanessa Barragao 2019

As with any art medium there are a number of different genres within the fiber field including the personal, political, environmental, aesthetic, abstract, figurative and such. Artwork may be grouped by medium, technique or concept. Most fiber artists exhibit in a wide arena of museums, galleries and corporate settings. There have been many events like competitions, biennials, workshops and forums that provide platform for textile artists to connect, exchange information and show their work. Techniques other than crafts like heat applications also being practiced in contemporary examples so does the materials like plastics. But crafts still form the basis in most examples. The final works can be objects, sculptural structures, wall hangings, indoor or outdoor installations. They may be in mini, small, medium or large format. Every artist uses these techniques in her/his own unique way of expression. Artists from other disciplines also make use of textile crafts or materials from time to time since their potential seems limitless.

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DO-04

REVIVAL OF HIMROO TEXTILES

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Abstract

Himroo is one of the traditionally woven brocaded fabric belonging to Aurangabad. It is a fabric of intricate weave with a cotton warp and silk as weft. Himroo fabrics were known for its superior brightness and elegance. The texture of the traditional fabric has been compared to a spider's web. Mesmerizing floral, geometric and animal motifs inspired from temples, mosques and paintings from the walls of Ajanta caves are recreated with unbelievable accuracy. Himroo had reached the pinnacle of prosperity and has tried to survive till this day in spite of depression and keen competition from power looms. It has flourished, evolved and declined with time. More than 500 families were involved in Himroo weaving before independence and presently 2-3 master craftsmen are left. The originality and clarity of Himroo designs was gradually reducing and this affected the craft. Presently, Himroo faces a lot of competition from the power loom sector, as it is selling power loom products in the name of Himroo. This paper focusses on the revival of Himroo textiles through design intervention, product development and revival of old traditional Himroo patterns through development of new jalas. It also attempts to document the woven craft of Himroo in detail and making a documentary focusing on revival of Himroo. Secondary data was obtained through various books, articles, museum pieces, private collections by visiting different institutes, museum and libraries of Delhi and Aurangabad. Primary data for the study was collected through purposively selected sample practicing the craft**.**

Keywords: Himroo, Handloom, Jala, Kimkhab, Cotton and Silk weaving

Introduction

Weaving of Himroo was one of the earliest industries of Aurangabad in Maharashtra. 'Himroo' is a fabric of intricate weave. Himroo was considered a royal fabric known for its elegance since they were woven in the background of silk. This famous cloth is being produced in the town of Aurangabad where once it was very popular but gradually declined with time.

The low cost and high rate of production has increased the sales of power-loom products and drastically affected the handloom Himroo industry. However, the intricate and traditional designs cannot be produced by power-looms, hence traditional Himroo is losing its characteristics. Since, power loom cannot produce authentic Himroo, fabrics are being duplicated and sold in the name of Himroo.

It has been observed that the compactness of the weave forming the design in a Himroo shawl is reducing day by day, so the originality and clarity of the design is

gradually vanishing. Emphasis has to be paid to maintain the level of intricacy in weaving that an authentic traditional Himroo shawl deserves. Also, very little and sketchy information is available with reference to Himroo textile craft. Hence the need is felt to document the art in depth with reference to its history, technical process of hand weaving and economic aspects. Also, negligible mention about the traditional Himroo motifs, designs and patterns are evident in published sources.

Himroo is a very rare royal textile, which has lost its way. The sales of Himroo have decreased tremendously over the last decade. Remedial measures for sustenance of the craft are required by the government agencies, weavers and people involved in this craft to make it prosper. For the revival of Himroo, detailed documentation, design and product development will be of assistance. Hence the following objectives are formed keeping this in mind:

Objectives

To document Himroo textile in depth with refence to its history, material, technique and motifs
To revive Himroo through technical and product intervention important for its sustenance

Methodology

Primary Data was collected mainly by means of interview and observation technique. Semi structured interviews will elicit more information and allow for interactive participation between respondent and the investigator. The main purpose for in-depth discussions is to gain meaningful information. Separate interview schedules were prepared for owners, weavers, helpers, retailers, scholars and for market accessibility.

Observation technique proved beneficial to understand the working of the loom, ergonomics of the weavers and working conditions. For data collection from handloom Himroo industry census sampling technique was used as there are only few weavers practicing Himroo craft. The main centre of production was Aurangabad but while exploring it was found that it is being produced in Hyderabad as well, hence both centres were included for data collection. Revival of Himroo textiles is an exploratory research and qualitative data was analysed for concluding. Secondary data was obtained by visiting different libraries, institutes and museums of Aurangabad, Hyderabad and Delhi.

Findings and Discussions

In an attempt to revive and promote Himroo the study was carried under different sections, Firstly, documentation was done by analysing the primary and secondary data. In the second section, design and product intervention was done by developing new jalas which are the design forming element in Himroo textiles. After the weaving of new Himroo patterns, products were designed based on contemporary needs.

Detailed Documentation of the craft of Himroo

Insufficient information was published regarding the technique, motifs, design layout of Himroo textiles. It was considered an important step toward revival of Himroo to document it in depth, publishing it on good platforms so that the information is available and help people to understand and popularise the craft. Later a documentary was also prepared to make Himroo craft reach to the masses.

- History of Himroo

The antiquity of traditional Himroo weaving can be drawn out from two legends that contribute in tracing the origin of Himroo. Firstly, it is known that Himroo weaving is said to have been brought to Devagiri (present day Aurangabad) during Mohommad Bin Tughlaq's reign. He renamed Devagiri as Daulatabad and shifted the capital from Delhi to Daulatabad in 1326. He insisted that all industries should also be shifted to the new capital. A number of craftsmen shifted to Daulatabad and established the first industry in the city. Mohommad Bin Tughlaq's experiment gradually failed and the capital was shifted back to Delhi in 1335. However, by then the Himroo weavers got well settled in Daulatabad and continued their tradition in the same place (Moin, 2014).

Yet another record states that Malik Ambar, the Prime Minister of Murtaza Nizam Shah of Ahmadnagar in 1610, found a site and named it Fatehnagar. It is said that in 1653 when Prince Aurangzeb was appointed the viceroy of the Deccan for the second time, he made Fatehnagar his capital and called it Aurangabad. Since the medieval times it was a city known for its beautiful, well planned gardens, fountains, ponds, palaces, mosques and monuments including the Ajanta Caves and Ellora Caves. Aurangabad is also titled as "The City of Gates" (Chand, 1981).

There are references to Kimkhab or the fabric of dreams in the accounts of Aurangzeb's rule during the 17th century. The fabric was very popular with the kings, ministers and the Nizams. It was made with rich gold and silk threads. Kimkhab was interweaving of silk and rich gold threads in a rich variety of colours and floral designs which made the brocades appear most gorgeous and one of the highly prized silk fabrics of India's legendary heritage. The Indian craftsmen made silver and gold wires of such extreme fineness that the entire fabric could be woven from them, producing literally a cloth of gold (Gillow and Barnard, 1993).

Further with the decline of Mughal and Maratha power the demand for Kimkhab was drastically reduced. Fortunately, several craftsmen received patronage from the Nizam of Hyderabad and his ministers. Literary evidence has been established that Kimkhab however in later days after the gradual disappearance of the princely classes languished due to lack of demand. The new consumers who mostly belonged to the middle classes could not afford the expensive and gorgeous cloth while tastes of consumers also underwent a change (Singh, M, 2001).

Hence, weavers altered from their traditional material to silk and cotton and a look alike started to be made. It was called 'Hum-Roop' or similar. This new cloth was an imitation of the old rich Kimkhab as designs continued to be the same. Hum-roop was later connoted to Himroo and the fabric which was once known as Kimkhab underwent a change and assumed the name Himroo. Himroo is a fabric of intricate weave, woven in cotton warp and silk or artificial silk or rayon weft.

Himroo in those days was patronized by the royals and princely class who demanded the rich handloom textiles. To meet the royal demands, the entire Nawabpura area of Aurangabad echoed and reverberated to the sounds of shuttles moving up and down, nearly 500-600 looms were working in town (Bhandari, 2000).

Process of Himroo production

- Raw material:the main material required is cotton yarn for the base fabric and rayon for extra weft in all colours. All yarns are pre-dyed and ready for use on the loom.

- Technique**:** Brocading technique are widely used for ornamentation of fabrics. The ornamentation is brought about by using extra weft threads to interlace with the warp threads, while the main weft thread interlaces with warp threads to form the ground fabric. The extra weft thread interlaces with the warp threads limited to the width of area where it is required or it may be used as pattern weft from one selvage to the other.
- Brocaded fabrics of India have earned a great reputation for their craftsmanship and grandeur. Brocade traditions in India are mainly divided into 3 categories: Silk brocades, Cotton brocades and Mixed brocades.
- Himroo falls under the category of Mixed Brocades (cotton warp and ground weft, silk extra weft). It is woven on a throw shuttle pit loom with cotton warp, cotton ground weft and rayon extra weft (brocading threads). For the production of large designs Jala is used. Jala is a shedding mechanism which is used to produce designs having large number of ends per repeat.
- Himroo is brocaded fabric with twill ground weave. It uses 4 shafts (3 up 1 down warp face twill) for the twill. The motifs are figured with extra weft brocading threads. Special ends are used to bind big floats of extra weft patterns.
- Jala:The function of Jala is same as that of a jacquard machine in modern weaving (Fig1). The Jala arrangement is, therefore, essentially an arrangement by which each warp thread of a unit or repeat of a design is controlled independently. The arrangement involves passing each warp thread of a repeat of a design through a loop, and then connecting each loop by some means to a lifting thread. Then selecting and grouping all such lifting threads to be lifted for each pick in order so as to lift the corresponding warp threads and lift the groups one by one again in order, till all the picks are laid to complete one repeat of the design.

Fig.1 Jalas

Fig. 2 Traditional pit loom used for Himroo

- Loom: The loom consists of a wooden frame having four vertical poles at each corner. The warp beam on which warp threads are wound is kept on a wooden frame at a height of about 6 inches from the ground, at a distance of approximately 6 feet from the other side of the loom (Fig.2). The warp threads are first passed through a network of threads Jala, and then through healds from four shafts held in a position one after other by strings. These strings are respectively attached to the four bamboos. The other ends of these bamboos are attached to bamboo pedals or treadles placed in the pit, near the feet of the weaver by means of separate strings. The treadles are in slanting position and helps in operation when the weaver presses it with his foot.

- The particular shaft connected to the treadle is thus lifted up thereby creating the required shed. There is another shaft which carries only the special binding ends (fruit binding), these ends do not pass through the jala.
- After that there is reed through which the warp threads are passed lastly. The reed hangs with the help of strings and it can be moved to and fro by the weaver for the purpose of beating. After passing through the reed the warp threads are finally wound on the weaver's beam or cloth beam.
- Finishing: Extra threads if any are trimmed and edges of the stole and shawls are knotted to give a complete look.

Design and Motifs

The fabric has a fantastic visual appeal with glossy rayon extra weft pattern and motifs on cotton twill ground. The motifs appear to be embossed over the ground. The backside of the fabric is even more appealing with plenty of colours bound together. The actual beauty and authenticity of Himroo is its back side.

The designs are elaborate and are mostly composed of floral and geometric motifs. Nature has always been an inspiration for art since early time. A lot of flowers and fruits are seen in Himroo such as pine apple, pomegranate bud (anarkali), almond, mango (kairi) are commonly seen.

The designs have amusing titles like Gulbaden, Guldasta, Karbooza, Panchi , Jaledaar kairi, Lakhon mein ek, Shamian, Banarasi and other fascinating names found in Himroo and all these floral designs have a Persian influence seen. Animal motifs like swans, duck, elephant, birds (Fig.3) are also popularly used in Himroo shawls.

Fig.3. Birds pattern

Fig.4. Geometric pattern in Himroo

Designs with circles, hexagons, octagons, ovals form geometric motifs (Fig.4.).

Architecture of Aurangabad has also been an influence to Himroo designs. Like Ajanta design, lady with a flower (Fig.5) etc. are traditional designs and are preferred by foreigners

Ajanta cave no. 2

35-40-year-old *Himroo* Design

Fig. 5. Architecturally inspired Himroo pattern

Persian influence especially in the form of paisley motifs is seen in Himroo. A lot of stylised paisley with small floral designs around them and minute designing are seen in Himroo. It usually has an all-over motif placement. There are many designs that can be woven on the Himroo cloth.

With an ethereal synthesis of cotton and silk, this handwoven fabric has superb blends of green, blue, black, gold and other romantic colour combination, that were once upon a time made-to-order by the royal household, noble and courtiers.

The traditional articles of Himroo included Shawls, stoles, bedspreads and yardage. Nizams of Hyderabad used the Himroo fabric for shervanis, coats, jackets, gowns, shirts and blouses. In fact, it became a part of their tradition and culture and no royal marriage was considered complete without the use of Himoo.

Present status of the craft

Around 1940's demand of Himroo suddenly nosedived as most of the weavers moved to Pakistan after independence. In the year 1949 there were about 150 artisan families but according to the Rural Economic Enquiries and by 1951 only 30 families were engaged in the craft. Aurangabad being the main centre of production presently only two master weavers are practising the craft of Himroo. The rest of the weaver families have joined power loom sector because of the easy work and higher income. The weavers who know how to weave handloom Himroo are not able to pass it to their sons as the children today are educated and have entered different jobs which are more relaxed and provide a fixed income. All these issues lead to a dearth of master weavers who can make jalas and weave Himroo, so new designs could not be produced using jalas. Gradually only a few hundred traditional designs were left to weave who's jalas were present and ready to be used on a loom. A lot of these designs are lost because of lack of conservation of Jalas and not cataloguing all the designs once being produced. Presently only one master weaver (Fig.6) is left in Hyderabad capable of producing jalas to help keep the production of Himroo.

Fig.6. Syed Omar (Master Weaver making jala in Hyderabad)

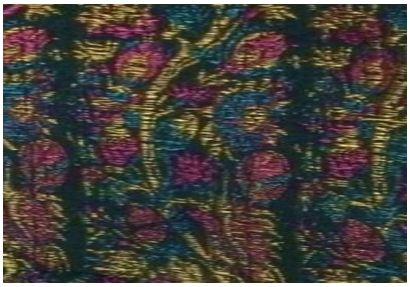

Fig.7. Presently woven pattern

Old jalas are being used in Aurangabad for producing Himroo, but the sales of Himroo is mostly depended on the tourist. Due to lack of awareness about authentic handloom Himroo, foreigners are being sold powerloom products in the name of Himroo. Also, the compactness of the weft weave forming the design in a Himroo shawl is reducing, so the originality and clarity of the design was gradually vanishing which led to hazy designs (Fig.7.) difficult to understand and hence the sales of Himroo declined.

Design and Product Intervention

In the past Himroo had a huge design vocabulary, but due to lack of conservation most of those were lost and only a few are being woven. So, to increase its design base,

newjalas were developed keeping in mind traditional designs inspired from museum articles, old private collections and literature. Weaving with expertise was done as a part of intervention (Fig.8). Also, the clarity of the craft was reducing gradually which lead to production of unclear motifs which also affected its sales. About twenty-two new jalas were prepared and weaving was done in different colours. Due to the fine construction of yarn, delicate designs are being introduced in the weave.

Paisley, double paisley, Lotus, Ajanta designs have been introduced. Ilaichi buti (Cardamom motif) and laung buti (clove motif) are the other traditional motifs that have been revived.

Revival of Himroo was started in Hyderabad by Suraiyaa Hassan Bose around twenty five years back. Presently she has about four to five looms working toward revival of Himroo, Mashroo and Paithani

Fig.8. Revived traditional patterns

Product intervention

The revived Himroo patterns were used to create products which were made by observing the market and a survey was done. Keeping in mind the authenticity of Himroo and ethnicity some products were designed (Fig.9). Shawls, cushion covers, clutch, handbags were made as prototypes for Himroo products.

Fig.9 Products designed using Himroo

Conclusion

The lesser known exquisite handicraft of Himroo fabric has a refined delicate appeal. Himroo still holds a place of its own variegated designs and rare textures that adds to our Indian heritage. The production of handloom Himroo has declined immensely especially due to the wide market made available for powerlooms. The revival of Authentic handloom Himroo is the need of the hour. Beautiful patterns are created by Master craftsmen of Aurangabad and Hyderabad with blends of cotton and silk. New jalas were made by the master weaver of traditionally inspired designs. These beautiful patterns were woven with precision to give a feel of the traditional authentic Himroo..

It was discovered that shawls were the only product being made in Himroo. Since they hold a small market, a survey was done to explore new products that would sell in Himroo textiles.

Himroo as a product has ample possibilities in the future market. The upcoming scenario of Himroo can be improved by creating awareness amongst people, inspiring people to take up the job of weaving and showing them the future prospects of the craft that might help in reviving Himroo.

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DO-05

WEAVING IN MIZORAM: AN ART AND A LIVELIHOOD

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Abstract

Mizoram lies in the southernmost tip of the northeast states. The Mizo are divided into numerous tribes of which Lusei tribe are considered the most prominent. The Mizo culture revealed itself in small things, most notably it`s folklore, which was reflected in their dances and textiles. Weaving has always been an integral part of the Mizo culture. Young Mizo girls learned weaving at a very tender age. Women with fine weaving skills were highly appreciated in Mizo society. Every Mizo girl was expected to know the art of weaving which also met the practical needs of herself, as well as her family. Traditionally weaving was more of an art form and it was an excellent way of expressing a woman`s creativity. Cotton was locally grown in the jhums (slash and burn cultivation). Textiles were woven on loin looms and fabrics of limited width would be woven. Two pieces of fabrics had to be sewn together for a wrap around. However, with the development of shuttle looms, fabrics of bigger width were produced. At present in Mizoram, weaving has now emerged as a livelihood. According to the information received, Thenzawl, a town which is 90 km from Aizawl has become a leading handloom centre in Mizoram. Most of the artisans were women. Few men had also taken up the craft. The handloom owners set up the looms in and around the residences of the weavers. There were no specific working hours. The homemakers could manage with the household chores. Cotton has been totally replaced by acrylic, wool, and rayon. The fly-shuttle looms were used instead of the loin loom. Experts were paid for preparing the loom: winding of bobbin, warping, denting and drafting. Handloom units in Thenzawl focused on the local market and agents from Aizawl and other towns.

Keywords: Mizoram, weaving, loin loom, fly-shuttle loom

Introduction

Mizoram is one of the smallest states of India. Mizoram shares its border with Assam and Manipur in the north, and Tripura in the south. Flanked by Myanmar on the south and the east and Bangladesh on the west. Aizawl is the capital of Mizoram. The majority of Mizoram's population consists of several ethnic tribes who share close physical similarities. These groups are known as the Mizo. The Mizo are divided into numerous tribes. The major tribes of the Mizo include Lusei, Lai, Hmar, Ralte, Paite, Mara and a few others. Of the numerous tribes comprising the Mizo, the Lusei were considered the most prominent. Mizoram is known for its unique, distinct and colourful traditional textiles.

Textiles are a way of life and the non-verbal language of people. Fabrics speak to us at multiple levels. Its raw materials speak of the geo-climatic conditions and

trade. The techniques speak of the level of civilization as well as links with others. Since time immemorial, textile weaving was probably one of the most developed art forms in the Mizo culture. The use of bright and striking colours, as well as varieties of geometric patterns, made the textiles quite distinctive. Earlier weaving was considered solely women`s responsibility. Every Mizo girl was expected to know the art of weaving, which also met the practical needs of herself, as well as her family. The weaving was excellent and was executed on indigenous handlooms using homegrown cotton. Superficially, the handloom appeared easy to handle, but considerable practice was necessary to ensure equality in dimensions and regularity of design. The warp was bound over a fixed beam of wood or bamboo, on the loom and the other end was tautened by the weaver wearing, round the hollow of her back, a leather strap to which was attached the other end of the loom. The weaver sat between this leather strap and the loom, adjusting her position to suit the warp length. The weft was passed through the warp and was battened firmly down by the use of a smooth and comparatively weighty, blade of polished wood, usually of sago palm.

Significance of the study

With greater opportunity and development taking place all around, Mizo girls have slowly been giving up weaving. Many of the women are now into different professions and they do not have time to practice weaving. Due to this the tradition of weaving is dying. An inborn talent, which Mizo women have in weaving along with their intuitive ability for exquisite colour combination and beautiful pattern, could help the Mizo women to become entrepreneurs. It is also important to know the current scenario of the traditional craft. Efforts should be made so that the traditional artistic craft that has been so much an integral part of their life and culture should not be allowed to wither away due to any change in their culture. Mizoram unlike many other northeast states does not have much agricultural products to expose. Thus, it is important for the government to open doors for such skilled weavers and encourage them in exploring their creativity.

Objectives

1. To trace the importance of weaving among the Lusei tribe of Mizoram
2. To study the changes that have taken place in weaving over the years
3. To document the current scenario of weaving among the Lusei tribe

Methodolgy

In order to fulfill the objectives of the study, data was collected through primary and secondary sources. Interviews were carried out with handloom weavers and handloom owners for obtaining in-depth information.

Collection of Primary Data

Semi-structured informal interview schedule was formulated for two different groups

- Handloom owners
- Handloom weavers

Collection of Secondary Data

Secondary data was collected through review of literature. The review of literature was carried out to gather information about the history and the tradition, the technique used by referring to various published and unpublished works from

- Chhinga Veng YMA Library, Aizawl
- District Library, Aizawl
- Private book collection and individual work
- The Aizawl State Library, AizawlVisits were also made to the handloom units in order to observe study and document in-depth information for the study.

The sample for the study was selected through purposive sampling technique. A sample size of 50 was selected, which include 25 handloom owners and 25 weavers from Thenzawl who were interviewed.

Locale for the Study

Thenzawl, a town that is 43kms from Aizawl was identified as an important centre for the handloom industry in Mizoram. The town concentrated on weaving Lusei traditional textiles.

Tools and Data Collection

Semi-structured informal schedule was formulated to find out the weaving technique, textiles woven and procedures of weaving in Thenzawl. Different interview schedules were constructed for handloom owners and handloom weavers. It contained both open-ended and close-ended questions. Interviews were carried out at their workplaces or residences. The interview schedule was conducted in the local language, Mizo.

Findings and Discussions

Weaving has always been an integral part of the life of the Mizo culture. The men are not much involved in the craft. According to the respondents, from a very tender age, Mizo girls started helping their mothers or other female members of the family at different stages of weaving. Young girls would have a miniature loin loom on which they would learn weaving. As they grow older, they gradually learnt the weaving techniques and start full-fledged weaving. Even though a woman should be engaged in the jhum cultivation, fetched water for the family, pound the rice and cook for the family, she has to find time for weaving. Every family was supposed to be self-reliant. It was also mentioned that Mizo women would not consider weaving as a difficult household chore. Thus, the women would often say, “Eng mah ka thawk lo, puan ka tah mai mai.” This means, “I am just relaxing but weaving.” The women took weaving as an excellent way of expressing their creativity. They copied beautiful motifs from their surrounding environment. Mizo women, therefore, are deeply honored for their skills. They would keep the woven textiles as treasures and when they got married, these woven articles were taken as their marriage gift. The courtship of a woman by a man usually took place at night. The girl would often industriously prepare for the next day’s weaving by cleaning and spinning the cotton, or generally preparing the implements for weaving. On such nights, it was not unusual to see the young man assisting the woman by her side, by helping her in weaving.

Preparation of Cotton Yarn by Traditional Method

According to the respondents in earlier times, cotton was grown in the jhums i.e. slash and burn cultivation. The seeds were sown amidst rice and other vegetables during May, while others also prepared separate cotton fields. Usually, cotton flowers were plucked in December. It was highlighted that the preparation of cotton was women`s responsibility. The plucking of cotton was called La ên. The harvested cotton was brought home and spread in the sun to dry for three to four days, after which it was cleaned by separating the seeds

from cotton with the help of a locally made, ginning machine. It was called herâwt. Herâwt was made of crude wooden parts greased with the help of pig's fat.

The cotton was again teased using lasai which was made of bamboo and looked more like a bow. The string was strummed with a small bamboo stick to fluff up the cotton into cotton flakes. The teased cotton became downy and the heap fluffed up in size (Fig. -1). The processed cotton was then rolled into a half-foot long stick called lachawn which was spun into thread by using a spinning wheel called hmui. Hmui was another important tool in the preparation of cotton yarn. The respondents added that a woman has to carry lasai and hmui when she moves to her in-laws home. The processed thread was again spun on to a spindle called hmuithla and these were turned into spools called latui. Further, the spools were wound into skeins by using ladinlek, which was locally made of wood.

Figure 1: Processing of cotton with Lasai
Source: miyzone.blogspot.com

The cotton skeins were boiled or dipped in starch extracted from cooked rice to make the thread strong. After boiling, the threads were spread and hung to dry in the sun using lazarban which consisted of two posts and two horizontal bamboo bars which held the skeins. These spread skeins were then brushed with lakhuih (brush) to remove the starch on the thread. When the skeins dried up, they were rolled into thread balls using a bamboo tube with a wooden base called suvel. These threads, when rolled into balls, were called lahlum, which were ready for weaving. The weaving was carried out on the loin loom.

The Loin Loom

As mentioned by the respondents the traditional Mizo textiles were woven on a loin-loom locally known as thembu (Fig. -2). In olden day, thembu was also taken along when a woman got married. It was observed that circular warp encircled the breast beam themkawl (F), immediately in front of the weaver, and the warp beam themtlang (A), which was the bar or bars at the upper end of a loom where it was attached to the wall. The warp was kept taut as the weaver leaned back against a strap kawngvawn (G), which was usually of leather, attached at either end of the breast beam and passed across the weaver's back. Other elements of the loom included a (large diameter) shed rod thembupui (C), a large bamboo bar in the loom which passed over and under alternate warps; heddle rod them tang (D), to permit manipulation of the string heddle. Hnahchawi, to lift those warps that passed under the shed rod and, by doing so, created the counter shed; bobbin puanphei or laphei, a piece of thin bamboo stick about two feet long, upon which the weft yarn was wound. The bobbin carried the weft through the shed and counter shed. A sword themtleng (E), a flat polished bar to tamp the weft into place; a

notched stick tukrek (B), a comb-like bar to space the warps; a temple themper, a small pointed bar, made of split bamboo for maintaining constant width of the textiles as it was woven. Often the breast beam or warp beam consisted of two sticks, which permitted the warp to be stabilized and the woven area to be wound onto a beam as the weaving process.

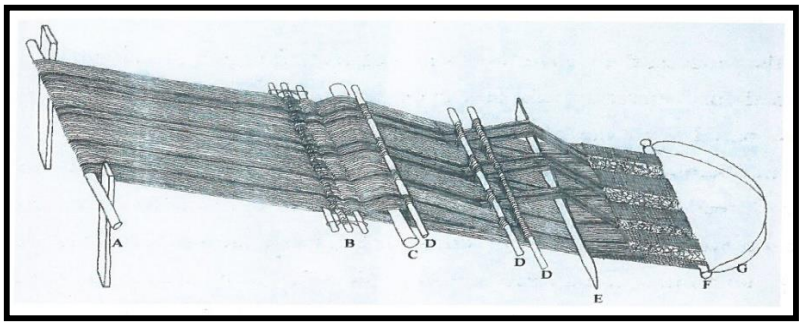

Figure 2: The Loin Loom
Source: W, D., & Fraser, B.G. (2005)

Warping

The cotton warp threads were starched by boiling the threads in rice water before being dried and were then used for warping on the loin loom. The respondents informed that women carried out the process of warping. Although warping could be done with one yarn at a time, however it was usually done with two yarns at a time. Two yarns were wound on bobbins, and the free ends were tied to the stick representing the breast beam. The breast beam was tied to the chair in which the weaver sat in appropriate distance from the warp beam. A weaver's assistant carried two balls of yarn back and forth between the breast beam and the warp beam. According to the respondents during the process, the weaver kept a thick bamboo out a little distance from her to be used for separating odd and even sets of threads. She entangled them in loops prepared with the help of additional thread on additional sticks placed against the bamboo. The whole mechanism of the operation so far done enabled the warp threads to be so manipulated that the odd set of threads stand crosswise against the even set of threads on one of the bamboo sticks. The weaver then lifts up the loops a little. The operation also produces required space between the warp threads to enable the weft threads to slide through the whole breadth with the help of a bobbin.

Patterning on Loin Loom

The cloth they wove was called puan. The term puan could be used to refer to any piece of cloth. The decorative weaving done on the surface of the cloth was known as Zeh. Most of the puans were woven in plain weave and its variation. Coloured cotton yarns were used for patterning the puans. The respondents informed that the pattern on loin loom was worked in between the threads with a porcupine quill. Ordinarily three themṭang (heddles) were used, but for elaborate patterns as many as seven may be required. The sequence of shedding included changing of the shed after the end-to-end passage of the pick. The picks were then selected and lifted by hands where the extra weft for patterning was worked in with the porcupine quill. The main ground pick was passed end to end followed by the beating process.

Development of Looms in Mizoram

Although the Lusei traditionally used a loin loom there was a gradual improvement of technology to weaving. From the Loin loom, they first switched over to

throw shuttle loom and then to fly shuttle loom. According to the respondents, the looms were modified by introducing the paddle system, whereby, as their feet moved from one paddle to another, the textile was woven in designs of various colours. Weaving occupies a very vital role in Mizoram today. The handloom industry has been playing a crucial role in the socio-economic development of Mizoram until date. Subsequently, Mizoram has become one of the treasure houses of the handloom industry in northeast India. Although most of the weavers are women, few of the men have also started taking up the craft. This has made many of the Mizo women self-reliant financially and helped them lead their lives with dignity and respect. According to the respondents today, the fly shuttle loom have overtaken the loin loom. It was also informed that since the loin loom takes a longer time to weave, the Mizo women have somehow stopped using it. Today the loin looms are used only at home level and not much for commercial purpose. The tradition of weaving continued among the Mizo. According to the respondents, although weaving was also carried out in Aizawl, the traditional textiles of the Lusei tribe were woven only in Thenzawl. According to the handloom owners, many of the handloom owners in Aizawl also set up their looms for weaving their traditional textiles in this town. Thenzawl is a town in Serchhip district in the state of Mizoram. It is an important center for the handloom industry in Mizoram.

History of weaving in Thenzawl

As informed by the master craftsperson from Thenzawl, in the year 1978, Co-operative Society of Mizoram in collaboration with Khadi and Village Industry, Govt. of Mizoram set up Weaver`s Service Center in Mizoram. The Co-operative Society`s local board had set up a centre in Thenzawl. Initially it was a one-year certificate course and weaving was taught on fly-shuttle loom. The warping of the loom, denting, drafting, and weaving were taught to all the trainees. However, since most of the artisans wanted to start their own unit it was not possible for them to continue with the certificate course. Today, the weavers in Thenzawl acquired their skills from their mothers, elder siblings and friends.

In Thenzawl, the handloom owners would set up their looms near the residences of the weavers for their convenience. This made it possible for the homemakers to manage with the household chore. There were no specific working hours. It was observed that in most cases, there was no separate industry for the handloom units. Looms were set up in and around the residences of the weavers (Fig. -3). The weavers in Thenzawl were paid according to the number of puans they could weave and they did not have monthly wages.

Figure3: Looms set up at the basement of the weaver`s house

Yarns

According to the information received from the handloom owners and weavers, the used of locally grown cotton has been replaced totally. Acrylic yarns, locally referred

to as Industry lâ (Lâ literally means yarn or thread in the local language), were used for the warp, weft and patterning of the traditional puans. However, wool was also used for weaving the patterned stripes on some of the traditional puans. All the yarns were sourced from the neighboring states.

The Loom

As mentioned earlier the traditional back strap looms were no more used for weaving the traditional textiles. The Fly-shuttle looms, locally referred to as Indian loom were use in Thenzawl (Fig. -4). The loom had different parts like the warp beam, the shuttle, picker, picking arm, cloth beam roller, cloth beam, the treadle, the reed, heddle frame with harness, adjustable batten and a seat for the weaver.

In Thenzawl, a minimum of 10 puans to a maximum of 40 puans were usually warped on one loom at a time. Although it was possible to warp yarns for more than 40 puans at a time, the beam of the loom became too heavy and as a result, the weaver could not weave smoothly.

These bobbins were unwound onto the warping drum by threading the yarn through a small heddle and reed kept between the bobbin frame and the warping drum. It was for the smooth winding of the warp. The circumference of the drum was 1.5 meters (Fig. -7). Trained experts carried out the warping and were paid Rs.1000 to 1200 per loom.

Figure 4: Fly-shuttle loom

Preparation of the loom

Figure 5: Winding of bobbin Figure

Figure 6: Bobbin frame

As highlighted by the respondents, most of the weavers were not able to warp their loom. Thus, experts were employed for each intermediate steps. The weaver`s society of Thenzawl has a fixed rate for these trained experts according to their job. The

handloom owners informed that, the dyed hanks of yarns brought from the local market were first wound to a spool called bobbin (Fig. -5). It was mentioned that the experts who was paid Rs.70 per 12 kg wound them with a revolving machine (12 kg of yarn was enough for 20 rounds on the warping drum). The bobbins were kept on the bobbin frame, which could hold 120 bobbins at a time (Fig. -6).

Once the winding was done on the drum, the warps were wound onto the warp beam by sleying the reed. Trained experts who were paid Rs. 1000 to 1200 per loom carried out the denting and drafting of the loom. The warp beam and the harnesses were hung together and two experts carried out the threading of the heddles (Fig. -8). The two experts sat on either sides of the warp beam. Each warp was threaded through a narrow opening in one of the many strings called heddle by following the draft plan. The expertise was paid Rs.400 per loom. After threading the heddles, they sleyed the reed again and then tied the warp to the loom.

Figure 7: Warping drum

Figure 8: Threading of heddle

The weft yarns were wound on the bobbin, which was mounted on the wooden shuttle after threading. The shuttle was thrown back and forth through the shed by pulling a rope that operated the movement of the warp.

Marketing

Thenzawl specializes in weaving traditional textiles like puanchei, ngotekherh, pawndum and tawlhlohpuan. According to the handloom owners, puans were sold out individually per piece. At times, few handloom units also weave non-traditional puans. In this town one could see that there are number of local shops on the roadside selling these textiles. Since travelers have to pass through Thenzawl while travelling towards the southern Mizoram, local shops also made good business. The respondents mentioned that the handloom units in Thenzawl focused on the local market and agents. These agents would sell the textiles at higher price in Aizawl, other towns and the neighboring states like Manipur, Meghalaya, etc. The respondents also mentioned that these textiles were also sold outside India (Fig. -9).At times, costumers would also come from Aizawl to buy the textiles in bulk. According to the respondents the weavers could not fully meet the demands of the market.

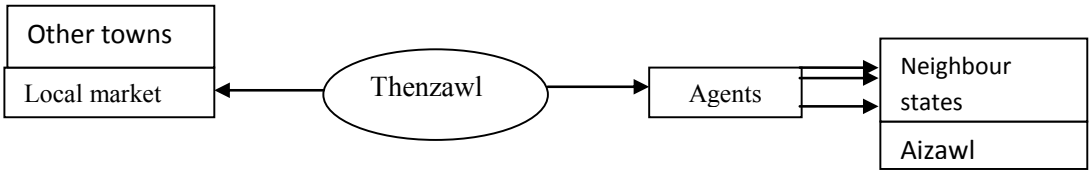

Figure 9: Sale of goods from Thenzawl handloom units

Conclusion

Weaving still holds an integral part in the Mizo life. Handloom industry plays a crucial role in the socio-economic development of Mizoram. Although traditionally weaving was an art, it has now emerged more as a livelihood. The handloom products were famous for the use of vibrant tribal color combinations, which were very distinct from other traditional textiles of the country. The woven products of Thenzawl town are slowly gaining worldwide popularity. Even though, the whole town is engaged in weaving the traditional textiles, the demands for these textiles are ever increasing. Contemporized textiles with small motifs are also in fashion in the market today. Puans are also taken outside the state for exhibition cum sale and they are slowly gaining worldwide popularity.

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DO-06

DESIGN INTERVENTION IN MASHRU-A MYSTICAL FABRIC OF GUJARAT

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Abstract

India has been a reservoir of diverse art and craft where handloom textile forms a major part of it. Its credit goes to the artisans who work with hardship to realize it. At present survival of many handloom textiles is of major concern due to several issues especially its inefficiency to meet the consumer's preference. This makes designer's role very decisive in endowing significant cultural product where product undergo certain changes to ensure continuous survival ensuring it's cultural, visual stylistic and technical connect with the craft intact. Present study was conducted to intervene with Mashru-a traditional handloom craft of Gujarat. This craft is known for its rilliance, multicolored stripes and decisive weave structure. In Indian subcontinent its style has developed as an audacious expression over generations where certain designs are replicated till today as an identity of community work and as a representative of certain customary carrying specific value and belief. The basic objective of the study was design and development of innovative patterns in its traditional palette considering its existing infrastructure constant. Here four designs were developed in different permutations with artisans in view to cater wider audience. Being developed as fabric of royal it later penetrated as fabric of local mass. Therefore, the four versions of fabric will help in approaching its all set of users. The global shift towards green fashion coupled with design intervention can gear its growth in creating linkages with new markets. This study can be found very helpful for other similar craft studies of design intervention, in disseminating regional sensibilities, diversities, resources and in strengthening socioeconomic benefit of various stakeholders involved in it.

Keywords: Mashru, Design Intervention, levels of design, yarn selection, material diversification.

Introduction

Design Intervention In Mashru-A Mystical Fabric Of Gujarat :

India is hub for crafts whether it is textiles, wood, metal, clay or any other material due to its artistic, intellectual, receptive and cultural facets. In recent period this fact seems to be rolling down because of its depleting number. Crafts have given identity to our nation politically, economically and socially. It has helped in maintaining social, religious, inter-religion, communal integration and has helped in bringing its visibility worldwide. In India craft is more than a being a product- a gesture of love, appreciation, belief, connection, welcome, praise and acceptance, i.e. why whether it is a household

ritual or a grand formal occasion its role is substantial. This comprehension brings the obligation of securing these traditional practices called 'craft'. Crafts are "those activities that deal with the conversion of specific materials into products, using primarily hand skills with simple tools and employing the local traditional wisdom of craft processes. Such activities usually form the core economic activity of a community of people called 'craftsmen'" (M. P. Ranjan). Craft is very important as they are' "handmade, a vehicle for self-expression, unique amidst a proliferation of mass-produced products in the marketplace" (Paige 1999: 76). "A craftsperson is one who is skilled in a craft technique and though he may produce a number of similar objects, each one however expresses the maker's creativity" (JasleenDhamija-2003). Mashru is a traditional handloom textile of India, earlier woven in several parts of India like Agra, Varanasi, Hyderabad, Mysore, Chamba, Ajamgarh (Hatanaka & Nakatomi 1996), at present mainly limited to Patan and Kutch-Bhuj of Gujarat.

Mashru literally means "permitted" (Ali 1900); it was developed as a way to wear silk in Muslim community without breaking their ceremonial law of silk prohibition. This fabric comprises of silk warp and cotton weft in satin weave which allows silk to rest on top and cotton below it touching the body. Initially being originated as fabric for men of Islam (Ali 1900) gradually breachedinother communities, especially for local folks of Gujarat and its neighboring states like Rajasthan and Madhya Pradesh (Hatanka & Nakatomi 1996). At present this craft is at the verge of extinction; many of its honored techniques like Brocade and Ikat had already disappeared; only few conformist and easy-going designs are into practice. The opulent silk warp has been replaced by rayon in Patan and cotton in Kutch-Bhuj region. Earlier it might have been the requirement of that time to substitute silk with rayon and cotton to sustain it. The evolving nature of consumer, government policies, business environment and economy demand evolution in craft also. At present the shift towards sustainability in every walk of life is creating huge opportunity for craft as well as scope of design appropriation in it. Sustaining a craft without compromising quality, aesthetics and visual organization are very important. In this concern sustaining craft with innovation in material, process and value addition can be practicable. For this study researcher has selected yarn as the basic material for innovation.

Yarn is the most crucial raw material to create the fabric. Every yarn has certain design characteristics which is further passed down to define the characteristics of developed fabric. A craftsperson, "is someone who chooses the design for the product selects the materials needed and generally personally makes" (Campbell 2005: 27). Here the role of weaver becomes very crucial as in one hand he is selector and consumer of the raw material for the product to be developed whereas in other hand he is producer of the product for another consumer. Since artisan is making product for other consumer therefore the consideration of consumer also becomes important in selection of raw material. In this entire cycle of production and consumption yarn has contextual feature that to what extent material is convincing artisan to adopt it looking into the requirement of self as well as consumer. There is always possibility to elevate the value and property of product through varying raw material. 'Textile design is concerned with designing not only products but also the materials that form the products. Here, designers should relate their material and products to an existing context and environment that correspond to users created meanings and experiences' (Hasling & Bang 2015). 'Craft items are heavily influenced by raw materials' (Standard & Mullet 2015); 'can act as a source of

inspiration, motivate the making' (Kouhia 2012: 31) and also 'colors and hand of materials could act as inspiration for crafter'(Gabbert 2000).Design Intervention in Craft "involves designing new products; redesigning existing products, with changes in shape, size, color, surface manipulation, function and utility; exploring new markets and reviving lapsed markets; applying traditional skills to meet the new opportunities and challenges; and the introduction of new materials, new processes, new tools and technologies. "It is seen as an interface between tradition and modernity, that matches craft production to the needs of modern society" (Harita Kapur & Suruchi Mittar 2014). This approach gives huge opportunities of intervention in craft sector and at the same time huge responsibility. Any craft is known because of its specific technique, motifs colors, and certain patterns of repetition as these elements create the visual identity to that craft. Therefore, to intervene in a craft it is very crucial to understand the visual organization of that craft. "Design interventions have a very important role in every step of the process in creation of the craft. They should focus on the identity of a craft, its social and cultural relevance to its religion, and the process and materials involved, to incorporate the interventions in the right situations, with efficient expected outcomes and reasoning's" (Amrita Panda 2012).

Viewing into the need of craftsmen, identity of the craft as well as the shift of market trend towards sustainable textiles in connects with consumers need researcher has undertaken this study. For this researcher has referred Donald Norman's (2004) Levels of Emotional Design and Casey Standard and Kathy Mullet's research article "Yarn Design Characteristics Which Influence Crafters to Consume Either Artisan Brand Yarn or commercial yarn" as the basis of the study. It has been applied for selection of yarn by the artisan looking into the levels of design characteristics of the yarn. Later its analysis has been applied in creative application of yarn for Mashru textile considering the visual understanding of the craft and willingness of the artisan to undertake it.

Objective

The objectives of the study are as follows:

- To understand the visual organization of Mashru textile
- To understand the design attributes of diverse materials and its creative application for Mashru textile.
- To target wider categorical segment of consumer for Mashru through application of diverse materials.

Limitation of the study

There were limitations in the study due to less number of artisans practicing Mashru as well as their willingness to weave the fabric for this study. Therefore, four artisans were included in the sample. Although out of the four selected artisans only one artisan worked with three yarn content and rest of the three artisans worked with one yarn content. Due to being the majority of Mashru weaving in Cotton and Rayon warp since few decades; it has restricted the willingness of artisan as well their proficiency in execution of either finer or newer material. Other major constraint was that Mashru is satin fabric; therefore, most of the artisans felt themselves incompetent in execution of new warp material. To bring change in weft yarn is quite easy but change in warp need high level of skill and willingness especially working with silk and other handspun yarn.

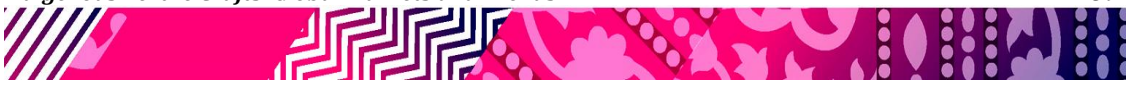
Mashru is mainly known for its multicolored striped patterns occasionally enhanced by Butti and Ikats. In addition to it one of the major objectives of this study was introduction of new material to the craft along with the existing one to cater wider audience; therefore, designs were kept limited to stripes only.

Study of few specific design characteristics of yarn also raised limitation in the study as there were other factors (like cost) also which encourage artisan in selection of yarn for their product development.

Methodology

It was an exploratory cum experimental study which were conducted under three phases. Under first phase visual analysis of Mashru fabric were done to understand the visual organization of the Mashru. It was done through samples and photographs of Mashru collected through weavers, books and archives. Under second phase yarn design characteristics were studied and were related to Donald Norman's 2004 Levels of Emotional Design. For this observation and case study method was adopted where all weavers were interviewed and observed to determine which specific yarn design characteristics influences them for the selection of yarn among- silk, rayon, Tasar for Mashru fabric. Rayon were kept under commercial category of yarn whereas Mulberry silk and Tasar were kept under niche category. Perspectives of each artisan were documented. Sample was drawn through snow ball sampling technique. Data were collected through open ended questionnaire. The entire process of data collection and fabric development took one and half year. Respondents were addressed questions pertaining to demographics, consumption of raw material, clientele, their experience with various yarns they have used earlier, any preferable yarn, specification of materials obtained from trader/mahajan, reason behind selection of specific yarns like yarn color, dyes, fastness, count, texture- luster, extent of evenness, strength, fiber type, yarn count, weight and aesthetics. Their opinions about the consumed yarn were related with the predefined yarn category among commercial and niche. They also revealed whether they have used all stated yarns (Mulberry silk, rayon, Tasar) or not, or to what extent they are willing to use any of these unused yarn for further Mashru weaving on the basis of yarn design characteristics behind it. As per the Donald Norman's (2004) Levels of Emotional Design; there are three levels. First is visceral level which deals with sensorial perception like taste, look, and sound, hence color, visible texture was included in it. Second level is behavioral which deals with functionality, usability and feel of product, hence suitable yarn count & reed, and feel of yarn (flexural property) were included in it. Third level is most difficult to employ which deals with emotion based on intangible concepts; all about message, about culture and about meaning of product (Norman 2004). Hence it included desire of making greener difference: handspun/natural yarn content/hand dyed/revival of specific hand dyeing and motif.

In last phase creative application of diverse yarn were done in different permutations with artisans in view to cater wider audience considering the feature and prospect of Mashru as well as yarn design characteristics. For this existing infrastructure capacity were studied, competency and willingness of artisan for new development were observed, digital explorations were made, designs were selected in each material and were woven on traditional loom set-up with the help of selected artisans.



Findings and Discussion

For the first objective of the study **"**to understand the visual organization of Mashru textile" its samples sourced from artisan, stores and its photographs collected from archives, books and other resource centers were studied. Mashru fabric is about union fabric in silk and cotton in satin weave where silk lies in warp and cotton in weft. It's a live example of cultural globalization that happened centuries back. The concept of borrowing certain elements from other crafts and culture is evident in its color, pattern and form. In every region of India, it has grown with the unique identity of that region. Like in Gujarat abundance of green has been seen in Mashru which has been hardly seen in another center. Mostly found in thin and thick bands of colors placed next to each other. The bold color stripes juxtaposed in contrast color fashion creates design and at the same time makes it protruding visible, glossy, creating an optical bearing; yet in a balanced manner. Its pattern repetition throughout the width gives an impact of foreground and background equally important. Its features can be summarized as follows:

- Band of colours to create symphony.
- Use of bold, highly saturated colour palette with major emphasis on use of red and its various tone along with orange, yellow, green.
- Colour and pattern often give festive and warm sensations.
- Highly lustrous in appearance.
- Face and back of the fabric are often in different colour due to satin weave.
- Satin is usually of seven or eight ends.
- Satin usually composed in twill fashion.
- Visibility of strong optical movement of colours in design.
- Motifs usually geometric in nature and often arranged as cluster of sub geometric forms.
- Sub units of geometric motifs are often found in some auspicious numbers like seven, twelve.
- Motifs are often symmetrical in nature.
- Motifs are usually arranged with adequate breathing space, making it soothing and composed.
- Motifs are usually placed in vertical strand or in block repeat.
- Many times, ornamented with dual colour chevron Ikat or pulled Ikat.
- Ikat bands are usually found in red, orange, yellow and green colour.
- It's trans-seasonal in nature, suitable for both summer and winter.
- Usually found as medium weight fabric suitable to jackets, blouses and furnishings.

To understand the design attributes of diverse materials and its creative application for Mashru textile, Donald Norman's (2004) Levels of Emotional Design were studied and related in the context of yarn. According to Don Norman (a prominent academic in the field of cognitive science, design, and usability engineering) "why we love (or hate) everyday things distinguishes between three aspects or levels of emotional system (i.e. the sum of the parts responsible for emotion in the human mind), which are as follows: the visceral, behavioral and reflective levels. Each of these levels or dimensions are heavily connected and interwoven in its own specific way".

Visceral Level

It apprehends appearance or the visible qualities of a product and its perception by observer/user. "Act of distinguishing one product from other not by the tangible benefits it offers the user but by tapping into user's attitudes, beliefs, feelings and how they want to feel, so as to elicit such emotional responses".(Norman's 2004) Therefore, color and surface texture were considered for the visceral level.

Behavioral Level

"Behavioral design is all about use. Appearance doesn't really matter. Rationale doesn't matter. Performance does. What matters here are four components of good behavioral design: function, understandability, usability, and physical feel. Sometimes the feel can be the major rationale behind the product". (Norman 2004) Therefore, suitable yarn count & reed, and hand feel were considered for this level.

Reflective Level

Reflective design covers a lot of territory. It is all about message, about culture, and about the meaning of a product or its use". (Norman 2004) Therefore, Handspun, natural fiber content, revival of traditional hand dyeing technique and traditional motifs were considered for this level.

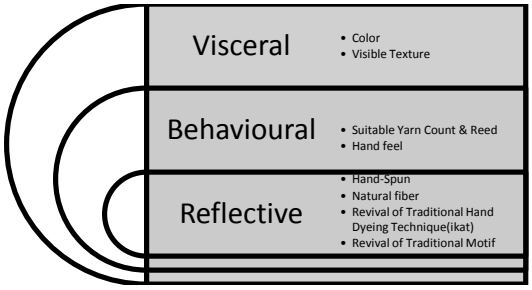


Fig. -1 Relating donald a. Norman's three levels of design to the factors included in study

While interviewing artisan they revealed several characteristics of yarn like luster, beauty, luxurious look, attractive appearance, elegance, softness, hand-feel, color, texture, linear uniformity, uniformity of dye, quantity available, price, demand of market, special requirement of client, selling price, profit margin, capability to manage yarn during weaving and other preparatory process, acceptance by dyeretc. As the factors inducing them in selection of raw materials for their product development.

Responses were gathered from two artisan were husband and wife. In India, Patan is among few weaving centers where women are also involved in weaving apart from preparatory processes. There were four looms in their house, two were operated by them and rests two were operated by other weavers hired by them on basis of order requirement. Their weaving workshop was inside their house. The outer foyer and first floor of the house were converted into workshops. The house was cemented and was located in the heart of the town amidst by other weaver houses. They were involved in this profession for more than fifty years. At present Janak Bhai is 73 years and Vasumati Ben is 71 years old. Age is not a barrier for them. They are very passionate about their craft. Both of them are quite educated. Janak bhai graduated in science and further did B Ed. Whereas Vasumati Ben studied till higher secondary. Belonging to the family of weavers Janak Bhai started weaving at the age of 15, after few years he tried his career in diamond polish, then textile hawkerfor few years and laterrejoined family tradition of Mashru weaving. His wife Vasumati Ben had comparatively longer association with

Mashru. She also belonged to the family of weavers; she started weaving before marriage and later continued it after marriage also. She plays very crucial role in deciding cost and in taking weaving order. Another major issue while looking for weavers who can weave in diverse materials, it was found that most of the weavers were of old age and were making rayon Mashru only. In entire Patan, only janakbhai and Vasumati Ben can weave silk Mashru apart from rayon Mashru.

Fig. – 2 Mashru Weaver: Vasumati Ben Khatri from Patan

Fig. - 3 Mashru Weaver: Janak Bhai Khatri from Patan

In order to understand the design characteristics of yarn in the selection process, they were asked to recall about commonly used yarn by them, any favorite weaving assignment which they anticipated again. They started revealing about their past assignment and also shown few fabric swatches which they kept with them as a matter of pride. Yardage was the main product made by them. The consumption and expenditure of yarn completely depended upon nature of material and product in demand. Throughout their weaving carrier so far, they have woven only around fifty silk Mashru, mostly they have woven rayon Mashru. They said they were interested for silk weaving but were not getting order frequently. Then they were asked to show their favorite Mashru sample in silk and rayon, hoping that they will remember their decision of selection of yarn.

Fig. – 4 Artisans Showing their earlier woven silk

Fig. – 5 Rayon Mashru collection to researcher

During discussion it was found that in both commercial and niche category of yarn, color, textural (visceral) properties of yarn are very important. Mashru is about bright color and luster, so these properties are must to give woven fabric the identity of Mashru. Along with that from customer's perspective also, bright colors are fast moving especially in commercial category. Suitable yarn count and feel of the yarn are also very important as the behavioral property of yarn in both commercial niche category of yarn. This gives an idea to the weavers that whether they will be able to handle the yarn during different processes of production or not as well it also determines the quality of fabric to

be woven. Especially, while working with silk it is more crucial as silk is delicate and difficult to manage compared to rayon.The third level i.e. reflective property of yarn included desire of making greener difference (hand-spun) and revival of traditional hand dyeing technique and motif. Artisans revealed that in commercial category it does not have much significance whereas in niche category it is very significant. In niche segment customers are ready to pay for these interventions, although their demand is quite less compared to commercial one.

Table1. Preference of yarn design characteristics in selection process of yarn for Mashru fabric

	Levels of design	**Yarn Design Characteristics**	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
Category 1: Niche Category (Mulberry Silk X Cotton)	Visceral level of design	Color(bright)		2			
		Visible Texture(luster)	2				
	Behavioral level of Design	Suitable Yarn Count & Reed	2				
		Hand Feel	2				
	Reflective level of design	Hand-Spun	2				
		Natural fiber	2				
		Revival of Traditional Hand Dyeing Technique(ikat)	1	1			
		Revival of Traditional Motif	1	1			
Category 2: Commercial Category (Rayon X Cotton)	Visceral level of design	Color(bright)	2				
		Visible Texture(luster)	1	1			
	Behavioral level of Design	Suitable Yarn Count & Reed	2				
		Hand Feel	1	1			
	Reflective level of design	Hand-Spun					2
		Natural fiber			2		
		Revival of Traditional Hand Dyeing Technique(ikat)			2		
		Revival of Traditional Motif			2		

Note: *Numbers in table represent preference by both artisans*

After looking into the preference of consumer towards reflective level of design, specifically hand spun, natural fiber and revival of specific hand dyed yarn technique, it was introduced for Tasar silk and combination of Tasar and Mulberry silk warp. Convincing artisans for aforesaid yarns was very difficult whereas they easily agreed for

Mulberry silk and rayon warp. They didn't agree for revival of traditional motifs in both commercial and niche category due to availability of lesser number of harnesses and their unwillingness to bring any change in existing loom setting. Hence, Mashru fabric were woven in four warp types taking into consideration of artisan perspective of yarn design characteristics, their willingness to weave in diverse material as well as for targeting wider categorical segment of consumers. For new design and development of Mashru fabric, information was deduced from the discussion of first and second objective and was applied for it. The designs to be developed were categorized under two categories on the basis of raw material and their design characteristics: Niche category and Commercial category. The Niche category included three designs Mulberry silk, combination of Mulberry silk & Tasar silk and Tasar silk whereas commercial category included only rayon. Initially many digital designs explorations were made. Then the designs were shown to textile experts and weavers. The selected designs were developed on loom with the help of selected artisans

Table 2: Selection of warp in commercial and niche category of Mashru fabric along with considered yarn design characteristics

	Designed Fabrics	Warp Variety	Visceral Yarn Design Characteristics	Behavioral Yarn Design Characteristics	Reflective Yarn Design Characteristics
Niche Category 1 (Mulberry Silk X Cotton)	Design A	Silk X Cotton	Color(bright), Texture (Luster)	Suitable yarn Count and reed, Hand-Feel	Hand-Dyed, natural fiber
	Design B	Tasar Silk + Mulberry Silk X Cotton	Color(bright), Texture (Luster)	Suitable yarn Count and reed, Hand-Feel	Hand-Spun, Natural fiber, Hand-Dyed, Resist-Dyed
	Design C	Tasar Silk X Cotton	Color(bright), Texture (Moderate Luster)	Suitable yarn Count and reed, Hand-Feel	Hand-Spun, Natural fiber, Hand-Dyed
Commercial Category: III (Rayon X Cotton)	Design A	Rayon X Cotton	Color(bright), Texture (high Luster)	Suitable yarn Count and reed, Hand-Feel	Hand-Dyed

The development of samples in diverse materials gives wider consumer option for Mashru. With the current trend in sustainable fashion developed samples can be efficiently positioned for high end market. The birth of Mashru took place for royal Muslims who were prohibited to wear pure silk. Later it found its scope in the tribal and rural costumes and rituals. Diversification of material and revival of silk along with maintaining the requirement of rural and tribal folk can cater to wider category of consumers.

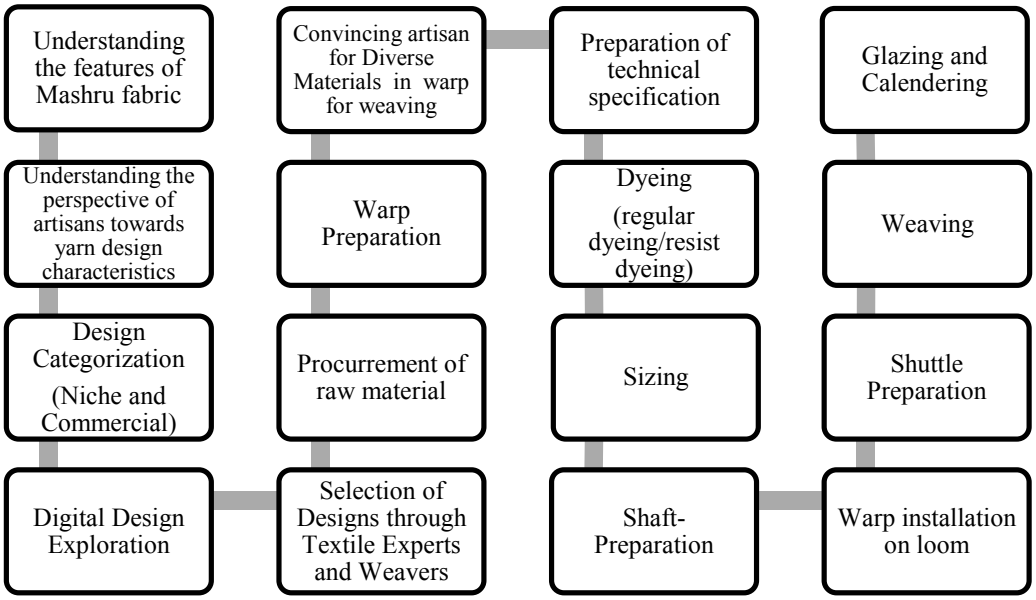


Fig. - 6
Diagram depicting the workflow adopted during design and development of Mashru fabrics in diverse materials

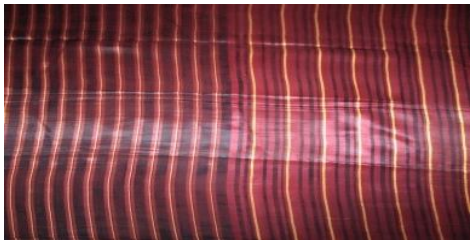


Fig. -7 Rayon Mashru
(Commercial Category)

Fig. -8 Mulberry Silk Mashru
(Niche Category)

Fig. -9 Tasar Mashru
(Niche category)

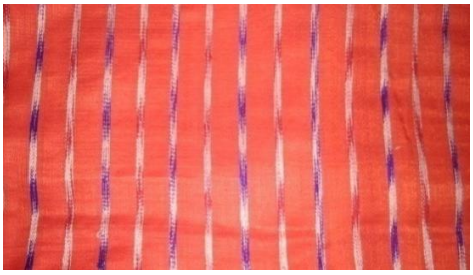


Fig. -10 Tasar and Mulberry Silk Mashru
(Niche Category)

V. Conclusion and Implication

Design intervention in the field of traditional textiles is an imperative key to encourage craft. Every time to bring newness to product is huge challenge. If it is associated with trend and evocative narrative, it becomes easier. At present design is above aesthetics. To mindful and conscious consumer function and narrative associated with the product is new aesthetics. In this study researcher has made an attempt to design-develop Mashru fabrics which can be positioned for both traditional and mindful conscious consumers. After study it has been concluded that any development has several

contexts associated with it. It is responsible task of designer to critically examine various levels of product from consumer's as well as maker's perspective prior to weaving. The Norman's level of design acts as an important tool in understanding product. Its application in the area of traditional textiles can help in developing newer product, widening the range of consumer and reducing the risk of failure of product. This study can be found helpful in other similar study of design intervention, in disseminating regional sensibilities, diversities, resources, in strengthening socioeconomic benefit of various stakeholders involved in it, in strengthening socioeconomic benefit of various stakeholders involved in it, in appreciating how the perceived value of the product can be enhanced, in understanding factors associated to sustainability and development of traditional products, in application of Norman's level of design for new development, as case study for student in visualizing importance of textile material in better way and empathetically understanding the reason behind consumption of specific material.

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DO-07

TRADITIONAL TEXTILE OF LEPCHAS OF SIKKIM STATE

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Abstract

India is a land of multiracialism where one can find amalgamation of diverse thoughts, beliefs, culture, food and textiles. This ideology makes India along with its 29 marvelous states a versatile country across the globe. One such state in north- east of India is Sikkim. It is cohabited by multiple cultural-linguistic groups out of which Lepchas are the significant ones. Lepcha the original inhabitant of this state are closely associated with nature. The tradition of handloom textile weaving in Sikkim is centuries old and Lepcha women play a significant role in it. Today where everyone is talking about sustainable fashion globally, investigators are taking initiatives to revive some of the languishing textiles of seven sisters of northeast. They have taken efforts to revitalize traditional textiles of seven sister state but somehow the brother state commonly known as Sikkim has remained unfazed. Established Indian designers also have been taking initiatives to document and revive their textile craft form. But, many facts of these textile craft are still unexplored and still are anonymous to the rest of the sphere. Hence there is a need to document and revive the traditional textiles of Lepchas of Sikkim. The main objective of this paper is to sensitize people about these alluring textiles. Lepchas handloom, cane and bamboo products are also famous for their intricate designs. These intricate textiles are not easy to make. Loin cloth woven on a back-strap loom is a time-consuming process. It is recognized by their white Base with rhythmic strips in black, red, yellow and green ornamented with inter woven motifs which has its own significance. In order to accomplish the above need and objective, the method adapted is survey along with interviews of locals on field. This paper looks in the depth of Lepcha an indigenous tribe and focuses upon the distinctive features of their few traditional textiles in terms of yarns, looms, colours, motifs used with their symbolism.

Keywords: Lepcha, Handloom, Traditional, Textile Craft, Back-strap Loom

Introduction

India constantly known for its profuse cultural heritage and living in harmony with flora and fauna has been an important part of Indian culture.This has been profusely reflected in a variety of traditional practices, religious beliefs, rituals, folklore, arts and crafts, and in the daily chores of the Indian people from centuries. India along with its 29 marvelous states a versatile country across the globe. One such state is Sikkim. (Fig 1)

Sikkim the best kept secret in the Himalayas is nestled between Nepal, China, Bhutan and West Bengal. It wasruled by a monarchygovernment the '*Chogyal's (*King) until 1975 and became the 22nd state of India on April 23rd 1975.

The various ethnic groupshas their own nomenclature for this enchanting land. The Nepalese call it *Sukhim* or new home, while Tibetan refers to it as Denzong or valley of rice and to the Lepchas, the original inhabitants of Sikkim; it is Nye-al-ale or heaven.

Sikkim's history dates back to fourteenth century when KhyeBhumsa, a prince from Tibet, following a divine command travelled to Sikkim and came in contact with the Lepchas(3) and the ancestors of Bhutias. The tribe was from the Kham area of Tibet. The Tibetans migrated in early 17century and these Tibetan migrants (known as Bhutias) were follower of the sect of 'Red Hats' tried to coveretSikkimese " worshipers of nature" to Buddhism. They succeed to some extent, though the Lepchas tried to keep themsleeves aloof as far as possible. (3) Hence Lepcha's consider as the original inhabitant of this state, they are a Mongoloid community living in Sikkim, Darjeeling, Southwest Bhutan and Eastern Nepal. They call themselves Rong from the Lepcha words Rongkup or Rumkup meaning the children of snowy peak/ the children of God. They are nature worshipers;consider themselves as the novel native community. Lepcha inhabitants are concentrated in the central part of the Sikkim State. Majority of Lepchas are settled in Dzongu, Penlong and Dekchu Valley of north Sikkim or in Darjeeling, Kalimpong of West Bengal.

Fig 1: Map of Sikkim
Source: https://www.tourmyindia.com/states/sikkim/map.html

They love the solitude of the forest and live in harmony with their environment. They existed much before the Bhutias and Nepaleses migrated to the state. Before adopting Buddhism or Christanity as their religion, the earliest Lepcha settlers were believers of bone faith or mune faith.Lepchas are a very small indigenous tribal community who co-habit the sub Himalayan region of the Kanchenjunga basin along with the Bhutias and the Nepalese. It is believed that they had been here for some millennia but as this area was inaccessible it was out of the purview of the marauding races from the sub-continent, thus they were left undisturbed and untouched. As they stayed in isolation for a very long time devoid of any influence from other superior races they developed their own strong distinctive culture. With the advent of time the Lepcha women began weaving and produced remarkable cloths with the little resources that they could obtain from the forests.

The proof of their isolation can be found in the fact that they ingeniously produced clothes from the highly stingy but fibrous nettle plant and coarse silk from the caterpillars of the jungle; even the dyes were made from the plants found in the region.

They had no idea of producing woolen or cotton clothes which were found in the region. It was only later that these materials came into use.(6)

Objectives

The main objective of the study was to focus on the traditional textile made in cotton and nettle on loin loom ornamented with interwoven motifs which has its own significance used by the lepchas of Sikkim State and to sensitize people about these textile.

Purpose

In the last few decades many traditional societies have been witness to rapid change and westernization. Textile whatever may be its origin serves as a status symbol for the individual in the society.

Today where everyone is talking about sustainable fashion globally, investigators are taking initiatives to revive some of the languishing textiles of seven sisters of northeast. They have taken efforts to revitalize traditional textiles of seven sister state but somehow the brother state commonly known as Sikkim has remained unfazed. Established Indian designers also have been taking initiatives to document and revive their textile craft form. But, many facts of these textile craft are still unexplored and still are anonymous to the rest of the sphere.

The main purpose is to give them a unique perspective to see their culture and tradition from a different angle. Why not to use the traditional techniques, motifs and give these people a global and bigger market beyond Sikkim. For which we have to empower our crafts men in a digital age, for crafts and technology to work together for sustainability in the future. Hence there is a need to document and revive the traditional textiles of Lepcha's of Sikkim.

Methodology

The present paper is the result of a field survey conducted at Gangtok. A prior research permit was taken from the Department of Forest, Environment, and Wildlife Management Office, Government of Sikkim. A structured interview schedule was developed with open-ended questions related to general information of the weavers, weaving process concerning yarn, motifs, colors used. Data was collected from the Directorate of Handloom and Handicraft (DHH, Sikkim) where the researcher interacted with the weavers and some government officials to understand the facts of these textiles. They were requested to narrate the indigenous technique, motifs for the same. Few visits were made to the local markets to interact with the local textile distributors because most of the textiles with indigenous motifs were available with the rural folks. Information related to historical contextual of the indigenous communities of Sikkim was collected through the literature available in the craft museums and libraries. The museum included National Museum, Delhi, Craft Museum Directorate of Handloom and Handicraft, Gangtok, Namgyal Institute of Tibetology, Gangtok. The Libraries included Library of Department of Clothing and Textiles, Faculty of Family and Community Sciences, The Maharaja Sayajirao University of Baroda, Vadodara. National Museum Library, Delhi, Indira Gandhi National Center for Arts (IGNCA) Library, New Delhi.

Fig: 2 '*Sisnu*' plant

Fig 3: Fabric made out of Nettle fiber
Source: Procured from Karma Sonam personal collection, Gangtok.

Findings and Discussion

The present study aimed to document the traditional textile of Lepcas of Sikkim. Sikkim though a small state is known for its diverse cultural heritage which is an amalgamation of various ethnic traditions in the state, keeping their ethnic distinctiveness intact. Art and Crafts play a very vital part in their life as it gives them a good tourist market plus livelihood to the under privileged.Lepchas the creative minds of this exquisite state have resourcefulness in their hands which makes a link between religion and craft very strong. Metaphors and portraits related to Buddhism which is a predominant religion of the people of this state, are seen in almost every form of art and craft.

Raw Materials used

Handloom weaving of Lepchas which is explicit of their community has a beautiful story to articulate. In ancient times when Sikkim was not even a part of India and was ruled by chogyals and monarchs, lepchas used yarn spun out of nettle '*sisnu*' or ' sorhing' plant (see fig 2) to weave textile materials. The weavers used to harvest and extract fiber out of the nettle and prepare yarn out of it by themselves. The fabric woven out of nettle fiber was used to be in plain weave and courser and quite strong. It was believed that the fabric made out of nettle was hard to wear and tear which was perfect for these woodland dwellers.

Sisnu (nettle) is the naturalfiber (see fig 3), native to the Himalayan belt used by the local weavers of Lepcha community long before the cotton or wild silk was used. *Sisnu*plant grows to the height of about 3 meters with a 5- point leaves, whole plant include stem and leaves and is covered with thorns which makes it difficult to pluck or peel bare hands. Now a days due to the easy availability of cotton yarns, usage of nettle is facing a stopover and the local Lepcha weavers are shifting to Cotton yarns which are dyed in various dyes (natural and synthetic) in orderto cater to the market demand.

Loom used

Lepcha weaving is done on a backstraploom.(see fig 4)The fabric woven on Lepcha loom is in plain weave with extra warp ornamentation. Back starp has two warp beams that require a wooden frame, so these looms are usually set up against the wall of a porch in weaving shed, or indoor. On this loom the warp stands upwards away from the weaver, and around the upper warp beam.

The breast beam, typically a length of wooden rod split in half, lengthwise, so that it grips the cloth and is tied to the weaver's backstarp with cords. The backstarp is a piece of leather, cheaper substitute can be woven jute panel or any padded fabric or canvas, with wooden dowels at each end by leaning backwards, the weaver maintains warp tension.

Presently after some government intervention programs they have been shifted to throw shuttle loom with jacquard attachment. (fig 5)

Fig: 4 *Loinloom* (Backstrap)

Fig: 5 Throwshuttle loom with Jacquard attachment

Fig 6: Yarn dyed with Natural Dyes
Source: Directorate of Handloom and Handicraft, Gangtok.

Colours

Traditionally all thehandlooms were dyed with natural dyes(see fig 6) which were easily available to them locally. They majorly relied upon the natural source for dye extraction (vegetable dyes) and colouring there traditional clothes, shawls, hats etc. and woolen yarn for weaving. They used different parts of various plants and shrubs such as roots, barks, fruits, leaves and vines to produced different colours.

Some of these like madder (Majito), walnut, 'chucha', 'halhale' and 'shungay' which are available in the forests. Later chemical dyes took over because of easy application process and consistency in colour. Now a days, natural dyes (see Table1) have again taken over and have become popular and its products also have niche market.

Table no 1: Various Natural Dye sources

S.No	Local Name	Botanical Name	Part of a plant	Colour
1.	Chucha	Rhubarb	Roots	Golden yellow
2.	Cho/Majito/Madder	RubiaCordifolia	Vine	Red
3.	Shungay	SymplocosRacemosa	Leaves	Yellow
4.	Taga/ Okher/Walnut	JuglanRegia	Bark, fruit	Brown
5.	Halhale	RumexNepalisis	Leaves and Root	Green Dye

Motifs and its Representation/Symbolism

Lepchas have their own traditional motifs which has its significance associated to their tribe. Mostly it has been observed that all ethnic groups focuses on motifs which are inspired from nature and their surrounding like flowers, leaves, trees, etc.

Earlier *'Thokroah'(* male draped garment)was woven without motifs only with two or three colour strips. (see fig 7) Later Lepchas got introduced to motifs. The entire motifs they make on *'Thokroah'* is inspired from nature.(fig 8[a])

To introduce motifs extra weft technique was used. A stitch called phoolkanta used to lift the warps. It is done in bright colours mainly red, yellow, green and blue.

Fig 7: Traditional *'Thokroa'*

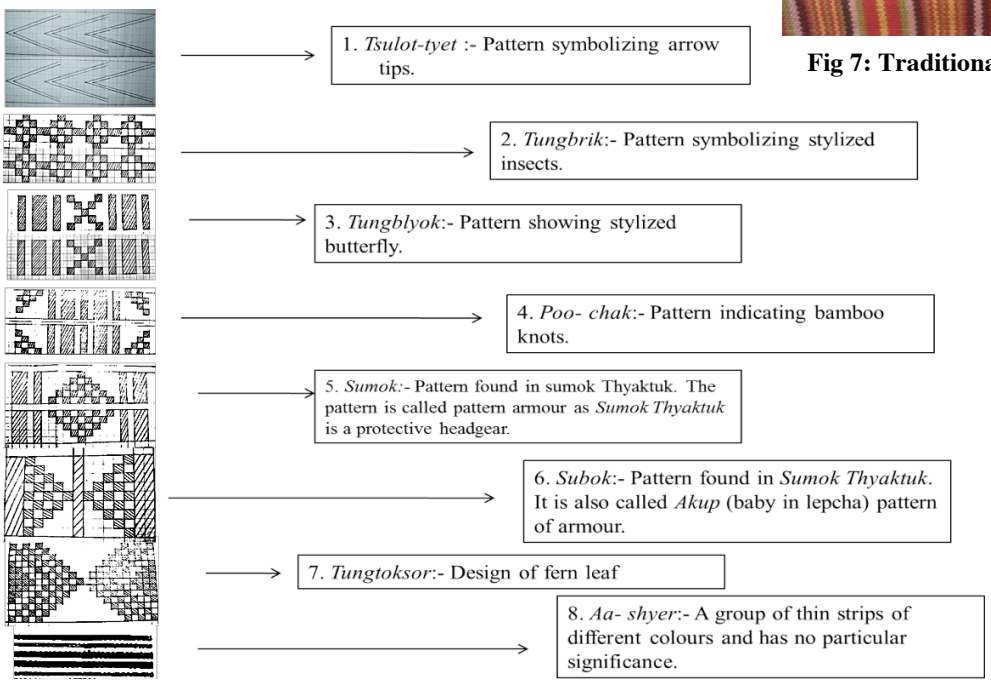


Fig 8[a]: Dum – praa(*Thokroah*) with traditional motifs inspired from nature.

Traditional Textile

The Lepcha Community largely inhabitats in the Dzongu area in the north district if Sikkim. The upper Dzongu area because of its inaccessibility has kept the traditional weaving alive. Sakyong village has many such weavers who are still practicing this art. The Lepcha women are skillful weavers. They weave 'Dum – praa', which is a men's dress. Each village in Sikkim state produces'Dum – praa' (see fig 9) for their men. 'Dum

– praa' has dual roles to play; during the day time, it is worn as a garment and at night it is used as a blanket. The Directorate of Handloom and Handicraft (DHH), Sikkim produces 'Dum – praa' at Gangtok.

Fig 9: '*Dum – praa'* fabric
Source: Personal Collection

Fig10: Lepcha couple in their traditional attire
Source: From PalchenLepcha's Personal Collection, Dzongu

Fig 11: Lepcha couple in their traditional attire
Source: From PalchenLepcha's Personal Collection, Dzongu.

The Arts and Crafts Center,Kalimpong has a Lepcha Weaving Department. It produces and supplies bags, dining table mats etc. for the market but, ironiScally, it does not produce 'Dum – praa' for the Lepchas. Prices for a 'Dum – praa' may range from Rs.500 to 2,000 depending on its size, design, pattern, and quality.Although there are many Lepcha patterns or designs when weaving a 'Dum – praa', the following three patterns or designs are very much in use:

1.**Tagaap**: This is the oldest Lepcha pattern or designs. It is woven with a floral designs or patterns.

2. Khemchu: It is a scissors design or pattern.

3. Tamblyoak: It is based on the butterflies patterns or designs.

4.**'Dum – praa'**, however, it is also known by three other names by its materials, make, and design:

5. KoojooVaadoah : This is the oldest kind of Lepcha dress for men. It is made from Koojoo, as the name implies, nettle plants. It is light and soft, but always in a plain colour without any pattern or design. No dyeing or any pattern, occasionally embroidery is applied and used in KoojooVaadoah. It is of dark cream colour which is its natural colour. Today KoojooVaadoah dress is not made and available or used for two reasons; firstly, nettle plants are not available in plenty, and secondly, cheap cotton fibres are easily available in the market.

6. Thokroah: This dress is made from thin, soft fibres. '*Thokroah*' can be easily recognized by their white base with rhythmic strips in black, red, yellow and green ornamented with inter woven motifs which has its own significance. Embroidery is markedly absence in the '*Thokroah'* dress.[8]

7. Menchhyo dress: It is recognised by its beautiful embroidery at the top end of Menshhyo dress.

Dumdyem, Gado (Lepcha Women Dress)

The Lepcha ladies have a dress of their own, in earlier times it has been said that themales and the females were difficult to distinguish because of their dress, as both of them wore the same earthly colour nettle dress slung over their shoulder and short pants but with time feminine instincts took over and the '*Dum Dyem'* came into being. The 'Dum Dyem' is a flowing dress brightly coloured and smooth as the cloth was derived from cocoons of caterpillars from the jungles. The coarse silk threads were dyed and woven into this simple flowing dress which is slung over both shoulders cris crossing just below the neck and held at the waist by a waistband called "*Naamrek*", the end piece of this dress is then wrappedand put over the waistband.

It has been observed that Lepcha weaves have acquaintances with other Himalayan region also. There are close links between weaving tradition of northeast India, Bhutan, Tibet, Burma and more distant lands. Before the mid 1600 parts of eastern Bhutan and areas that now lie in India and Tibet (China) were encompassed in a single cultural and political area. Lepchas fabric production exhibit robust similarities with the tradition of nearby native people in South Bhutan. The customary cloth worn by the Lepcha men resembles the garment worn by *"Sherdukpens"*in Arunachal Pradesh. Women use a backstrap loom and work with cotton and silk imported from other nearby countries. Other than these two fibers nettle fiber was also used, the process of obtaining nettle also bears similarity to both Lepchas and Bhutanese. The weaving and the patterning and the technique has lot of similarities with that of Bhutan.

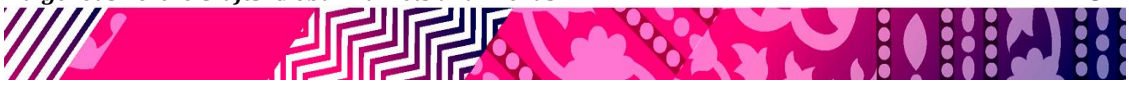
The present range of Lepcha weave available in the market are bags and purses, cushion covers, napkins, table mat etc. [(4)]Lepcha hand woven jacket is another utility item and has greater market acceptability.

Table 2: Standard sizes of handloom products which are woven at DHH

S.No.	Products	Size (L X W)
1.	Daree	120"X30"
2.	Daree (Medium size)	120" x27"
3.	Bag Tan (File folder yardage)	120"x19"
4.	Cushion Cover yardage	125"X18"
5.	Napkin	16.5"X16.5"
6.	Table Mat	18.5"X12.5"
7.	Jhola (Bag) large	36"X12.5" with flap
8.	Jhola (Bag) small	28"X10.5"without flap
9.	Jhola (Bag) large	28"X12.5" without flap
10.	Jhola side Panel	150"X5"
11.	Waist belt	160"X2"
12.	Tray cloth	23.5"X13"

Summary, Conclusion and Implications

Traditional textiles of the Lepcha and their dress has not been borrowed or acquired from any individual or other tribes as the Lepchas were in isolation for a long period of time, they in time developed a sense of self dignity and began to cover themselves up to preserve their modesty. Lepchas are the indigenous people. This paper



gives us a unique perspective to see their culture and tradition from a different angle and presents us with a parameter according to which we can measure the growth of this culture in isolation.

The strides that they took in interlacing fabrics were huge effort in ethno cultural dialect; although the dress may be of use only for ceremonies and commercial goods available in present day market, it still gives us ample room for study an research into the primitive tribes in isolated areas of India where these cultures are still just not surviving but flourishing.

On the other hand now a days '*sisnu*' (Nettle) weaving is completely vanished even in internal areas of this region, It is also frozen like many other ethnic culture that have disappeared from the face of earth and is about to become a thing of past. To keep the culture of Lepcha alive Government of Sikkim has taken few efforts like opening of the training centers for all craft of Sikkim including Lepcha weaving, but still lot of work needs to be done towards the revival of this ecofriendly fiber by improving the quality so that it can give competition to other fibers in market plus it will develop and increase the fashion supply chain of this region which will sensitize the rest of the world.

Acknowledgments

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DO-09

CO-CREATION THROUGH DESIGN PROCESS FOR REVIVING INDIGENOUS KNOWLEDGE ABOUT TRADITIONAL TEXTILE PATTERNS

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Abstract

Woven textiles of Thailand are especially evident for their intangible cultural heritage, which contributes to the Soft Power of Thailand through various means, i.e. the national identity and branding. However, in the recent decades, a number of weaving communities have been declining as a sequence of the expansion of industrialization and globalization for trade of mass-produced goods. Few young people are being trained in traditional weaving, whereas experienced weavers are over forty years of age. Indigenous knowledge of traditional weaving is likely to be lost in the near future, if there is no immediate action happened to reinforce their cultural adherence and continuity. Designers are encouraged to design for cultural revitalization. The author utilizes research and educational activities to letting the young generation engaged in design for cultural revitalization. A co-creation project was implemented with the weaving communities of Long district, Phrase province because of the erosion of indigenous knowledge about woven textiles. These communities wanted to reinforce and revival their indigenous knowledge of woven textiles by developing some tools, which they could use to exchange knowledge with other people. They preferred a booklet of traditional textile patterns and a card game. It was agreed to explore a vintage collection of a type of traditional skirts, known locally as 'sin tin chok', which are exhibited in the 'Komol Phaboraan Museum'. This design process lasted eight months, involving fieldwork and data collection, booklet design and design of a card game. The research group included the principal researcher, a specialist in game design and five undergraduate students. This design process embraced people within the district (i.e. textile masters, experienced weavers, villagers) and outside the district/province (i.e. undergraduate students, school children, teachers, potential users and tourists). Co-creation through design process can enable knowledge exchange between engaging actors that does not limit to indigenous knowledge about woven textiles. Their knowledge exchange may expand to other knowledge domains, such as local history and languages, and digital technology.

Keywords: Co-creation, Design process, Design and culture, Traditional textile patterns, Weaving Communities

Traditional textile, design, research and education

In the context of traditional textile production, within a given cultural group, there will be a preferred symmetry or symmetries used to decorate objects (Brainerd cited in Arnold, 1992, p.8). Their group will consistently use the specific symmetries in their design systems (Washburn and Crowe cited in Arnold, 1992, p.55). The design of pattern

structure from any given cultural group shows their unique preferences for a cultural system in many aspects (Washburn and Crowe cited in Arnold, 1992, p.55), for example, cultural and historical principles, geometric principles in practice and correlation to design (Washburn and Crowe, 1988, p.ix; Arnold, 1992, p.2). The fundamentals of pattern structure and their symmetry characteristics can be used as a tool for cultural analysis (Arnold, 1992, p.55; Hann, 1992, pp.581, 589; Washburn and Crowe, 1988, p.ix; Hann, 2003, p.81).

Woven textiles of Thailand are especially evident for their intangible cultural heritage (Conway, 1992, p.9;Ministry of Culture, 2009), which contributes to the Soft Power of Thailand through various means, i.e. the national identity and branding (verbal communication with Kosit Panpiemras in 2012). Soft Power is a means for a country to success in world politics, in ways that a country is able to persuade others to do what it wants without force or coercion. It describes and evaluates the comprehensive national strength, including culture, political values and foreign policies (Nye, 2004).Woven textiles are an integral part of the social life and religious belief associated with Buddhism of Thai people from their birth to death (Conway, 1992, p.9). For example, woven textiles are used for cloth-making, household products, gifts-giving, and presenting in religious ceremonies (Conway, 1992, pp.41, 135). Additionally, woven textiles play a role related to financial value (Museum of the Bank of Thailand Northern Region Office, 2011).

However, in the recent decades, a number of weaving communities have been declining as a sequence of the expansion of industrialization and globalization for trade of mass-produced goods (Warren, 1983; Wherry, 2008). A number of the younger generations have migrated from villages to urban areas for job opportunities, which can provide a lucrative income, and a modern lifestyle. Few young people are being trained in traditional weaving, whereas experienced weavers are over forty years of age(Author, 2015). Indigenous knowledge of traditional weaving is likely to be lost in the near future, if there is no immediate action happened to reinforce their cultural adherence and continuity(Author, 2015). It is critical to enable our understanding of design in relation to cultural significance, for example, design structure can be used as an indicator of cultural adherence, continuity and change (Arnold, 1992, p.55).

Designers are encouraged to make positive contributions of design for cultural revitalization at the local level (Walker, Evans, Cassidy, Jung, and Holroyd, 2018).Enabling factors, which support and underpin how design can reconnect with various aspects of traditional culture are identified, including promotion, enterprise, and research and education (Evans, Holroyd, Walker, Cassidy and Jung, 2018, p.344).Scholars address that ‘the focus of higher education on art, craft, and design is facing constant changes’, which focus more on design, digitalization and an industrial approach, for example in universities in UK and Finland, rather than cultural and traditional aspects that strengthen the sense of local identity(Kokko, 2018, pp.231–232). The author is an educator, researcher and designer, working in a university in northern Thailand. Iadmitthat this situation is also happening in higher education institutions throughout Thailand, where several courses are being replaced by new courses involving computer programs and digital technology.

The author inquired how research and education could be used as a platform to connect craft enterprise and multiple actors to support the revival of indigenous

knowledge about traditional textile patterns. Co-creation design is a strategic approach to innovation; it is the key to investigate new opportunities for enterprises and unlocking new sources of competitive advantage (Frow, Nenonen, Payne and Storbacka, 2015, p.463). However, there is deficiency of the literature that 'offers a detailed exploration of the specific dimensions and categories that are important in co-creation design' (Frow, Nenonen, Payne and Storbacka, 2015, p.464). For example, how firms can purposefully identify co-creation opportunities, what tools and processes can enable effective co creation (Frow, Nenonen, Payne and Storbacka, 2015, pp.464, 356), how we can encourage work on practices for collaborating with partners? (Barczak, 2012 cited in Frow, Nenonen, Payne and Storbacka, 2015, p.464).

Research context, approaches and methods

Research approaches included ethnography, use of archives and museums, geometric symmetry concepts, and grounded theory (based on Cassidy, 2018, pp.277–289).

Selection of the case study

Most of the population in northern Thailand are the 'Tai Yuan', an ethnic Tai group that settled in this region for over many centuries (Conway, 1992, p.135; Museum of the Bank of Thailand Northern Region Office, 2011). The Tai Yuan women are specialized in a weaving technique known in a local word as 'chok' (McIntosh, 2012, pp.3–9), which means to weave and create patterns by slipping weft threads of different colors in and out on the loom (Suchitta, 1989, p.97). This weaving technique is described in English as discontinuous supplementary weft (McIntosh, 2012, p.6). They usually produce the special type of traditional skirts, which is called in a local term as 'sin tin chok' (Figure 1A). It is made up of three separately woven bands sewn together, including a waistband, a body part and a lower part (Figure 1B) (Suchitta, 1989, p.97; McIntosh, 2012, pp.3–6). Chok weaving technique is employed for making the decorative patterns at the lower part of these skirts (Figure 1C). These patterns can be used to distinguish woven textiles of the Tai Yuan living in one area from others, such as those residing in the northern region from the central provinces (McIntosh, 2012, pp.3, 5). This type of skirts can also distinguish the Tai Yuan ethic group from the other Tai groups of Thailand, such as Tai Lue, Tai Khoen, Tai Yai, Tai Mao, and Tai Phuan (McIntosh, 2012, pp.3, 5).

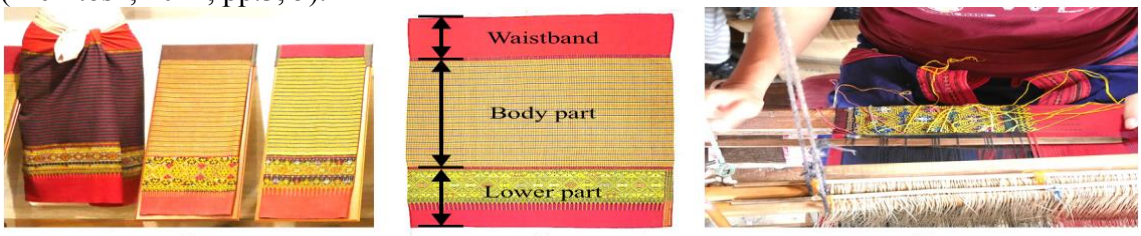

Figure 1 The Special Type of Traditional Skirts (i.e. Sin Tin Chok) and 'Chok' Weaving
(Photograph by Author, 2018) -The identification of a critical area for design

In 2018, an exploratory research was implemented with a case study of the weaving communities from Long district, Phrase province. In northern Thailand, they are one of the best-known producers of a type of traditional skirts that is called locally as 'sin tin chok'.In the previous study, the author (2015, pp.174–186, 202–207; 2018, pp.88–91) identified four potential areas for design to foster the future viability of weaving

communities. These four areas include: (i) design and production development; (ii) product design and development; (iii) design in relation to marketing and sales; (iv) and design to support weaving expertise transfer between generations. Based on this finding, the group leaders and experienced weavers in Long district were inquired in 2017 and 2018 to select a critical area for design intervention .They addressed a critical need for design intervention that can cure the erosion of indigenous knowledge about traditional textile patterns. Additionally, based on a list of the potential mechanisms, which can enable Weaving Expertise Transfer(i.e. books, weaving courses and training materials, promotional events, learning center sand digital media), they identified a pattern booklet and a card game for which they could use tenable knowledge exchange. The research objectives and co-creation opportunities

Therefore, this design research was initiated with three objectives as follows. First, it was **to create the patterns booklet**, which displays textile patterns in photographs and plotted graphs, and provides information about the history of Long weaving, the identity of Long woven textiles, the patterns' descriptors and meaning. Second, it was **to create the card game**, which is applicable to various groups of people. The Long representatives preferred products in the form of physical objects, and not yet on digital gadgets. From their perspective, physical objects are easy to use and can be applicable to various groups of poplin various situating environments. For example, weavers may use the pattern booklet to communicate with training novices, visitors or potential buyers. Tourists may play a card game, while they are waiting for entering the museum. Potential users of these products may vary from weavers, weaving trainees, villagers, school children, tourists, visitors, textile enterprises and interested people from within the district and beyond.These requirements were linked with the third objective, which were **to generate co-creation opportunities through the design process**. This paper focuses on co-creation through the design process. Other aspects of this research project will be written separately in other papers.

Sampling materials

The seventeen traditional skirts exhibited in the 'Komol Phaboraan Museum' in Long district (Figure 2: Left) were the sampling materials for this research. These seventeen skirts used to belong to the Tai Yuan residing in Long district, who donated their skirts to this museum. Each of these skirts are estimated to be more than a hundred years old (from verbal discussion with Komol, the owner of this museum).Komol selected these seventeenth skirts for display based on their patterns, which uniquely represent the local identity and are different from the others. Geometric symmetry concepts were introduced for the analysis of decorative patterns at the lower part of these skirts. An example of the decorative patterns is shown in Figure 2: Right.

Figure 2 A Collection of the Traditional Skirts Exhibited in the 'Komol Phaboraan Museum'*(Photograph by Author, 2018)*

Research process

This research employed 'grounded theory approach 'for collecting information and the analysis of information collected (Glaser and Strauss 1967 cited in Castree, Kitchin, and Rogers 2013; Scott 2014)

'Grounded theory is a research method that generates theories inductively on social processes through the analysis of qualitative data' (Glaser and Strauss, 1967 cited in Cassidy, 2018, p.283).… 'Grounded theory approach is normally carried out by researchers who are already experienced in the area being studied. It allows them to probe deeply into the data collected' (Cassidy, 2018, p.284).

The author conducted the fieldwork without any preconceived design framework or theoretical statements, but with experiential knowledge about relation between geometric symmetry in the practice of textile design, digital technology, co-creation design, task management, and research process. This research process consisted of three main tasks(Figure 3): creating the patterns booklet (Task-1) and the card game (Task-2), and generating co-creation opportunities through the design process (Task-3). Task-1 and Task-2 comprised several steps, some of which are carried out iteratively in respond to their other relevant steps. For example, an iterative process between the booklet design and developments of it, or between the games play design and the game testing. Task-3 was carried out when co-creation was feasible and appropriate to activities of Task-1 and Task-2.For example, co-creation within the research groupthroughdesign process, co-creation between the research group and the community representatives during the product presentations and discussions, and co-creation between the research groups with the potential users during the game testing. Fieldwork was mainly conducted in Long district three times, every three months. Each visit in Long district lasted two days. Fieldwork was also conducted beyond Long district.

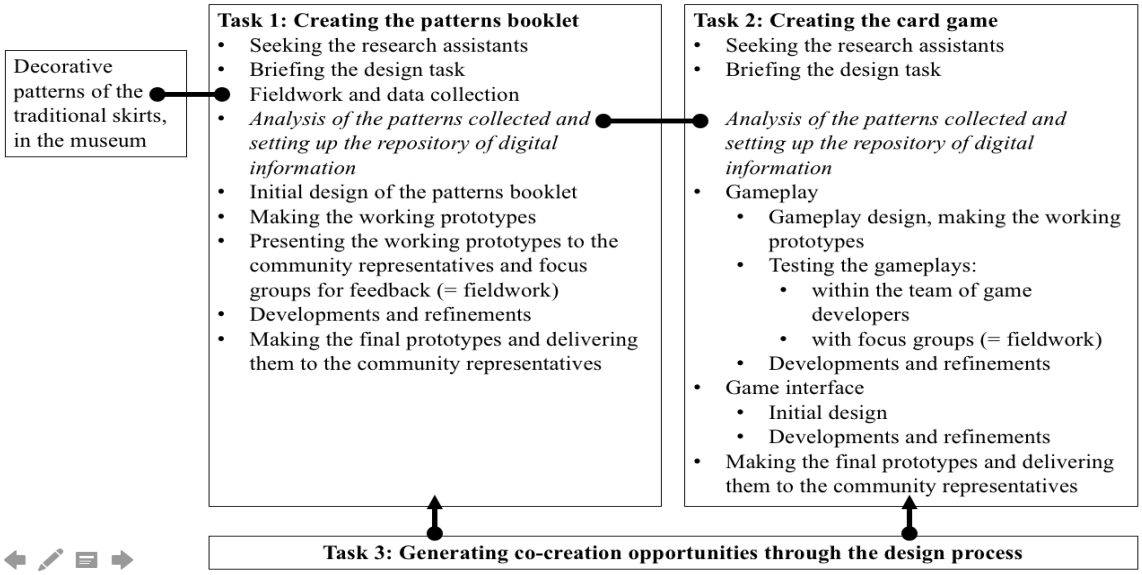

Figure 3 The research process

The research participants

Multiple actors were involved in this research. The research group from the education institution included the author (acting as the principal researcher, the project

manager, and the design director), a specialist in game design and five undergraduate students. Upon the announcement of a need for research assistants that offers a little amount of remuneration for their services, a student came in contact and span to the group office. Other engaging actors also contributed to this research project. They can be classified into two groups. First, the representatives from the weaving communities of Long district included two weaving experts (age 64, 67) and two weavers (age 44, 48). Three of them have continuous experience in woven textiles for more than 30 years with cultural purposes and commercial purposes. Although, another weaver (age 48) has just returned to weaving for about four years, she was a fast learner since she grew up in Long district and used to be involved in weaving when she was young. Four of them were the key informants pertinent to the indigenous knowledge of woven textiles.

Second, the people, who participated in the game testing. It was conducted in Long district with local people and tourists from other provinces. The local people included an artist/writer (age 44), and three children (age 6-7) and five children (age 13-15) accompanied by their parents or guardians. The tourists included two university teachers (age 37, 39) and a group of eight tourists (age 35-48) visiting the Komol Phaboraan Museum. Additionally, the game testing was conducted in two provinces in the northern region. The participants included four undergraduate students (age between 20-22) and five children (age 11-12).Prior to conducting the game testing, the research group got permission from the key informants and the participants, including the children's parents or guardians.

Methods and tools for collecting information

Methods included interviews (and audio recording if permitted), review of artifacts, photographing, game play testing, observations, and video and audio recording (if permitted).Tools included digital cameras, audio recorders, the working prototypes of the patterns booklet and the card game in softcopy and hardcopy versions, a computer system connecting to the Internet, Cloud Storage and software (i.e. Microsoft Excel, Microsoft Word, Photoshop, Illustrator and In design).

Findings and Discussion

During this project implementation, the research process was developed into more details, which were adjusted at times to suit with the available resources and the situations. Detailed exploration of the design process that incorporated co-creation are depicted as follows.

Co-creation through design process of the Patterns Booklet (Task-1)

This design process consisted of two phases: exploration (Figure 4); and finalization (Figure 5).The purpose of the exploration phase was to decode the textile patterns from digital photographs and record this information in a computer system. It was also to explore the competency and understanding of the research assistants, budget and production time, and opportunities for co-creation within the research groups well as with the community representatives; this was also applicable to design process of the card game. The initial design of the patterns booklet was the result of this exploration phase. This booklet included the eleven decorative patterns. The community representatives were satisfied with this working prototype and provided recommendations as follows. The research group should: complete the seventeen decorative patterns; depict the decoded patterns with their change as a result of production developments; revise the

design layout, and add name and description of every pattern motif. Therefore, the author sought a more budget in order to fulfill these recommendations in the finalization phase. It is noted that team meeting and working with close supervision between the principal researcher and the research assistants was arranged more than it was planned, in order to ensure that the assignments were fulfilled and met the standard within the timeframe given.

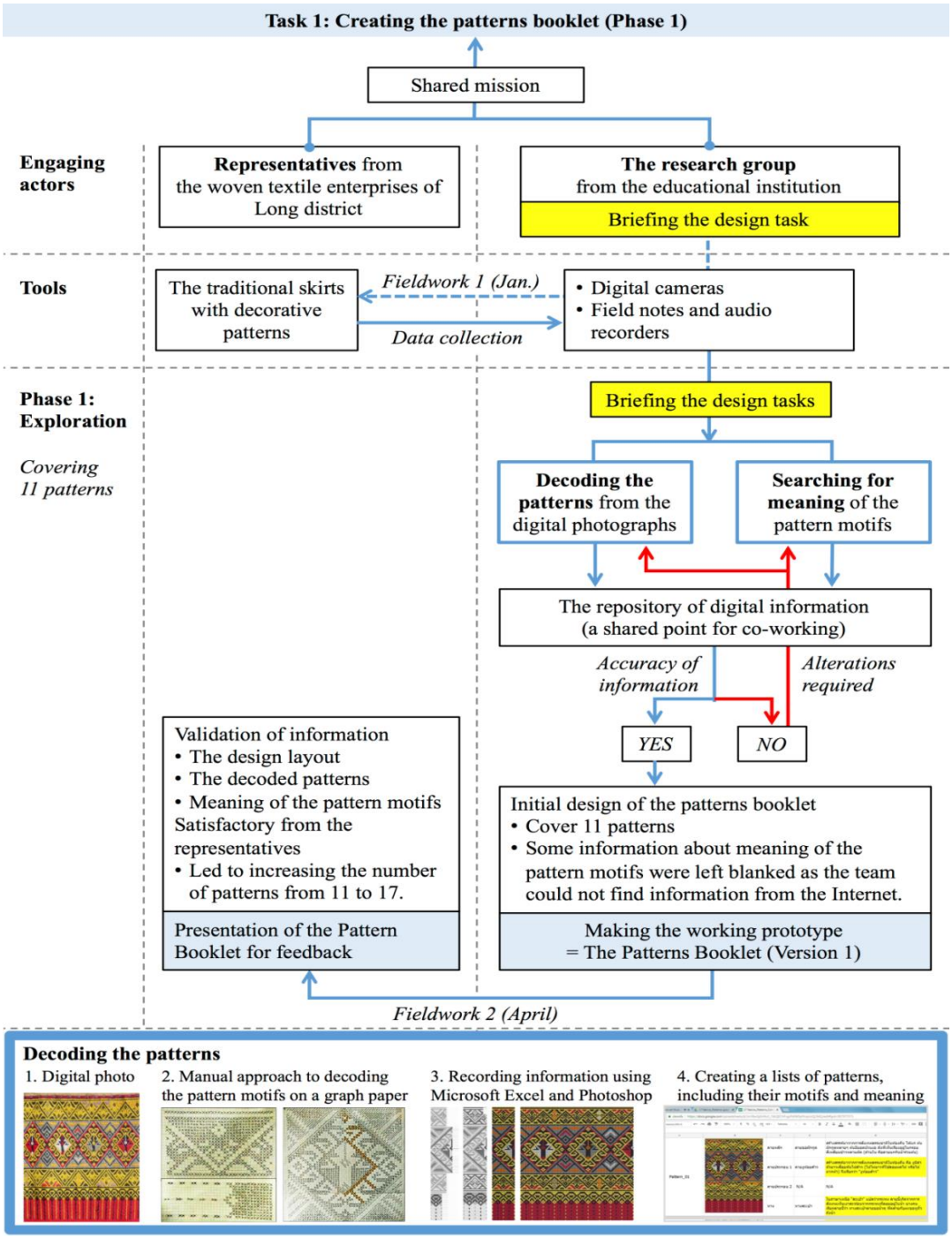

Figure 4 Co-creation through Design Process of the Patterns Booklet – Phase 1

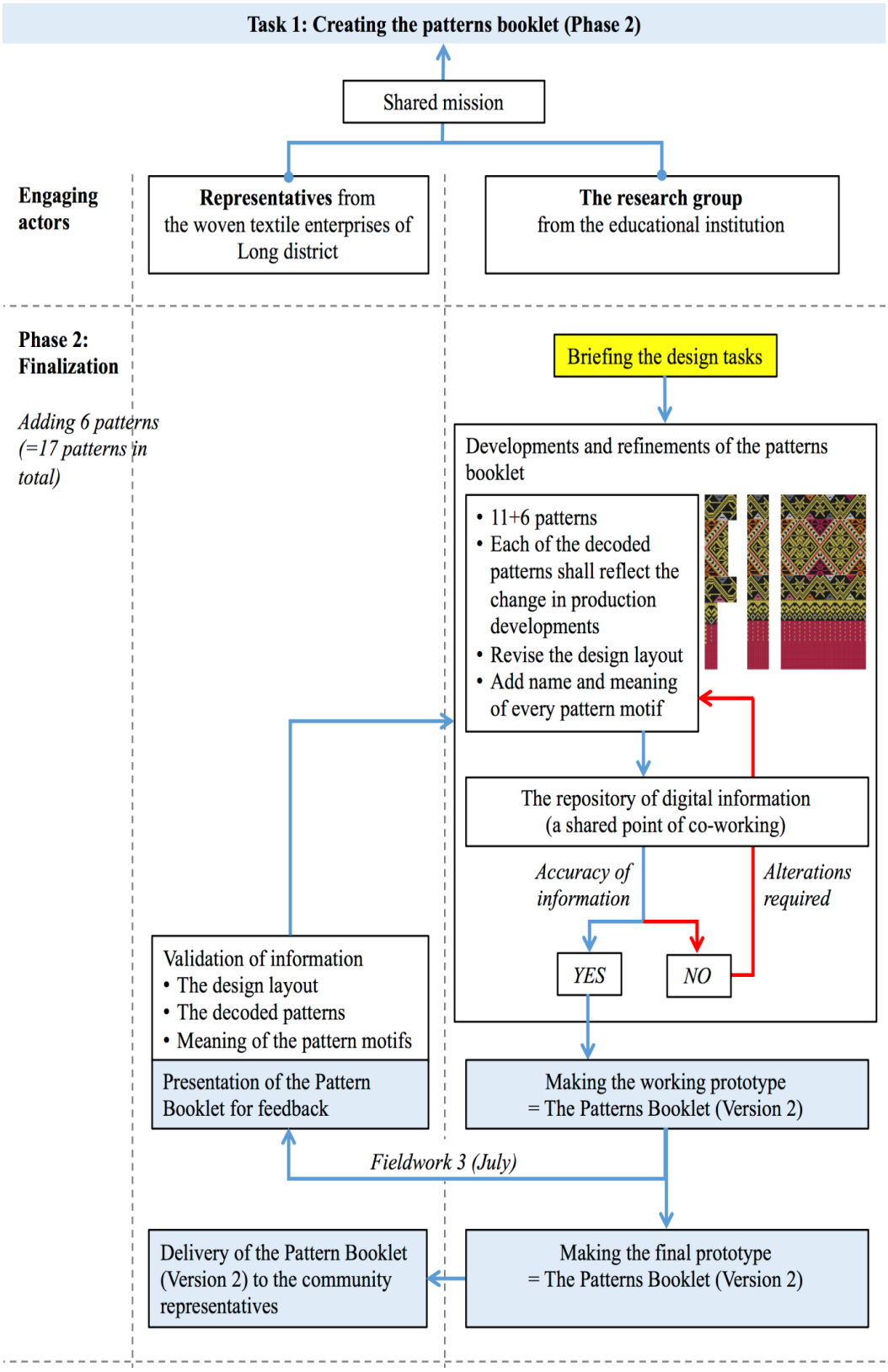

Figure 5 Co-creation through Design Process of the Patterns Booklet – Phase 2

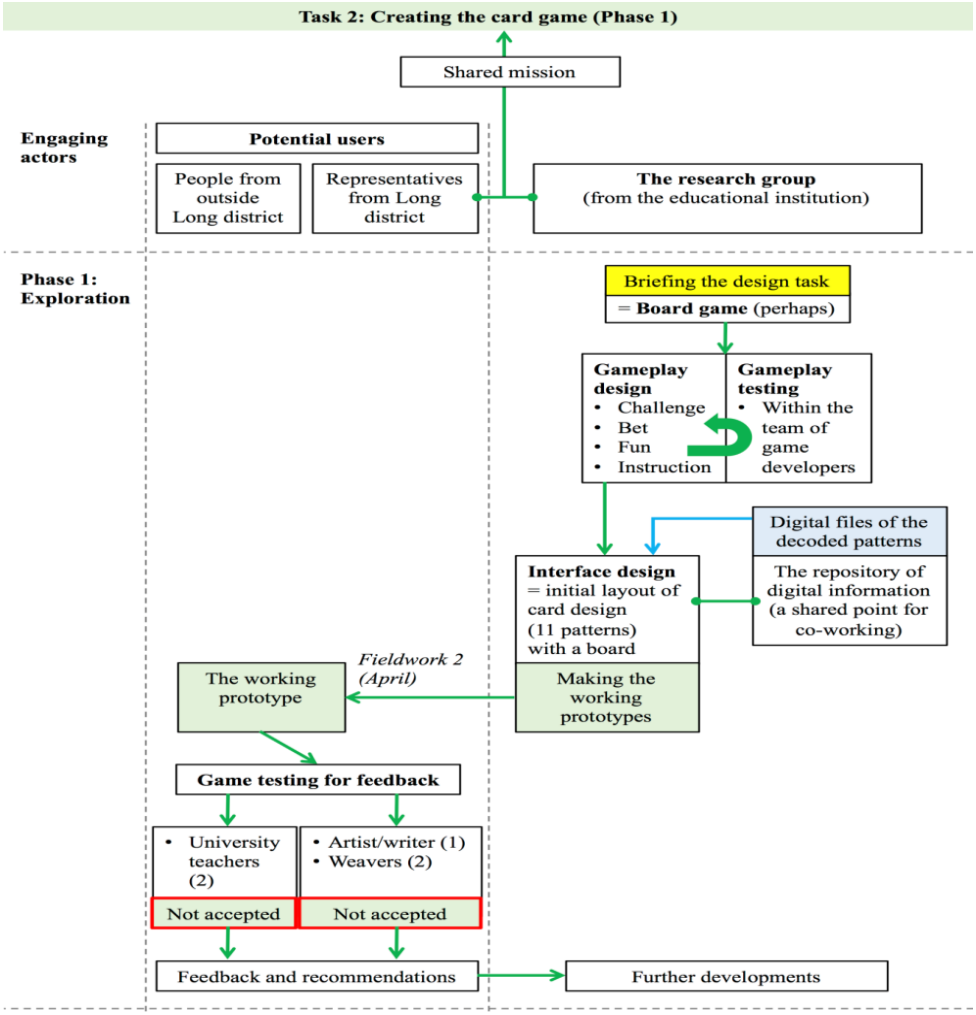

Figure 6 Co-creation Through Design Process of the Card Game – Phase 1
Co-creation through design process of the card game (Task-2)

This design process consisted of two phases: exploration (Figure 5); and finalization (Figure 6). Design processes of the patterns booklet and the card game were linked through textile patterns and fieldwork 2 and 3.

The purpose of this exploration phase was to explore a game, which could interest the community representative and potential users. In the beginning, the research group came up with different ideas for developing the card game, such as matching textile patterns or creating the full patterns in ways which players could also learn about the design structure of traditional patterns.

Yet, the research group agreed on developing a board game with a storyline about collecting woven fabrics or trading of. The research group developed the game play and conducted game testing within the research group several times prior to making a proper prototype of cards and a board. Next, this board game was tested with potential users from Long district (including one artist/writer, two weavers) and from outside this district (including two university teachers).

This board game was failed to be accepted because it had so many rules, which were considered 'complicated', 'taking sometimes to understand'. As a result, they were not in the mood to play this game.

They recommended developing the card game without a board game, which are easy to play. One set of cards should be applicable to playing different games. In Phase 2, the research group designed the card game for multiple players and developed two game plays entitled: Connecting Pattern Motifs; and Matching Pattern Motifs.The same setoff 68 cards (17 patterns x 4 parts = 68 cards) could be used in both game plays .Game testing was part of the game play developments, which the research group carried out several times with the Long representatives and potential users. Eventually, they accepted these two game plays and it was observed that they felt fun in playing these games.

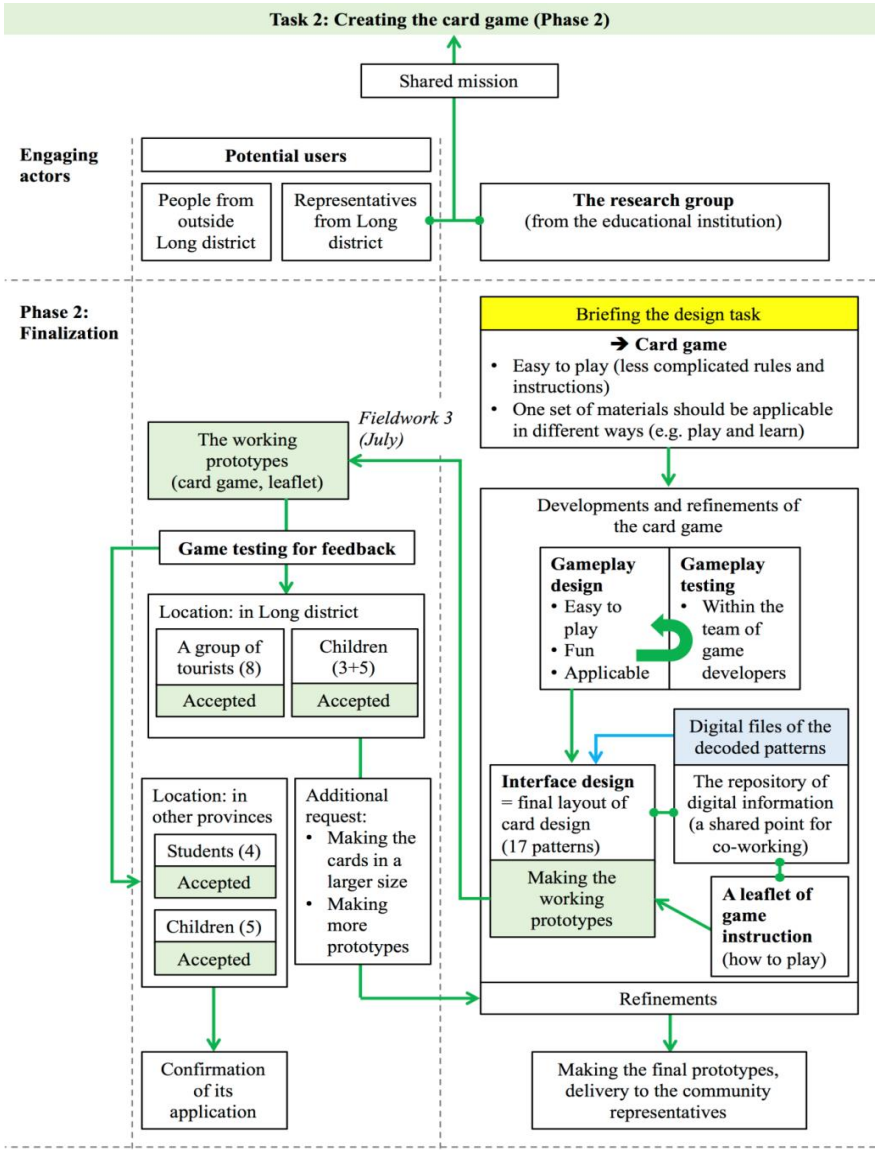

Figure 7 Co-creation through Design Process of the Card Game – Phase 2

Conclusion and implications

This paper begins with the significance of traditional textile, design, research and education with an emphasis on a critical need to revive traditional weaving and woven textiles in Thailand. The author inquired how research and education could be used as a platform to connect craft enterprise and multiple actors to support the revival of indigenous knowledge about traditional textile patterns. Co-creation design was employed as a strategic approach to investigate new opportunities for enterprises and increase their competitive advantage. However, there is gap in the existing literature, for example, those: offer detailed exploration of the specific dimensions and categories that are important in co-creation design; demonstrate how firms can purposefully identify co-creation opportunities; what tools and processes can enable effective co creation. In 2018, a research project was implemented in association with the weaving communities of Long district. The objectives were to create the patterns booklet and the card game, and to generate co-creation opportunities through the design process. This paper depicts detailed exploration of co-creation through design process of the Patterns Booklet (Task-1) and the card game (Task-2).Co-creation in these design processes occurred in various dimensions, including: co-creation for access to resources such as licensed software offered to the university members; co-creation in the forms of ideas, design and production; co-creation through various engagement platforms such as digital applications, tools and products, museum space (based on Frow, Nenonen, Payne and Storbacka, 2015, p.471).Co-creation also enables knowledge exchange between engaging actors, whose their knowledge expand toothier knowledge domains, e.g. local history and languages, and digital technology – besides woven textiles.

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DO-10

SUSTAINABLE ASPECT OF TRADITIONAL TEXTILE CRAFT OF *BHOTIA* TRIBE IN UTTARAKHAND

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Abstract

In Uttarakhand state, there are five tribal communities i.e., *Jaunsari*, *Tharu*, *Buksa*, *Raji* and *Bhotias* who practice the distinctive traditional craft. Out of these tribal communities *Bhotia* tribals living in the high Himalayan region are known for their handloom weaving craft since decades. They were also known as international traders until 1960 when they used to have business linkages in Tibet. This Indo-Tibetan trade stooped completely due to the invasion of Tibet by China. The textile crafts of *Bhotia* comprised of spinning of woollen yarn and its use in weaving or knitting for making fabric which in turn was used in both household as well as apparel by hill population. This textile craft was practice by women folk among *Bhotia* and was handed over to the daughter by her mother. Presently, this craft is declining owing to various factors. Descriptive research was conducted for exploring these factors responsible for the decline of this craft. The study was conducted in five villages selected for each sub-group of *Bhotia* tribe of Uttarakhand through survey method using an interview schedule. The researcher explored the information related to the sustainability aspects and marketing status of the traditional textiles. The traditional textiles produced by the *Bhotia* tribe were well-designed carpets (*dun* and *asan*), woollen blanket (*pankhi*), woolen quilt (*thulma* and *chutka*), shawl, stole, muffler and wool fabric (*pakhi* and tweed). The steps involved in production were procurement of raw material, scouring, carding, spinning, dyeing (optional), warping and weaving of the final product. It was found that the steps of production had remained almost the same except few changes in reagent and machines owing to the present day technological advancement. These have resulted in easy processing of material but had led to the problem of pollution. The major problem faced by the tribals were related to the consumer behavior and non-establish marketing channel for traditional goods. This has led to movement of tribal people into other occupation and decline of traditional craft of *Bhotia* tribals.

Keywords- *Bhotia*, craft, textiles, tribe, woollen

Introduction

The traditional textiles of India have a rich heritage and offer diversified product range. The origin of Indian textile history can be dated back to the Indus valley civilization where the people used the handspun cotton yarn for making their clothes(**Kenoyer, 2004**). There were many favorable factors which were responsible for

sustenance of rich traditional textiles of India. These included most commonly the availability of variety of raw materials in abundance within the country; favorable geographic and climatic conditions; widely prevalent social customs and distinct local culture of producing and fulfilling the need of the people within the region**(India-craft, 2011)**.The tribal communities and their habitat constitute very significant part of our country. About half of the total tribal population of the world live in India. A few of these communities are still untouched with the modern lifestyles and generally depend on the resources available in their vicinity for full filling the basic necessities of life**(Anwar, 2018)**.

Tribes of Uttarakhand represent the ethnic groups residing in the state. Every district of Uttarakhand has more or less a moderate percentage of the tribal population.Historical records suggest that the tribes of Uttarakhand are earliest settlers of North India. In the past, their main concentrations were confined to remote, hilly and forest areas **(Mohanty, 2006)**. The tribes of Uttarakhand had long sustained their age-old traditional ways of living.Five tribes of Uttarakhand are *Jaunsari*, *Tharu*, *Buksa*, *Raji* and *Bhotias*. These tribes of Uttarakhand can also be divided as *Tarai* tribes and hill tribes according to their settlement either in the *Tarai* and hill region in the state. *Tharu* and *Buksa* are *Tarai* tribes while *Bhotia*, *Jaunsari* and *Raji* are the hill tribes**(Farswan, 2017)**. In the present study, researcher explored different sub-groups of *Bhotia* tribe to document the traditional textiles produced by them; the changes in manufacturing practices, factors responsible for decline in production of traditional textiles and identification of areas wherein intervention needed to establish sustainability aspect of traditional craft in Uttarakhand.

Methodology

The descriptive research design was used for the present study. Data was collected from five sub-groups of *Bhotia* tribe i.e., *Tolcha*, *Marcha*, *Shauka*, *Rung* and *Jadh*. One village was selected for each sub-group of *Bhotia* tribe. Hence, Lata and Chinka villages located in Chamoli district were taken for *Tolcha and Marcha* sub-groups, Darkot and Baluwakot villages located in Pithoragarh district were selected for *Shuka* and *Rung* sub-groups and Dunda village was selected from Uttarkashi district for *Jadh* sub-group (Fig. -1). Further, ten families were selected purposively from each village resulting in total fifty families that constituted sample for data collection.

Fig. -1. Location of the study

The data was collected through survey method wherein self-developed interview schedule and checklists were used as tool for collecting information pertaining to

traditional textiles of *Bhotia* tribe. The data was collected through personal interview methodand was later organized for drawing appropriate interpretation.

Results and Discussions

The result derived from interpretation of data is presented as follows.

General Description of *Bhotia* Tribe

Bhotias, a Mongoloid ethnic community, traditionally lived in the high Himalayan region, close to the Tibetan border. *Bhotias* are subdivided into five main categories: *Jadhs* in Uttarkashi, the *Marchas* (once mainly traders) and *Tolchas* (farmers) in Chamoli, the *Shaukas*(near Munsiari)and *Rung*(near Dharchula)in Pithoragarh (near Dharchula) **(Mohanty, 2006)**.The *Bhotia* tribal community used to live in their own region and engaged in the work of trading since the historic times. Before 1962, *Bhotia* people through the various places of the Himalayan region used to go Tibet for trade. Due to geographical asymmetry, language problem, transportation problem and great difference in culture and tradition of Tibetan, the people other than *Bhotia* of Kumao-Garhwal region were not suitable for performing trade with Tibet people. This was the reason for the monopoly of the *Bhotia* people in the Tibetan business from India. But in 1962, China army attacked India, due to which, the age-old business of *Bhotia* tribes stopped completely. Before the *Bhotia* people would realize what had hit them, the Uttar Pradesh government applied the UP Zamindari Abolition and Land Reforms Act, as Kumaun and Uttarakhand Zamindari Abolition Act in 1964-65 in Kumaon hills. As these trance human group used to stay at different places in a year called '*padav*' where they stopped for weeks to rest and get ready for long journey due to trade. So they were being considered as non-occupant land-owners by the government as all these places were not their permanent residential place. In this way they lost almost everything to their occupant-tenants. Transportation and trade stalled due to external conditions and land snatched through the state undertaking land reform. Hence, this group of tribals was soon converted from the self-reliant group into a mendicant one. The record would show that a political decision to provide Schedule Tribe category to Bhotia tribals on 1967 to provide relief to the *Bhotia* tribe**(Tolia, 2012)**. The reservation had provided opportunities to the tribals for opting employment in government firm. This is also one of the reason of migration from the hilly region.

Traditional Textiles of *Bhotia* Tribe

The textiles of any region communicates the availability of the resources, climatic conditions and technological advancement. The study of the traditional textiles of the *Bhotia* tribe reveals that spinning of woollen yarn and its use in weaving or knitting for making fabrichad been the specialty of this tribe. These woolen textiles were used in both household as well as apparel by hill population. This textile craft was practiced by women folk among *Bhotia* and was handed over to the daughter by her mother. The traditional textiles produced by the *Bhotia* tribe were well-designed carpets (*dun*(Fig.-2) and *asan*(Fig.-3)), woollen blanket (*pankhi* (Fig-4) and*Kambal*(Fig.-5)), woolen quilt (*thulma*(Fig.-6) and *chutka*(Fig.-7)), shawl, stole, muffler and wool fabric (*pakhi*(Fig.-8) and tweed (Fig.-9)).

Fig.-2 *Dun*

Fig.-3 *Asan*

Fig.-4 *Pankhi*

Fig.-5 *Kambal*

Fig.-6 T*hulma*

Fig.-7 *Chutka*

Figure 8 Pakhi

Figure 9 Tweed

These articles were used for the protection in the cold climatic conditions that prevailed at their residential location. Besides household consumption, these products were also sold for income generation.The varieties of looms namely backstrap loom, horizontal loom, pit loom and handloom for weaving traditional textiles are available in their households. Most of the weavers are expert in weaving on all the type of the looms but few weaver are weaving only on frame loom due to the non-availability of other

looms in their area. The traditional method of producing woollen products among *Bhotia* tribals in past was more sustainable in nature i.e., it was a socially acceptable craft, had no or very less impact on the environment and was remunerative in nature. The processing steps involved from procurement of fiber to finished textiles were shearing, grading, scouring, carding, spinning, dyeing (optional) and weaving. The wet processing i.e., scouring and dyeing was carried out with natural ingredients which had no effect on environment. These textiles have long shelf life upto 50 years if used properly and biodegradable in nature.

Changes in Manufacturing Practices

Following were the changes observed in manufacturing process of *Bhotia* tribe.

Raw material The major raw material used for weaving was wool that was collected from local sheep reared by themselves. Apart from the wool collected from the local breed of sheep, they also used to import wool (Tibetan wool and Pashmina) from the Tibet via their trade route before 1960's. Afterward, shortage of wool occurred with the closing of trade route. The number of families rearing sheep had also reduced a lot due to non-availability of grazing area which has further decreased the availability of wool among the tribal people. This has also been reported by **Maikhuri *et al.***, that the average population of sheep and goat declined by about 75.11% in the last 30 years at the high Himalayan region of Uttarakhand due to reduction in grazing area, conservation policies and restrictions imposed on grazing rights by the Forest department.

Hence, the tribals had started sourcing wool and other yarns from different sources. Today, theLudhiana coloured woollen yarns are very common among the *Bhotia* tribe due to its low cost and easy availability in the nearby town.But the yarns are not made of pure wool fiber. Blend of synthetic fiber and wool were used for its manufacturing and the colour used for dyeing were also synthetic dyes. The products made of Ludhiana woolen yarns are not as durable as pure wool products owing to the slippage of yarn made by synthetic fibers and also causing degradation problem during disposal.

Souring agent Traditionally scouring was carried out with warm water which was collected from the natural hot water springs. The wool fibers were soaked in warm water till it turns lukewarm and in some cases *reetha* (*Sapindus mukorosii*) or *pangar* (*Aesculus indica*) solution were used for cleaning highly soiled wool fibres.Presently, the natural hot water spring had reduces and instead of natural washing agents, detergents were preferred by *Bhotia* tribals. The reason for alteration in the washing agent was thatless toiling was required in scouring and it is readily available. The use of *reetha* and *pangar* required soaking at night for preparing washing solution and subsequent washing.

Dyeing Traditionally the yarns were dyed naturally in hanks using open bath container and aqueous method. The natural dyes were used by *Bhotia* tribals for dyeing which were extracted primarily from plant resources collected from nearby forest areas.The Table -1 shows the list of the traditional plant dyes used by the *Bhotia* tribe. With the emergence of synthetic dyes suitable for wool dyeing, the *Bhotia* tribalssubstituted the natural dyes with the synthetic ones.

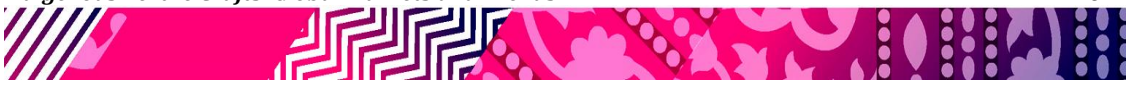


Table -1 Traditional plant dyes used by *Bhotia* tribe.

S.No.	Local name	Botanical name	Parts used	Colour yield
1.	*Jangli palak/ Khukhuyinya**	*Rumex nepalensis*	Root, stem	Yellow
2.	*Bagmaru**	*Eupatorium*	Leaves	Green
3.	*Kilmora*	*Berberis asiatica*	Root	Yellow
4.	*Akhrot**	*Juglans regia*	Bark and outer covering of seeds	Rust brown, maroon
5.	*Dolu*	*Rheum aystrale*	Root	Yellow
6.	*Kaphal*	*Myrica esculenta*	Bark	Yellow, maroon
7.	*Haldi**	*Curcuma longa*	Root	Yellow
8.	*Tantri/ Archa*	*Rheum moorcroftianum*	Root	Yellow
9.	*Darim*	*Punica grantum*	Fruit rind	Yellow
10.	*Burans*	*Rhodendron araborium*	Flower	Pink, Maroon
11.	Harda*	*Terminlia chebula*	Fruit	Black

*Plant material still in use by the *Bhotia* tribals for dyeing their woolen yarn

Factors Responsible for Decline in Production

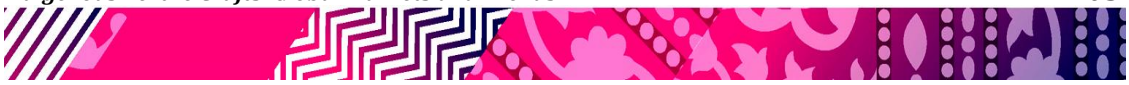
Following were the factors responsible for decline in the production of traditional textiles produce by the *Bhotia* tribe.

Shortage of raw material Earlier the tribal people used to have their own sheep for the procurement of the raw wool and also import the raw wool from Tibet. But today the number shepherd had reduced a lot due to the reason that rearing sheep is a very difficult task and grazing lands availability had also reduces a lot. Due this the shortage of raw wool appeared in the villages.

Raising cost of wool The number of families rearing sheep are decreasing but the demand for the wool is same. This was the reasons for raising cost of the wool every year. The government have opened many sheep farms in Uttarakhand but the procured fleece from these farms were send to Wool Carding Board, Munni ki reti, Tehri Garhwal, Uttarakand. The fleece were graded and sold from here with brand name "Uttarakhand Wool" through bidding. The *Bhotia* tribals were not getting any benefits from these sheep farms.

Lack of carding facilities Earlier the tribal people used to card wool with carding brush. The manual method of carding is tedious and time consuming process. The government had facilitated craft person by establishing carding unit in hilly areas. But most of the time these units are not in working conditions. The tribal people living in the remote areas had to travel a long distance for carding of scoured wool fiber and have wait for their turn which sometime take days. This causes extra expenditure to the artisans.

Lack of marketing support The weavers used to sell their products from home, in the local market and exhibition cum sales organized by the government. The main consumer were the local people and tourists. The profit raised from selling the goods in the local areas was very



less due to limited population and low tourist footfall at their places. Also the articles sold from these marketing channel were very less in number and consumer bargained a lot on local produce.

Low and irregular income prospect The weaving of traditional textiles is a tedious and time consuming process as most of the process are carried out manually. The completion of the producttook weeks resulting in high production cost. The final cost of the products automatically increased due to which the weavers were unable to getmuch profit on the sale of the product.

Shrinking of tribal population in village The *Bhotia* people are migrating from the village to the nearby town or cities for availing better education for their children and job for themselves. The tribals who were living in the villages were only performing weaving.

Intervention for Promotion of Traditional Textiles The major reason given by the *Bhotia* tribals for decrease in the production of the traditional textiles was difficulty in sale of their textile goods. The channel of distribution of goods adopted by weavers were from home, in the local market by hiring space in existing shop and participation in exhibition cum sales organized by government agencies. The total sale of product through these channels was very less due to competition from the machine made synthetic goods that had low cost as compared to traditional textiles. In order to contribute toward promotion of tribal traditional textiles of *Bhotia* tribe, the researcher established a few aspect wherein interventions could improve the current scenario. Following are few interventions focusing at improving marketing of traditional textiles.

Branding of traditional textiles Modern consumer is more conscious for quality product hence they are attracted towards branded products. Considering the importance of brand consciousness among consumer, it was proposed to opt for branding of handloom product which could help in reducing the problem of marketing for the tribal artisans. Branding also helps to distinguish a product from its competitor, creates a lasting impression and establish identity of the product in the minds of customers. It also plays a significant role in communication that helps in making purchase decision among consumer and promote consumer loyalty too.

Labelling of traditional textiles A label is a communicator between the buyer and product. It contains various types of information of that textiles, such as buyer name, country of origin, types of fabric, types of yarn, fabric composition, garments size and care instruction. Under Consumer Protection Act, 1986 there is a 'Right to Information' for the consumer and labels were as information provider of the products. Without any label, a textile product cannot be sold in the foreign market. The development of label for traditional textiles will fulfill the requirement of global market.

Trademark The development of brand and its use on label can only be a success for it if registered as trademark of a manufacture. A trademark is a mark that legally protect the brand name or part of a brand. It is an important step that check the fraud use of the brand by other manufacturers. The procedure of registration is carried out online at http://ipindiaservices.gov.in/tmrpublicsearch/frmmain.aspx

Awareness campaign of government schemes The government launches various schemes under Integrated Handloom Development Scheme, Integrated Development & Promotion of Handicraft, Block Level Cluster Approach, Rashtriya Krishi Vikas Yojna, Integrated Livelihood Support Programme etc. for the benefit of artisans. There were many

weavers who were unaware of these schemes. So, an awareness campaign would not only helps the weavers but also the government for proper penetration of scheme benefits to those for whom it is planned.

Conclusion

The *Bhotia* tribals of Uttarakhand are known for their woolen textiles but due to the globalization and change in market scenario, the production of traditional textiles has reduce to some extent. The branding of the products and brand registration would help in creating an identity of such products. It would further help to provide information regarding the benefits of using sustainable textiles to consumers. The government had launched various schemes for the promotion and development of the weavers of Uttarakhand. Despite these efforts the proper penetration of the schemes among the weavers would only be possible through the organization of awareness campaigns. The periodic assessment of the scheme should be conducted in regular time interval to have continual and targeted impact of schemes.

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DO-13

AESTHETICS STUDY OF HIJAB MOTIF TREND IN INDONESIA

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Abstract

The development of creative Industry in Indonesia, made fashion Muslim in Indonesia growing rapidly in past ten years. Especially the hijab as Muslim woman head cover. A square scarf with signature design, which is made by local brand has been consumed by every woman in Indonesia. The production of signature scarves is limited edition, because the design is different in every series. In the beginning of research, there are seventy local brands that active to make signature scarves. The design are floral, geometric, and there is a motif that inspired by some cultures. Narrow the research area, there are a couple signature scarves has become a trend setter in the couple of years. What the different of this kind of signature scarves? Is it the material or the motif that make them popular? Or the brand itself? Started with those questions, this research start to evolve.The appearances of digital printing in home industry, and the popularity of voal fabric (mixture of cotton and polyester fibers) is two of the reasons why this signature scarves popular, but the motif must be analyzed by aesthetics approach. The motif composition (shape, lines, dots), colors combination, rhythm and others design principle for formal elements in motif must be elaborated to find the aesthetic appeal.

Keywords: Signature Scarves, Hijab, Motif, Aesthetics

1. Cultured inspired pattern:

1) Indonesian Cultured Inspired:
   A scarves that inspired by Indonesian culture. There is a scarves that has some Indonesian traditional textiles as backgrounds, or full in the design of scarves motif. There is a pattern that drawn Indonesia island, or city that become heritage in Indonesia.
2) Japanese Cultured Inspired:
   A scarves that inspired by Japanese culture. There is a scarves that inspired by Japanese
   traditional textiles, such as *sashiko* and Japanese patchwork (crazy patchwork), or design composition that look like kimono appearances, with clouds or diagonal organic wave lines that divided scarves area that fulfil with natural or geometric pattern.
3) Middle East Cultured Inspired:

A scarves that inspired by Middle East Culture. Mosaic and arabesque is a pattern that generally inspired form for signature scarves. The placement of this pattern usually in the centre, and has symmetrical composition. Not only that, in Middle East, the popularity of the traditional rugs also become inspired pattern for signature scarves

Introduction

Muslim woman in Indonesia generally wear hijab as their head covering. Hijab style comes with various style. There is shar'i hijab that covers a woman's head to the waist, a scarves, and a shawl that covers from head to chest. Scarves not only use for head coverings, but also as fashion items for Muslim woman. The hijab style is an expression of women to show their taste or mood on the day's clothes. There are two types of scarves in Indonesia, plain scarves and motif scarves. In early 2010, plain scarves and shawl were very popular with every woman, because there was a pleasant experiences to make style from twist and fold. Signature scarves have started to gain popularity since 2017. With simplicity to use them, but still giving a beautiful and colorful appearance is something that attracts women's attention to wear them.

How have signature scarves become more popular than other motif scarves on the market? Signature scarves is a term of square fabric with a design motif that is placed with the consideration of the designer how the motif looks when women use it as a head covering, they gave their signature brand in the corner of the scarves. This scarves is a limited edition and has a different design series depending on the Muslim holiday, or the strategic release of the brand. The hijab brands produce a dress, clothes, pants, skirt, and hijab, and other accessories of hijab look. Since 2017, hijab brands that only produce scarves have begun to appear. This is because of the popularity of signature scarves, so there is an opportunity for new brands that only produce signature scarves.

At the beginning of the study, there were some similarities in materials and design motives in several brands. The similarity of fabric produced is voal fabric (a mixture of cotton and polyester fibers), because the polyester fibers contained in the fabric can absorb the colors of chemical paint from digital printing machines in the Indonesian home industry. On the other hand, there are motifs that must be studied to find the trends, and the appeal of the composition of signature scarves motifs. The purpose of this study is to find the characteristics of the signature scarf design as a popular signature scarf design, to find the formula of popular signature scarves design period 2018-2019 (especially from the motif) and to known is there any related between the brand that has many followers to contribute in the signature scarves popularity.

Objectives

Aesthetic approach is an approach that specifically emphasizes aspects of art and design in relation to attractiveness or aesthetic appeal. In this research, signature scarves studied with motif composition (shape, lines, dots), colors combination, rhythm and others design principle for design elements. With this approach the design formulate will be know, especially the placement of the motif on signature scarves.

Hypothesis

At the beginning of the studied there were seventy brands to be researched, but because there were so many design motif of signature scarves that had been released (generally each brand releases more than three series in a year) the focus of the study was focused with twenty brands, with period of time in 2018-2019. The selection of twenty brands was done by purposive sampling, with fifteen brands having more than hundred thousand social media, and five others were brands with followers below hundred thousand. There is an initial assumption that five medium brands will follow the scarves design of fifteen brands that have a large following, so that it can be known what brands and designs are currently popular.

Methodology

This research was conducted with a qualitative method, an aesthetic approach. There are four stages of research, the first stage is to record seventy brands found on social media (instagram and websites) with data collection in the form of the number of posts, followers, and data regarding the time of establishment, and the founder of the company. The second stage is to divide the brand based on followers. The data is divided into two, brands with followers above hundred thousand, and brands below ten thousand followers.

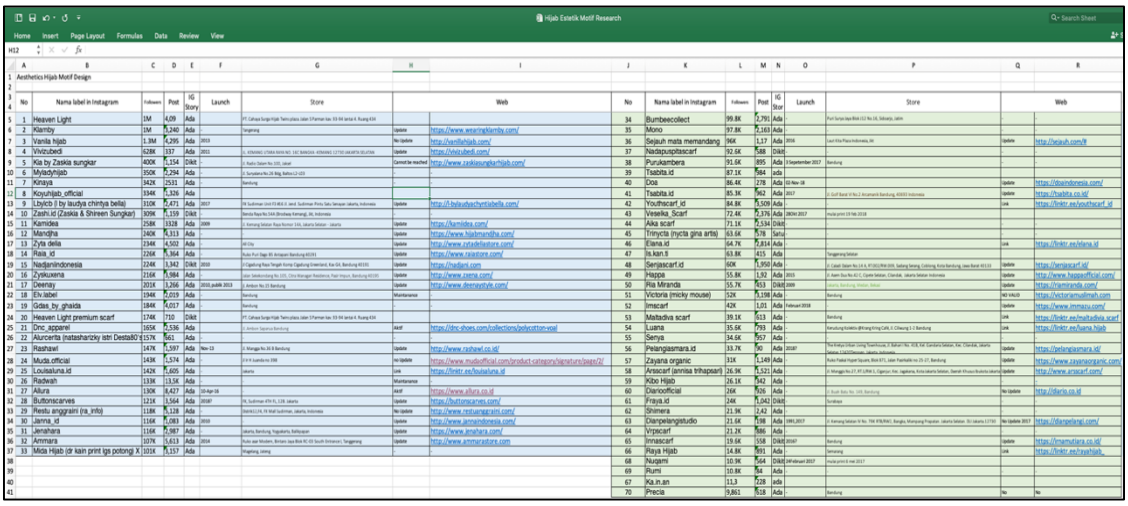


Figure 1. The record of hijab signature scarves brand brand detail

From the picture of Figure 1., the left side (blue area) are list of brands with followers above hundred thousand, and the right side (green area) are list of brands below ten thousand followers, it can be seen that more brands has followers under one hundred thousand. This is because there a new brands that only produce signature scarves starting to appear after 2017. After the research is focused, the third stage is to examine design in each brands. The examination based of the design of the scarves that has been released, and visual data (full square) design of scarves motif.

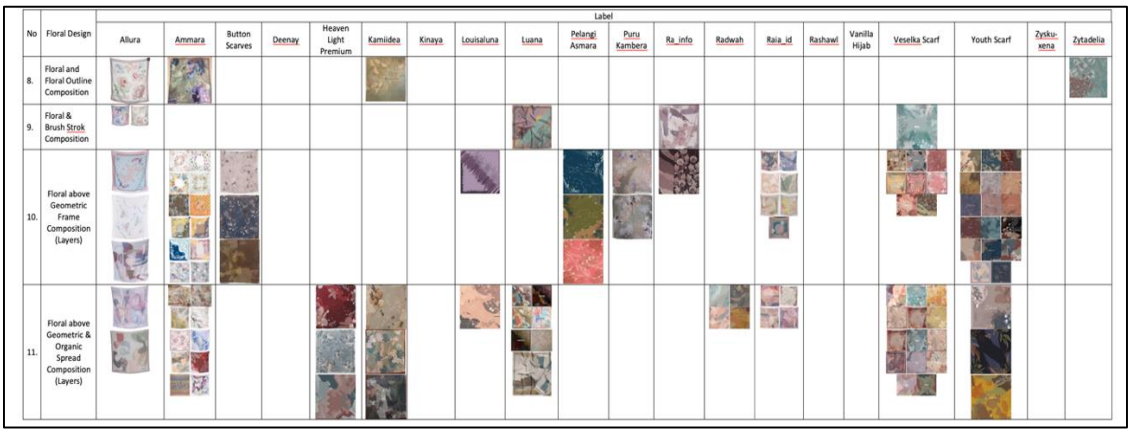
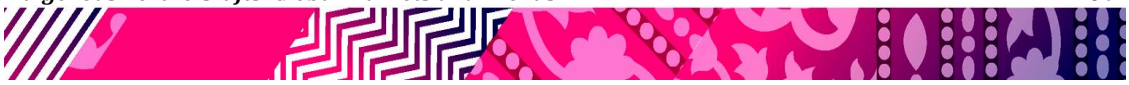


Figure 2. The classification design of signature scarves motif

The classification design of scarves motif is divided into six parts, design that has natural pattern, geometric shape pattern, organic shape pattern, scenery themes, cultured inspired pattern, also monogram and letter pattern. Each of the six part has detail design, such as:

2. Natural pattern:

1. Spread Flowers:
   A scarves that has a flower motif with spread composition around the square shape. The pattern came from cropping photo of flowers, or computer made.
2. Growing Flowers:
   A scarves that has a floral motif grows pattern from one side of the square scarves. Generally the flowers pattern came from hand drawing, or computer drawing.
3. Bouquet Flowers:
   A scarves that has a floral bouquet pattern in side of the square scarves. Generally the flowers pattern came from hand drawing, or computer drawing.
4. Floral in Frame (full and corner):
   A scarves that has florals (flower, leaves, stalk) and sometimes with insect pattern combination surrounds the edges of the square scarves, just like a floral frame. There is also a floral that placement in the corner of square scarves, combine with geometric frame, or stalk of flowers pattern surrounds the edges. Generally the flowers pattern came from hand drawing, or computer drawing.
5. Floral Drawing with Outline:
   A pattern of florals (flowers, leaves, stalk) that came from hand drawing techniques. The lines drawn are colourful. The composition is spread flower but near each other and overlapping.
6. Floral Paintings:
7. A pattern of florals (flowers, leaves, stalk) that came from water colour or oil paint techniques. The composition is spread flower but near each other and overlapping, and floral motif grows pattern from one side of the square scarves.
8. Floral in Mirror Repetition:
   A scarves that has a mirror repetition from bouquet flowers composition, combine with leaves and stalk. This composition usually gave a symmetrical design.
9. Floral above Floral Outline Composition:
   A scarves that has floral (flowers, leaves, stalk) and sometimes with insect pattern combination above some outlines. The outline has lines shape a floral motif, such as leaves, of the shape of flowers.
10. Floral & Brush Stroke Composition:
    A Scarves that has floral pattern combine with brush stroke made by computer drawing. The brush stroke drawn are colourful. The composition is spread or bouquet flowers near with brush stroke, and sometimes overlapping.
11. Floral above Geometric Composition:
    A scarves that has floral (flowers, leaves, stalk) pattern above geometric shapes made by computer drawing. Generally the floral composition is spread and framing the scarves, but the geometric shapes came with millimetres block appearance, or little geometric shapes that spread inside the square scarves, or geometric shape has a big size in the centre of scarves but fill with little spread geometric shapes.



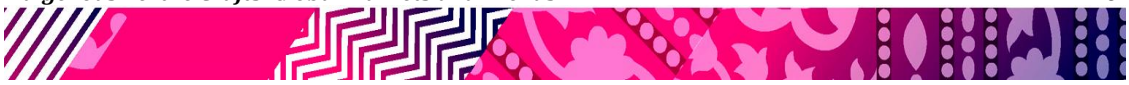
12. Floral above Geometric & Organic Composition:
    A scarves that has floral (flowers, leaves, stalk) pattern above organic shapes made by computer drawing. Generally the floral composition is spread or bouquets form in the scarves, but the organic shapes came with or big organic shapes fulfil the square scarves. Sometimes the organic shape overlapping with floral form.
13. Forest Inspired:
    A scarves that has a floral motif, but especially the leaves pattern. The composition is spread leaves but near each other and overlapping, and there are tree grows pattern from one side of the square scarves.

Geometric shape pattern:

1) Geometric:
   A scarves that has geometric shape. The geometric are being repetitive in parallel lines, or opposite lines. There is combination of geometric shape (such as square and bullet) that near each other or overlapping. Generally this kind of scarves made by computer drawing.
2) Geometric Spread Composition:
   A scarves that has a geometric with spread composition, or spread but overlap each other shapes around the square shape. Generally this kind of scarves made by computer drawing.
3) Geometric Part with content inside:
   A scarves that has big size geometric parts combination fulfil with little geometric shapes, or nature pattern inside. Generally this kind of scarves made by computer drawing.
4) Geometric & Organic or Floral Half Square Composition:
   A scarves that divided by half (from square to be two triangle shapes), with geometric shape in side of one triangle, and organic or floral pattern in the other triangle.
5) Geometric Drawing with Outline:
   A pattern of geometric that came from hand drawing or computer drawing techniques. The lines drawn are colourful. Generally has a asymmetrical design.
6) Geometric & Floral in Frame:
   A scarves that has a frame, fill with pattern. The pattern are geometric parts combination fulfil with little geometric shapes, or nature pattern inside.
7) Geometric & Floral Transformation Composition in Warp:
   A combination of geometric and floral pattern. Geometric and floral has near each other or overlapping composition. The composition usually has diagonal shape splitting the square scarves in two part. The warp means that there is a warp transformation after the geometric and floral join together, the effect of transformation is the change of diagonal shape from splitting the square scarves, become wave diagonal shape.
8) Geometric Transformation Warp:
   A scarves that has geometric shape that are being repetitive in parallel lines, or opposite lines, and then twist with a little bit warp transformation. The effect of warp transformation is a little bit wave from the geometrics pattern.

Organic shape pattern:

1) Organic Abstract Composition:
   A scarves that has organic shape pattern with abstract, and irregular placement at square scarves. Generally this kind of scarves made by computer drawing.



2) Organic Brush Stroke:
   A scarves that has brush stroke as a pattern, but the composition look like geometric shape appearances. Generally this kind of scarves made by computer drawing.
3) Organic Shapes:
   A scarves with organic shape as the pattern. The composition is spread organic shapes but near each other and overlapping. Generally this kind of scarves made by computer drawing.
4) Organic Sketch Line:
   A scarves with organic shape as the pattern, but the organic shape is made by hand drawing. Sometimes the composition combine with computer drawing.

Scenery themes:

1) City Scenery:
   A scarves that has city silhouette pattern combine with geometrical shape, or organic shape, or floral pattern. The city silhouette drawn with the appearances of iconic of city, and sometimes there is a title name of the city. The composition of city silhouette motif stand from one side or two of the square scarves.
2) Mountain Scenery:
   A scarves that has mountains drawn pattern combine with organic shapes or floral pattern. The composition of mountains motif stand from one side or two of the square scarves.
3) Sea Scenery:
4) European Cultured Inspired:
   A scarves that inspired by European culture, which is in the scarves appearances with product items that resemblance the culture, such as British that popular with tea time so the appearances in scarves is product like cups, pot, cookies or cake.
5) Modern Lifestyle Cultured Inspired:
   A scarves that inspired by modern culture, which is the era of 21s century.
   a) The 90s: the motif that inspired by things that happened in 90s, such as snake and ladders game.
   b) Sport: the motif that inspired by variety of sport, such as tennis, basketball.
   c) Music: the motif that inspired by music products, such as disc, cassette, radio tape, disc.
6) Ethnic Style:
   A scarves that has ethnic and exotic pattern in the designs, there is a full pattern in the scarves, or just symbols. The composition of the symbols pattern is by repetition, with diagonal, or frame shape in the square scarves.

Monogram and letter pattern:

Monogram is a motif made by overlapping or combining two or more letters to form one symbol. This motif become a pattern in scarves design. Sometimes the composition be united with geometric shape, or a little bit floral spread.

After the classification design of scarves motif is divided into six parts, the next part is find what is the characteristics of signature scarves design of twenty brands. From the data on Figure 2., visual data is transformed into written data so that the brand design character is found from the frequent types of square scarves released.

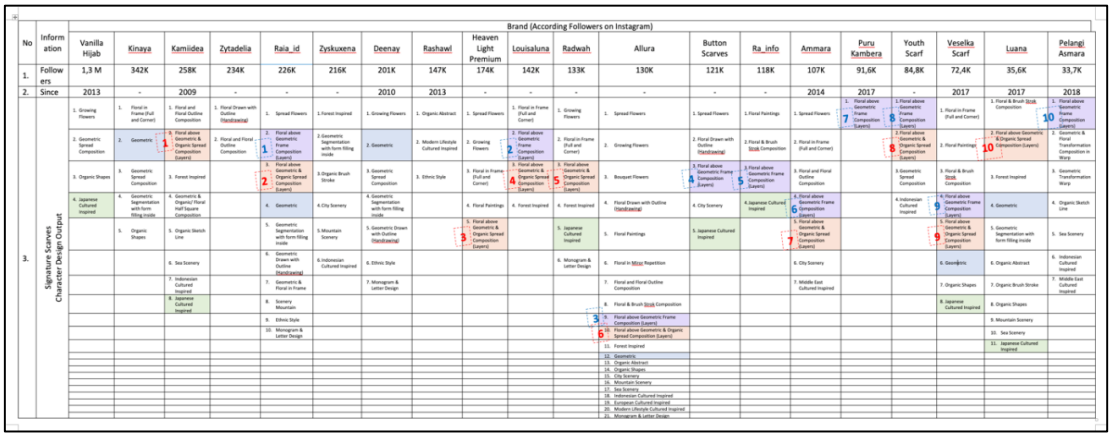


Figure 3. The brand design character from the frequent types of signature scarves releases

From the Figure 3, there were two character design of signature scarves that discovered usually use in ten brands, which is Floral above Geometric Composition and Floral above Geometric & Organic Composition. There also Japanese Culture Inspired composition design that gain the popularity in the third place, with seven brands usually wear it as their character design. The three characteristics signature scarves design as a popular signature scarf design in the period 2018-2019.

Figure 4. The three character design sample of popular signature scarves (left floral above geometric composition (Ammara brand), middle floral above geometric &organic composition (Luana brand), right Japanese culture Inspired composition design (Kamiidea brand)

The stage four in this research methodology is using aesthetic approach to examine the composition of popular signature scarves design. From the Figure 4., the similarity of the three character design are using more than two layers for their design. The first layer is the background composition, which is geometric repetition, organic combine with geometric, organic fill with natural or geometric shape inside the organic part. The second layer is the main motif or pattern, which is floral. The composition of the floral generally around the edges of square shape of scarves but in the spread or bouquet floral composition.

In the Japanese culture inspired design, there is also main motif and pattern that spread of floral, however there is composition just like in the right of Figure 4. Which is the main motif is the floral combine with other natural pattern inside some organic shape that divided the square scarf into more than two areas.

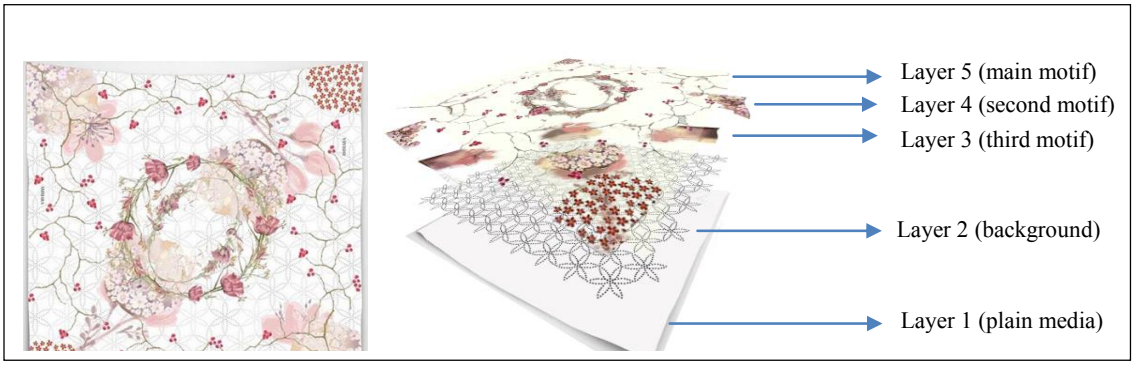


Figure 5. Sample of layer composition of floral above geometric composition ((Ammara brand)

From the picture of Figure 5., there is five layers in the signature scarves. The first layer is plain media of the scarves. The second layer is geometric repetition for the background of the scarves, the pattern is like a star in the dots lines. The third layer is water colour flowers motif, this pink tinge of water colour give feminine and softness effect. The fourth layer is little flower that has spread composition inside the third layer. The placement of fourth layer is above the third layer, and the flowers placement is in the corner of scarves and in dark pink water colour of the third layer. The fifth layer is the main motif, which is the flower bouquet with stalk and leaves.

The composition of signature scarves that has square shape generally has centre axis, even the centre axis blended together with the motifs or the background. This is can be seen in the two popular composition design in signature scarves. Why centre axis? Because when a woman use hijab as their head cover, they flip the square to become a triangle shape. When woman put the scarves, the centre axis that has been fold put it in the centre of forehead. That's why the main motif usually has around the edges of square shape of scarves, because it is not going to be fold, and the composition motif is can be seen perfectly.

Finding and Discussion

After the aesthetic approach was carried out, not only were the characteristics of the signature scarf design as a popular signature scarf design in the period 2018-2019 discovered, but a formula for the composition of the signature scarf design was also found. Is it the brand that has many followers gave contribution for popular signature scarves?

From the picture of Figure 3., not only the release and the character design of popular signature scarves that can be known, but also the characteristics design of the brand can be known. The design composition with layers, and spread of floral became commonly design that being used in signature scarves design, however the colours combination, the size of the motif became something that distinguish the brands. The history of released signature scarves design also became the characteristic that distinguish the brand from other. There is some similarity, but if we analyse the details, there a signatures drawing of design from designers brand. So brand that has many followers gave contribution of composition of layers and spread floral for popular signature scarves, but still each brand can still manage their characteristic design.

Conclusion

The aesthetics study of hijab motif trend in Indonesia research has four stage of identification. Which is the first stage is to record seventy brands found on social media,

the second stage is to divide the brand based on followers, the third stage is to examine design in each brands, The fourth stage is using aesthetic approach to examine the composition of popular signature scarves design. There three output that came from this research, which is:

1. The characteristics of the signature scarf design as a popular signature scarf design in the period 2018-2019, which is floral above geometric composition, floral above geometric &organic composition, and Japanese culture inspired composition design.
2. The Formula for the composition of the signature scarf design, which is the design are using more than two layers for their design. The first layer is the background composition, which is geometric repetition, organic combine with geometric, organic fill with natural or geometric shape inside the organic part. The second layer is the main motif or pattern, which is floral. The composition of the floral generally around the edges of square shape of scarves but in the spread or bouquet floral composition. The composition of signature scarves that has square shape generally has centre axis, even the centre axis blended together with the motifs or the background.
3. Brand that has many followers gave contribution of composition of layers and spread floral for popular signature scarves, but still each brand can still manage their characteristic design.

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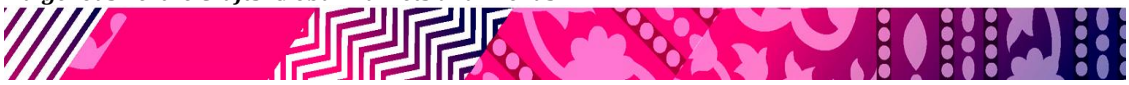

DO-14

STRATEGIES FOR REVIVAL OF INDIGENOUS ARTS AND CRAFTS

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Abstract

In an emerging technology-run and industrialized world, people are increasingly forgetting the traditional indigenous crafts and moving towards new innovation and fast fashion. Due to this, the skilled artisans are facing unemployability issues and in turn are moving to alternative income generation methods, like daily wage labor and farming; as a result art and craft is losing its grip. Preserving and protecting the skills and knowledge of indigenous crafts is a soaring challenge. Hence, it is very essential these art and craft forms are revived and awareness spread about them in urban space. Along with the Government intervention programs, the designers and companies as part of their Corporate Social Responsibility are taking considerable measures to uplift the artisan's work. This paper presents strategies for reviving the indigenous arts and crafts. It has been seen that some global crafts are commercialized and strongly influenced by cosmopolitanism and consumerism, while some crafts with high intrinsic values are still in decline and need specific interventions. Whereas, "excessive" intervention in commercial promotion, creating fast fashion with imitations and mass production of the craft inspiration could potentially homogenize local crafts, thereby discouraging their distinctiveness and their intrinsic values. The aim of this paper is to identify various possible reasons for decline and death of the arts and crafts and suggest various strategies that will help revive the direction of different arts and craftworks. Hence, the paper is based on the deductive research methodology. It is an attempt to understand how revival of indigenous crafts leads to social change, employability, nationalism, heritage values, distinctiveness and increased tourism.

Keywords: crafts, design intervention, revival, strategies

Introduction

Importance of revival of traditional arts and crafts:

Craft today is defined by preciousness and an extraordinary value is attributed to the handmade as an exotic species. In our developing world, it is either considered to be simple hand-work or a resurrected practice for the poor to gain access to valuable foreign exchange. Traditional arts and crafts have developed over millennia and today, not just each region, but even micro-regions have their own unique traditions. In today's times, there are only a few traditional craft producers that survive. In the world, millions of people possess traditional knowledge and skills and are still struggling to make a living by producing and creating handcrafted goods. In a vast majority of the cases, it is an entire way of life in question and to alter that in many cases just means the end of that

form. Skills are often learnt and perfected over decades and to dilute the learning process, is often a distortion that changes the form. It is believed that many traditional arts and crafts are facing extinction and the Government as a well as private agency is concerned about the same. Commercialization and modernization resulted in the stylized version of the craft resulting into the loss of its original identity and importance. Commercialization has ruined the originality of the art. New art forms are being introduced without knowing the importance of the traditional art or each symbol in the art. Traditional art and craft has reached overseas, but along with reaching overseas it has also lost its traditions. It is a sorry state that the traditions of the art or crafts aren't preserved and new styles and themes have been formed. (Patel, 2016)

Endangered arts & crafts of the world:

Some handmade tales of India are on the verge of extinction and getting replaced by machine made products. India includes Chamba rumal- Himachal Pradesh, Madhubani Paintings- Bihar, Rogan Painting- Gujarat, String Puppetry- Kendrapara, Dhokra Art- West Bengal, Paitkar painting- Jharkhand, Bamboo art- Assam, Kalamkari- Telangana, Thanjavur painting- Tamil Nadu, Mirizhim craft- Manjula in Assam, Samphe Lampee- Imphal, Lasingphee- Imphal, Miniature paintings- Andra Pradesh, Cherial painting- Cherial in Andra Pradesh, Danka- Udaipur, Gesso work- Bikaner, Warak printing- Udaipur, Mend ki Chapai- Sanganer, Pithora painting- Jhabua, Sanjhi craft- Mathura, Horn craft- Cuttack in Orissa, Namda and Pinjrakari- Kashmir, Sherpai- Bhirbum in West Bengal, Handloom Weaving, etc.

Whereas, around the world, the list goes on. Some of them are Columbia painting, Stencil painting of Fiji Islands, Chinese knife batik printing, Bogolanfini of Mali, traditional folk art of America, Blockwork of Spain, Ukranian Embroidery, Molas, Whimsies and Kalagas of Indonesia, Adinkra cloth of Ghana, Kesi of China, Coptic textiles of Egypt, Jacobean embroidery of England, Schwam Embroidery of Germany, Assisi embroidery of Italy, Chinese letter block printing, Stencil starch printing of Nigeria and Japan, tapestry weaving etc. The UK has a longstanding history of craftsmanship, however research conducted by the Heritage Crafts Association (HCA) claims 37% of traditional crafts are in danger of dying out. There are currently 17 crafts – including clog making, paper marbling and piano making – classified as 'critically endangered' which are at serious risk, with a further 45 on the 'endangered' list. Whether it is performing arts or woodwork, metal casting or dyeing, the range is varied and most forms have a highly developed theoretical basis, documented. For some traditional practitioners, it is not just art but the individuals or the family's entire life and livelihood revolving around it. The slowly changing modes of life allow traditions to continue over generations.

The current forms of economy, with their overwhelming desire to establish similar patterns in production and indeed our lives, are leaving very little space for these cultural forms to coexist. As the result, each passing moment is seeing the death of these age-old arts. As the younger generation today wants to study and not follow the family traditions of being an artisan or a handloom weaver, there is a gradual and imperceptible movement towards the obliteration of these heritages, which may remain only as museum pieces.(Endangered Arts, 2005)

"An estimated 71% of artisans work as family units and 76% attribute their profession to the fact that they have learnt family skills" -Fab India.

Objectives

To identify various possible reasons for decline and death of the indigenous arts and crafts. To suggest various strategies that will help revive the different arts and craftworks

Methodology

This paper is an exploratory and conclusive study based on design thinking. The starting point of this research is inspired by the fact that if we accept that crafting objects by hand is one of the defining traits of being human, then our present state of culture in which craft has disappeared in the "overdeveloped" world and is rapidly disappearing in the developing world should cause us to pause and think about what it is that has been lost or is about to disappear. A five-phase description of the design innovation process is described by Plattner, Meinel, and Leifer as: (re)defining the problem, need finding and benchmarking, ideating, building, testing. The researcher incorporated design thinking to resolve the ill-defined problems, adopt solution-focused strategies and used adductive and productive reasoning.

Results and discussion

Reasons for decline and death of traditional arts and crafts

The researcher, through secondary data and analysis, reviewed the various possible reasons for decline and death of traditional arts and crafts.

Poor income generation:

While there are a number of factors that are limiting furtherance of an art and craft form, varying almost by region, there is an overriding factor too - the lack of viable economic sustenance, which often creates bitterness amongst the artist themselves.

Poor facilities available:

Mostly the people who practice the traditional arts and crafts belong to rural areas, specifically those interior areas that have very poor facilities for survival. Poor electricity, poor resources are some of the challenges these artisan face which makes it difficult for them to survive their art and craft.

Digitization and Modernization:

Digitalization and modernization of the craft lead to a decrease in demand of the handicraft sector. The new stylized forms of the same art, lead to a decrease in its traditional value hereby the craft losing its identity. Digitalization and modernization are the root cause of traditional crafts disappearing. The originality of the craft is dying and due to modernization, there are artisans who have given up on making traditional and original crafts hereby focusing on making stylized modern paintings. Hence, old craft heritage is being lost.

Lack of awareness of the Government schemes:

Even though there are plenty of Government schemes to promote these artisans, there is very little awareness of these schemes amongst them. Hence, the support is unable to reach these artisans who belong to such interior rural parts.

Industrialization and Technology run world:

In a growing technology-run and industrialized world, people are increasingly forgetting the traditional crafts and moving towards new innovation. Due to this, artisans are moving to alternative income generation methods, for instance - daily wage labor and farming; and traditionalism is losing its grip.

Fast Fashion trend:

The world is changing due to changes in trends. Majority people want new fashion in every few months. To meet up to the customer needs, companies produce new trends every month. Thus, the traditional slow fashion is unable to meet the demands of the ever changing wants of the customers.

Imitation and substitute of traditional:

Since modern machinery has changed the look of the fashion industry. Companies and brands now create imitations of the traditional art and technique. It is easier to do so, cost effective and at a much shorter time period. Majority of customers do not even mind buying imitation and substitute of the original traditional art and technique, because they have to pay less for it.

Un-Employability:

Since the demand for traditional methods are declining because of all the above reasons, the artisans do not have that much of demand in the industry. Hence, they face un-employability issues. Since the art and craft is the only work they have learnt all their life, and when the demand for it slows down, they are left with very little choice of work, and look for labor jobs with daily wages. And hence the decline of the art leads to the death of it.

Strategies to help revive traditional arts and crafts

These arts and crafts are the inheritors of centuries of traditional skills and complex knowledge acquired after long periods of apprenticeship. The arts and crafts represent, economically, strong value-added activities. There are various approaches to the preservation of crafts. Examples include historical attempts to engineer national identity, as seen in governmental initiatives in Japan, Scotland, and Slovakia; communities of practice may be supported through learning and teaching programmers; or semi-industrial craft practices may be brought into direct contact with the very drivers that threaten them, for example in the potteries in the United Kingdom. Many makers drop the term ‘craft’ in favour of ‘design’ or place a marketing emphasis on ‘quality’ in order to pacify markets and consumers, as they find that consumers can have a mindset of crafts as something that is handmade and not of a good quality. Researchers have further critiqued some attempts at preservation of communities of practice, for the subsequent‘re-contextualization’ of cultures, which become separated from the evolving vernacular they were once an authentic part of. In India, this can be seen in the Western and Northern regions where there have been attempts to regenerate weaving and handloom craft in the Saurashtra and the Maharashtra regions through the injection of grants. Besides, various other strategies that will help revive the direction of different arts and craftworks are:

Understand the global market:

To keep the traditional craft alive, it is important for artisans to understand how trade fairs work and participate in the same with an all-round understanding of the profit and loss and pros and cons involved in the global market.

Increase interaction with the consumers: Artisans need to interact with the consumers and tell them all about their work and the meaning behind it. This inspires the customers and establishes a connection between art and buyer. This also helps the artisans know what the consumers want or need.

Recognize it as a source of supplementary income:

Since the craft sector is the second largest employer in rural India after agriculture, it is a source of supplementary income for the seasonal agricultural workers, who have limited alternative employment opportunities in the village.

Use this large arena of women's employment:
Most handicraft industries are large arenas of women's employment. In their free time, women they have to depend on these crafts for earning the income for their family.

Design intervention:

In an attempt to make handmade more relevant to the younger generation, traditional artists have been encouraged to add a contemporary style to traditional family crafts. It is seen as an interface between traditional and modernity, that matches craft production to the needs of modern living. Through this mixture of forms of arts and crafts the traditional handicraft industry has more hope for shining.

Setting up Digital archives:

The idea behind setting up a digital archive in the form of a website is to not just create a repository of information for the purpose of preservation but also allow the rest of the world to see, without compromising the uniqueness of their craft or designs. We need to bring the tribes of rural parts under the umbrella of digital inclusion to expose them to the services and opportunities the internet has to offer. However, the intention should not be merely to teach them to operate a computer but to provide them contextual, relevant and timely digital literacy, so that they can access the internet to consume the information it offers and share the knowledge that they hold with the rest of the world. (Manzar, 2017)

Understand promotional strategies:

To bring back art and handicrafts into the market, craftsmen and the artisans need to understand the modern market and its promotional strategies. They have to understand their space in the global market and then fix the price of their products.

Conduct workshops:

At both the rural and urban levels, workshops should be organized that enhance the skills and also the knowledge of the people. Skill showcase, design education, creative and product development workshops can be followed up with pricing, marketing, branding, micro-finance etc. These workshops can help artisans eradicate the communication gap between the two representations of society and bring in a better understanding of demand and supply. It also initiates traditional art awareness.

Education:

Every school and colleges such have as part of their curriculum the information regarding their traditional arts and crafts. Nowadays, only specific design programs offer such information to the students. Information and knowledge about the heritage of the country needs to be instilled right from school level, to spread awareness.

Conferences and seminars:

The main key is to Inform and spread awareness. Conferences and seminars promote the idea of research thinkers to participate and come up with ideas to resolve issues and promote awareness. There can also be exhibitions and workshops of the arts and crafts during the seminars and conferences to increase the awareness and sales.

Commercialization in retail outlets:
Retail brands need to collaborate with these skilled artisans to help commercialize the products handcrafted by them. Majority of these workers lack the ability and facility to commercialize their product. Brands can provide them a platform to do so.

Designer as Facilitator:

Through craft, designers connect with the natural world and the collective past. Traditional craft skills are adapted to contemporary design Designers bridge the gap

between the market and the artisan, as today the artisan is geographically apart from his/her client, to be able to understand his/her aesthetic and socio-cultural needs. Designers help in finding the relevance of craft with respect to the artisan, the consumer and to the global market. These awareness programmers will also initiate collaborations between the artisans and the urban designer and brands to explore the opportunities together. Through these kinds of initiatives and activities, we can save our crafts and promote our traditional craft nationally and globally so that it finds its place in the dynamic art culture of the world. These initiatives will bring out the traditional craft and also introduce the hidden talents.

Personalization and customization:

The technological advancements have led to a new lasting trend that is customization and personalization. Customers desire to have products as per their personal choices and preferences hence many brands and designers are working on this concept to scale their business. If artisans are able to provide this facility to the customers, it will give a boost in their sales and valuation of their products.

Tax free products to be sold:

Since the Government has levied compulsory taxes on all goods and services, the sales of the traditional items have gone down thus resulting into low sales. To support and promote these artists, the government must withdraw the levy of tax on these products. This will ensure lower prices and higher sales.

Boost in tourism:

One's next vacation should be to promote arts and crafts so as to empower rural artisans. Developing and integrating them within a network of tourism offerings can benefit the whole collective economically. It can create a new dynamism and providing sustainability for both sectors. Tourists get to witness demos of the crafts, and participate in hands-on workshops in making their own art and craft items. They get to meet the artisans and know their lives. Tourists can also witness first-hand the ethos, designs, tools, techniques, and materials that define the crafts. Each workshop participant takes home rich and unique memories, and their own souvenirs

Social media platforms to sell and promote traditional arts and crafts:

Social media has taken the millennial by storm. The millennial and Gen Z are daily visitors of social media for promotions, updating their doings, shopping and information. If this platform is used by the youth to promote the traditional arts and crafts, it will make a great difference in reviving it. Influencers have lakhs of followers on these social media and create an impact by their posts. This should be taken into consideration for promoting such sensitive issues.

Lean manufacturing to promote artisan works and improve efficiency:

To improve efficiency and productivity of the artisan's work, lean manufacturing methods need to be identified and implemented to cater to their needs thereby improving the quality of work and ease of operation. This will lead to lesser dissatisfaction of the artisans towards the facilities.

Influence through Cinema to the masses:

In today's time, if a person needs to be recognized for his or her achievements or contributions, a biopic or movie is released about their life. Cinema can affect or trigger the minds of the mass at once. This spreads awareness and sensitizes the population towards important issues. Movies can be produced that highlight the plight of the artisans

or the scenario of the traditional rich arts and crafts of various regions. This will popularize the art or craft to a very great extent.

Research projects:

The young scientists and research scholars need to take up research projects to help revive these dying arts and crafts. Young fresh minds need to equally participate in the upliftment of them and they very well have the power to do so. A very large amount of the population take up funded or unaided projects as part of their degree fulfillment, if they invest their time in the direction of this, the scenario will change largely.

Connectivity of internet:

Internet has a lot to offer to rural areas, as rural connectivity can ensure better access to government schemes, entitlements and rights. Digital market linkages can enable tribal communities to exhibit their craft and agricultural produce to the world for an improved livelihood; access to the Internet can keep them updated on government notifications and other relevant information; digital documentation can preserve and showcase their richness for prosperity. Today just an internet connection and a smart phone can help in a big way.

Housing facilities promoting it to their guests:

Airbnb and the Heritage Crafts Association collaborate on new Experiences to save unique crafts from extinction by allowing their guests to apply for a workshop of these endangered arts & crafts in the house. Other housing facilities all across the globe can also participate in such activities to promote their endangered arts and crafts.

Conclusion

Preserving and protecting the skills and knowledge of traditional crafts isa growing challenge. So, it is high time that these traditional forms are revived and awareness be spread about them in urban space. We need to move towards a world where handcrafted items are given due respect and the artisans also get the recognition they deserve for their skills.

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DO-15

REDISCOVERING CULTURE THROUGH DESIGN EDUCATION TO TRANSFORM FASHION

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Abstract

The Indian subcontinent was known for its exquisite crafts from the prehistoric times. The flourishing civilizations of the Indus Valley already knew how to spin, weave and dye yarns. At the heart of this frenzy of production was the craftsman whose artistic endeavor found expression in various textile techniques like weaving, embroidery, dyeing and printing.

However, the systems and contexts in which these traditional crafts and craftspeople functioned no longer exist, and they have no alternative but to modify every aspect of the craft from methods, techniques, materials, tools, colors and ornamentation. Also, competing with the contemporary industrialized and technological products has no denotation, as they are no match to the craftsman's comprehensions and concepts. Hence, in order to sustain the legacy through the future generations, a re-discovery of crafts need to be done.

One of the ways to do so is by sensitizing and educating the younger generation to the legacy of craft culture. The paper discusses a case study of the Craft Initiative at the National Institute of Fashion Technology (NIFT), India. The Initiative aims at providing the students with continuous exposure to the traditional handloom and handicraft clusters in the country, thereby providing an opportunity for creative innovation and experimentation.

Through the initiative, the students are able to re-define, re-position and develop a distinct identity of the indigenous traditional crafts and look at the Indian fashion in its new avatar of contemporary traditional chic or exquisite luxury, allowing the re-emergence of the incredible creative force to rediscover the culture of India. Indian fashion not only has a global presence today, but has allowed for the re-emergence of the incredible creative force to rediscover the deep-rooted culture of India for today and for the future.

Keywords: rediscovering culture, traditional crafts, legacy, fashion, contemporary

Introduction

India is known for its rich diverse craftsmanship and the variety of hand-woven fabrics that are a part of the Indian traditional textiles. The rich heritage of Indian textiles and products have a highly niche appeal because of being hand crafted and individualistic in identity. The embellishing, dyeing and printing techniques on fabrics like Soof embroidery, the Kantha stitch, Zari-Zardosi, Ari work, Persian embroidery, Block print of Rajasthan, Ajrakh printing, Batik etc. are unique to each state and geographic locations in India. Historic evidence place India as a significant contributor to the world textiles as many ports in India were famous trading stations for the exquisite Indian textiles. The silk route stretched between China and the Mediterranean through India. The Indian

subcontinent knew how to spin, weave and dye yarns. Rich cottons and silks from India were popular with the West. The techniques of weaving, dyeing and printing have ever since been passed as a legacy from one generation of artisans to the other. Post-independence, the conflict between the import of new products and technologies, and the consequent effects on the cultural diversities, had started long before globalization, at least in the nations that were colonies earlier. Colonial rule brought exposure to the Western world, education, ideas, thinking and more importantly, the products, the technologies and the ideas of industrialization. Colonial architecture, products, dress and costumes added to the already existing diverse cultural legacies left behind by the several empires that had ruled India earlier. Some of it was a direct trans- plant; others attempted synthesis with the local traditions (Athavankar, 2002).

As a result, many of the techniques of weaving and embellishing textiles have been adapted to the present times and contemporizing of motifs and processes has already taken place. As a result, many of the techniques of producing the traditional textiles no longer exist.

With the industrialization and globalization, in the year of early 1980's the business of textiles in India took a big leap. The fabrics were now available at much cheaper and in abundance with many machine-made ornamentation techniques. These fabrics were softer and had more longevity as the dyes were fast and the finishes were of higher quality. Hence, the acceptance of these fabrics over the traditional textiles grew. The quality was better due to use of synthetic/ blended yarns and the cottons and hand spun fabrics were now a passé. The craftsperson had no alternatives but to modify every aspect of the craft, from the methods, techniques, materials, tools, colors and ornamentation. Over time, as the craftsmen saw the shift in consumer preferences, they started looking at emulating the industrial products without realizing the importance of their inherent techniques and methods thereby resulting in the loss of heritage. Many indigenous crafts and textiles became languishing or extinct. With lack of global design sensibilities, the craftsmen struggled to compete with the comprehensions and concepts of the industrial products which had strong influences of the fashion trends. As a result, the future generations no longer believed in continuing with the legacy and looked for newer avenues which had lesser physical labor and better returns. Gradually the shine of traditional textiles and crafts started diminishing. Unfortunately, many of these artisans faced a struggle for survival, competing against the cheap, rapidly produced products of the modern age. Several challenges like mass production, power looms churning cheaper products, disinterest of younger generation in carrying forward the traditional family crafts and the ever-changing fast fashion, are a big set back to the traditional crafts.

In the early 1990's however, as the Indian subcontinent became an important destination for textiles and finished garments, fashion in India emerged as an industry of eminence and there was a need for designers and design schools. Interestingly, with the deep-rooted culture, the demand for garments at pace with the global trends could not deter the Indian consumer from following ethnic trends especially in occasion dressing. This is seen as a savior for traditional textiles of India which has kept the weavers and artisans hopeful and the crafts relevant and sustainable till the present times.

Co-creation Through Design Education: A tool for survival of the Indian crafts :

The National Institute of Fashion Technology (NIFT), one of the premium design school and first of its kind in the country, was established in 1986 under the Ministry of Textiles, when India began to understand the business of "Fashion". The prime objective

of the institute was providing human resource for the growing textile industry of India. A significant number of designers graduating from the institute each year would cater to the indigenous requirements of the Indian clothing with focus on traditional ethnic wear. The faculty experts at NIFT were quick to pick the clues for the future and started a dynamic and a farsighted move of connecting the weavers and artisans of traditional Indian crafts with the students of NIFT who were emerging as the new fashion trend setters and innovators of the country. The craft cluster Initiative was initiated by NIFT in 1992 where the students pursuing design programmer at NIFT were exposed to the grass root level and sensitized to the work of the artisans. Over time, the craft cluster became an integral part of the curriculum for building a social connect.

As the institute grew in size, reaching out to more number of students and geographical locations within the country, new clusters and new crafts were added in the list of crafts NIFT worked with. In the year 2006, NIFT was funded by the Central Government for the SGSY project. Several clusters and crafts were identified across the country to be included under this project that added a new characteristic to the design education in the country. The project was inclusively designed to offer complete solutions to the artisans for their crafts- from product designing to manufacturing and followed by providing market linkages. The project was a huge success and the students and artisans benefitted from the same.

As a leader of fashion education in India, NIFT realizes the importance of its social responsibilities and continues its endeavor to create grounded designers who are able to appreciate and adapt the global fashion and at the same time be responsible for taking the unique traditional crafts of India to the world. With active support from the Ministry of Textiles, Office of Development Commissioner (Handlooms) and Office of Development Commissioner (Handicrafts), NIFT yet again, developed and implemented a New Craft Cluster Initiative 2.0 in 2016, which aimed to provide the students with continuous exposure to the handloom and handicraft clusters, thus providing an opportunity for creative innovation and experimentation. Through this initiative the students assist artisans to develop distinct identity of the handloom and handicraft clusters through design intervention, development of promotional materials and providing direct market linkages to the artisans and weavers.

NIFT Craft Cluster Initiative 2.0- A Case Study :

The Craft Cluster initiative at NIFT is designed with the objective to sensitize NIFT students to the realities of the craft sector and give insight into regional sensibilities and diversities, resources and environment. Through this initiative, NIFT has been successful in creating a widespread awareness and sensitivity in assimilating crafts into fashion and vice-versa. The Craft Cluster Initiative has been envisaged to provide the students of NIFT systematic, continuous and regular exposure every year to the diversely rich and unique handlooms and handicrafts of India.

The students at NIFT specialize in the areas of design, technology, management and communication. Under this initiative, according to the specialization, students contribute in varied areas in the clusters like design intelligence, design innovation, product development, supply chain management, brand management, retail entrepreneurships, organizational development and systems design and development. The students contribute in the areas of process innovation, production planning, and research-based improvisation and quality management. They assist artisans to develop distinct

identity of the handloom and handicraft clusters through logo, promotional materials like posters, brochures and catalogues. Table 1 shows the contribution of different students according to their area of expertise. There are clear guidelines and deliverables specified for the students keeping in mind the expertise of each stream like the students of Design

Table 1: Students' contribution according to the area of specialization

Area of Specialization	Areas of Contribution in the Cluster
Design	• Design innovation • Design management • Design intelligence
Management	• Supply chain management • Brand management • Retail entrepreneurships • Organizational development • Systems design & development
Technology	• Process innovation • Production planning • Research based improvisation • Quality management

Each NIFT campus has adopted 2 – 5 craft clusters based on the number of departments in the NIFT campus. While the students of the Design departments take up diagnostic study, design developments and training workshops, the students of Fashion Communication, Masters in Design and Masters in Fashion Management are associated with the craft clusters for research, branding and promotion and building or improvising operational system.

The list of craft clusters under the initiative, is drawn by the NIFT Campus in consultation with the local offices of DC (Handlooms) and DC (Handicrafts) while selecting craft clusters with equal representation of both handlooms and handicrafts. Interestingly, the process of identification of new craft clusters is an ongoing exercise, so that there is rotation of clusters and new clusters benefit from the Initiative thereby reaching to new beneficiaries each year. Each batch in a department adopts a craft in the identified cluster and continues with the same for a period of 5 years. In a span of less than three years, NIFT has reached out to more than 3500 artisans and weavers in approximately 600 clusters across the country (as shown in Figure 1), and the numbers are growing, as more artisans now want to be a part of this dynamic initiative.

The students enthusiastically work in the clusters with the artisans to co-design. It is a symbiotic effort where the students learn from the vast experience of the artisans and in turn share their knowledge on design and color sensibilities with them. Figure 2 shows the students in the clusters undertaking various activities.

The Impact

The Craft Cluster Initiative of the Institute is carefully designed with the intention to involve NIFT's professional capabilities in the areas of design, technology, marketing and management for developing the craft sector. Through this initiative, NIFT has been successful in creating a widespread awareness and sensitivity in merging crafts with

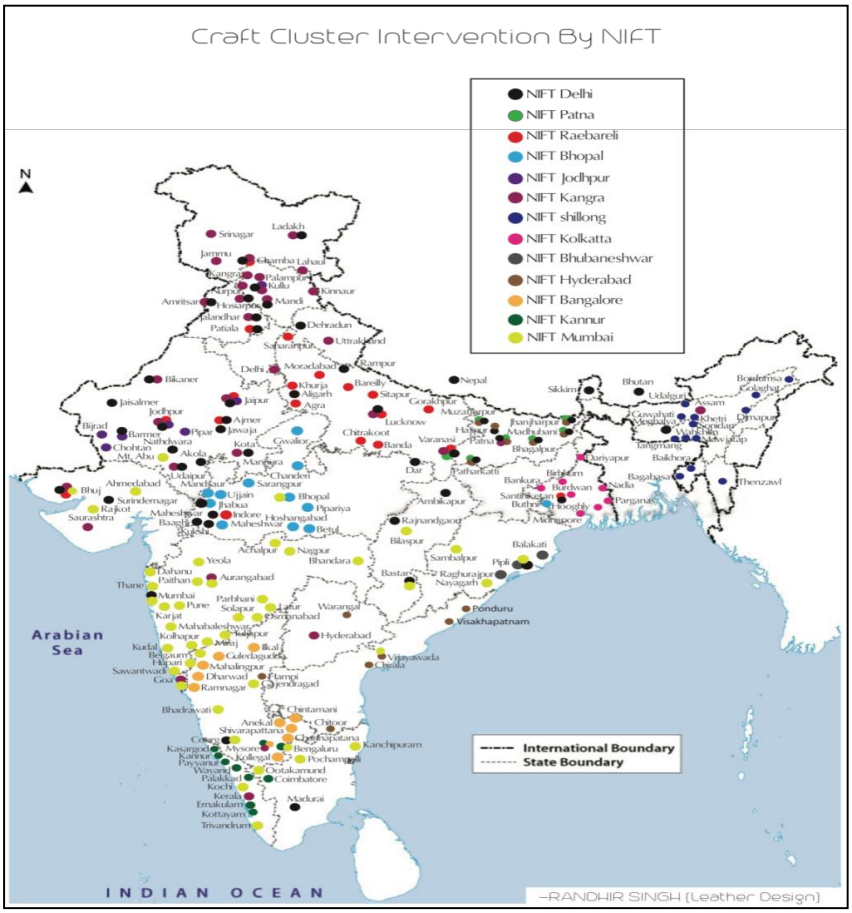

Figure 1: NIFT Intervention under the Craft Cluster Initiative

Figure 2: NIFT students working with artisans and weavers in the cluster for various activities under the Initiative

fashion. A huge resource in form of faculty, students and alumni is available to support and boost the skills of the artisan in the clusters

The NIFT students coalesce the traditional creativity of India's rich craft heritage with contemporary design and marketing strategies and act as a Community Builder for community rehabilitation, as a Trainer, an interface between tradition and modernity, as a Documenter, as an Integrator, as a Catalyst and as young change agent for the weavers and artisans with the foremost objective of preserving the heritage of Indian textiles and crafts.

Through this initiative, the students from NIFT help bridge the gap between the market and the artisan. They are able to find the relevance of craft with respect to the artisan, the consumer and to the global market and hence NIFT can be the interface, between the artisans and the market by helping the artisan to manufacture according to the needs of modern times and demands. NIFT students under their dynamic craft cluster initiative have gone a step further for innovating handcrafted designs with a fusion of modern technologies and traditional craft skills and providing dynamic market linkages.

Digital tools can help enable artisans and weavers to connect directly with markets and access affordable credit. An emerging ecosystem of online marketplaces, affordable communication tools, online consumer communities, is bringing a change in the current retail scenario. The growth of e-commerce platforms particularly online marketplaces has activated avenues for artisans to connect with customers all across the globe. A growing tribe of young independent designers is actively collaborating with artisans to transform the aesthetic of traditional crafts to appeal to global consumers.

As a step, further from just being a facilitator of design to the artisans and weavers, NIFT has associated with three giants of online business to provide the artisans with opportunity to reach out to the consumers through the use of technology. These companies have been able to successfully promote the traditional crafts of India to the consumers across the globe as they take the story of traditional crafts to the world. The Digital Bazaar is a platform that provides a direct market link to the artisans and the weavers circumventing the middlemen and reaching out to the consumers with quality products at better pricing.

Through this Digital market linkage, NIFT and the partner companies are not only selling products but are selling dreams, they are raising hopes and they are creating futures for the traditional crafts that were either ailing or becoming industrialized in order to compete with the trends in the markets.

As quoted by one of the digital business company about the artisanal connect through NIFT, "We realize that the journey is long and we need to partner with like-minded organizations like NIFT who can help us achieve our dream of bringing numbers to our crafts. We are happy to join hands with NIFT for the Digital market with the prime focus on bringing producers online, revitalizing crafts and for developing new products to create livelihoods. The Digital platform supports direct sales, allowing producers to undertake direct orders, removing the middlemen and thereby increasing their profits and their income levels."

Conclusion

Through this initiative the students are able to re-define, re-position and develop a distinct identity of indigenous traditional crafts and look at the Indian fashion in a new avatar of contemporary traditional chic or exquisite luxury, allowing the re-emergence of the incredible creative force to rediscover the culture of India. NIFT is making sincere

efforts to engage with artisans and weavers in the country and hand-hold them to teach them the use of technology, make them understand the significance of the rich heritage, and get the right price and market for their products.

At the end of five years, NIFT is positive about the impact of growth of economic and social well-being of the chosen craft clusters as a result of this intervention.

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DO-16

CRAFT EDUCATION AND ITS IMPACT ON WOMANHOOD IN INDIA AND ABROAD – A DIFFERENT PERSPECTIVE

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Abstract

According to Oxford Dictionary, the term "craft" is defined as "an activity involving skill in making things by hand". In my experience as an artist, an art and craft workshop organizer and an independent researcher in the field of traditional art heritage and culture for the past 20 years, I have been fortunate enough to witness craft education from an entirely different perspective altogether. Craft not only refers to an activity involving the intricate manipulations of hand, it means much more. For a 70-year-old grandmother from Kazakhstan, craft education inspired confidence and hope in a life devoid of either and filled her with the positivity of creativeness. For children and teenagers afflicted with disabilities, who have been abused and ostracized by the society, craft education served as a means of adding wings to their flight in pursuit of fulfilling their dreams. While the "Palli Mangal" programmed in association with Ramakrishna Mission helped many villages, women earn a living through craft education, it also filled them with the optimism of being able to realize their dreams. On the other hand, when traditional Indian art forms such as Madhubani, Patachitra and Tanjore in combination with various brush techniques and vibrant colors, is transformed from saree to scarf, from decorated dried coconut to stylish tote bags, from cushion covers to canvas, the brilliant creativity reaches the minds and souls of people and brings happiness, mitigates the darkness of melancholy and brings them back to the rhythm of a healthy life. Then, the concept of craft is no longer limited to handmade creativities, but instead is a method of imparting essential life skill that promotes greater understanding of diversity and adds meaning to life. In this paper, I have presented the very essence and impact of craft education on human lives by drawing from my experiences in the last 20 years - from the optimism of a cancer patient to the excitement of a pregnant mother, craft education has brought a smile to the faces of people of from age 5 to 75 from various countries across the globe and is, undoubtedly, a beacon of hope for human beings.

Key Words- Craft Education, Womanhood, Creativity, Hope, Social bonding

Introduction

According to Oxford Dictionary, the term "craft" is defined as "an activity involving skill in making things by hand". In my experience as an artist, an art and craft workshop organizer and an independent researcher in the field of traditional art heritage and culture for the past 20 years, I have been fortunate enough to witness craft education from an entirely different perspective altogether. Craft not only refers to an activity involving the intricate manipulations of hand, it means much more. For a 70-year-old grandmother from Kazakhstan, craft education inspired confidence and hope in a life devoid of either and filled her with the positivity of creativeness. For children and teenagers afflicted with disabilities, who have been abused and ostracized by the society, craft education served as a means of

adding wings to their flight in pursuit of fulfilling their dreams. While the "Palli Mangal" program in association with Ramakrishna Mission helped many villages, women earn a living through craft education, it also filled them with the optimism of being able to realize their dreams. On the other hand, when traditional Indian art forms such as Madhubani, Patachitra and Tanjore in combination with various brush techniques and vibrant colors, is transformed from saree to scarf, from decorated dried coconut to stylish tote bags, from cushion covers to canvas, the brilliant creativity reaches the minds and souls of people and brings happiness, mitigates the darkness of melancholy and brings them back to the rhythm of a healthy life. In this paper, I have presented the very essence and impact of craft education on human lives by drawing from my experiences in the last 20 years - from the optimism of a cancer patient to the excitement of a pregnant mother, craft education has brought a smile to the faces of people of from age 5 to 75 from various countries across the globe and is, undoubtedly, a beacon of hope for human beings.

Stress is one of the world's largest health problems, leading to exhaustion, burnout, anxiety, a weak immune system, or even organ damage. In Germany, stress-induced work absenteeism costs about 20 billion Euros per year. Scientists have analyzed stress from a biological, psychological, and sociological point of view. Recent research from different universities, including the Crafts Council and the Museums Association – shows that engaging with the visual arts can reduce reported anxiety, and that visiting museums can protect against dementia's development. 'Cultural activities encourage gentle movement, reduce social isolation, and lower inflammation and stress hormones such as cortical,' says the author, Dr Daisy Fan court. 'The arts are linked with dopamine release, which encourages cognitive flexibility, and they reduce our risk of dementia.' that textile craft helped them cope with depression and negative feelings, while offering social support and positive relationships. One of the strengths of craft practice, especially as a contributor to well-being, is precisely that it can be both solitary and collective, and it's up to the individual to decide.

Objectives

There had been many other opinions regarding the effect of craft education and its effect on human minds till date and the difference on opinions will be continued. Various research and analysis on this topic have revealed that practicing art and craft has been a major stress buster for human mind, hence helping people to overcome their various stresses. Hereby, I am not providing evidences and data to establish facts but would like to share my experiences related to common people and some lesser known facts about them. This may be a small one but this initiative of mine can illuminate lives of at least few people. Primarily I am an artist, writer and researcher, though not a scientist, and above all a mother. There are many people who travel to pursue their job opportunities in different places of India and abroad. Same with me, I have travelled a lot, various locations during the last 24 years, came across many different experiences while living at different locations. I have seen, felt and learnt a lot of things from the surroundings. The major contribution towards my learning comes from the Indian art and craft forms. I felt one more invariable thing both in my country and outside that everyone wants peace and happiness. All of us are running in life, chasing some goal, but the question is that at the end of the day, are we happy? specially in the case of females.

Hypothesis

Following the teaching of Swami Vivekananda and 'Charaibeti' mantra (from Upanishad) which says always keep moving ahead, I have attained a different perspective towards the journey of life. Following this path, I have learnt a lot of traditional art forms of India and the history behind them. Swami Vivekananda once told sister Nivedita few things about Indian art and craft where he mentioned that 'a lot of jewels are scattered in every corner of India, find out those with the same eagerness with which a mother tries to find out her lost child, don't stop till you find and then establish it in front of the world. This very important message shows me the path to progress further in this direction. I don't know whether I had been able to establish it or not but I am sure that my efforts got reflected in lives of several people.

Methodology

Various Training program, meet people from different back ground, Arrange various craft workshop, Presentation, Lecture, Exhibition.

Findings, Summary, Conclusion and Implication

Phase 1:

My first Art n Craft school started in Luck now, where I conducted classes from 2005.I noticed there is a ritual in northern India that if the new bride brings some artwork created on her own, she gets a lot of importance at her in-law's place. Hence, a lot of girls used to come and learn handwork, especially ceramic work, Madhubani art, wax art, decorative glass painting, hand-made waterfall and Tanjore art etc. There were two sisters who used to come from Hardwar to learn, and I used to wonder about how would they go back along with their artifacts and art works so big in size, but they believed in creating joyfully keeping all the worries behind.

In this context I wish to mention two ladies of my life, one is my mother in law and another is an aunt of mine. They always supported women who create something. They always assumed that they could not learn and perform any kind of art and craft in their family life so I should do something. Art is such a medium which not only makes a woman self-dependent but also elevates her self-esteem and her respect in the society. This mental support made me to carry out this work of women upliftment through art and craft during the past many years. I continued the journey when I came back to Kolkata, my home town, where this effort rose to an institutional level from personal level.

Phase 2:

I have been associated with 'Pallimangal Pratishthan' (an effort by Ramakrishna Mission for welfare of village women) conducted by Ramakrishna mission, Kamarpukur (around 60 Km from Kolkata, West Bengal), from year 2009 to 2014 and there I experienced that the ladies from lower economic strata are very much keen to learn and know something new but are short of resources. They were being trained for making incenses sticks, pickles, cloth bags etc. but were never associated with the proper art and craft techniques. This was even beyond their rarest of imagination. From year 2009 Swami Bishwanathananda ji, then Secretary of Ramakrishna mission, encouraged me to start the work of teaching the village females about various techniques of art and craft. I started off primarily with fabric painting and batik resist dye techniques on fabric. The village women got surrounded with the fantasy world of colors, brushes, wax and clothes. This made them happy and satisfied at the same time.

These village women used to come from very far, like distances up to 8 Km, using buses as their mode of conveyance or some used to ride bicycles also. The best part was, that their return journey was filled with a new hope and bliss. Slowly, they started making several items, such as sarees, shawls, bed sheets, bags etc. using the batik and fabric painting techniques and selling these items in the outlet of same center. In some time, these items were the things in demand at the center. Those who worked for preparing these things during night after all their daily chores are finished had now new hopes of having a source of income as well as a reason for self-dependency. This was a dream come true for them learning the things which were so called 'elite' till date. Not only this a girl known to me, Sandhya, told me that now she feels happy that she can buy small things to her child on her own. There are certain things, which a woman aspires for, out of her daily routine, be it a small accessory for her own use or a gift to some loved one, this very spark which I saw in Sandhya's eyes that day motivated me further. Some of them used to save up to Rs 5000 per month, which was a huge amount for them. These things may be very meager for many but of high importance for maintaining self-respect of some others.

Later I worked at another branch of Ramakrishna Mission, Jayarambati center (around 3 Km from Kamarpukur) where local girls prepared sarees after fabric art workshop, they make it amazingly beautiful. As an Indian it was very satisfying to see that the centers were open for all religious sects and for people from all walks of life, the only thing required was a thirst of learning. Later the items prepared by them were also displayed for sale. The center used to supply the raw materials and used to keep back the cost price only after sale, giving away the total profit to the women artists preparing the items. Through the classes I got intimated with them. They feel like a dear one for me. I realized that some of the women used to come leaving behind their sick husbands, some had a lot of mouths back home to feed and some didn't even have a proper house to live in. But none of these problems ever became a hurdle in the way of these women, finding joy out of their new creations made through the knowledge of art and craft I was trying to share with them.

Craft education is a value addition to a person; this can be practiced throughout one's life for creative satisfaction or earning money. For example, a girl can pursue the knowledge even after her marriage for creating new things for business and also teaching other people around her.The craft education is bliss in both ways where the person who is learning gains something new, uses it to earn livelihood, uplifts her lifestyle and finds mental satisfaction, similarly the teacher also finds immense joy by sharing the knowledge and hence enhancing sense of fulfillment. Any work of art is not small and certainly not if it helps a mother finding her own world of joy with her children and family, this sense of fulfillment enables a teacher to move further on the path of sharing knowledge.

Here I would like to mention about the village women of the village 'Sihar' of West Bengal where the main source of income for women was various products of bamboo like basket, brooms etc. I carried out a project there for village women, on request of the respected Mata ji, Secretary of Sihar Sharada Math. The place was very distant from Kolkata and there was no suitable place for women for night stay. There were routine bus services and in case if they are missed the difficult public conveyances were the only respite. I reached their along with all the raw materials, conducted the classes, put in my efforts only to see the beautiful and amazing outcomes made by the village women. After the craft education classes of three months (though not at a stretch) were over, a lot of ceramic work stuff, glass paintings, beads jewelry, handmade candles, different types of cloth decorated by fabric painting etc. had already been successfully prepared.

It was very fulfilling for me that my learning and knowledge of different types of art and craft work found a proper direction of use. That was the first year when the items prepared by the women of Sihar village were being displayed for sale in the annual fair of Sharda Math Head quarter.

Overcoming all the hurdles and ignoring the other problems of life both the teachers and the students came for a beautiful journey of learning which gave a sense of fulfillment to both. This whole effort was later on covered by DD Bangla in year 2013 as a documentary which was shown on the channel at that time and still available online. That time the villagers of Kamarpukur, Jayrambati and Sihar and other nearby villages found happiness upon watching themselves on television. It was a first-time experience in their lives to watch their daughters, wife and other women of family on national television. That day was a remarkable day in my life as an artist, who has spent about 20 years learning and performic art and among those about 10 years have been devoted to social work as well.

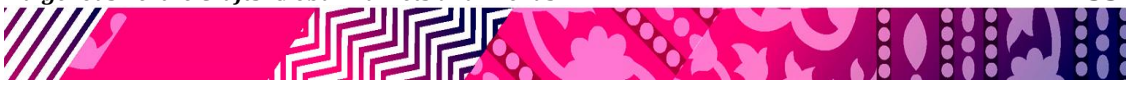
Phase 3 :

There may be differences in the types of problems faced by the rural and urban people, rural people lack in basic amenities for life and urban people are highly dissatisfied in their lives even after having a lot of resources. I have worked in Kolkata, during 2009 to 2014, with the students of 'Chatra kalyan Samstha' and other housewives of city, teaching them traditional art and craft forms of India. The students used to come after finishing their classes and the women came after doing their household chores, but the joy of learning and creating something new used to be immense. I remember about a lady who was 65 years old in her initial stages of cancer, almost alone, because kids settled in America and not so much time t spend with mom. The joy she found after creating a piece of craft through her own hand is an experience beyond explanation, both for me and her. One of my other friends, almost my age, who also suffered from cancer came to watch the students, how they create something new even in her last days. She was in her last stages and could not sit for long durations, hence, I visited her once and created a piece of art in front of her so that she can experience few moments of happiness by looking at the piece of art. The Chatra Kalyan Sanstha first time participated in a fair organized by the Belur math, displaying the items prepared by them and selling them was a moment of proud for the children of the institution. They still are working. Not only that, the students, initiated the job of teaching the techniques to their mothers and other ladies of family under the direction of one of those girls, Ms. Poulomi. According to Ms. Devyani, an important member of the Chatra Kalyan Sanstha – 'they are delighted and proud to learn and practice the art and craft education in their daily lives, which they never have ever thought of'. Most of the above ladies, in their 50's , either domestic helpers or belong to the lower strata of society feel proud and happy when they are being recognized for their work of art.

Phase 4 :

After 2014, I experienced the effect of craft and education in countries outside India as well. I came across the fact that how people living in bigger cities are facing the grave problems of depression and loneliness.

As a voluntary guide of National Museum of Bangkok which enabled me to meet people from 35 countries around the world. I always had the feeling and desire to share the traditional Indian art forms with other people who led me to organize various workshops, presentations, talks and exhibitions on the same and hence have achieved my goal of establishing Indian art and craft forms at international level, though to a small



extent. This has left several positive effects on the participating people by enhancing their interests and passion towards art and craft.

All these efforts have helped in three various ways first, I could spread the knowledge about Indian traditional art forms in Bangkok among an audience of mixed nationality, secondly, I could provide a common platform to people of different age group, nationality, culture, mental status to learn and create something new while enjoying and also earning by practicing these art forms (for example children of Thanksgiving Home, Bangkok) and thirdly I could revive the healthy mental state of some people facing loneliness and going through the psychological rough phases of life.

Outside India, knitting, embroidery and water coloring are the usual common forms of art, but Madhubani painting, Patachitra painting, Garhwali painting, Mandala art, are not that well known among people outside India. Indian philosophy and appreciation of art are the prime elements of these traditional art forms. Hence, when a 75 years old grandmother from Kazakhstan discovers the beauty of Ramayana through the lines of Madhubani painting, gives me immense sense of joy. Saul Akanayea was very active throughout her life but has to stay in Bangkok due to some personal reasons where she was responsible for taking care of three grandchildren who was quite challenging for her mentally and physically. I have witnessed the sense of fulfillment in her after one of these workshops, when I was able to bring out the child in her, when she created something new on her canvas in this age after learning an entire new art form. She used to send the photographs of her work to her relatives back home and shared with me the applauds received from her relatives. In her words – 'For me it was a unique experience, because I had never, since my school days hold a brush in my hand to create art, the relaxed atmosphere that Anita created had such stimulating effect on my self-esteem that I took pleasure in being able to create a piece of art. We put away all our daily concerns and focused on our creative process of producing beauty on canvas immersing into and encouraging medium of friendly support.'

German, French, Swiss, Thai, Scottish, Japanese were among a lot of people who came to attend the workshops, who might have heard of these art forms of India somewhere, or may have seen some in photo graphs but were never able to do something on their own.

Before I conclude, I would like to iterate two instances here. I happened to meet a person, born Thai-Chinese and a teacher by profession, a person of great and kind heart but was somewhere unhappy inside. She joined my mandala mediation art workshop, and I was left mesmerized to notice the change within her after the three-day workshop. She held herself responsible for her Karmas of past life which she got to know as a result of past life regression analysis and this was hampering her present life as well. The amazing drawing lines of mandala art set her emotions free in front of me and by the time she finished the workshop she had already shed a lot of her baggage. Her transformation was nowhere less than a free-flowing river which just left a small opening inside a mountain. In her own words – "Thank you for your 'quotes' and advices. Before I came here I knew that there are some answers awaiting for me, only I don't know what are they. Even now when I think of it, I still have goose bumps and my body still shivers. I know what 'the voice' said is the truth. These three days class helped me settle my mind in many aspects of life. I feel ease and more relaxation. In fact, it's a big result for me. Now, I can move forward."

Some pregnant ladies also came for the workshop who later shared with me, that thoughts of a pregnant lady affect the baby in the womb. Madhubani and Mandala paintings demand a lot concentration along with lot of scope for using variety of colors that gives a joy of

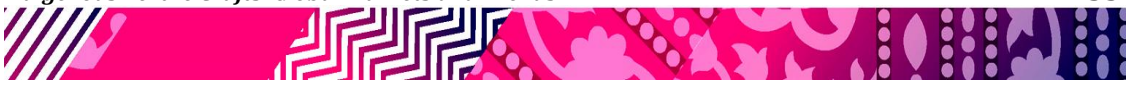
creation with meditation power which helps mother and the unborn baby both. There are a lot of stories which are beyond the scope of this writing. I am concluding my writing by sharing the experience of working with few mentally and physically challenged kids of Bangkok.

I have been working with an institution 'Thanksgiving home' which is working for the well-being of mentally and physically challenged children. They are getting their education and basic knowledge of sports and other physical activities, but they started learning craft for the first time with me. The youngest of them was just four years when we started. They were four sisters. Their father sold off the eldest of them when the mother got sick and after she died, he tried to sell off the others as well. They have been rescued from such a situation by Mr. Wanchai of Thanksgiving home, and it is not at all difficult to understand the mental conditions of the kids. There are two more girls who got affected with single side facial paralysis leaving that side incapable of doing any of the normal functions like hearing, speaking, see things etc. Another young girl is suffering with Alzheimer's disease. Likewise, everyone has some or the other problem. After they learnt art and craft from me and prepared some decoration items by their hands for their home, I witnessed the immense joy they were filled with. They always used to ask Mr. Wanchai to send the photographs of their artwork to me, i.e. Khun Anita (In Thai language the word 'Khun' is used to address a person). They learned process of tie and dye. And made several types of apparels like frocks, T-shirts, shawls etc. along with my help and all this was out of their love for learning something new. We put a stall in the famous Ganesha festival of Bangkok, held in National stadium of Thailand in year 2017. I was highly elated to see that they got their confidence and happiness back when people were not only coming to see their work of art but also buying those things.

When they learn fabric painting on T-shirt in year 2018-19. They chose their designs and painted their T-shirts accordingly. They were highly elated and happy to see the finished work of art that is their own created dresses. They returned to their homes wearing those shirts they created on their own. Today they can create greeting cards, small furniture painting, wall decoration, dress designing etc. Dr. Wan chai writes to me that – 'you and your art gave our children confidence that even they can fly. You have created the wings of their dreams. I have created bank account for them using the money they earned out of their own creations. Some of these kids have participated in the art competitions of their schools and won prizes as well, this was unimaginable some time back. Today they are teaching this art to people who are even below them. They are leading their life in happiness and helping other people to live the similar way'.

Conclusion

Though I don't remember the exact number with whom I have shared my knowledge with till date, but my journey includes more than 500 people of various background and age groups, starting from Lucknow to Bangkok. Hope this number keeps on multiplying in its own pace by sharing knowledge and making the circle bigger. I believe this is a great achievement, inner peace and happiness for myself as well as all the participants through the medium of craft education in life. This is the uniqueness and importance of craft education. The concept of craft is no longer limited to handmade creativities, but instead is a method of imparting essential life skill that promotes greater understanding of diversity and adds meaning to life.



DO-17

IMPARTING BEADWORK SKILLS THROUGH SELF-INSTRUCTION MANUAL TO WOMEN OF VADODARA CITY

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Abstract

India is synonymous to exotic arts and handcraft. In India, every state has their own handicraft techniques for making art and craft products. Gujarat is blessed with rich and vibrant tradition of handicraft. It is widely differing in its proportions of its patterns to the element of wonderful exquisite artifacts on various forms. The fascinating textiles, elaborately carved wooden and stone jharohkhas, bandhani and beadwork are some of the famous crafts of the states. Beadwork is a versatile craft of Gujarat state. It requires skill, patience and hard work. Its main feature is that the beads were stitched together with the help of needle and thread. The background is created with white beads and motifs with colored beads. The designs and motifs used in the beadwork were not documented or illustrated to refer; it was in the master artisan's mind. These skilful and highly creative artisans are today few and far between. Today, saving the craft from total extinction and also for easy learning a self-instruction manual was designed and developed for further reference. An experimental and analytical study was carried out for pretesting of the manual. The three groups from Vadodara city were randomly selected for the study. The existing beadwork skills of the trainees were assessed through observation method and analysis of samples created by them. Each of these trainees groups were then provided with self-instruction manual and a kit of beadwork material for self learning and skill development. The samples created by the trainees of each group of mono-bead and tri-bead techniques were analyzed and evaluated on various parameters like initiation and completion of sample, technique followed directions of the needle passing through the bead and overall appearance which includes shape, thread tension, color combination and selection of the even beads. Assessment of manual was also done with regards to understanding of instructions. It was found from the study that self-instruction manual can be useful as self learning tool for the people who have inclination towards learning the beadwork craft. The self-instruction manual can be useful for the preservation of the beadwork craft. It is an effective teaching aid for academic teaching and also for personal teaching at various levels of education and age groups. It will serve the purpose of instructor independent medium.

Key words: Bead work, Mono-bead technique, Tri-bead technique, Self-instruction manual

Introduction

Crafts are an integral part in the human life, despite the rapid social and technological changes that are taking place. The fascinating craft of beadwork was popular with number of countries like, Egypt, Rome, Tibet, Afghanistan, Indonesia, Africa, Central America and India. In the Western world, special artists create craft objects and they are considered as luxury items. But in India, like many other developing

countries; it is the main source of employment for a vast majority of the population, next to agriculture till date. The beadwork craft developed in India since nineteenth century because of the influence of the European traders. They bought beads as articles if trade. Unlike other places, where the beads are stitched on cloth to form a pattern, here they were used with no backing material at all. In India, beadwork is mainly practiced in Gujarat, Andhra Pradesh and Rajasthan[4].

Beadwork is known as 'moti bharat' in mother tongue of Gujarat. The main feature of this bharat is, the beads are not stitched on a background but the beautiful rich coloured beads are stitched together with, the help of needle and thread. The motifs and designs are dictated by the technique of putting one and three beads together. The art of grading the beads is important, as their size, texture and colour give the richness and regularity of the pattern. In Gujarat, beadwork is a specialty of Rajkot, Bhavnagar, Jamnagar and Junagadh[1].

The beadwork can be described as a group of beads strung together; as with a necklace by stringing which is very simple and straight forward, and the presentation causes more attention towards the beads. The beads and colour of beads are the important parts of their placement which enhance the design of beadwork. Beading is common to most of the continent and the cultures of past and present. Nylon twisted or polyester-cotton blend thread is used for stringing the beads. There are different types of beads used for the beadwork. They are jako moti, magiya moti, jablonex moti, hajari moti and vatana moti. Needle used for the beadwork was suitable to thread and bead size[6].

A mathematical computation of any design makes replication fairly simple but also disallows much scope for individual creativity. However, its high degree of sophistication, the number of people involved in its production, the vividness and precision of its style and technique all make it a major craft of Gujarat[4].

These beadwork techniques can be learned through various ways and means. Simultaneously one can use various media along with it. Basically, there are two ways of conveying instructions to the learners- (1) Instructor-based and (2) Instructor independent.

Instructor independent instruction media can be effectively used in formal education situations where a teacher or instructor is not working with the students but the designed instructional media was used to promote the instructions[3]. The use of self-instruction manual allows teacher to spend more of their time in other works. Here, the effectiveness depends on the instructional media[5].

The major aim of developing an instruction manual was in field of mass instruction as well as self learning. The manual developed was centered on the thinking and technique of self learning. Since it was a self-instructional device, it was customized and adapted to individual differences. In this, learning would be more rapid as well as interesting. It would direct towards specific objective and retain for better and longer time.

Objectives

1. To study the existing beading skills of each selected group.
2. To develop self-instruction manual of beadwork technique.
3. To impart knowledge and skill of beadwork technique amongst the women of Vadodara city with the help of developed self-instruction manual.
4. To study the effectiveness of the self-instruction manual as teaching aid.

De-Limitations

- The study was limited to two non-government organizations (NGOs) of Vadodara city i.e. Friends Society, Fatehganj and Bhagini Samaj, Karelibaug and selected group of home makers.
- The self-instruction manual was prepared in two languages only i.e. English and Guajarati.

Methodology

The bead work craft practicing places of GujaratlikeRajkot, Virpur, Jetpur, Surendranagar and Porbandar of Saurashtra and Vadodara were surveyed to know the status and products of the craft. The retailers of all places in Saurashtra and Vadodara; about the products, techniques, beads and designs used for the beadwork craft were surveyed.

A self-instruction manual was developed to teach bead work.The techniques included in the self-instruction manual were mono-bead and tri-bead techniques of beadwork. Penta-bead and septa-bead techniques were worked on same principle as tri-bead technique.

A pilot study was conducted for pre testing of the self-instruction manual.

The two groups were randomly selected for the pilot study:

(1) A Skilled group, who could read and understand the instructions of designs in English and

(2) A non-governmental organization group; who could read and understand the instructions of designs in Guajarati.

Both the groups were given a kit consisted of hand embroidery needle (size 12), thread (nylon twisted-414 Denier) and multi-coloured beads (Jako Beads). Total twenty five trainees were selected for pre-testing of manual. Observation method was used by the investigator to observe and assess the groups. This pre-testing helped in the preparation of final instruction manual of beadwork.

Plate 1: Beadwork Kit Given to Each Trainee

Plate 2(a), 2(b) : Self-Instruction Manual in English and Gujarati

Development of self-instructional manual

On the basis of data obtained during pre-testing of manual, investigator developed final self-instruction manual using Microsoft Office word-2007. The manual was developed in two languages i.e. English and Gujarati.

Selection of sample:

The selection of trainees was done through interview method with questionnaire. A structured close-ended questionnaire was prepared in English and interpreted in

Gujarati for the two non-governmental organizations groups selected for the study. The same questionnaire was also given to the home makers, which was filled by them.
Purposive sampling method was used for the selection of the trainees. Criteria for the selection of trainees were:

a) Should be able to read and write.
b) Should have basic knowledge of needlework.
c) Willingness to learn the beadwork.

The effectiveness of the developed self-instruction manual was studied on three groups using random selection. Two selected groups had secondary and higher secondary education in Gujarati medium and one group had completed their graduation in English medium. The two non-government organizations (NGOs) selected were Friends society, Fatehganj; Bhagini Samaj, Karelibaug and one graduate group of home makers, Karelibaug, Vadodara.

Assessment of the existing beadwork skills of trainees:

After the selection of trainees, the investigator assessed their existing beading skills. For this, a kit was prepared consisted of, a hand embroidery needle (size 12), thread (nylon twisted thread of 414 denier), bees wax and multi-coloured jako beads. The trainees were given the freedom to develop and create anything from the raw materials provided to them.

Plate 3: Skill Assessment of Group

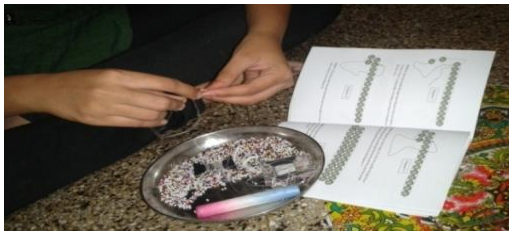

Plate 4: Use of Self-Instructional Manual by the trainees

Imparting Beadwork Skills:

From the pre-testing of the manual a self-instructional manual was developed in English and Guajarati languages. The developed self-instructional manual was given to the selected trainees to study the effectiveness of manual. The effectiveness of the manual was analyzed on various parameters of teaching and learning methods.

Assess the Effectiveness of the Developed Instructional Manual

Effectiveness of the developed self-instruction manual was assessed by the samples created by the trainees by referring self-instruction manual. These samples were created by following the step-wise instructions or diagrams mentioned in the manual.

These samples were then analyzed on the following parameters:

- Initiation of the sample
- Thread tension
- Technique followed
- Completion of the sample
- Overall appearance of the sample

After completion of training, the data was collected about the experience of trainees regarding learning of beadwork through self-instruction manual without instructor through close-ended questionnaire. The data was analyzed for effectiveness of the manual.

The samples created through experimentation were then subjected to analysis. Three point scale evaluation sheet was prepared for rating of the samples on bases of the various features given in the evaluation sheet like working of techniques, design creation, completion of sample, thread tension, shape and overall appearance of the sample.

Results and discussion

The pre-testing of manual was done with two randomly selected groups of twenty five trainees in each. Some difficulty levels for understanding handout of beadwork by the trainees were attended by the investigator. The investigator observed some gap-levels (i.e. Language, Diagrammatic Representation and Instructions given in handout) in understanding handout of beadwork by the trainees during developmental testing, most of the trainees could understand the languages used in handout.

Demographic Details of Randomly Selected Groups:

The demographic details of the trainees of each group were included age group, education and languages known. The details are as follow:

Table 1: Background Information of Trainees of all Group

N= 15 per Group

Sr. No.	Details	Bhagini Samaj (NGO)		Friends Society (NGO)		Home Maker Group	
		Frequencies (f)	Per Cent (%)	Frequencies (f)	Per Cent (%)	Frequencies (f)	Per Cent (%)
1.	**Age Group (in years)**						
	18-27	9	60	11	74	4	40
	28-37	4	27	3	20	2	20
	38-47	2	13	1	6	4	40
2.	**Education**						
	Secondary	8	53	10	67	-	-
	Higher Secondary	7	47	5	33	-	-
	Graduate	-	-	-	-	10	100
3.	**Marital Status**						
	Married	9	60	10	67	7	70
	Unmarried	6	40	5	33	3	30
4.	**Family Types**						
	Nuclear	13	87	8	53	7	70
	Joint	2	13	7	47	3	30
5.	**Languages Known**						
	Gujarati	15	100	15	100	-	-
	English	-	-	-	-	-	-
	Both	-	-	-	-	10	100

Assessment of Existing Beadwork Skills of each Selected Groups :

Most of the trainees, from each group did not have any previous knowledge of beadwork. Majority of the trainees from Bhagini Samaj and home maker group had high interest and the trainees from Friends Society had moderate interest to learn beadwork craft.

A kit of beadwork was given to the trainees of each group. They tried to create various samples by stringing, looping, and making ring flower by joining the loops of beads. They used multi-coloured beads for sample making. Most of the trainees arranged beads in systematic order and some arranged randomly. All of them had good colour choice, so they had created samples with good colour combinations.

From the existing skill assessment of the trainees, investigator observed and analysed that the selected groups of trainees could learn mono-bead and tri-bead technique. They possess basic skills required for beadwork i.e. threading, beading and arrangement of coloured beads.

Table 2: Evaluation of Mono-Bead Samples of All Groups on Various Features N=15 per group

Features for Mono-Bead Technique	Evaluation	Bhagini Samaj (NGO)		Friends Society (NGO)		Home Maker Group	
		Frequencies (f)	Per Cent (%)	Frequencies (f)	Per Cent (%)	Frequencies (f)	Per Cent (%)
Initiation of Sample	G	13	87	12	80	9	90
	F	1	6.5	3	20	1	10
	P	1	6.5	-	-	-	-
Needle Passing Direction	G	9	60	9	60	7	70
	F	5	33.5	4	27	3	30
	P	1	6.5	2	13	-	-
Completion of Samples	G	6	40	5	33.5	4	40
	F	7	47	5	33.5	5	50
	P	2	13	5	33.5	1	10
Overall Appearance							
Bead Evenness	G	10	66.5	12	80	7	70
	F	5	33.5	3	20	3	30
	P	-	-	-	-	-	-
Thread Tension	G	11	73.5	8	53.5	6	60
	F	1	6.5	5	33.5	3	30
	P	3	20	2	13	1	10
Colour Combination	G	15	100	15	100	10	100
	F	-	-	-	-	-	-
	P	-	-	-	-	-	-
Shape	G	9	60	6	40	5	50
	F	3	20	4	26.5	4	40
	P	3	20	5	33.5	1	10

Keys: G = Good, F = Fair and P = Poor

Analysis of the Samples on the Basis of Developed Self-Instruction Manual:

Trainees had created samples and design samples of mono-bead and tri-bead techniques by referring the self-instruction manual of beadwork. These samples were coded by investigator for the analysis.

Mono-bead samples:

Investigator analyzed samples created by the trainees through three-point evaluation sheet. The samples were evaluated on various features like thread tension, bead evenness, technique used, beginning and ending of the sample and the direction of needle to pass through while working with beads.

Table 3: Evaluation of Tri-Bead Samples of All Groups on Various Features

N=15 per group

Features for Tri-Bead Technique	Evaluation	Bhagini Samaj (NGO)		Friends Society (NGO)		Home Maker Group	
		Frequencies (f)	Per Cent (%)	Frequencies (f)	Per Cent (%)	Frequencies (f)	Per Cent (%)
Initiation of Sample	G	13	87	15	100	9	90
	F	2	13	-	-	1	10
	P	-	-	-	-	-	-
Needle Passing Direction	G	12	80	15	100	10	100
	F	3	20	-	-	-	-
	P	-	-	-	-	-	-
Completion of Samples	G	11	74	11	74	5	50
	F	2	13	4	26	4	40
	P	2	13	-	-	1	10
Overall Appearance							
Bead Evenness	G	10	66.5	9	60	6	60
	F	5	33.5	6	40	4	40
	P	-	-	-	-	-	-
Thread Tension	G	12	80	15	100	10	100
	F	2	13	-	-	-	-
	P	1	7	-	-	-	-
Colour Combination	G	15	100	15	100	10	100
	F	-	-	-	-	-	-
	P	-	-	-	-	-	-
Shape	G	7	47	10	66.5	7	70
	F	4	26.5	5	33.5	2	20
	P	4	26.5	-	-	1	10

Keys: G = Good, F = Fair and P = Poor

It was found that majority of the trainees had initiated the samples correctly by leaving required amount of thread at the beginning, but few of them had left very little thread at the beginning which resulted in increment of thread tension and also zig-zag placement of the beads in the foundation row. Some of them followed incorrect direction of needle passing through beads. Some of them had completed samples with unfinished end by not securing the knot. Most of them had followed the correct direction to pass the needle through beads and few of them did not follow correct direction which resulted in tight thread tension, irregularity in placement of beads and deformation of shape. Some of the trainees had maintained the correct thread tension and had selected even beads for mono-bead sample making, resulted in proper shape and appearance of the samples. All these affected the overall appearance of the samples. Majority of them had excellent overall appearance of the samples by maintaining proper thread tension, shape, selecting even beads and completed properly.

Tri-bead samples:

Tri-bead samples were analyzed through three-point evaluation sheet on various features like thread tension, needle direction, beginning and finishing of samples, selection of beads while making sample of beadwork.

The evaluation of tri-bead samples revealed that most of the trainees had initiated the samples correctly and majority of them had completed the samples by putting knot and

fused the extra thread at the end. Majority of the trainees had followed tri-bead technique correctly for making design samples and few of them had followed incorrect direction of passing the needle. Most of them created same design as presented in the manual by placing correct position of coloured beads. Some of them had selected mixture of even and uneven beads for the sample making, which resulted in distortion of the shape.

Effectiveness of the Self-Instruction Manual:

Most of the trainees of all the groups expressed that anybody could learn beadwork from self-instruction manual without any instructor but some of them thought that with the instructor learning could be more easy and quick. It was found that majority of the trainees had created mono-bead and tri-bead samples by referring both diagrams and instruction for sample making. They could relate the diagrams while reading the instructions. It was found that all the trainees from home maker group had thought that the table given in the manual about the raw material was useful for the learners. All the trainees of each group liked the way of presetting the information in the manual which could be used as a teaching aid to teach or learn the beadwork craft.

Conclusion

Beadwork is an art practiced in India. In beadwork, the beads are stitched together with the help of needle and thread. For teaching, learning and preservation of the craft for many years self-instruction manual was developed. The developed self-instruction manual was tested on three groups to impart skills and knowledge of beadwork. It was found that the trainees had successfully created various samples of techniques and designs from the manual. They found the manual easy to understand and follow.

This craft can be learnt with basic skills of threading the needle and beads. The self-instruction manual was developed for making learning of beadwork easy, free from instructor with step-wise diagrams and instructions for mono-bead and tri-bead techniques. It also had detailed diagrams of mono-bead, tri-bead, penta-bead and septa-bead designs. The self-instruction manual can be used by people of different age groups and educational levels. The manual is an effective teaching aid to teach or learn the beadwork without any instructor or teacher. It can also used for academic teaching and personal teaching.

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DO-11

FASHION WITH THE FEMINISM IN TANG DYNASTY CHINA

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Abstract

The appearance of Empress Wu Zetian in Tang Dynasty China (AD618-907) had created conditions for the rise of feminism. Due to the emergence of Empress Wu Zetian, women's social status had been improved significantly. Some female politicians appeared at that time, and began to have political rights like men, such as Queen Wei and Princess Taiping.The flourish of feminism led to an open dressing trend in the Tang dynasty. This essay analyse the fashion changes by the feminism in Tang dynasty China.

Keywords: fashion, feminism, Tang dynasty

DO-12

THE HISTORICAL AND CULTURAL NARRATIVE ON *PACCHEDIS* PRODUCED IN GUJARAT

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Abstract

'Time' and 'space' are two of the most crucial elements, one relates to while befitting the significance of a textile in a given culture. The other important cues that aid in interpreting information pertinent to the textile are its visual language and well-designed functional principles. The case of *Pacchedi* textiles discussed in the paper have long lasted in the cultural circuit of the state of Gujarat. The old photographs, paintings, artifacts analysis and interviews held with the patrons, producers and traders had led to the information generation on varied dimensions of the identified subject. In the current paper, attention has been paid to discuss the evolutionary prefigures that are intrinsically connected to the existence of present form of *Pacchedi* Textile. The analysis made it discernible that the textile in the present time exists as the resultant of the developments brought about in the forms of traditional *patkas* and *sashes*. This evolution that occurred with the passing epoch and periods brings in different meaning to the *pacchedis* that are used today.

Keywords: *Pacchedi*, evolutionary patterns, draped garment

Design & Innovation (Poster)

KAMANGIRI PAINTINGS ON APPARELS: A SUSTAINABLE APPROACH

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Abstract

Kutch, the land of Indian art heritage which is an amalgamation of rich paintings, embroidery and other traditional crafts. Much of them have been explored by researchers, designers, NGO's but still there are some lesser known art forms too. Kamangiri painting is one such art of wall painting. These paintings which once enjoyed a royal status are now on the verge of extinction. Artists practicing these paintings are no longer interested in doing this art and are moving out in search of other occupation for their sustains. Major factors contributing towards this downfall are: 1. Less demand 2.Less appreciation 3. Less incentive. Hence the researcher felt a pressing need to study, popularize and sustain this art. This art got severe setback due to earth quake when most of the old houses with this painting were damaged. As this painting was done on walls which was not moveable it remained localised only. An effort was made to incorporate traditional motifs and their configuration used in Kamangiri paintings to create yardages which can cross the geographical boundaries and reach to people far off Kutch also. Designing was done using selected motifs from Kamagiri paintings to suit the apparels. Digital printing method was purposely used to print the fabrics to achieve fineness and detailing of these paintings which would have been impossible to achieve with any other forms of printing. Khadi fabric was used to promote its use among consumers. Apparels were designed using Kamangari printed fabric in three categories which included palazzo and kurta, blouses and stoles. The designed apparels were displayed to gauge the opinion of the consumers and their approach towards them. The results revealed a very positive response and the respondents agreed that apparels with Kamangiri print would be an effective method in sustaining and preserving this lesser known art of Kutch.

Keywords: Kamangari, paints, motifs, extinction, revival.

Introduction:

The state of Gujarat is known for its cultural heritage. Kutch is one of the centres for art and craft in this state. The region of Kutch is vibrant with diverse art and craft flourishing in different areas with its specific characteristics. Many of these survived with the passage of time, aided by the Government and Non-Government agencies which helped in sustaining them through the passage of time. These include Rogan Painting, Weaving, Tie & Dye, Embroidery Work, Leather Craft, Lacquer Craft, and Copper Bell Craft. Some *Kutchi* artists are relatively unknown even within the borders of Kutch. Even though there are rich traditions of art and literature existing in Kutch, very few attempts have been made to acquaint people with these.

Some of these art in this region which has enjoyed a golden era is now dying or on the verge of extinction. "*Kamangari*" is one such art. Dating back to the 18th century,

the *Kamangari* painted on scrolls and walls, unique to Kutch is now a vanished tradition- its remnants are found in a couple of Bhuj's museums and a few random surviving home. It was at its best in the 19th century after which it lost its importance. The first evidence of this painting was found during 1799 in Mandavi. It was the first painting done on the wall for decoration with the theme of marriage ceremonies. It is vibrant, colourful and unstructured in nature and in local language it is called "*Kamangari Bhint Chitro*", and the person who does this painting is called "*Kamangar*". *Kamangar* community is known for their skills in paintings. From the paintings one can understand that the paintings were done in a collage to fill the space on the walls of the room. The reasons for having murals in the house were to decorate them and create an ambiance to teach pity and honesty to the growing children through the depiction of religious themes associated together with themes of daily chores as well as legacy of the family and community

Purpose of the Study

Kutch is famous for its art and craft of which some are vanishing, *Kamangari* is one such art. These wall paintings known for its simplicity and spontaneity, which once enjoyed a golden era, are now on the verge of dying. The wall paintings are not moveable so the people other than Kutch have no knowledge about these paintings. The main purpose of the study is to transfer and popularise these paintings through textiles amongst people as textile is more moveable surface and can reach masses.

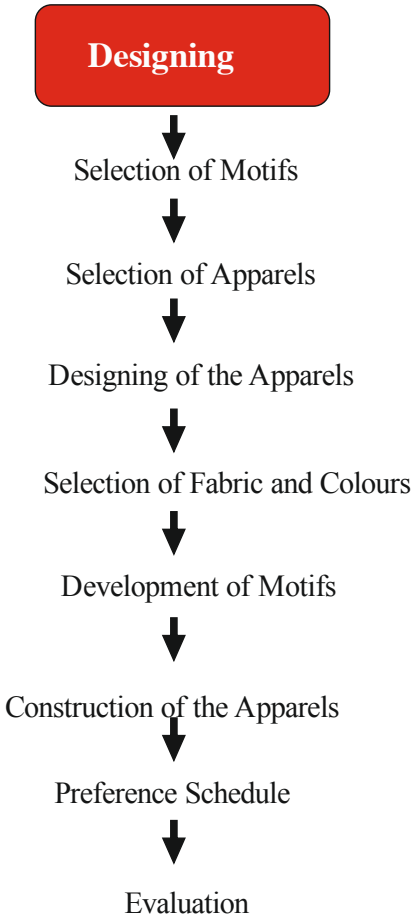
Motifs used in Painting

The peculiarity of *Kamangari* style is in its depiction of flora and fauna. The distinct black out line is one of the essential features of the painting. These wall paintings were known for its simplicity and spontaneity. The themes painted were generally taken from the myths and legends of the incarnation of Lord Vishnu probably under the impulse of the revival of Hindu *Vaishnav Bhakti*, personal devotion to a God as the means of salvation but there are many secular themes such as durbar scenes, royal procession, hunting, romantic, escapades like those *Dhola-Maru* as well as animals, birds, *Jogis*, elephants, camels with their attendants or riders, a bullock chariot and pastimes such as wrestling and hunting. There appears to be no coherent plan in the choice of subjects and it seems that the artists painted what they fancied. The *Kamangar* artist derived his inspiration for painting from his local surroundings. In simple style, he generally painted elements of local life in its vivid colours.





Methodology



Through an exhaustive design process the researcher created fifteen designs keeping in mind different apparels i.e. Kurta – Pallazzo, Blouse and Stole. The division of the designs were as follows:
Category 1: Six Kurtas and Two Pallazzos
Category 2: Three Blouses
Category 3: Three Stoles
In all the above three categories the different motifs were used according to suitability.

In category 1, in Kurta & Pallazzo, human figurative motifs were used for design $1A_1$ and $1B_1$, the bird figure motifs were used for design $1A_2$ and $1B_2$ and the floral motifs were used for design $1A_3$ and $1B_3$. Three types of placements were selected. Design –$1A_1$& $1B_1$ had full bordered centre yoke, Design- $1A_2$ & $1B_2$ had horizontal panel used at upper side and bottom of the apparel and lastly Design $1A_3$ and $1B_3$ had half yoke at the centre front and back.
Pallazzos were printed with over-all floral prints using CAD.

In category 2, Blouses were designed and stitched with high neck and 3/4th sleeve for highlighting the print and more space to print the design. There were ornamented designs used for design B1, B2 and B3. Design 2A had front high neck and back low neck pattern, Design 2B had a combination of plain and printed fabric, Design 2C was short loose crop top of the wearer to give a sophisticated look.

In category 3, three stoles 3A, 3B and 3C were designed printed with over-all ornamented motifs.

All the printing process was done by Digital Printing method, at Shruti Fashions, Surat. The base fabrics used was Polycot Khadi fabric, sponsored by Khadi emporium, Vadodara.

Results and Discussion

Total 12 garments in three categories were displayed in the Department of Clothing and Textiles, Faculty of Family and Community Sciences, The Maharaja Sayajirao University of Baroda, Vadodara to a heterogeneous group of respondents.

The designed garments were displayed and opinion of the respondents were taken for the same

Categories of garments and code were as follows.

Category 1: Six Kurtas in two sets paired with a palazzo

Category 2: Three Blouses

2A

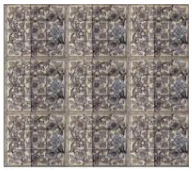
2B

2C

Category 3: Three Stole

3A

3B



3C

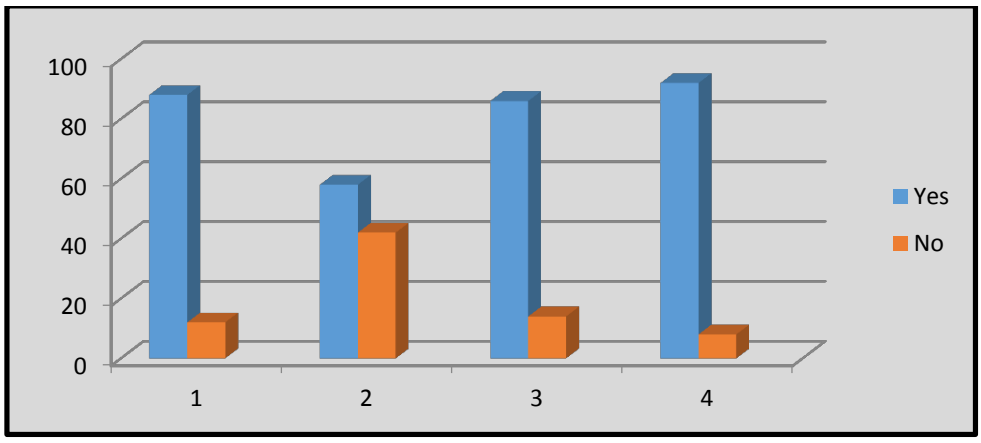
Total of 50 respondents gave their response.

Products thus developed were displayed and opinion of the people was taken. Total of 50 respondents gave their response. Data thus collected was analyzed and the following conclusions were obtained.

1. Theme and innovativeness, awareness, exclusiveness of garments:

Table – 1 Theme and innovativeness, awareness, exclusiveness of garments (N = 50)

Sr. No.	Statement	Yes		No	
		F	%	F	%
	Innovativeness in concept of designing of the displayed garments	44	88	6	12
2	Awareness towards designs of displayed garments.	29	58	21	42
3	Exclusiveness of the displayed garments	43	86	7	14
4	Reflection of theme in the displayed garments.	46	92	4	8



Graph 1: Theme and innovativeness, awareness, exclusiveness of garments

From the above Table 1 and Graph 1, it can be concluded that majority of respondents (i.e. 88%) opined that there was innovativeness in concept of designing of the displayed garments. It reflected modernity in tradition. Traditional garments were very well designed and printing on that added to its value.

They felt innovative as the material used was Khadi and designing with Khadi has changed their perception regarding the monotonous use in plain straight garment only. Designing of garment especially the printed blouse category was appreciated by majority of respondents. Khadi being a comfortable fabric was liked for its use in blouse with chic designs.

Respondents knew about the palazzo but palazzo made from dhoti was not known to them.

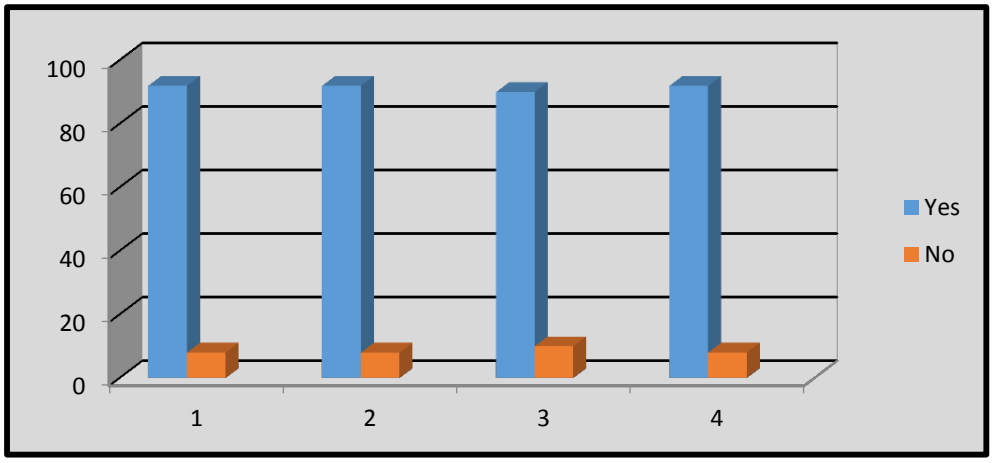
The design of palazzo with the material selected and print was something which they were not aware of 92% respondents felt that the theme was very well reflected in the garments.

Use of tradition for designing modern outfit was judicious. In the collection traditional wall painting i.e. *Kamangari* painting, traditional fabric i.e. *Khadi*, traditional garments i.e. *kurata* , stole and blouse were taken and new collection was designed and developed with new silhouette and surface ornamentation.

2. Source of inspiration, design of garment, wearability and acceptance:

Table – 2 Source of inspiration, design of garment, wearability and acceptance (N = 50)

Sr. No	Statement	Yes		No	
		F	%	F	%
1	Judicious application of wall paintings as a source of inspiration by the designer in the displayed garment	46	92	4	8
2	Proportionate amalgamation of traditional features with contemporary ones in the displayed garments	46	92	4	8
3	Consumer preference towards wearing the displayed garments	45	90	5	10
4	Acceptability of designed garments amongst the urban masses	46	92	4	8



Graph 2 : Source of inspiration, design of garment, wear ability and acceptance

From the above Table 2 and graph 2, it was concluded that majority of respondents agreed that there was judicious application of wall paintings as a source of inspiration by the designer in the displayed garment and proportionate amalgamation of traditional features with contemporary ones in the displayed garments.

Majority of the respondents (i.e. 92%) opined that there was judicious application of the wall paintings as a source of inspiration. The essence of the painting was not lost.It

was looking same as it was on wall.Selection of the motifs and design configuration were excellent.The method selected for transferring it on textiles i.e. digital printing was most appropriate as number of colours can be seen and the clarity of design was also there. Sharpness of the print with so many colours was possible only with digital print method. Lay out of the design on garments was also liked by the respondents.

3. Cost of the displayed garments:

Cost is the major factor for any collection for its marketing and popularity. Costing of the garments was done and opinion of the respondents was taken about the appropriateness of the costing. Though developing a new single garment costs a little more but then the range should be appropriate.

Table 3 : Price of the garments

Category	Set	Price in Rs.
Category I	$1A_1$, $1A_2$ and $1A_3$	2200(each)
	$1B_1$, $1B_2$ and $1B_2$	2200(each)
Category 1I	2A, 2B and 2C	750(each)
Category III	3A, 3Band 3C	290(each)

From the 50 respondents, 36 opined that the cost projected for the garments were appropriate and they found them very fairly priced. The price for category I was found to be reasonable by all the respondents. Most of them suggested that these garments could be priced little higher looking at what they purchase from the market. They were ready to pay more also basically for the material used and aesthetic appeal of the garments. Price of 2200 Rs. for a set of three *kurtas* and a *palazzo* was far reasonable looking at the designing and finishing of the garments..Few of the respondents felt that the stoles could be kept at to price range at 450Rs to 500Rs instead of 290 Rs. Stoles were the most demanded from the whole lot of collection of all three categories. The material used, overall print, colour and price coated made it most favourable.

Of the 50 respondents only 2 respondents felt that the garments were overpriced. They were of the opinion that at least 10% cost should be reduced. All the garments were sold at the coated price and many orders have been placed. Most of the respondent felt that the garments were lesser priced. Opinion was also taken from the respondents regarding transferring of wall paintings onto apparel as a technique to popularize the art form. A very high percentage of respondents (i.e. 94%) agreed that the idea of transferring the wall paintings onto apparels is very interesting and will further help in popularizing the art. As walls are immovable, it can be appreciated when people reach to that place and get an opportunity to see that but if it is transferred on textiles it can reach to people in different parts. Also on textiles it will be more durable as when compared to transferring it to other material like paper.

The respondents were also asked for their valuable suggestions.

They felt that the pastel shades and colour combinations used in the fabrics chosen for the garments were appealing though some felt that bright colours could be incorporated. Some felt the concept is innovative and could be applied to other products like sarees too. Many respondents felt that taking the wall paintings onto clothing is an

interesting way to popularize the folk art among common masses. Some of them felt that the printed designs could be done using blocks and also felt that other fabrics like silk could also be explored. Few opined that the use of prints could be in more areas in certain displayed garments. Many respondents found the finishing of the garments very neat. It was concluded that selection of the material, colour of the design and finish of the garment plays a very important role in popularising any design.

Conclusion

The present study was an endeavour to revive, preserve and popularize the marvellous Kamangari paintings which is almost disappearing. Overall the concept of transferring *kamangar* paintings on *khadi* fabric was appreciated . This concept can be explored further for its popularisation and sustainability. The painting transferred on textile will help in sustaining Kamangiri painting.

Acknowledgement

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DP-03

PHULKARI EMBROIDERY: SUSTAINABILITY IN PRESENT ERA

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Abstract

The creative expression of the Punjabi women on fabric is popularly known as *Phulkari*. The technique of *Phulkari* embroidery is very old and different theories regarding its place of origin are found in literary works. This embroidery was practiced throughout the rural Punjab with lot of stylistic regional variations. The popular places producing some of the excellent craft works were Peshawar, Sialkot, Rawalpindi, Amritsar, Patiala and Faridkot. Presently, the tradition of this needle work is being practiced in and around Patiala, Rajpura and Fatehgarh Sahib areas in Punjab by different self-help groups. As the times changed, so did the traditional *Phulkari*. Like most other traditional crafts, *Phulkari* also took a backseat as the craft was time consuming and cumbersome supported by a number of socio-economic changes in the Punjab state. The interest in *Phulkari* is being again taken by government craft centres and non-government organisations who are beholding the revival of the embroidery. After the long legal battle of five years, the *Phulkari* embroidery has achieved the GI Status in 2011. The journey of *Phulkari* from traditional to modern to contemporary times have witnessed many changesin terms of thread, the base fabric and the technique of executing the craft. In its contemporary *avatar*, this vibrant folk art is usedin bright as well as subdued coloursnot only on *odhinis* but also on saris, suits, jackets, coats, skirts, bags, belts and home furnishings like bed covers, cushion covers, table runners, mats, coasters etc. The traditional craft is feared to vanish because of automated designs produced for resemblance to hand work and faster production, so, it is essential to uplift the craft so that it does not hangs back.The steps toward its revival include creating awareness for this traditional craft through research studies, welfare schemes for the artisans and new marketing initiatives by the government. Even the fashion designers like Manish Malhotra, Surabhi Chawla and Zara Shahjahan have embedded this artifact in their collections and have contributed towards its sustainability in today's fashion era.

Keywords: contemporary, embroidery, traditional, *Phulkari*, revival, sustainability

Introduction

Phulkari is analyzed as '*phul*', flower and '*kari'*, work i.e. floral work or flowering. It is a special, traditional hand work,mainly found in Punjab. However, in west Punjab this embroidery is famous as '*bagh*', means garden, in which the entire surface of the shawl is decorated with floral designs.

Phulkari is an integral part of the life of Punjabi girl. In any simple or elaborate functions, festivals, one or the other type of *Phulkari* or *bagh* is invariably used. It is said to be auspicious, a symbol of happiness, prosperity and *'suhag'* of a married woman. However, it is considered as a

great treasure. The rough and coarse base material of *Phulkari* symbolizes hard and tough yet colourful life of Punjabi woman, the rich and glossy work with pat potrays her dreams and aspirations. It can also be added here that, *Phulkari* has delicacy, elegance and grace to the heavy personality of the Punjabi women. Therefore, *Phulkari* is a part and parsel of Punjabi girls trousseau. The maternal mother, grand mother take special pains, care, interest, attention and pride in embroidering *'chope'*. However the girl also had to work on it from her early age. It depicts her skill, art and hard work that adds to her eligibility as bride. It takes years to complete such shawls used during wedding ceremonies. They are also a symbol of love, faith and affection.

Origin And History

The origin of *Phulkari* can be traced back to the 15th Century AD. However, it is said that, an earliest mention on *Phulkari* was made in the famous love story of *Heer-Ranjha* written by Waris Shah (1725-1790). *Phulkari* was an article, customarily presented to the girl during her wedding. Bhanabhatt mentioned in 'Harshacharita' around 17th century that in some dresses were worked out with embroidery flowers and foliages on the wrong side of the cloth where the technique and stitches were similar to the ones used in *Bagh* and *Phulkari*. On this basis, it was expressed that a similar embroidery was prevalent in different parts of india, but did survive only in Punjab, while similar motifs are seen in the traditional art of Bihar and Rajasthan. Some expressed that this embroidery migrated from Persian art, where an embroidery form called '*Gulkari'* having similar literal meaning, *'gul'*, flower and '*kari*', work, which did resemble *Phulkari*. There is another theory which discloses that the *jatt* tribe of east Punjab, basically peasants, migrated from central Asia, are the pioneers of this craft. This theory was strongly supported by Flora Ann Steele, in her famous paper on *Phulkari* work. She also mentioned that people carried out *Phulkari* with cotton thread in olden days and with passage of time silk floss was introduced and now it is prepared with vivid, luxurious colour combinations.

The embroidery was practiced throughout the rural Punjab with lots of stylistic regional variations. The popular places producing some of the excellent craft works of *Phulkari* were Peshawar, Sialkot, Jehlum, Rawalpindi, Hazara, all now in Pakistan, as well as in Amritsar, Jalandhar, Ludhiana and former Sikh states of Patiala, Nabha, Jind, Faridkot and Kapurthala (Bisla1984). Presently the tradition of this needlework is being practiced in and around Patiala, Rajpura and Fatehgarh Sahib areas of Punjab and carried out by many self help groups in villages.

Coarsely hand woven *Khadi* fabric was used as base material because of its durability and ease in counting threads while embroidering. The soft untwisted silk floss called *Pat* available in strands came from Kashmir, Afghanistan and Bengal. This thread was dyed at Amritsar and Jammu for distribution all over Punjab. Traditionally, golden yellow, red, crimson, orange, blue, white, violet, green and dark brown formed the colour range in untwisted silken floss known as *Pat* (Grewal and Grewal 1988)

The designs of *Phulkari* Craft displayed creative imagination, originality and excellent knowledge of colour blending. This excellence possessed by the women of Punjab came with years of practice so that they could give free rein to their needles without referring to any pattern books or model designs (Hitkari 1980). The roots of *Phulkari* being connected to the rural Punjab, the motifs were inspired from village life and nature. Basically, geometric motifs were used involving the basic geometric shapes like triangles, squares, vertical and horizontal lines. Complicated patterns like lozenges, pentagons and wavy lines were also embroidered by expert and experienced women. These geometrical shapes were also used for making highly stylized motifs like rolling pins, birds, animals

etc. through use of colour variations (Grewal and Grewal1988). The *Phulkaris* and *Baghs* were further named according to the type of patterns embroidered, the colour of base material and its functional use. The various types were – *Chope*, *Suber*, *Til Patra*, *Nilak*, *Thirma*, *Darshan Dwar*, *Shishedar Phulkari*, *Sainchi Phulkari*, *Ghunghat Bagh*, *Vari da Bagh*, *Bawan Bagh*, *Velan Bagh etc*.

Traditional *Phulkari* and *Bagh*

Sainchi Phulkari

Bawan Bagh

Darshan Dawar

Evolution From Traditional To Contemporary

As the time changed, so did the traditional *Phulkari*. This was to keep pace with the changing fashion. What changed was the threads used for the embroidery, the base fabric, the technique of executing the craft. With time, the silk floss of olden times was replaced by synthetic which comes in two varieties, viscose and polyester. Now, the embroidery is done from the top of the cloth which is traced with motifs. New patterns and colour combinations have been developed. This along with other advances brought an abrupt decline in the hand work tradition. Like most other traditional crafts, *Phulkari* also took a backseat as it was time consuming and cumbersome supported by a number of socio-economic changes in the Punjab state.

With the changing times the look of *Phulkari* is also experiencing change keeping in pace with modern times. A modern day shift has seen *Phulkari* embellishing a varied range of fabrics, from chiffon to satin to cotton. In its contemporary avatar it is being fashioned on jackets, *saris*, suits, *dupattas*, coats, skirts, scarves, purses and handbags. Today, this vibrant folk art is embroidered not only on apparel products but also on bedcovers and home furnishings in bright and vivid colours.

Contemporary Phulkari Articles

Threat To The Traditional Craft

As the traditional craft is feared to vanish because of automated designs produced for resemblance and faster production, it is essential to uplift the craft so that it does not hangs back.

Today, in the race of modernization we are forgetting our roots and in the modern world of fashion, duplication from mill made products serves as an option in place of the traditional textiles to us. In contemporary label, *Phulkari* is a lot different from the original work. It is a coarse style of embroidery that showcases mechanical work rather than sophisticated and detailed hand work. Therefore, traditional *Phulkari* artifacts need to be treasured, protected and carried forward keeping in mind the needs of the modern day consumer. For this many individuals, government organisations, and NGOs are working at various platforms to preserve and revive this centuries old exquisite traditional heritage.

Revival Of Phulkari Embroidery To Its Former Glory

1. Gi Status:

The Patent Information Centre (PIC) of Punjab State Council for Science and Technology had filed the application for GI status for Phulkari in March 2005. A Mumbai-resident had filed an opposition claiming that it would affect those earning a living through this work outside Punjab. In 2011, after a five-year-long legal case, Phulkari was awarded the Geographical Indication (GI) status in India, which means that after that only registered traders and manufacturers, from Punjab, Haryana and Rajasthan states would be able to use the term for the traditional craft, and the Patent Information Centre (PIC) of Punjab State Council for Science and Technology would issue a logo or hologram to distinguish the product.

2. Government Revival Schemes:

1. Punjab Small Industries & Export Corporation Ltd: (PSIEC) is an autonomous body of the State Government of Punjab and duly incorporated under the Companies Act, 1956 for the purpose of promotion of business and service to industry.
2. Micro, Small and Medium Enterprises Cluster Development Programme (MSE-CDP) In *Phulkari* cluster, artisans at *Dera Bassi* are trained to use new tools and develop new designs so as to cater to the urban tastes and above all enable them to market their goods profitably.
3. Rural Entrepreneurship Development Programme (REDP): Maximum financial support to any entrepreneur will be Rs 1.75 lakh with training component at Rs 1.0 lakh and incentive component at Rs 75000/-.
4. Skill Development Programme (SDP) The financial support for Skill Development Programme for a minimum of 25 trainees.
5. Rural Mart Scheme: A pilot scheme for setting-up of retail market outlets to facilitate marketing linkages for the handicraft and agro-based products.
6. Heritage Festival organized every year at Patiala, *Kapurthala* and Amritsar to promote the Punjabi Culture where embroidery artisans form a self-help group to market their

craft in coordination with non-government agencies and two-day skill up-gradation workshops organized at Quila Mubarak, Patiala.

7. "*Mai Bhago Istri Shakti* Scheme: The objectives of the scheme are to train at convenient places, provide hassle free credit and assistance and strengthening of different income generating activities at the village level. Marketing of *Phulkari* products prepared by the societies is done through the network of PACS, showrooms/ sale outlets of WEAVCO, MILKFED and MARKFED Committee at Division level. Designers are engaged by WEAVCO, who help in preparing new designs, new colour schemes and good packaging of these products. The committee will also coordinate with other departments like *Phulkari*, NIIFT Mohali, Khadi & Village Industries Commission (KVIC), Khadi & Village Industries Board (KVIB), Krishi Vigyan Kendra, Punjab Agricultural University (PAU), Women Welfare Department, Social Security Department etc. to give a fresh lease of life to the dying art of *'Phulkari'*.
8. Scheme of Fund for Regeneration of Traditional Industries (SFURTI) Under this scheme, *Phulkari* cluster in Thuha village has come up with Khadi and Village Industries Commission (KVIC) and implemented by The Patiala Handicraft Workshop Cooperative Industrial Society.

Women trained in *Phulkari* embroidery by various Government and Non-Government Organisations

1. Involvement Of Designers And Researchers:

Big brands and fashion designing houses are cashing by introducing traditional *Phulkari* in varied forms by creating a whole range at fashion weeks. Traditional colour palette is changed to suit the taste of the customer. As by nature social commerce encourage sharing, this renewed form of *Phulkari* is enticing people around the world and there is rise in demand for *Phulkari* from the cities and NRIs who still want to remain connected with their roots. The designers from India and Pakistan are blessed with the excellence in designing skills especially when it comes to the traditional outfits. The designers like Ritu Berry, Manish Malhotra, Surabhi Chawla, and Zara Shahjahan have embedded this craft in their collections. Many women entrepreneurs and researchers like Rekha Mann, Simran Harika, Puneet Madan and Sunainna Suneja are working to modernize and revive the age-old craft of *Phulkari* in Punjab and give it some contemporary styling by using khadi as the canvas and dyeing the loose silk threads in bright original colours to produce small items like bags, jutties and decorative pieces employing the rural women.

Supporting the Centre and the State Governments and strengthening their hands in helping to reach larger number of crafts persons are the NGOs who have involved

themselves in promoting the handicrafts on one hand and protecting the rights of artisans on the other. Most outstanding among the NGOs are the Craft Council of India and it various regional centers rendering trainings and financial services to craft persons.

2. Awareness Drives For Youth:

The youth of today has become so addicted to copying the customs, traditions and fashion of the western countries that they have forgotten about their own heritage wealth. The traditions linked with usage of *phulkari* during marriages, festivals and events have to be revealed to the young generation so that they remain connected to original craft work and not get lured by the machine made counterparts. The beautiful hand work used to create typical *phulkari* motifs in different colours and sizes on products have a special significance. This has to be embedded in hearts and minds of today's youth so that they continue using traditional products and the demand for such products does not fade with time. It can be done through celebration of Heritage Day, organizing lectures on traditional v*irsa*, quizzes, through *phulkari* making competition etc.

3. Formation Of Self Help Groups:

The women of today especially from the rural background can be engaged together by formation of self-help groups and giving them training and further orders for making *phulkari* products. The women can be paid on daily basis and can earn by doing work in the village itself. Such self-help groups have generally an appointed leader who coordinates on the behalf of the entire group and gets work done from its members. The orders, loans and payments are also looked after by the leader with help from people of KVK's (*Krishi Vigyan Kendras*) or from some other government organizations.

Conclusion

Phulkari embroidery is a priceless craft that enjoys vibrancy in colours and sophistication through skillful execution of stitches. But, all that has been born must pass, it is not worth shedding tears over it. The sensitivity and creativity inbred in the Punjabi women will certainly find new forms of expression. Folk arts never stagnates, but always find itself developing. So, let us hope that the governmental efforts in course of time will help to preserve and continue the unique and fascinating *Phulkari* forever. Until then, it remains for us as individuals to save what is left over of the traditional *phulkari* embroidery from destruction and keep it for the new world of our children.

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DP-05

RENASCENCE OF ROGAN PAINTING: COGNIZANCE AND PRODUCT VARIEGATION

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Abstract

Gujarat is one of the most vibrant states of India as it has a rich culture and Guajarati's are known for their passion for vibrant, ethnic, aesthetic and traditional fashion. This paper throws light on one of the most spectacular traditional textile craft of Ahmedabad, Gujarat i.e, *Roghan Painting* which is dying a slow death. It is a traditional textile craft of Gujarat which has been practiced since ancient times at Ahmedabad. *Rogan painting* is a prevalent art of an oil based hand painting. A thick paste is prepared by boiling oil and then chalk color pigment and binding agent are mixed with it. Metal block or a stick rod is used for painting. The purpose of this paper is to give information and to create awareness regarding this craft as the artisans are slowly losing their values and is on brink of annihilation. Due to lack of awareness regarding this craft amongst the people, the youth is not ready to follow or to practice this craft because it is very laborious and time consuming and needs more patience to prepare it. Presently, only one family (Khatri family) in Ahmedabad is practicing *Rogan Painting*. They are facing numerous challenges to preserve this craft as they are very aged and don't have any financial support from Government or NGOs. Various products were also co designed for better selling in the market. Products were categorized into two categories: household textiles and apparels. Ten different article designs form each category were designed by the researcher and from that five designs were selected from each for the construction purpose. Fashion shows and live demonstration in collaboration with the artisans were organized for creating awareness where these products were showcased for the general public of Ahmedabad.

Key words: traditional textile craft, Rogan art, Ahmedabad, apparels, household textile

Introduction:

India is a country having a varied culture, which is still extremelyembedded in its antiquity and ethnicities. It possess anextensive range of traditional textiles and workmanship which provide artistic and enigmatic range of products. (Pandya.A &Vishwakarma. A, 2010)

Textiles have been produced in India since antiquity. However, very few of the old textiles and traditional textile crafts still exist. Reasons behind this could be that cloth has been regarded solely as an article of consumption, or as an art form and designs are lost through day to day wear and tear.

Gujarat has a rich legacy of weaving and handicrafts, encompassing disciplines like—*embroidery*, *tie-dye*, *block printing*, *beadwork*, ,*Rogan painting*, *metalworking*, *woodcarving*, *mata-ni-pachedi*, *applique work*, *lacquer work*, *pottery*, *patch work*, *marquetry*, *quilting*, *stone carving*, etc

Rogan painting is one of these traditional textile crafts of Gujarat which had been practiced since ancient times at Ahmedabad. The Rogan artwork of painting is an historic art over three hundred years old. The common and traditional Rogan flower motifs and designs express of a Persian influence and the word Rogan itself means oil-based in Persian. Today, Ahmedabad and Nirona in Kutch are the sole region where this work is created. When castor oil is heated over fire for more than twelve hours and cast into cold water, it produces a thick residue as gelatinous substance known as Rogan, which is mixed with natural colorings got from the earth. With a six-inch wooden stick or pen, the artisan then draws out from this a high-quality thread which is painted to the cloth. Rogan art is skillfully and accurately painted from one's very own creative innovativeness and is executed with complete concentration sitting on the floor without the use of a table-frame or any outline. Red, blue and yellow are the usual colors that are employed. *Rogan painting* is used for decorating wall hangings, table-cloth, curtains, sarees and skirt borders. (Swetha,R.G. 2017)

Floral motifs, animals and oriental architectural designs are the artist's favorite. A wall piece can take up to three months to finish. (Mahurkar U, 2005) Through age-old practices rural craftspeople have been telling stories about their day-to-day lives, their hopes and their history. Sadly, every few years many of the country's artisans abandon the crafts that have been central to their lives, in search of more lucrative employment.

Government schemes hardly reach the artisans, there is much dilution in design and educated opt for white collar jobs in cities, leaving aside their ancestral textile crafts.

It is marked that the state of Gujarat is very rich in terms of numerous crafts. The sad part is that most of these crafts are declining. Most of the craftsmen possessing extraordinary skills are leading a life of misery and poverty and are moving to other occupations to earn their daily bread, which is pushing these crafts further in the direction of extinction. To preserve this rich cultural heritage, awareness needs to be created about these crafts and these products need to be marketed in the right manner.

Artisans are not earning money as per their skill power. They are financial backward and not able to improve their lifestyle though they possess tremendous skill of making crafts. Due to their low education status and decentralized existence, primary producers often lack direct access to markets and market information, resulting in a disparity between production and market demand. Present study will be helpful to the artisans to improve their lifestyle. They will be able to upgrade their livelihood and Indian traditional textile craft will be continued. (Atler ,Dawans and, Miller, 2009)

Objectives of the study

1. To study the traditional method of making Rogan art.
2. To diversify products using Rogan art.

Methodology

Khatri family, who is the only family practicing Rogan art at Ahmedabad District, was personally approached to achieve the objectives of the present study. The interview schedule and participatory observation techniques were undertaken to get complete and authentic information. The data was collected with the help of both interview and observation methods. The schedule was prepared comprising open and close ended questions.

For product diversification, apparels and household products were prepared. Five articles from both the categories as per vogue were selected and made by the researcher. These were: Skirt, Full front short jacket, Top, Wrap around pant, Shrug in apparels and table runner,

table mats, curtain, sofa back cover and cushion covers in household products. Fashion show was organized for showcasing apparels. Opinion regarding apparel was taken by randomly selected 40 respondents (males and females) who had come to see the fashion show at ALT Training College, GIDC, Apparel Park, Khokhara, Maninagar, Ahmedabad.

For household products, each product was displayed on the table nicely so that respondents could easily get the idea about the products and able to see the product. 40 housewives between the age group of 35 years to 55 years of Khokhara area were randomly selected for getting opinions regarding the household products.

Details of Apparels:

1. Skirt: the base fabric was cotton jute blend. Motifs were diagonally placed on the skirt. Blue and orange colors were used for Rogan art.
2. Full front open short jacket: The base fabric was cotton jute blend. Motifs placed on the edges of both the front sides. Blue and orange colors were used for Rogan art.
3. Top: Cotton fabric of black color was used as base fabric. The color of the Rogan art was golden. Motifs were scattered all over the top with thick border on the hem line.
4. Wrap around pant: the base fabric was cotton. The color of the base fabric was blue and color of the Rogan art was white, orange and yellow. Motifs were placed at the hem line of the pant
5. Shrug: chiffon fabric of dark green color was used as base fabric. Motifs were scattered all over the shrug. The color of the motifs was white mixed with silver glitter.

Details of Household products:

1. Table runner: Cotton fabric of blue color was used as base fabric. Small floral motifs were used all over the fabric with borders. The color of the motifs was white yellow and orange.
2. Table mats: Six table mats were prepared by using blue colored cotton fabric. The motifs were small floral all over the mats with borders at opposite sides.
3. Curtain: Maroon colored synthetic shining fabric for curtain was used. Cotton fabric of same color was used for Rogan art and attached to the synthetic fabric of curtain
4. Sofa back: Cotton fabric of brown color was used. The design was triangular in shape.

Cushion covers: A set of five cushion covers were prepared by using Rogan art. Square patches of Rogan art fabrics were attached to the base fabric of cushion covers

Result and Discussion

The method of Rogan art was as follows:

In *Rogan art*, a paste made of castor oil and natural pigments is painted on the cloth. To prepare *Rogan* paste, the craftsman pours castor oil into an aluminium vessel and places it on a chula or earthen furnace. The mix is boiled till it becomes a gelatinous, yellow substance. A wooden stick is used to check the consistency and prevent the oil from catching fire. When oil becomes a gelatinous paste, it is set aside to cool for around five to six hours as the paste thickens.

Traditionally, stones or plant sources were used to make natural dye. Now, naphthol dyes are used. Mixture of dye includes water, white chalk powder and a binding agent. It is manually ground on a grinding stone (Plate 1 & 2) and then mixed with castor oil to form a gelatinous paste.

Plate 1: Dye powder

Plate 2 a,b,c: Manually grinding of dye

When a fabric is to be painted, the artist places a lump of Rogan paint in the palm (Plate. 3) and mixes it vigorously to form a thread-like substance (Plate 4)

Plate 3: Lump of Rogan paint on artisan's palm

Plate 4 (a) & (b): Artisan making thread-like substance for painting

Photograph no. 5: Half painted fabric folded to transfer design

Photograph no. 6: Design transferred from half painted fabric

Photograph no. 7: Painted fabric dried under sunlight

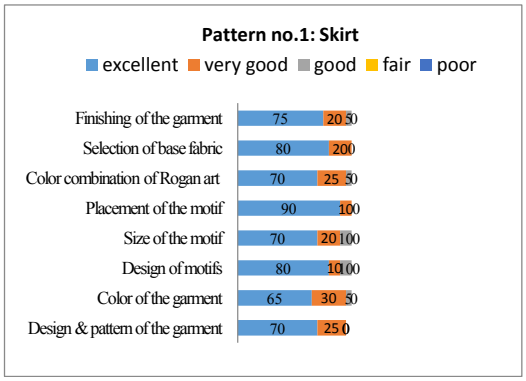
The painting is done on half of the fabric, and the other half of the fabric is folded on the painted part and pressed to transfer the design (Plate 5 & 6). This creates an identical mirror image.

The painted fabric is kept in sunlight for six to seven hours so that it is absolutely dry (Plate 7). The motifs are usually geometrical patterns and free hand designs. The paintings are done on traditional outfits like the *ghaghra*and *odhni*and also on bed sheets, wall hangings and quilts.

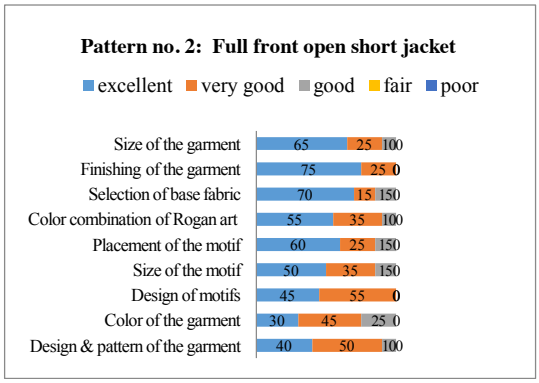
Evaluation of diversified products:

A) Apparels: Apparels were showcased at a fashion show and were evaluated by respondents who had come to the fashion show. Majority of the respondents were females (70%), maximum (55%) respondents were in the 21-30 years age group.

Plate 8 (a), 8 (b), 8 (c), 8(d), 8 (e) - Skirt, front opening short jacket, Top, Wrap around Pant, Shrug



Graph no.1

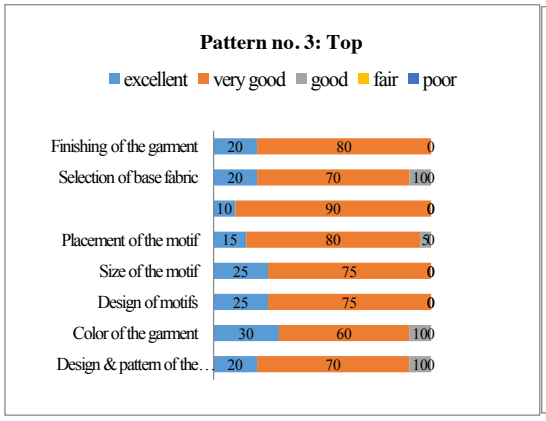


Graph no.2

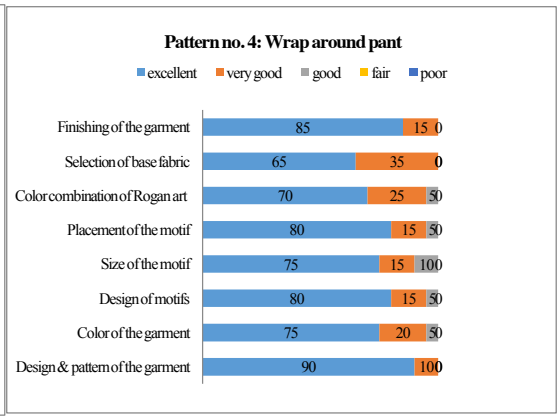
It is revealed from the graph no. 1 that majority (90%) of the respondents liked placement of motifs. 80% respondents said that base fabric and motifs used were excellent where as 75% respondents said that finishing of the garment was excellent. 70% respondents liked color combination of Rogan art and size of the motifs used as well as same percentage of respondents liked design and pattern of the garment also. Less (65%) respondents said that color of the garment was excellent.

Graph no. 2 shows that 75% respondents liked finishing of the garment. 70% respondents said that base fabric of the garment was excellent whereas 65% respondents liked the size of the garment. 60% respondents said that placement of the motifs was excellent. Color combination of Rogan art was liked by 55% respondents while 50% respondents said that size of the motif was excellent. Motifs,design and pattern of the garment and color of the garment were liked by 45%, 40% and 30% respondents respectively.

It is clearly seen from graph no. 3 that according to 90% respondents color combination of Rogan art was very good. 80% respondents said that finishing of the garment and placement of the motifs was very good. 75% respondents liked motifs used and size of the motifs. Design and pattern of the garment and base fabric was liked by 70% respondents whereas 60% respondents said that color of the garment was very good

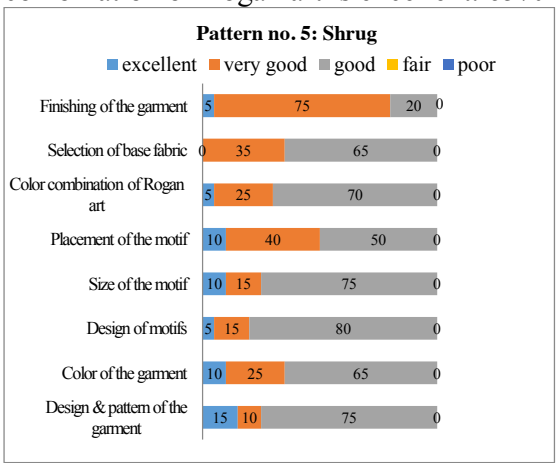


Graph no. 3

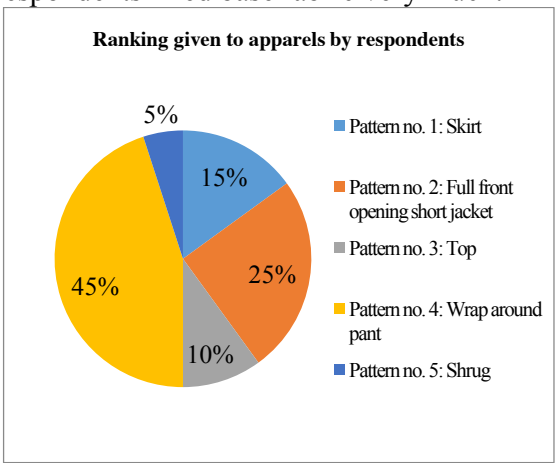


Graph no.4

Graph no. 4 shows that majority (90%) respondents said that design and pattern of the garment was excellent. 85% respondents liked finishing of the garment whereas according to 80% respondents liked motifs and placement of the motif. 75% respondents liked size of the motif and color of the garment. 70% respondents said that color combination of Rogan art is excellent. 65% respondents liked base fabric very much.



Graph no. 5



Graph no. 6

According to the graph 5, 80% respondents said that motifs used were good. 75% respondents liked the size of the motif as well as design and pattern of the garment while 70% respondents said that color combination of Rogan art was good. 65% respondents liked base fabric and color of the garment. Placement of the motif was liked by 50% respondents. very less (20%) respondents said that finishing of the garment was good.

Graph no. 6 reveals that pattern no. 4: wrap around pant got first rank given by the respondents (45%). 25% respondents gave second rank to pattern no. 2 full front opening short jacket whereas pattern no. 1: skirt had given third rank by respondents. 10% respondents gave fourth rank to pattern no. 3 top. Pattern no. 5 shrug got fifth rank by the respondents.

Household Products: 40 housewives between the age group of 35-55 years from Khokara area were randomly selected. Products were displayed on the table for getting respondents opinion regarding the products.

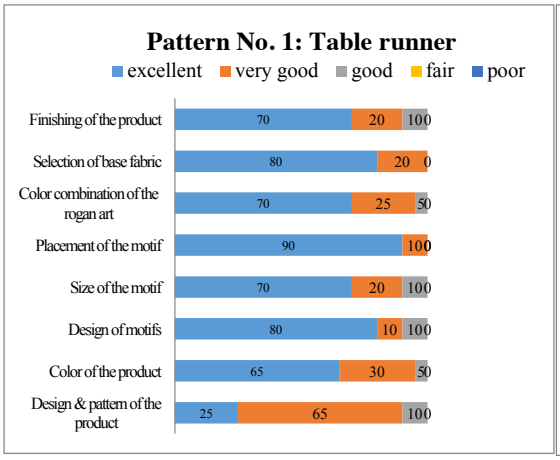
Plate. 9 (a) and 9(b) - Table runner and Table mats

Plate 9 (c) Curtain

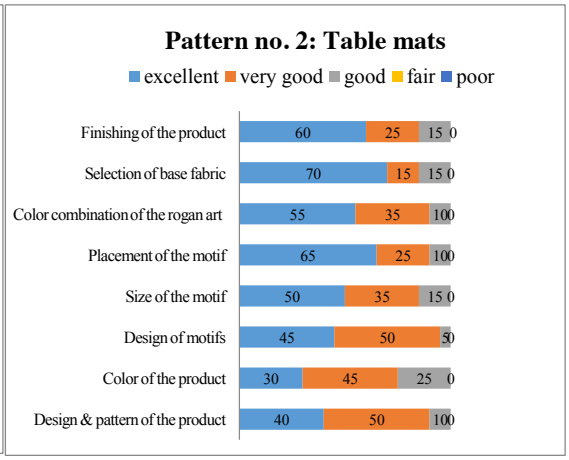
Plate 9 (d) Sofa back cover

Plate. 9 (e) Cushion covers

Graph no. 7 reveals that majority (90%) likes the placement of the motifs very much whereas 80 % respondents said that base fabric and motifs used were excellent. Size of the motifs, color combination of the Rogan art and the finishing of the product were liked by 70% respondents. According to 65% respondents, color of the product was excellent whereas design and pattern of the product was less (25%) liked by the respondents.

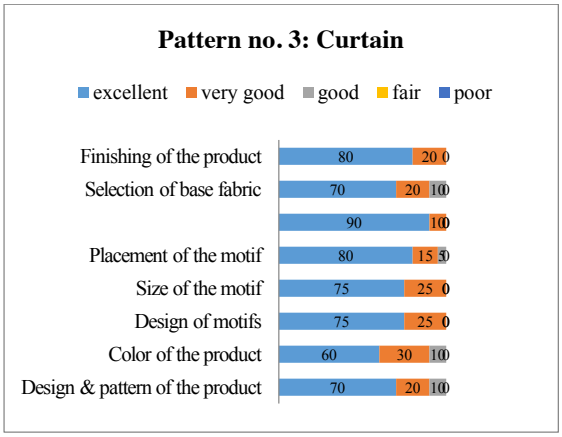


Graph no. 7

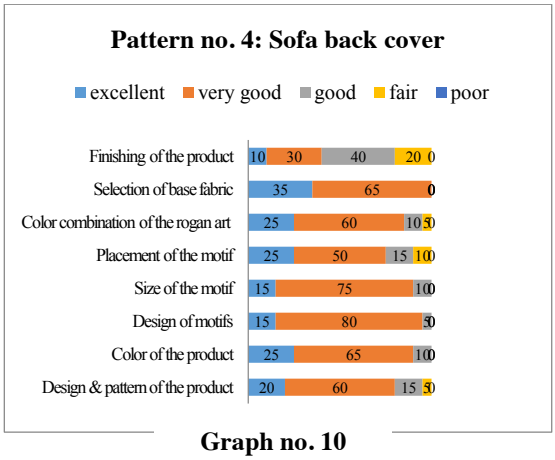


Graph no. 8

It is clearly showed in graph no. 8, that 70% respondents liked base fabric. Placement of the motifs was liked by 65% respondents. 60% respondents said that finishing of the product was excellent whereas 50% respondents liked the size of the motif. According to 45% respondents motifs used were excellent. Design and pattern of the product was excellent according to 40% respondents. Only 30% respondents said that color of the product was excellent.



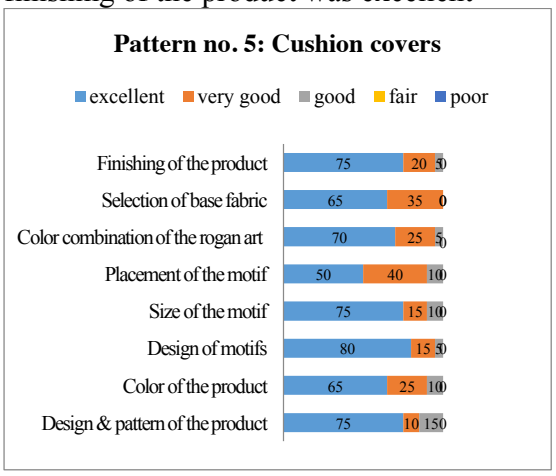
Graph no. 9



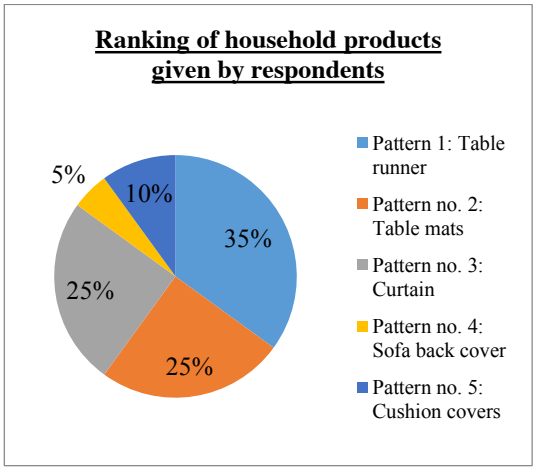
Graph no. 10

According to graph no. 9, it is observed that 90 % respondents liked color combination of the Rogan art. 80 % respondents said that finishing of the product and placement of the motif was excellent whereas 75% respondents said that motifs and size of the motifs were excellent. Base fabric and design and pattern of the product were liked by 70% respondents. 60% respondents liked the color of the product.

Graph no. 10 shows that 80 % respondents said that the motifs used were very good. 75% respondents liked size of the motifs whereas 65 % respondents said that base fabric and color of the product were very good. According to 60% respondents, color combination of Rogan art and design and pattern of the product were very good. 50% respondents liked the placement of the motifs. Very less (10%) respondents said that the finishing of the product was excellent



Graph no. 11



Graph no. 12

According to the graph no. 11, it is clearly seen that majority (80%) respondents said that motifs used were excellent. 75% respondents liked the finishing and design and pattern of the product and size of the motifs used whereas color combination of Rogan art was liked by 70% respondents. 65% respondents said that base fabric and color of the product were excellent. According to 50 % respondents, placement of the motifs used in the product was excellent.

Graph no. 12 showed the ranking of the household products by the respondents. It was observed that majority (35%) of the respondents had given first rank to pattern no. 1 i.e. table runner. 25% respondents had given second rank to pattern no. 2, table mats and pattern no. 3: curtain while 10 % respondents gave fourth rank to pattern no. 5, cushion covers. Very less (5%) respondents gave fifth rank to pattern no. 4 i.e. sofa back cover.

Conclusion

As a conclusion it was concluded from the study that the artisans of Rogan art were very extremely skilled and were able to create marvelous and enormous products using Rogan art. If they were exposed to the present market and guided in better way regarding the present era and demand of current fashion they would be able to revive this craft and could earn better money. It was also concluded from the study that to revive the craft product diversification was need as the respondents were fascinated by the products developed using Rogan art.

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DP-08

BLOCK PRINTING FOR CHILDRENS GARMENTS

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Abstract

Many traditional arts and crafts of India are slowly dying and have to be brought back to life. Hand Block Printing is an art which can be used for making every piece of cloth and design unique and different from the other. Block printing provides sustainable livelihood to many rural families, be it the block maker or the printer. It reflects human labour and sensibilities which machine made fabrics can never do. The traditional art of Hand Block Printing has played a vital role in improvising the modern attire to meet the growing demands of the society .This art has mainly been portrayed with emphasis on men's and women's apparel neglecting the young one's of the society. Small motifs printed on specific areas such as the collar, hemline, pocket, pleats introduce a decorative aspect to the garment. Keeping this in mind a research was planned to create block printed designs for children's garments. 25 motifs from each category of Natural, Stylized and Abstract designs were sketched and 4 of each were selected with the help of Questionnaire. Wooden Blocks were prepared from the selected designs & dresses were designed with specific areas for block printing. Motifs were printed on the selected areas, and the garments were constructed after printing. After development of prototype assessment was done. The respondents were of the opinion that block printing for children's garment is a fresh idea and this art could be adopted for contemporary wear. With the advent of Pigment colours this art form can easily be carried out by a layman at home thus helping in its revival. It is an easy art with widespread application which would provide sustainable livelihood to the artisans and help in preserving our age old craft.

Keywords:- Block printing, Children, Prototype, Sustainability and Revival

Introduction

Indian Handicrafts has played a vital role in the development and transmission of Culture. The growth of Handicrafts in society shows the sensitivity and development of ethnic Indian art. The cultural heritage of India is firmly bound to its handicrafts. It is a creation woven out of dedication to beauty.

Textile design is that craft which enriches the surface of the fabric and is produced by the artistic arrangement of motifs in different colours. Designs can be obtained by weaving, painting, printing and embroidery.

Block printing enables one to translate very complicated designs into permanent form. These patterns have originated in the natural form and then gradually been modified to suit the taste and fashion of modern times. Block printed fabric has crossed the thresh hold of use in traditional form and stepped into the modern fashionable world.

Children are no longer treated as ordinary human beings but have been given an identity of their own. Mothers like to dress up their daughters in frills, flounces, laces and ribbons. Children have been deprived of this traditional and beautiful art. Block Printing usually caters to the whims and fancies of the older generations and its simplicity has not yet reached the children's apparel.

Block printing on Children's garments will tend to introduce another decorative aspect to a simple dress. Designs can be produced with ease and printed on children's wear. Motifs selected for children should be various form of animals, birds, flowers and nursery prints. Yokes, collars, sleeve bands, hemlines, pleats when printed with blocks beautify a rather simple dress.

Block Printing provides sustainable livelihood to many rural families be it the block maker or the printer. It is an easy art with wide spread application which would provide sustainable livelihood to the artisans and help in preserving the age old craft.

Objectives

Fashions are subjected to fresh and new innovative ideas, creativity, and necessity. Block printing being a traditional art has been gaining importance. Modern demands facilitate the survival of this art. Due to the use of traditional designs which did not appeal for children's wear they were deprived of this beautiful and simple art. Hence the investigator felt the need to divert a little from the usual traditional prints and introduce this art for children's wear.

1) To design suitable motifs for the preparation of blocks.
2) To design dresses with selected areas for block printing.
3) To print the selected design on the garment.
4) To construct the garment after printing
5) Analysis of the printed design on the constructed garment

Limitation

1) The study is limited other use of cambric cloth
2) The colour of base fabric is limited to cream
3) The study is limited to the construction of A-line frocks for preschool girls

Methodology

The main aim of the study was to create block printed designs for children's garment. For this purpose an experimental research was undertaken. The procedure has been explained as follows:

1) Designing suitable motifs for the preparation of blocks
2) Placement of motifs on A-line dresses
3) Selection and preparation of the fabric
4) Drafting, cutting, printing and construction of the A-line dresses
5) Evaluation of the constructed garments

Designing suitable motifs for the preparation of blocks

For this purpose the motifs were divided into three categories, namely:

1) Natural
2) Stylised
3) Abstract

25 motifs were designed for each category and preferences were taken through a preference schedule in order to get the best 4 preferred design from each section. 65 respondents were selected from the faculty of fine arts and the clothing and textile department of the faculty of home science. In all 12 motifs were selected which were given to the block maker for the preparation of blocks.

Placement of motifs on A-line dresses

12 frocks were sketched with printing on various areas. The investigator and staff members of the department selected 4 style of A-line dresses carry out printing so that different areas of the garment would get covered. The area of printing would be collar, yoke, pocket, hemline, pleats etc. Placement on the dress was done according to the size of the block. The three categories of motifs was kept constant for each style in order to print frocks with a natural, stylized and abstract motifs.

Selection and preparation of the fabric

A closely woven cream colour cotton cambric fabric of Jupiter mill was selected for the printing and construction of the A-line dresses.

Preparation of fabric for printing

The fabric was thoroughly scoured in a bath containing MLR (1:30), soap 2g/l and soda ash. The fabric was boiled for 30-45 minutes in order to remove all the impurities, sizing etc. which were applied during the weaving process. After boiling the fabric was rinsed well with water and left to dry.

Drafting, cutting, printing and construction of A-line dresses

The basic block was drafted according to the chest girth of 49.8 cm. From the basic block adaptations were made for the various styles. The layout was done on the fabric, the required lines marked and cut according to the required shape. After cutting placement of the motifs was done according to its size. The collar, pockets were cut in rectangular shape so that the shape of the curved areas is retained which otherwise might get distorted while handling during after treatments. Small pieces were cut due to the limitation of the laboratory facilities. On a commercial basis, the placement could be done on the fabric itself and the entire fabric could be given the after treatment.

Printing of the A-line dress

Following steps were undertaken for the preparation of the A-line dresses.

1) Preparation of the printing table: A table of the required length and width was taken and covered with two layers of blankets and four layers of jute. Over this, another four layers of muslin was stretched and nailed on the sides to give a good padding surface.
2) Preparation of the printing paste: Solubilised vat dye with a 4% shade was used to prepare a printing paste. After printing the fabric was dried in a room and steamed in a steamer so that the colour would develop properly. After developing, the samples were thoroughly washed with soap and water to remove the traces of acid.
3) Construction of the A-line dresses: After printing the A-line dresses were constructed according to the chosen four styles. Total 12 A-line dresses were constructed with selected motifs from the three categories.

Evaluation of the constructed garments

1) Sampling procedure: A sample size of 50 respondents from TYBSC, Jr. MSc., Sr.MSc. and PhD were selected on a purposive sampling basis as these respondents had an idea of block printing.
2) Data collection: For the collection of data, a questionnaire was formulated with more close ended questions and a few open ended questions.
3) Analysis: The questionnaire elicited information pertaining to
    a. The acceptability of the traditional art for contemporary wear
    b. The acceptability of the designs at the ready-made stores
    c. Combination of other form of decoration with block printing
    d. Acceptability of block printed design on other articles for children
    e. The data collected was tabulated and subjected to statistical analysis wherever required; percentage analysis and ranking method was used. These methods were selected and used because of the objectivity and accuracy.

Findings and discussion

The results of the study have been divided under the following subheadings:-

1) Preliminary data of the fabric and dyes used for printing.
2) Designing of suitable blocks for children's garments.
3) Printing and construction of the selected A-line dresses.

Preliminary data of the fabric and dyes used for printing

Cotton cambric cloth of Jupiter mill was selected for the printing and construction of the A-line dresses. Solubilised vat dyes manufactured by Rainbow Industries Baroda was selected for printing. Colours used were :-

Name of the Dye	Percent Shade%
Artexol Golden Yellow IRK	4
Artexol Pink IR	4
Artexol Green IB	4
Artexol Brill Violet	4
Artexol Orange HR	4
Artexol Red Violet RF	4
Artexol Blue 04R	4
Artexol Scarlet IB	4

Designing of suitable blocks for children's garments

Designing of motifs was done in three categories i.e. Natural, Stylized and abstract. A Questionnaire was formulated to collect information regarding the feasibility and acceptability of the traditional art for contemporary designs for children's wear. Information regarding whether block printing for children's garment is a fresh idea or not was also obtained from the questionnaire.

Results of the preference schedule for the selection of the design for the preparation of blocks for the study

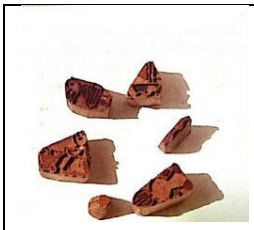
Preference was taken for the best four motifs in each category. The four motifs getting the highest frequency were selected for the preparation of the blocks. The table below gives the preferences of the respondents for the design of the blocks.

Table 1- Preferences of the respondents for the Design of the Blocks

NATURAL			STYLIZED			ABSTRACT		
Design no	**No. of respondents**	**%**	**Design no**	**No. of respondents**	**%**	**Design no**	**No. of respondents**	**%**
9	36	55.38	16	30	46.15	25	35	53.84
24	35	53.84	22	28	43.07	6	31	47.69
5	28	43.07	13	25	38.46	14	30	46.15
4	23	35.38	17	18	27.69	10	25	38.46
2	13	20.00	2	15	23.07	17	20	30.76
23	13	20.00	9	14	21.53	9	15	23.07
1	12	18.46	15	13	20.00	18	13	20.00
25	12	18.46	3	12	18.46	20	12	18.46
10	11	16.92	11	12	18.46	1	12	18.46
15	11	16.92	5	10	15.38	4	10	15.38

Plate1 Selected Motifs

Table 2- Prepared Blocks

		
Stylized motif	**Natural motif**	**Abstract motif**

After studying the preferences of the respondents the following motifs were selected for the preparation of the blocks. These 12 motifs were taken to the block maker for the preparation of the blocks. These motifs were later printed on A-line dresses. The A-line garments were printed and constructed to study the feasibility of the research.

Analysis of the printed and constructed garments

The analysis of the selected garments was carried out through a questionnaire. Opinion of the respondents was taken to get information regarding the Preference of the motif for each style.

1) Responses on block printing for children's garments as a fresh idea.
2) Adaptation of this traditional art for contemporary wear.
3) Acceptability of the garments at the readymade store.
4) Suitability of only block printed design or in combination with other forms of decoration.
5) Suitability of this art for other children's articles.
6) Acceptance of an overall block printed fabric over those on a specific area.
7) Opinions on block printings for children's garments.

1. Style no.1- After analysis of the respondents preference it was observed that Stylized motif was liked most followed by natural motif and abstract motif obtained 3rd rank.

2. Style no 2- In this particular style Natural motif was the most preferred motif of the three followed by Stylized and the abstract motifs
3. Style no 3- After analysis it was evident that Stylized motif was liked the most followed by natural motif and the abstract motif respectively.
4. Style no 4- In this particular style of dress. Natural motif was the most preferred motif of the three followed by Stylized and the abstract motifs.

Table 3- selected designs

Natural Motif no.	Stylized Motif no.	Abstract Motif no.
4	1	6
5	13	10
9	16	14
24	22	25

Table 4 - Prepared designs preference of the motif for each style

				
Printed with stylized motif	**Printed with natural motif**	**Printed with stylized motif**	**Printed with stylized motif**	**Printed with natural motif**

After analyzing all the 12 garments it is concluded that the stylized and natural motifs were liked by most of the respondents. The Abstract motifs were not preferred when compared to the other two and was ranked third in all the styles.

Responses on block printing for children's garments as a fresh idea

It was clear from the data analysis that all the respondents felt that block printing for children's garment is a fresh idea. When the same question was put forward earlier only 93.85% of the respondents felt that it was a fresh idea. This could be attributed to the garments displayed and actual conceptualization of the idea. Initially it was only the visualization of the idea.

Adaptation of this traditional art for contemporary wear

All the respondents showed a liking for this traditional art and agreed that it could be adopted for contemporary wear. The main reason could be the use of modern and contemporary designs for children as well as the localized application. Till now only all over designs in block prints were available in the market.

Acceptability of the garments at the readymade store

After analyzing the data it was observed that these block printed garments would be purchased if made available at the retail stores. All the respondents were in favour of buying it from these stores.

Suitability of only block printed design or in combination with other forms of decoration

Opinion of the respondents was taken whether only block printing would look good on children's wear or in combination with other form of ornamentation such as block printing combined with Hand Painting, Embroidery, Applique work or Bead Work. After analysis it was evident that 78% of the respondents liked the combination of Embroidery and block printing the most .Many of them liked it with Applique work whereas some preferred it with painting.

Block Printing gives a flat effect lacking depth. These various combinations would help in creating a relief or 3 dimensional effect enhancing its beauty and appeal.

Suitability of this art for other children's articles

Many of the respondents were of the opinion that Block Printing would look very nice on skirts, followed by blouses and shirts. It was not much appreciated on trousers and shorts.

Many of the respondents considered Block Printing suitable for Pillow Covers, Bed Sheets, Bibs, Feeders, Hats etc.

Acceptance of an overall block printed fabric over those on a specific area

Once this question was asked to the respondents it was observed that only 22% liked an overall printed fabric while 74% preferred printing on specific area.4% of the respondents stated that the choice would depend on the design of the fabric and style of the garment.

Opinions on block printings for children's garments

An open ended question was put forward to find out the opinion of the respondents on the study. Most of the respondents felt that it would add new dimensions in the field of children's garments giving variety to the wardrobe. This study could be of high commercial value due to its time saving factor. This would provide self-employment to the people and open up new horizons for the artisans .It would also help in sustaining the craft and help in innovation of new products.

Summary, Conclusion and Implications:

Textile Design is an art that enriches the surface of the fabric. New designs can be created by the use of various traditional arts such as embroidery, Applique , Printing etc. The traditional arts have played a vital role in improvising the modern attire to meet the growing demands of the society. These designs enhance the beauty and the overall aesthetic appeal of the garment hence opening up new vistas for creativity. Traditionally Block Printing has been portrayed with emphasis on women's apparel neglecting the young one's of the society .Mothers like to adorn their dresses in frills, flounces, laces , embroidery, painting etc ,however much thought has not be given to the application of block printing for children's wear. Contemporary designs tend to be simpler and more suitable to modern times. Block Printing is a convenient and simple method of adornment catering for individual use or mass production.

So this Traditional art was studied and revived by adapting contemporary designs for children's wear .Small motifs printed on specific areas such as collars ,hemlines, pockets, pleats ,introduces a new dimension to the garment. Thus the research was planned to create block-printed designs for children's garments.

On analysis after printing and construction of the dresses all the respondents were of the opinion that block printing for children's garment is a fresh idea and that this art could be adopted for kid's clothing. They would purchase the dresses with block printing done on specific areas if made available at the garment stores. They gave the suggestion that as block printing gives a flat effect lacking depth hence if it is combined with other

form of fabric decoration such as Embroidery, Applique or painting it would help in creating a three dimensional effect enhancing its beauty.

The respondents also felt that this study would bring about newness and would be of high commercial value due to its time saving factor. It would also provide self-employment and open up new horizons for the artisans

Recommendations

1) A study could be carried out on Block Printing accessories of children.
2) Combining block printing with other methods of decoration like embroidery, Applique, Hand Painting, could be carried out.
3) A similar study could be done by combined various motifs to give a new look to the garment.

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PHULKARI BEYOND GEOMETRY

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Abstract

India is a country of countless heritages of cultural arts and crafts. It has myriad, exquisite varieties of woven, printed, painted and embroidered textile crafts all across the length and breadth of the country. Punjab is one such state well known for its vibrancy in lifestyle, food and textiles and clothing. *Phulkari*, the most popular embroidered craft from Punjab is known for its vivacious colours and striking patterns. Until mid 20th century it was a non commercial craft practiced by the women of Punjab to present it to their daughters at the time of their marriage. It was embroidered with auspicious motifs in order to bless the bride for her new commencement of life which would also protect her new beginnings from evil eye. These embroidered motifs conveyed profound symbolisms. But with course of time, majorly after the partition of 1947the craft supported the partition survivors to feed their families and help them sustain the basic needs of life. Since then it took the course of commercialization. Today this craft is facing a lot of contemporisation in terms of its motifs. Hence, the need for this study is essential for the craft to survive the exploitation it is facing currently due to modernized industrialization. The main objective of this paper is to investigate *phulkari*motifs beyond common geometric designs and patterns which now-a-days are prevalent in the market. It is observed that with the developing technologies, producing an imitation of any embroidery has become extremely easy, which therefore have exterminated the true essence of this beautiful traditional embroidered textile craft. The methodology followed to achieve above objective is in-depth study and documenting the artifacts in National Handicrafts and Handloom Museum, Delhi. The paper deals with comprehensive understanding of few exquisite artifacts studied in NHHM for its detailed study with regards to its significance of motif, colour and its relativity to socio cultural connotations. This study attempts to revive the lost motif vocabulary in order to not only create awareness about the craft's rich history but also its potential to cater the ever demanding fashion and market.

Key words: *Phulkari*, Sainchi, Handicrafts, Museum Textiles, Motifs.

Introduction

India has a rich cultural heritage of a lot of celebrated epics which are popularly known asHindu mythology. Hindumythological stories are narratives found in Hindu texts about heroic stories of Gods and their deeds of wisdom. Indians have been following these mythological stories since time immemorial to live a life in order to fulfill its purpose. Prominent themes in Hindu beliefs include*dharma*i.e ethics and duties, *samsara*i.e the continuing cycle of birth, life, death and rebirth, *karma*i.e action, intent and consequences, *moksha*i.e liberation from *samsara* or liberation in this life and the various *yoga*i.e paths and practices.[1] These themes in the form of stories have been popularly followed by majority of people in India. Such mythological stories also include

stories about victory, stories of war, stories of love and affection, stories of kindness, stories of paying gratitude to others and a lot more. Indian mythological stories with the depiction of good and bad deeds have been the source of inspiration to a lot of artists across the country and world.

The same myth typically appears in various versions, and can be represented differently across socio-religious traditions. These myths have also been noted to have been modified by various philosophical schools over time and particularly in the Hindu tradition. These myths are taken to have deeper, often symbolic, meaning, and have been given a complex range of interpretations.[2]

Such depictions or celebrated events have been translated in the forms of various arts and crafts. Each of these depictions signifies a message. These can be found in the motifs used in various crafts, the colours used or the placement of a motif amongst other motifs. To summarize these crafts were a medium of depicting these values to people in their times.

Such similar patterns and depictions of stories have been observed in an embroidered craft of Punjab popularly known as *sainchiphulkari*.The term*Phulkari*stems from *phul*, which means flower, and*kari*, which means work. So the name translates as flower making. The embroidery is done with untwisted floss silk threads to simulate the effect of brilliant, coloured flowers. *Sainchi* is one such kind of *phulkari* which was embroidered with figurative motifs unlike geometrical patterns used in other *phulkari* and *baghs*.But with the course of time these motifs have been lost and are not practiced any more. One can only witness these in the artifacts with personal collectors or the textile and craft museums. Post partition the partition survivors had started selling their belongings in order to feed their families and that is when the trading of these valued textiles took place. With the time passing buy the trading took the turn towards commercialization where people started making *phulkaris* and selling them as business in order to support their families. The motifs were lost in this time as the symbolisms or the values or even the love with which it was made was no longer the main purpose or idea of making *phulkari*. Hence choice of motifs which were quicker to make were picked up. To add to the commercial turn that *phulkari* had taken the introduction of machine embroidery became a boom. It took over the market of hand embroiderers. It was even quicker to make number of *phulkari* pieces in very less amount of time. The combination of colours and patterns was also very easy. Experimentation with different fabric types was as convenient. This complete time that struck the embroidery is the major reason of the motifs not any more popular as the geometric ones.

Objectives

The main objective of this study is to investigate such figurative motifs which have been used to depict the stories and social messages of olden times and also to discuss the socio cultural message and symbolisms it conveyed.

Methodology

The methodology followed to achieve above objective is in-depth study and documenting the artifacts in National Handicrafts and Handloom Museum, Delhi. The researcher has undertaken one *sainchi phulkari* from the collection. These have been studied and documented in detail focusing the motifs to decode its symbolisms. It is an attempt to interpret its socio cultural representation and its meaning.

Findings and Discussion

*Sainchi phulkari s*are a kind closely linked to the mother goddess, locally known as *sanjhimata*. This goddess is associated with agriculture and worshipped during the during the *navratris*.

Figure.1: *Sainchi Phulkari*
Picture Courtesy: National Handicrafts and Handloom Museum, New Delhi.

Figure 1a: Centre piece of *Sainchi* magnified, consists a geometric representation of lotus motif surrounded with peacocks and *kikkar* flower filler motifs
Picture Courtesy: Crafts Museum, Delhi

The *sainchi* typically depicts daily village life with its trials, tribulation, joys and aspirations. Unlike other embroidered *chaddars* from Punjab that are geometric and abstract in their imagery, the *sainchi* is figurative in its expression, pieces narrating life in the villages of south east Punjab. Local animals are represented moving amongst wrestlers, farmers, weavers etc. train is also often displayed on *sainchi*phulkari this means of transportation brought by the British in the second half of century, having had a big impact on local population life. The geometric designs seen in the *baghs* are primarily associated with Muslim communities, which reflect the Islamic restraint on work. Hindu and Sikh*phulkaris* like*sainchis* incorporate human figures, animals, flowers and birds, presentinga rich repertoire of life. They depict scenes of everyday life. These are interspersed with stories of epics, myths, personal aspirations and desires.

Beyond their aesthetic values, *sainchi phulkaris* can be compared to our now a days media as they depict the ways of life interests and environment of the old time and rural people of Punjab. In addition they were produced in a relatively small area namely Firozpur and Bhatinda districts and also required a high embroidery skills.

Fig 1b: A figurative motif depicting Shravan Kumar
Picture Courtesy: Crafts Museum, Delhi

Fig 1c: A depiction of sacred blue roan horse in stable
Picture Courtesy: Crafts Museum, Delhi

Fig 1d: A of jewellery embroidered in yellow gold silk floss thread.
Picture Courtesy: Crafts Museum, Delhi

These are all the reasons it became so appreciated by the collectors and occupy a very unique position among the different varieties of *phulkari* in those days.

The research discusses one such unique master piece of *phulkari* from the collection of National Handicrafts and Handloom Museum.

Each exquisite piece of *sainchi phulkari* (fig.1) comes with a story. The above figure has a central piece of a circle, enclosed with an abstract geometric lotus shaped flower. *kikkar* flowers, popularly known as Acacia Arabica are used as a filler motif between the blank spaces in the circle and lotus. The lotus is regarded in many different cultures especially in the eastern religions as a symbol of purity, enlightenment, self regeneration and rebirth. Its characteristics are perfect analogy for the human condition: even when its roots are in the dirtiest waters, the lotus produces the most beautiful flower. The symbolic meaning of a lotus is to overcome the pain that prevails in the material world and become enlightened just like the lotus flower which starts to grow in the dirty and muddy water but manages to surpass the water and produce a perfect flower. Many Hindu gods and goddesses are depicted sitting or standing on a lotus flower for the same reason. [3]

The circle is outlined with the geometric shaped abstract peacocks guarding the lotus. The peacock is the symbolism of vision, royalty, spirituality, awakening, guidance, protection and watchfulness. In Hinduism it is associated with the Goddess *Lakshami* who is a deity representing benevolence, patience, kindness, compassion and good-luck. [4]The researcher observed that most of the *sainchis* have the central piece embroidered with the lotus in abstract form and surrounded with peacocks. This arrangement typically symbolizes that leaving behind all the material satisfactions one must concentrate on true path of enlightening one self. It can also be interpreted that one must leave behind all the negativity and lead towards a positive attitude and way of living.

The surrounding area of the centre piece is covered with motifs inspired from daily life such as a man exercising and a women spinning yarn. These motifs depict the simple and healthy way of living life; a day full of activities, engaging each one to achieve joy in whatever they did. There are also motifs depicting the story of Shravan Kumar. Shravan Kumar was a mythological character whose short life is depicted in Ramayana an ancient Sanskrit epic. Shravan Kumar's parents were hermits. His parents having become quite aged and therefore wanted him to take them to forty places of pilgrimage. It is a typical Hindu belief that pilgrimage to various shrines and holy places, undertaken in old age, purifies the soul. At the time the transport was scarce and costly. Shravan kumar could not afford it. Hence he decided to put each parent in a basket and tie each to an end of a bamboo pole, which he would shoulder while on their pilgrimage. Therefore he is revered as dutiful son. [5]the message the embroiderer want to give here is one must endeavour qualities like Shravan in them.

The other motifs include a horse embroidered with blue thread enclosed in a square stable. In Sikhism a blue horse holds immense importance. As it was Shri Guru Gobind Singh ji's personal riding horse. He was the tenth and last Sikh guru. A blue coloured roan horse does exist and is very rare to find. It is therefore associated with the tenth guru in his respect by Sikhs. The embroiderers cannot embroider the guru for various reasons; it would be treated like paying disrespect to the sentiments of people of the community and if handled unmannerly it would hurt people's emotions. Therefore a representation of His presence in the form of a blue horse was embroidered and enclosed in a sacred stable here in a square outlined shape.

There is another collection of motifs which represent bridal jewellery. This collection of motifs includes a hair accessory which sits on the forehead at the hair line commonly known as *mangtikka*, a huge circular nose pin and a pair of ear ring. These are embroidered with golden yellow silk floss threads to represent the jewellery made out of gold. It is well said that jewellery is

Fig1e: Embroidered locomotives. The two pictures describe the horse-carts and train.
Picture Courtesy: Crafts Museum, Delhi

very close to a woman's heart and she likes to flaunt it but keep it protected as well. In India a bride is supposed to heavily adorn jewellery on her wedding day. The people of groom's side judges the bride's father's status and prosperity based on the amount of jewellery the bride wears.

Therefore in olden days the jewellery for bride was made right from the time the girl was born keeping in mind the expense that goes in it. Therefore the bridal jewellery set is usually embroidered in *sainchi* to showcase the prosperity of the bride's family and the love and affection of the family with their daughter. The jewellery set is also often enclosed in a border which represents that it is kept safe. It is also observed that it is surrounded with birds and animals, specifically peacocks and snakes to guard the jewellery from evil eye. Peacock as it has the symbolism of a protector as discussed earlier and snakes especially *nagas* according to Hindu mythology were believed to produce gems on their hoods, therefore were a sign of wealth. [6]Snakes in Hindu mythology are also associated with gods like lord Shiva who wears it around his neck, Lord Vishnu who sleeps on snake, Ganesha who wears it like a belt, Kartikay who has a snake beneath his foot and so on. A snake with hood represents Anantaa mythological snake on which lord Vishnu slept. It is said that poison of snake Ananta could destroy the whole world. Hence it also represents destruction.

On observing the two ends and the motifs lays on top of each other in rows it is seen that one side is embroidered with horse chariots one behind the other and on the other side is a train with passengers travelling in it. As discussed earlier transportation in those days was many done by bullock carts, horse chariots or palanquins. British people when were ruling introduced Indians with faster means of transportation like motor cars and trains. However both were faster but people got more fascinated towards trains as one could travel long distances in very short period of time. Therefore both the mediums of transportation were embroidered to represent the changing and developing times.

Fig1f: A depiction of Krishna and his *gopis*.
Picture Courtesy: Crafts Museum, Delhi

The researcher observes the last two embroidered lines towards both the ends that are of human figures. These are majorly female with pots carrying on their heads. The

embroiderer has thoughtfully embroidered two lines of female figures wearing a traditional dress of Punjab consisting that of *salwar* and *kurta* and the other wearing a traditional dress of Haryana consisting that of *ghaghra* and blouse. Both the traditional costumes were quite prevalent in the old Punjab which included Haryana. On observing closely the researcher observes that there is only one male figure embroidered. This part of *sainchi*re presents Lord Krishna another mythological character and his *gopis* the cow-herding girls. Lord Krishna is known for his affection with *gopis* around villages that he went. Lord Krishna is the god of compassion, tenderness and love in Hinduism and is one of the most popular and widely revered among Indian divinities. He is portrayed in various perspectives like a god child, a prankster, a model lover, a divine hero and as a universal supreme being. *Gopis*is referred to a group of cow-herding girls famous for their unconditional devotion to Lord Krishna as described in Bhagavata Purana literature. Here the embroiderer has also tried to depict his cheerful and playfulness through embroidery. On the border it is observed that Lord Krishna is playing around with the pots of two *gopis*. Lord Krishna's nature is described to be playful, cheerful and mischievous, but only to spread love, happiness and wisdom.

Summary, Conclusion And Implications

All above discussed meanings and symbolisms of the motifs depicted in *sainchi* were very thoughtfully embroidered by the embroiderer. Each one of the motif is embroidered to give a message to the viewer and take a positive message from *sainchi*. *Sainchi* was used as a media in those days to communicate values and morals of life and was the only way of giving colossal wisdom embroidered graphically in one frame. The colour schemes were picked up to be of a bright colour palette like bright golden yellow, green, orange, magenta, olive green, pearl white, indigo blue. The *sainchi* discussed in this paper is embroidered in Yellow, maroon, white, indigo blue in silk floss and cotton embroidery threads. It is embroidered on a black coloured khaddar fabric with running stitch, double running stitch and herring bone stitches. The length of the stitches is between 0.2 to 1.2 cms approximately.

To conclude, *sainchi* is one of its kinds of *phulkari* with figurative motifs which have been lost with time. To revive these figurative motifs is an effort the researcher wants to attempt. The revived motifs would express the stories of the current times. The impact of reviving *sainchiphulkari* will be not only to give craft a new life but also the artisans a new set of motifs to embroider on their existing products. To match and cater the ever demanding fashion market's need, coming up with new innovative design ideas is very much required. Therefore the revival of the craft to give it a new life and the market creative avenues is necessary.

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DP-14

DESIGN INTERVENTION ALONG WITH THE TEXTILE DESIGN WORKSHOP AT TARAPUR AND UMDEPHUR

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Abstract

India is known for its diversity of culture, languages and art work. India lives in its villages as 70% of the population living in rural areas and mostly engaged in agricultural and related activities. In rural areas handloom and handicraft is one of the most important economic activity after agriculture in terms of both providing employment and earning. The Malwa region of west Madhya Pradesh was a very popular traditional printing center for cottons, however lost its prominence and is now almost unknown. As time passing the designs started losing its importance and got extinct. Thus the researcher was interested in revival of Tribal prints of Tarapur and Umdephur, as there are few printers left.The paper discusses the challenges faced by rural Hand printed artisans of *Tarapur* and *Umdephur* of Madhya Pradesh, India. The present study was focus on Training programne.

Keywords: Hand-block Print, Tarapur & Umedphur, Training Programme

Introduction

Indian traditional textile is a synthesis of various cultures.India has a rich heritage of manual work in handicrafts like: hand block printed textiles, blue pottery, jems, jewellery, sculpture, textile screen printing, and wood handicraft etc.

The hand printing industry is spread all over the India. The ones which follow the traditional techniques are found in desert belt e.g. Jaipur, Pali, Chittorgarh, Mathdwara, Jodhpur, Jaiselmer, Akola , Jawad, Mandsaur, Barmer, Sanganer, Bagru of Rajasthan a north-west state of India can be described as the land of most colourful dyed and printing textile of India.

Madhya Pradesh commonly known as the heart of India was the largest state in the country before the formation of Chhattisgarh, which broke away from Madhya Pradesh in 2000. Madhya Pradesh is known for many beautiful places like Khajuraho, Mandu ,Ujjain, Gwalior and it is also the hub of some of India's finest monuments of various religions like Hinduism ,Islam and Buddhist. In addition, the handicraft of Madhya Pradesh, which has a touch of its distinct traditions, also features as an appealing attraction of the state.

The Malwa region of west Madhya Pradesh was a very popular traditional printing centre for cottons , however lost its prominence and is now almost unknown. Different techniques are practiced here such as direct dyeing and printing and resist printing. Jawad was once the centre which exported the renowned Jazams to outside countries. The main villages where printing is still practiced are Tarapur and Umdephur a place near Jawad tehsil headquarter of Neemuch District in Madhya Pradesh.These

villages were under the princely rule and were renowned for their textile printing however with time due to lack of transportation and tourism this region went into oblivion. The Gambhiri river gently flows between the two villages. The success of this village for dyeing and printing works attributes to the moderate climate; also it is situated on the plains so it is very helpful for drying cloths on it. People do not have to search place for their material to be dried. The main occupation of this village was dyeing and printing.

The villages of Jawad, Tarapur and Umedphur specialize in *Nandana* and *Jawariya Dana* prints, Dabu and discharge techniques are used for the traditional motifs. From last many centuries this work was known and worn as a tribal print in the form of "*odhani", "lugda","gaghra", "paghdi", "safa", "angochi*"by villagers and tribes of the Nimar area. This craft is now practiced only by a few families of these villages namely Tarapur, Umdepur, Athana around Jawad.

The present study is an impart knowledge of textile design among the artisan.

Research Methodology

The research design for the study is as follow:

Imparting knowledge

↓

Pre – testing Questionnaire

↓

Post – testing questionnaire

↓

Analysis

Result & Discussion

The results have been discussed under the following sub-heads:

(KNOWLEDGE OF TEXTILE DESIGN AMONG THE ARTISAN)

Duration - 2 day of workshop (5 – January – 2017 to 6 – January – 2017)

Timings – 10:30 to 5 pm

Participants - *Pardeep Jhariya*, *Pawan Gangwar*, *Banwari & Pawan Jhariya*

Venue – Gangwar hand printer workshop in *Tarapur*.

This program was planned to improve the artisans performance at workplace, to update knowledge and to enhance their design skills and to help them to stay in the market.

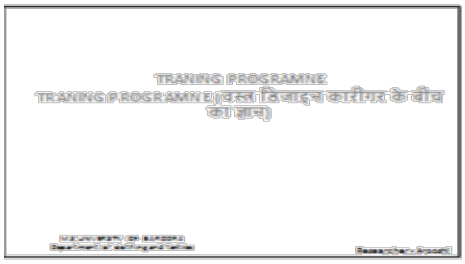
Planning and development of the content

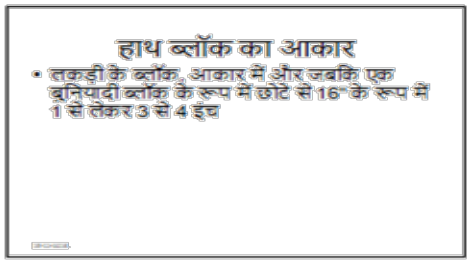
The collected data on design practice was planned and arranged in meaningful manner for the purpose of preparing the content for teaching visual aids, experimental exercise and discussion method.

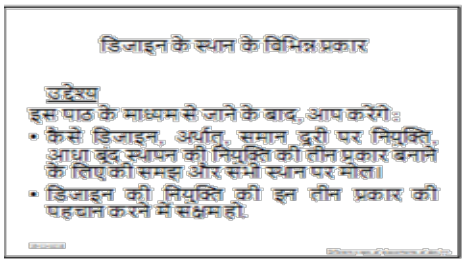
The content of the teaching material was planned in the following-

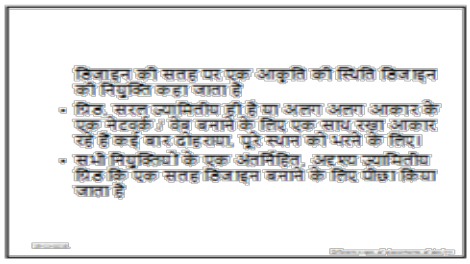
- Types of motifs- Geometric, Natural Abstract, Stylized. Types of layouts - Side, Half drop, Border, All over .Motifs – Styles and Colour Combination.
- Power point presentation and some sample of the block printed fabric for the references.
- Steps in different layouts.

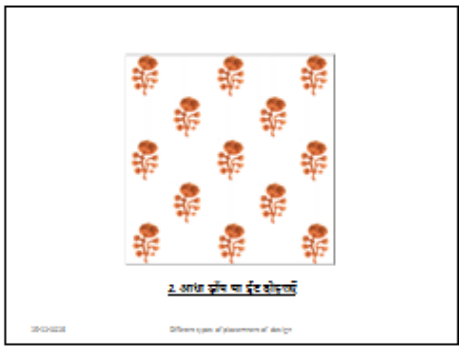
- Appropriate design for particular end use.

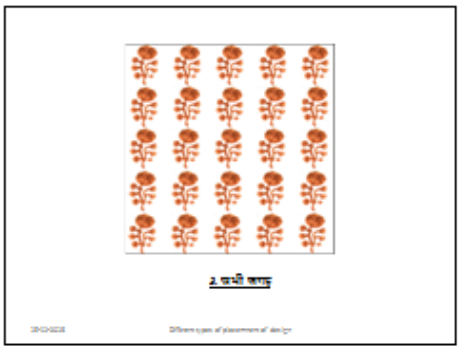












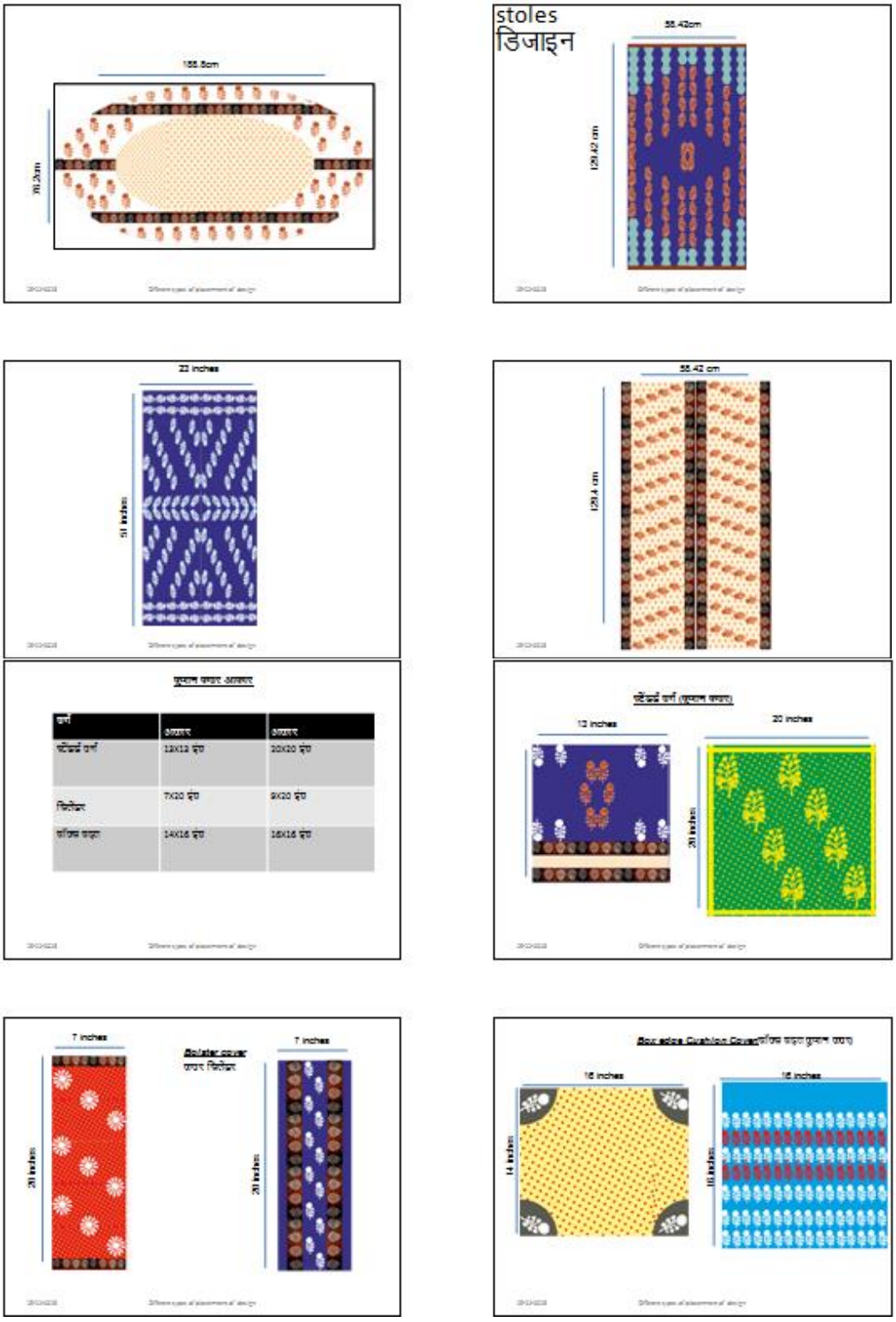


Plate 1 - PowerPoint presentation on textile design for training programme

Training program in textile design.

Researcher started training with definitions of motif, pattern and design, different placements, and allows the artisans to practice with different placements on fabric under researcher observation. To increase aesthetic appeal use of different blocks and use of different colour combination within their limitations on their product were guided. PowerPoint presentation in national language was introduced to the trainee to learn about things which were above mentioned.

Plate 2- During training programme

The main objective of this Training Programme was-

- Acquire an understanding of how to make three types of placement of designs, namely, equidistant placement, and half drop placement and all over placement.
- Be able to identify these three types of placement of designs
- Determine the suitable placement for the design.
- Describe design and its various types.
- Differentiate between motif, pattern and design.
- Make possible modifications in the design.

Activity

- Cloth samples of the six kinds of placements mentioned.
- Draw a square grid and make an equidistant placement design.
- Draw a square grid in such a way that horizontal squares do not fall exactly under each other and make a half drop placement design.
- Take a buti and place it a random order so that an all over placement design is formed.

Assessment of pre and post learning training.

The researcher prepared a questionnaire to analyze the key strengths, understanding of design placements and designing related to specific motifs of the region of the artisans. This questionnaire was administered to the artisans before and after the training program.

Only participants with both pre and post tests were included in the analysis. Pre- and post test **data were collected from the participants.**

Pre- Training

Researcher found that artisan was not aware about design skills and they were not trained before also. It was observed that so far the artisans were working on half drop (in his language ' *ek chode k ek')* and all-over placement (in his language ' *pura bhara hua*'). It was found that artisan were keen to learn about different placement, improvement in context of aesthetic appeal. The artisan was ready for the training programme.

Post- Training

The training was carried at different centres according to artisan's requirement.It was found that Pawan Gangwar was much more interested in knowing about Textile Design course and was ready for application on his product range. Pradeep Jhariya was not interested in knowing the course. Banwari Jhariya completed the session but not participate in the activity.

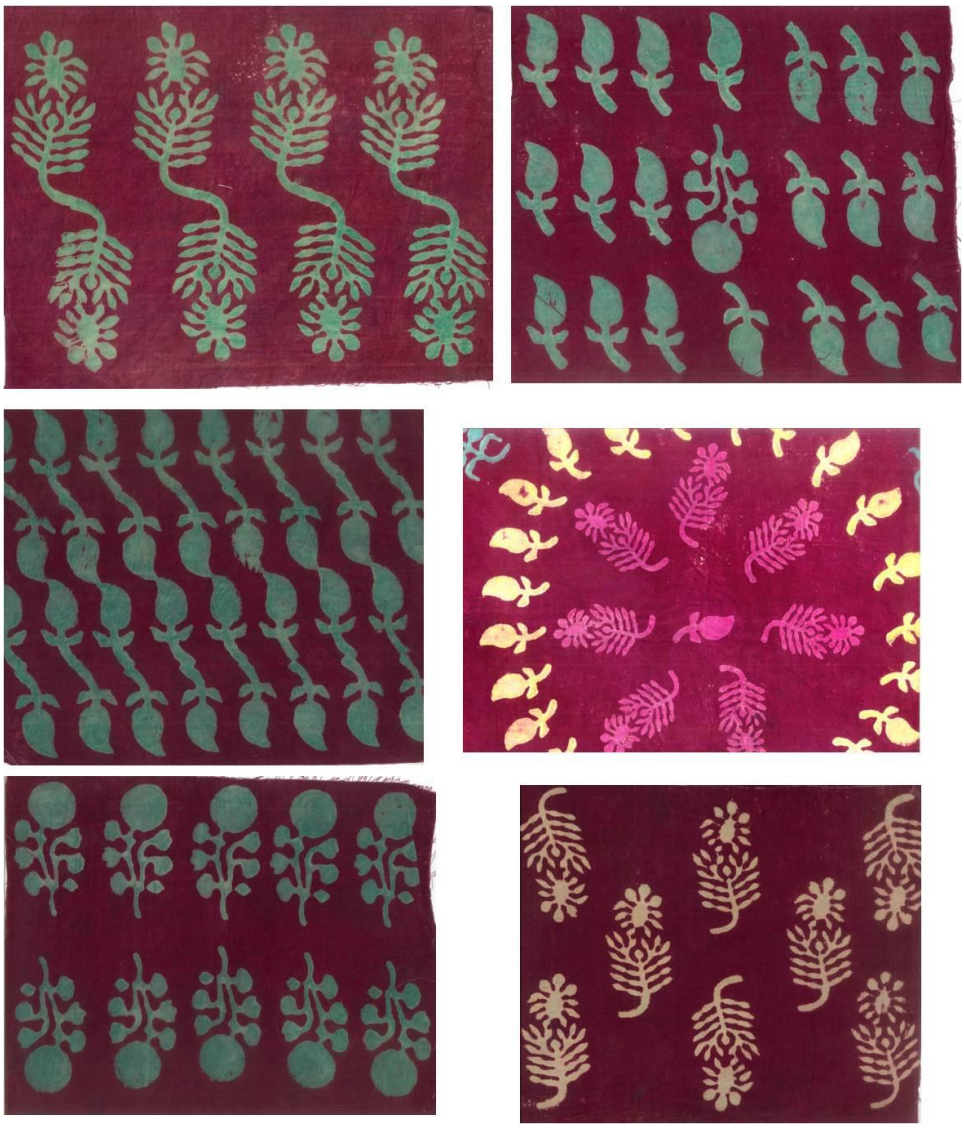


Plate 3- Sample developed during the training programme by Pawan Gangwar

Conclusion

It is a unique print but not properly positioned because of lack of branding activities done by rural entrepreneurs. Absence of sustainable marketing and communication activities is the main reason behind the problem faced by rural entrepreneurs. During the time of training programme researcher came to know from artisan's end that if they will apply the course of training and different placements which they learnt from researcher it will

not work for the local market which they cater for. This is because one the price will increase (which is questionable) and secondly would not be accepted in the local market. It was explained to them that they should be increasing their market and this training would help them in this regard. This shows the low efforts and lack of promotional activities to promote the product.

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DP-15

MONUMENTAL DESIGNS ADAPTED FOR TEXTILE APPLICATION

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Abstract

Sarkhej Roza comprises one of the most elegant and unique architectural complexes of Ahmedabad. In its architecture, Sarkhej Roza is an example of the early Islamic architectural culture of the region, which fused Islamic stylistic influences from Persia with indigenous Hindu and Jain features to form a composite "Indo-Saracenic" architectural style. History has always been a source of inspiration for contemporary designers and artists. One such source for inspiration is the matchless feature of Sarkhej Roza constructions; the incredible *Jaali* in its numerous patterns. In this study an attempt was made to revisit our own cultural roots and to introduce diversity and cultural identity to the world whilst remaining competitive. The purpose of the study was to use the rich designs of the *Jaali* as an inspiration and integrate its elements in developing pattern Layouts for textile applications. Fifty-four layouts that were novel and suitable for several apparel and conference kits were made using CAD technology viz-a-viz Corel Draw software. All the developed designs were subjected to visual evaluation for ranking of best designs in selected category by the panel of fifty respondents to judge these for factors most suitable for textile design applications. The created designs offer the scope to meet the ever-changing needs and appeal of the new world customers. Not only this, the concept also holds incredible promise for both collectors and researchers through greater access, interaction and preservation of heritage for future generations.

Keywords: Design, Novel, Sarkhej Roza monument, *Jaali*, Corel Draw software, Layout.

Introduction

Monuments are buildings, statues and other structures which are of historical importance. Monuments include residence of ruler like fort, palaces and garden. It also includes public structure like temple, mosque, bazaar, well etc. The monuments of India has become an inspiration for the future generations with respect to construction technology and designing used. Historical designs and motifs provide a foundation for enabling a dialogue between past and present fashion.

Mughal monuments had a combination of Hindu, Islamic and Persian culture. Mughal had built monuments at Delhi, Lahore, Aurangabad, Agra and Fatehpur Sikri. One such monument is Sarkhej Roza, that comprises one of the most elegant and unique architectural complexes of Ahmedabad. In its architecture, Sarkhej Roza is an example of the early Islamic architectural culture of the region, which fused Islamic stylistic influences from Persia with

indigenous Hindu and Jain features to form a composite "Indo-Saracenic" architectural style. The architectural style of Sarkhej Roza is a precursor to the Mughal period in a true amalgamation of Hindu, Jain and Islamic styles. Hindu craftsmanship and construction know-how were overlaid on Islamic sense of geometry and scale. The Roza Complex at Sarkhej was built at the advent of Sultanate era.

Jaali is one of the most important features of the Sarkhej Roza. *Jaali* as perforated screens for permitting light and ventilation in buildings have been used extensively in India. *Jaali* is a perforated stone or latticed screen, usually with an ornamental pattern constructed through the use of geometry or floral patterns. This technique is mainly found in Indian and Islamic architecture. Introducing these designs in textile can be a way to preserve these motifs. We can spread a uniqueness of Indian art to the whole world by this means. Infusing the motifs will give these motifs a shift from ornamental décor to utilitarian use. Designer can take source of inspiration from decorative designs present on these *Jaalis*.

The study undertaken was to explore the Sarkhej Roza *Jaali* as a source of inspiration for textile designing, developing different pattern and product layouts with selected *Jaali* designs using computer aided designing, which will introduce diversity and their own cultural identity to the world whilst remaining competitive.

The aim of the research was to preserve the Sarkhej Roza *Jaali* designs and explore the possibilities of using it as textile design. This could be made available as a resource for further investigation or inspiration. It could also be used in diversified mediums making it popular and further help in promoting and preserving the monumental designs of Sarkhej Roza. The present study was planned with the following objectives.

- To document the *Jaali* designs of Sarkhej Roza.
- To design different product layout using selected *Jaali* Motifs.
- Evaluating their market acceptability through an opinionnaire.

2. Methodology

The present study was a combination of Documentation and Exploratory research. The methodology for the present study was divided into three phases. They are as follows: -

Phase I – Documentation The *Jaali* designs were documented as thumbnail photographs. The motifs were classified as geometrical designs, floral designs and combination of geometrical and floral design.

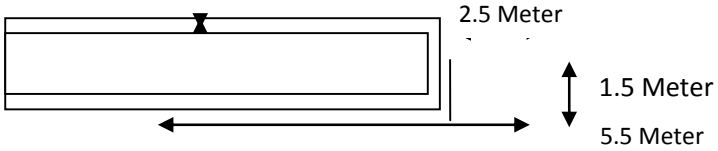
Phase II- Exploratory- In the Exploratory phase, product lines were created taking inspiration from Sarkhej Roza *Jaalis*.

The *Jaali* designs were classified into three categories (Geometrical designs, floral designs and combination of geometrical and floral design). Random selection technique was used to select the designs to gain variety in designing. *Jaali* were selected as per product requirement. Eleven *Jaali* designs were selected from geometrical design category. From floral category ten *Jaali* designs were selected and ten designs were selected from the combination of geometrical and floral category. These were further built into vector images to create a digital repository of designs using Corel draw software.

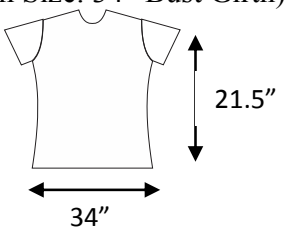
Product line was divided into two categories: One was apparel and another was conference kit. Products selected in Apparel category (Set I) were draped garment

(Saree), Stitched garment (T-shirt) and Yardages. For conference kit category (Set II) Bookmark, Charms, Conference bag, Diary cover, File folder and Multi-purpose pouch was included. The dimensions of each of these products are shown here with line drawings. (Figure 1 and 2)

a. Saree



b. T-shirt for female (Medium Size: 34" Bust Girth)



c. Yardages

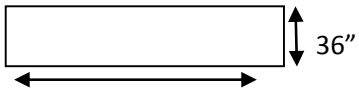


Figure 1: Diagram showing the product dimensions of Set I- Apparel

a. Bookmark

b. Charms

c. Conference bag

d. Diary cover

e. File folder

f. Multi-purpose pouch

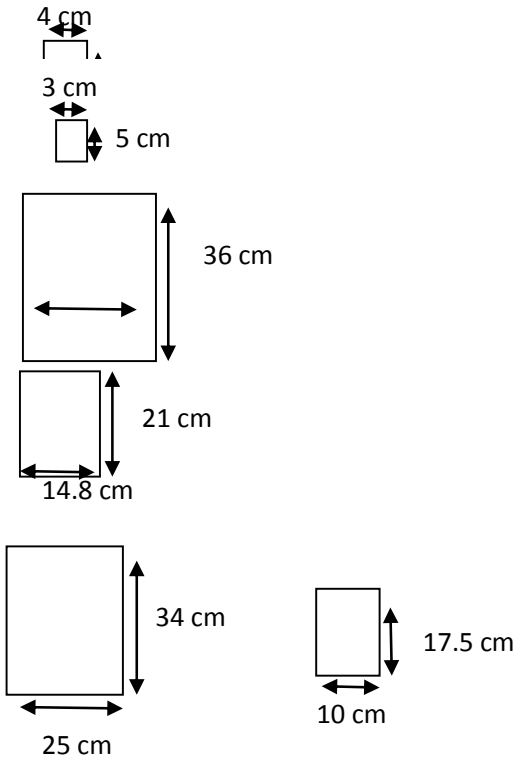


Figure 2: Diagram showing the product dimensions of Set II- Conference kit

The image of selected *Jaali* design was converted into vector design by using Corel Draw X7. The arrangements of motifs were done to explore the different layouts of design on selected product line using Corel Draw X7 and Adobe Photoshop CS. Total nine different layouts were developed in apparel category and eighteen layouts were developed in conference category. A total of 54 layouts were developed with foreground and background concept. Developed layouts were printed in black and white colour on A2 design sheets.

Phase III - Assessment of Pattern Layout for Consumers' Acceptability

In this phase, an opinionnaire was developed for the evaluation of consumer acceptability. Invitation cards were self prepared and all the teachers of various departments of Faculty and Family Community Science, Senior and Junior Master Students were invited. The Pattern Layouts were displayed in well lighted Seminar room of Clothing and Textiles department for evaluation by potential consumers (Plate 1).

Plate 1: Display of Pattern Layouts

Evaluation of the created layouts was carried out by 50 respondents. The created products layouts were ranked and subjectively analyzed in terms of appropriateness of developed designs, placement of design, cost, suitability of selected product, acceptability of concept.

The collected data were coded, tabulated and analysis of data was done using frequency, percentage, means scores and weighted mean scores and presented in tables and graphs.

3. Results

The present study was planned with an exploratory research design. This study focuses on the documentation of the *Jaali* designs of three main sections in the Sarkhej Roza which consisted of creative *Jalis*.

1. Tomb of Mehmud Begada (King)
2. Tomb of Rajabai (Queen)
3. Tomb of Sheikh Ahmad Ganj Baksh Khattu (Sufi Saint)

Selected *Jaali* designs were taken to create the pattern layouts of apparel and conference kit.

3.1. Documentation of Sarkhej Roza *Jaali* and its design analysis

There are approximately 2500 to 3000 *Jaalis* in these three sections of Sarkhej Roza. Many *Jaali* designs were repeatedly present. Keeping this factor in the mind researcher documented 360 *Jaalis*. From 360 *Jaalis*, the researcher found these to be 91 geometrical designs, 122 floral designs and 147 combinations of geometrical and floral designs. These *Jaalis* were made from Sand stone material.

Geometrical Designs: Geometric shapes such as square, circle, half circle, star, diamond, oval, triangle shapes were used as motifs and were arranged in square grid, diamond grid, ogee and rosette form. (Plate 2)

Plate 2: Representative Geometrical *Jaali* Designs

Floral Designs: Floral designs in a vase, flowers and leaves in different shapes were arranged as freehand motifs, scrolls, creepers, trees in symmetrical and asymmetrical balance. (Plate 3)

Plate 3: Representative Floral *Jaali* Designs

Combination of Geometrical and Floral Designs: Combination of geometrical and floral shapes was arranged in square grid and rosette form in symmetrical and asymmetrical balance. Square, circle, half circle, diamond, oval shapes were used with flower and creepers. (Plate 4)

Plate 4: Combination of Geometrical and Floral *Jaali* Designs

3.2. Pattern Layout through Computer Aided Design

Selected *Jaali* designs were used for creating pattern layouts of apparel and conference kit. These designs were used into two categories, A and B with foreground (Positive space i.e. the *Jaali* design itself) and Background (Negative space – i.e. the empty spaces of *Jaali* design) concept for each classification of designs-Geometrical, Floral and Combination of geometrical and floral designs. **(Figure 3 to 11)**

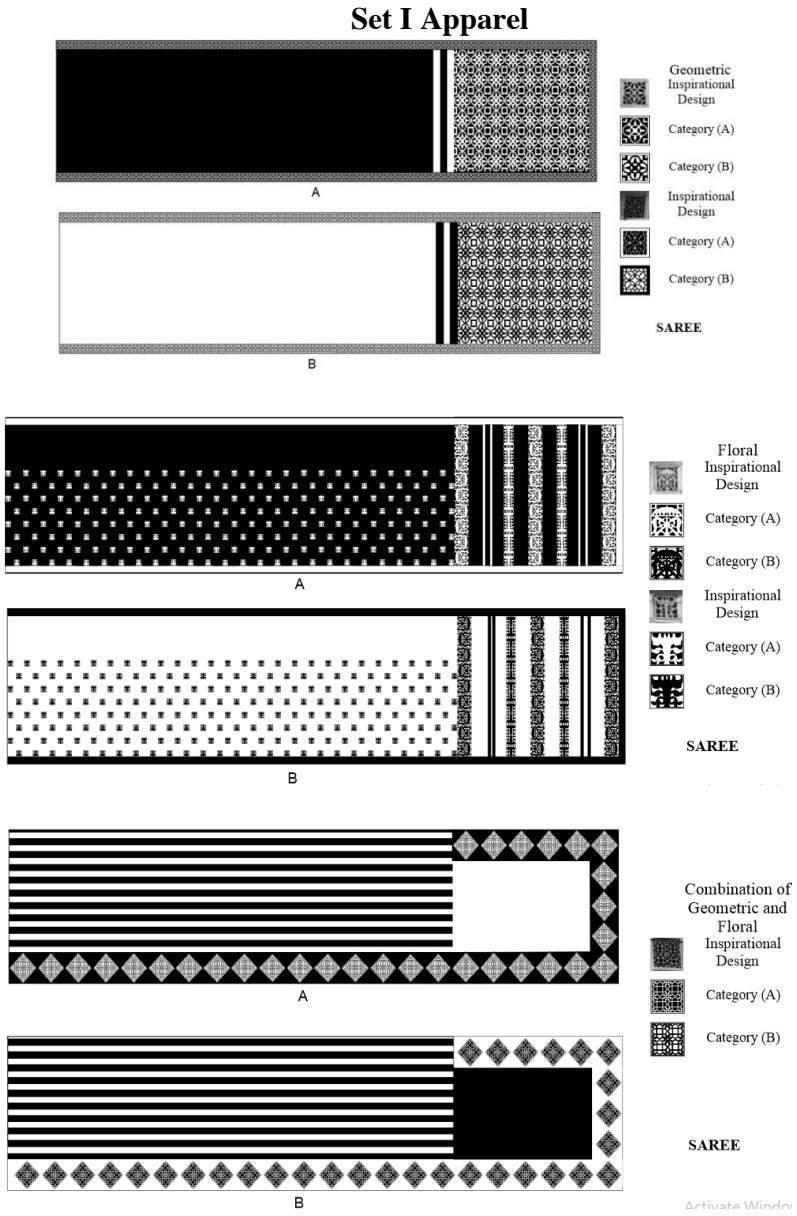


Figure 3: Pattern layouts for the Saree in different designs

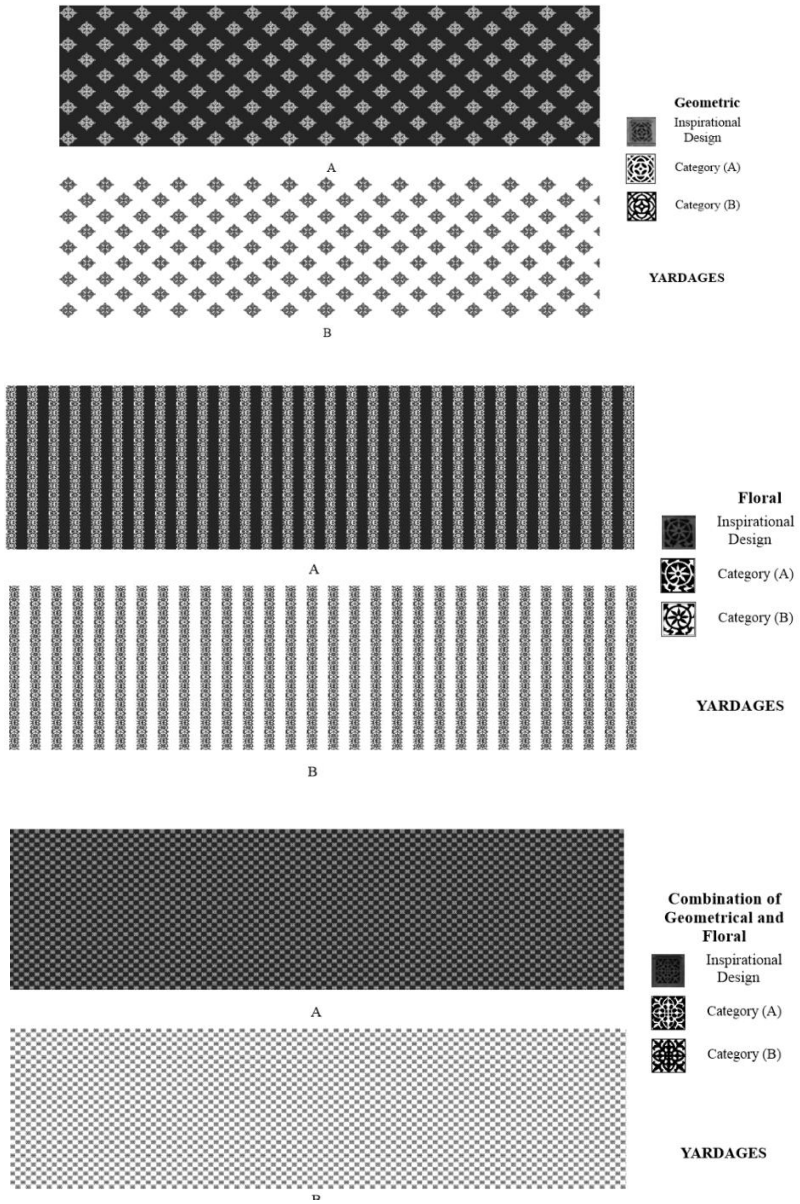
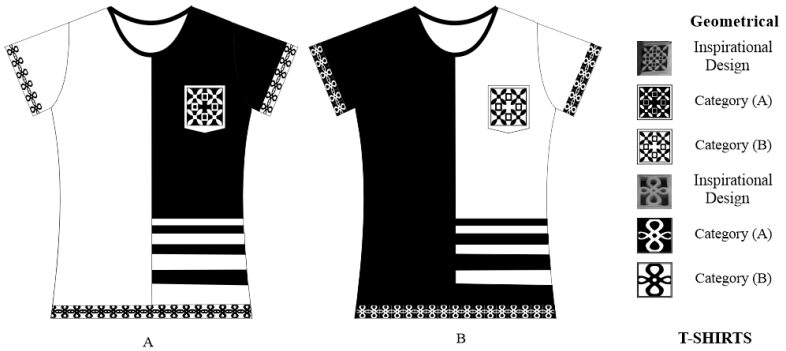


Figure 4: Pattern layouts for the Yardages in different designs



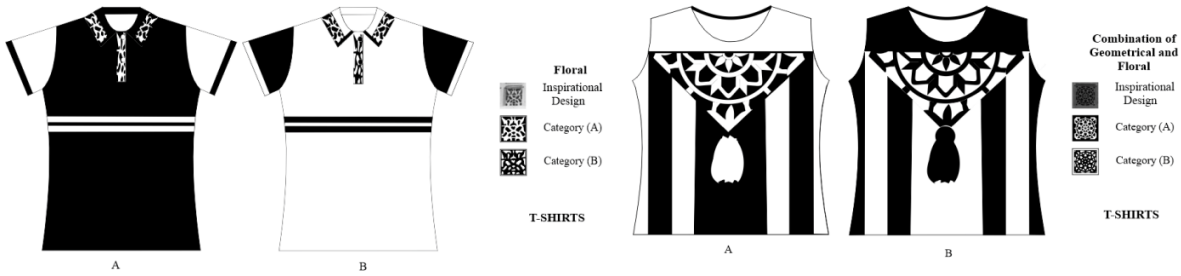


Figure 5: Pattern layouts for the T-shirt in different designs

Figure 6- Pattern layouts for the Book Mark

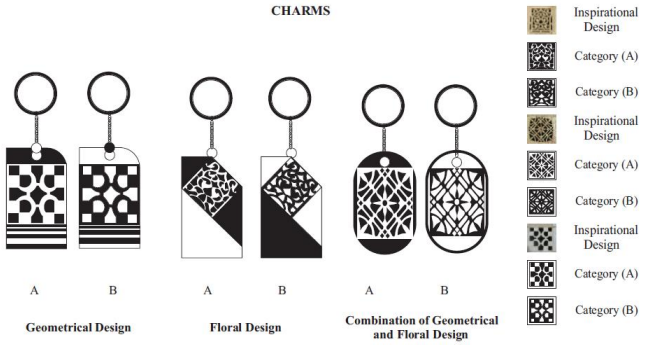


Figure 7- Pattern layouts for the Charms

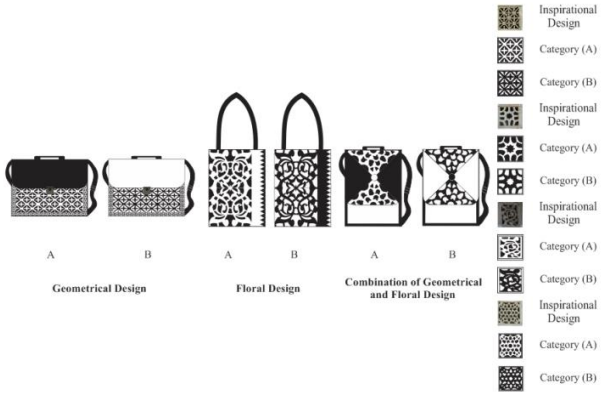


Figure 8- Pattern layouts for the Conference Bag

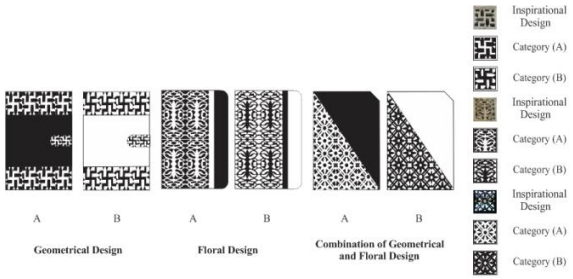


Figure 9- Pattern layouts for the Diary Cover

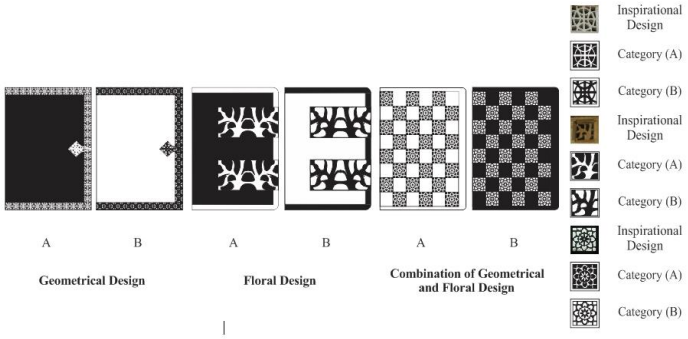


Figure 10- Pattern layouts for the File Folder

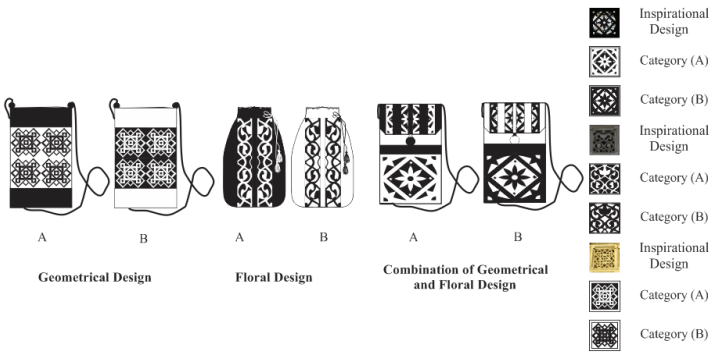


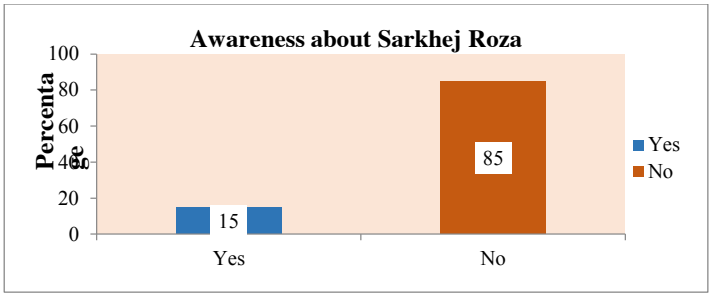
Figure 11- Pattern layouts for the Multipurpose Pouch

Respondents Profile

A total of 100 respondents were invited for the exhibition. Total 58 respondents visited the exhibition and 50 filled up the opinionnaire. These respondents were employed as academicians, students from the Department of Clothing and Textiles, Food and Nutrition, Human Development and Family Studies and Family Community Resource Management.

Awareness about the Sarkhej Roza

(N=50)



Graph 1: Graphical Representation of Awareness about Sarkhej Roza

The Graph 1 revealed that 85 per cent of the respondents were not aware about the Sarkhej Roza which indicated that it was a lesser known monument and this study has facilitated in making people aware of the existence and beauty of this monument. The design inspiration thus, also offers greater scope for bringing newness in textile designing.

Development of pattern layouts for selected products

This section included preparation of different pattern layouts of selected three designs i.e. geometrical, floral and combination of geometrical and foral design for three products in Set I and in set II six products. Total 27 pattern layouts were made by using selected three designs.

Assessment of product layouts for its aesthetic appeal

Preference of respondents for three design inspirations category i.e. geometrical, floral and combination of geometrical and floral design for 27 selected products was done on base of aesthetic appeal. Results obtained are presented in Table 1.

Table 1: Opinion regarding aesthetic appeal of Pattern Layouts **(N=50)**

Set I Apparel	**Geometrical Design**		**Floral Design**		**Combination of Geometrical and Floral Design**	
	WMS	**Rank**	**WMS**	**Rank**	**WMS**	**Rank**
a. Draped Garments (Saree)	3.2	2	**3.62**	**1**	3.18	3
b. Stitched Garments (T-shirt)	**3.38**	**1**	3.26	3	3.36	2
c. Yardages	3.16	3	**3.52**	**1**	3.32	2
Set II Conference Kit	**Geometrical Design**		**Floral Design**		**Combination of Geometrical and Floral Design**	
	WMS	**Rank**	**WMS**	**Rank**	**WMS**	**Rank**
a. Bookmark	3.30	3	3.32	2	**3.38**	**1**
b. Charms	**3.40**	**1**	**3.40**	**1**	3.20	2
c. Conference Bag	3.24	3	**3.42**	**1**	3.34	2
d. Diary Cover	**3.36**	**1**	**3.36**	**1**	3.30	2
e. File Folder	**3.40**	**1**	3.28	3	3.32	2
f. Multipurpose Pouch	3.28	2	3.22	3	**3.50**	**1**

(WMS: Weighted Mean Score)

From the Table 1 it was revealed that the respondents scored highest Weighted Mean Score in floral design for Draped garments (3.62) and Yardages (3.52). It was also found out that the respondents scored highest Weighted mean score (3.38) in geometrical design for Stitched garments.

The findings also reflected that the respondents scored highest Weighted mean score in floral design for Charms (3.40), Conference bag (3.42) and Diary cover (3.36). It was also revealed that the respondents scored the highest Weighted mean score in geometrical design for Charms (3.40), Diary cover (3.36) and File folder (3.40). Whereas in combination of geometrical and floral design the respondents scored highest Weighted mean score for Bookmark (3.38) and Multi-purpose pouch (3.50).

By analyzing the Table 1 it was also found out that Floral designs got the highest weighed mean score for aesthetic appeal of pattern layouts in both the sets i.e. Apparel and Conference kits.

Preference of developed product layouts

All the developed design layouts were evaluated by 50 respondents and their preferential choices for pattern layouts of designs are presented in Table 2.

Table 2: Preference of developed Pattern Layouts (N=50)

Set I Apparel	**Geometrical Design**		**Floral Design**		**Combination of Geometrical and floral Design**	
	WMS	Rank	WMS	Rank	WMS	Rank
a. Draped Garments (Saree)	3.22		**3.52**	**1**	3.32	2
b. Stitched Garments (T-shirt)	**3.4**	**1**	3.34	2	3.24	3
c. Yardages	3.1	3	3.38	2	**3.4**	**1**
Set II Conference Kit	**Geometrical Design**		**Floral Design**		**Combination of Geometrical and floral Design**	
	WMS	Rank	WMS	Rank	WMS	Rank
a. Bookmark	3.06	3	**3.44**	**1**	3.28	2
b. Charms	**3.38**	**1**	3.34	2	3.28	3
c. Conference Bag	**3.38**	**1**	**3.38**	**1**	3.26	2
d. Diary Cover	3.26	3	**3.42**	**1**	3.34	2
e. File Folder	3.28	3	**3.4**	**1**	3.32	2
f. Multipurpose Pouch	3.34	2	3.3	3	**3.38**	**1**

(WMS: Weighted Mean Score)

From the Table 2 it was revealed that the highest Weighted Mean Score (3.52) in floral design for Draped garments was highest. It was also found out that the highest (3.4) Weighted Mean Score for Stitched garments and for Yardages was established in geometrical design and in Combination of geometrical and floral design respectively.

Table 2 also shows that the in-Conference kit products for floral design Bookmark (3.44), Conference bag (3.38), Diary Cover (3.42) and File folder (3.40) obtained highest weighted mean score. In Geometrical design the highest Weighted Mean Score was

achieved for Charms (3.38) and Conference bag (3.38) while the Multi-purpose pouch scored highest Weighted Mean of 3.38 for combination of geometrical and floral design.

Factors affecting the selection of products

Selection of factors affecting the preference of respondents while making the purchase of the designed products as per the pattern layouts was also studied.

Table 3: Opinion regarding factors considered in making purchase of designed products as per the pattern layout (N=50)

Factors	Apparel		Conference Kit	
	Mean Score	Rank	Mean Score	Rank
Aesthetic Appeal	**5.26**	**2**	**4.96**	**2**
Colour	4.12	8	4.36	4
Cost	3.14	7	4.0	5
Pattern	3.66	6	**4.92**	**3**
Size	3.84	5	3.44	6
Style	**5.04**	**3**	3.32	7
Type of Motif	4.92	4	**4.96**	**2**
Type of Technique	**6.12**	**1**	**6.04**	**1**

The data in Table 3 reflected that while making purchase of the designed Apparel products, the respondents would consider the Type of technique, Aesthetic appeal and Style as deciding factors in ascending rank order.

The data in Table 3 also reflected that while making purchase of the designed products for Conference kit, the factors in order of importance to be considered by the respondents would be Type of technique, Type of motif and Aesthetic appeal.

All the respondent rated the types of technique used in both the sets as first parameter while making purchase followed by aesthetic appeal of the product.

Understanding the various preference factors of the respondents could lead to the development of products that would stand out of the competitors and achieve higher sales. Since it is well known that the final purpose of people buying objects is because people want to feel pleasure from owning them, tools to design with the consumers in mind have increased and now are being implemented in industry.

Preference for developed products

These designs were used into two categories, A and B with foreground (Positive space i.e. the *Jaali* design itself) and Background (Negative space – i.e. the empty spaces of *Jaali* design). All the developed designs were visually evaluated by 50 respondents and their preferential choices for created designs products are depicted in Table 4.

Table 4: Opinion regarding best category of designed products (N=50)

Apparel Set I	**Geometrical Design**				**Floral Design**				**Combination of Geometrical and Floral Design**			
	Category (A)		**Category (B)**		**Category (A)**		**Category (B)**		**Category (A)**		**Category (B)**	
	F	%	F	%	F	%	F	%	F	%	F	%
a. Draped Garments (Saree)	36	72	14	28	25	50	25	50	**31**	**62**	19	38
b. Stitched Garments (T-shirt)	**39**	**78**	11	22	29	58	21	42	**31**	**62**	19	38
c. Yardages	35	70	15	30	**34**	**68**	16	32	27	54	23	46
Conference Kit Set II	**Geometrical Design**				**Floral Design**				**Combination of Geometrical and Floral Design**			
	Category (A)		**Category (B)**		**Category (A)**		**Category (B)**		**Category (A)**		**Category (B)**	
	F	%	F	%	F	%	F	%	F	%	F	%
a. Bookmark	30	60	20	40	35	70	15	30	**40**	**80**	10	20
b. Charms	37	74	13	26	27	54	23	46	38	76	12	24
c. Conference Bag	**41**	**82**	9	18	29	58	21	42	37	74	13	26
d. Diary Cover	24	48	26	52	30	60	20	40	30	60	20	40
e. File Folder	30	60	20	40	32	64	18	36	22	44	28	56
f. Multipurpose Pouch	38	76	12	24	**40**	**80**	10	20	25	50	25	50

From the Table 4 it was revealed that majority of the respondents preferred category A (foreground (Positive space i.e. the *Jaali* design itself) for geometrical, floral and combination of geometrical and floral designs in both the sets of Apparel and conference kit. These motifs might have been preferred being appealing and depicting the culture heritage of Sarkhej Roja Jaalis.

Majority of the respondents preferred Category A in Conference kit except Diary cover in Geometrical design and File folder in Combinational of geometrical and floral design preferred Category B.

Finally, it was also revealed that hundred per cent respondents were willing to purchase these products if available in market. Respondents appreciated the innovation and creativity. The motifs and patterns provide significant elements for designing.

Wilson, 2001 in his study also reported that a wide range of designs may come from a variety of different sources and different designers use different methods for developing design work from initial ideas. The themes and ideas are selected and subsequent artwork based around these theme ideas.

Conclusion

India, being famous for its traditional monuments and the artistic skills used are beyond description. Highlighting this fact that the cultural heritage of India if not preserved can be lost forever. This research has made an attempt to expedite this concern with the renewed stream of ideas in the area of textile design by constructing novel and more resourceful connections between past and present.

Product fashioned with historical inspiration has an imperative role in conserving culture and historical values. Enduring historical motifs and designs offer an instrumental research source for the designers in the creative field of textile design. With the new advanced ideas, the potentials to redesign the magical old classical designs; there was an incredible scope in the form of Sarkhej Roza *Jaalis*.

This study discovered the unidentified facts of use of historic *Jaali* designs of Sarkhej Roza in textile designing. The designs were used to generate abundant pattern variations, and bring in series of re-construction of heritage designs in form of contemporary creations.

The researchers assert that with the proper use of the design elements based on design principles, repeats and layouts on the Corel Draw and Adobe Photoshop software, innovative design collections can be created for design applications in not just apparel but allied industry applications.

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DP-16

MAGIC OF TRADITIONAL *SANJHI* FLOORPAINTINGS ON HOUSE HOLD TEXTILES

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Abstract

Since ancient times textiles have become a rich cultural heritage. Art and culture convey a rich and royal textile tradition in Rajasthan. Sanjhi paintings which are significant in their uniqueness, elegant and complex nature have disappeared nowadays. This artistic representation of Sanjhi art produced an elaborate textile designing that blended with an important visual, cultural expression and a distinctive craftsmanship. These design / motifs are different as compared to the other traditional art of Rajasthan. There is need to explore possibilities for the conservation of this art form viz other artistic media for future generations. The reason for using traditional motifs in textiles is to keep our designs or motifs alive. The Indian folk arts with painting play important role in creating new designs. It is, in terms of textile design, aesthetic of artistic value, visually intense, as a priority and has a wide range of design types. The objective of the study is to identify the textile design patterns and its unique design formats depicted in*Sanjhi* traditional folk art. The effort was targeted towards finding the possibility of applying Sanjhi motifs / designs on house hold textile articles. Sanjhi motifs/designs were adapted for centre design, overall and border designs. Total sixty motifs / designs were developed using CorelDraw software keeping in mind their suitability for articles like cushion cover, folder, coasters, table mate, purse, pooja *thali* cover, *choki covers*, *vandarwar*and table cloth etc. Developed design sheets were subjected to visual evaluation for selection of one best design in each category by the panel of thirty respondents to find out the acceptability and marketability of the developed designs. Finally articles were prepared by using selected designs and these prepared articles were evaluated by thirty respondents. Results revealed that developed products were highly appreciated by the respondents.

Keywords: Traditional, Folk, Heritage, Craftsmanship, Motifs

Introduction:

India is marked by its rich traditional heritage of Tribal/Folk Arts and Culture. Since the days of remote past, the diversified art and cultural forms generated by the tribal and rural people of India have continued to evince their creative magnificence. The folk paintings have rich heritage. Without folk paintings, there is no identity of culture in human life as well as occasion will be incomplete.

Sanjhi is a traditional art form, prevalent in many parts of India , especially in Rajasthan, Madhya Pradesh, Uttar Pradesh, Haryana and Punjab. *Sanjhi* tradition is also prevalent in Maharashtra and Goa. We take up here the tradition as witnessed in Rajasthan and Malwa region of Madhya Pradesh. *Sanjh*i art form is associated with a festival known by the same name. The festival of *Sanjhi* is celebrated by young girls in honour of a goddess named *Sanjhi*or Sanjhya. This festival coincides with the annual worship of ancestral spirits during the Hindu month of Ashwin (September), that lasts a fortnight, beginning with the first day of the dark-half of the Ashwin month and concluding on the sixteenth day i.e. the new moon day of the same month. During this fortnight, known as *pitri-paksha* (the fortnight of the ancestors), young girls in Rajasthan and Madhya Pradesh emboss various motifs inside a parallelogram with four gateways, on front walls of their houses. These motifs are embossed in cow-dung every day and are scraped off the next day. In their place new motifs are drawn. This process is repeated everyday till the 13th day, when the process of drawing a full blown Sanjhi know as *kilakot*(literally-fortified dwelling) begins. Everyday new motifs are added to the ones drawn on the previous day and finally the pictograph depicting the story of Sanjha is completed on the 14th day. On the new moon day, i.e. the last day of *pitri-paksha*, *kilakot* is also scraped off the wall and this along with the earlier scrapings is immersed in the river, accompanied by ritual worship amidst dancing and singing.

Significance of the research:

India had always been known as the land that portrayed cultural and traditional Vibrancy through its Traditional arts and crafts. Art and culture also convey a rich and royal textile tradition in Rajasthan. Folk paintings give aesthetical feelings and remind us about the native life through their colourful line drawings. *Sanjhi* paintings which are significant in their uniqueness, elegant and complex nature have disappeared nowadays. Further commercialization of these tribal paintings creates a new source of non-agricultural income as these have achieved eminence in the national and international art market. There is need to explore possibilities for the conservation of this art form with other artistic media for future generations.

Justification of the research:

In the existing state of competitive market and textile design techniques, the designers need to acclimatize some contemporary practices to keep our heritage art, craft, designs and motifs alive. Designers and crafts persons today endure to discover, rejoice and reproduce our rich original substantial art and crafts of heritage with the numerous ways and forms of textile design. With the new advanced ideas, the potentials to redesign the folk natural designs, there is an incredible scope in the *Sanjhi* folk and heritage arts. The patterns can generate abundant variations, which may bring in series of re-construction of heritage designs in form of contemporary creations.

This artistic representation of *Sanjhi* art produced an elaborate textile designing that blended with an important visual, cultural expression and a distinctive craftsmanship. These design / motifs are different as compared to the other traditional art of Rajasthan. The reason for using traditional motifs in textiles is to keep our designs or motifs alive. The Indian folk arts with painting play important role in creating new designs. It is, in terms of textile design, aesthetic of artistic value, visually intense, as a priority and has a wide range of design placement types. The objective of the study is to identify the textile design patterns and its unique design formats depicted in *Sanjhi* traditional folk art. The effort was targeted towards finding the possibility of applying *Sanjhi* motifs / designs on house hold textile articles.

In fashion industry, there is always a demand of something new and artistic. The adaptation of *Sanjhi* designs on textile is an innovative and new collection to the people who want to adopt their tradition with minute modernization. With the changing world of fashion the field of textile demands for unique, different and new designs which give us the opportunity to use the adapted traditional *Sanjhi* motifs. Keeping this point in mind various house hold furnishing products were developed by using *Sanjhi* motifs and assessed their marketability

Objectives:

1. To record and documentation of traditional *Sanjhi* motifs.
2. To develop placement with the Sanjhi folk motifs for house hold textile products.
3. To find out the acceptability and marketability of developed products by using *Sanjhi* motifs.

Material and Methods:

The research procedure followed has been categorized along with relevant details under the following heads:

Selection of sample:

Thirty respondents selected randomly which included faculty members and students of CCAS, consumers and women.

Collection of motifs/ designs:

Traditional designs of *Sanjhi* painting from the *Nathdwara*, *Udaipur* and *Devgarh* region were collected for the study from various primary and secondary sources like Site seeing, survey, books, cards, internet and library.
Sanjhi motifs/designs were adapted for center design, overall and border design. Total sixty motifs / designs were developed using CorelDraw software keeping in mind their suitability for articles like cushion cover, bag,wall pictures, *vandarwar and toran*. Developed design sheets were subjected to visual evaluation for selection of one best design in each category by the panel of thirty respondents to find out the suitability of the developed designs forproduct development. Finally articles were prepared by using selected designs and assessed their market potential.

Development of household textile products:

Pure cotton and Cotton silk fabric were selected for making various products. Different fabric embellishment techniques like free hand painting, block printing, stencil printing, embroidery etc. were used for enrichment of the developed household textile products.

Data Collection tool:

Five point rating perform was developed for data collection. On the basis acceptability of motifs in terms of end use of the product, colour combination, clarity of the motifs, acceptability of fabric texture, placement of the motifs, acceptability of fabric enrichment technique and overall appearance using five point rating scale. Rating criteria were i.e. most accepted – 5, more accepted – 4 accepted - 3, less accepted - 2 and least accepted – 1.Weighted mean scores (WMS) were calculated and ranks were assigned to the developed products.

Results and Discussions:

Acceptability of *Sanjhi* products among consumers:

Thirty respondents selected randomly which included faculty members and students of CCAS, consumers and women. Developed products were evaluated by 30 consumers.

Table1: Acceptability score obtained by all developed Sanjhi design products= 30

Parameters / Products	Acceptability of motifs in terms of end use of the product	Colour combination	Clarity of the motifs	Acceptability of fabric texture	Placement of the motifs	Acceptability of fabric enrichment technique	Overall appearance	Over all Mean
Choki cover	4.8	4.8	4.69	4.73	4.77	4.81	4.76	4.77
Cushion cover	4.78	4.71	4.72	4.73	4,75	4.76	4.77	4.74
Bag	4.77	4.75	4.71	4.71	4.68	4.74	4.7	4.73
Wall picture	4.8	4.77	4.73	4.73	4.74	4.77	4.76	4.76
Toran	4.67	4.67	4.68	4.7	4.67	4.62	4.61	4.66
Overall mean	4.78	4.75	4.70	4.72	4.71	4.74	4.72	4.73

Data in **Table-1** shows in detailed the overall acceptability score obtained by all developed Sanjhi design products. Overall mean score of all the products ranged from 4.66 to 4.77. Further, it was observed that highest mean was scored by the Cushion covers; there was not much difference between mean scores of developed home textile products. Similar overall mean were obtained with little difference for each parameter of evaluation ranging from 4.70 to 4.78. It shows that all developed house hold textile products were found very good to excellent on each parameter and appreciated by most of the respondents in all criteria.

The results are in conformity with the findings of Rajvanshi (2008) in which six new designs in different color ways were developed for designing different apparel items (*i.e*. short kurta, dupatta and wrap-round) from *Phad* paintings using screen printing technique. Data revealed the developed designs were highly appreciated by the judges and consumers as shown by their acceptability (above 80% for each category of selected apparel items)

Assessment of market potential of developed products

To find out the market potential of the developed house hold products respondents were asked to give the most appropriate cost on which they are willing to purchase the developed product. For this purpose cost price was calculated and then profit of 20, 30, 40 and more than 40 per cent was added. Respondents were asked to select the price.

Preferences of the respondents according to market potential of the developed products

n= 30

S.no.	Products	20%	30%	40%	More than 40%
1.	Choki cover	20 (66.66)	5 (16.67)	5 (16.67)	0 (0.00)
2.	Cushion cover	15 (50.00)	11 (36.67)	4 (13.33)	0 (0.00)
3.	Bag	14 (46.67)	13 (43.33)	3 (10.00)	0 (0.00)
4.	Wall picture	9 (30.00)	4 (13.33)	5 (16.67)	0 (0.00)
5.	Toran	14 (46.67)	13 (43.33)	3 (10.00)	0 (0.00)

Finding of Table shows that maximum consumers favoured 30% profit on products followed by20% profit on products. Few respondents like to pay 40% of profit. All the respondents highly appreciated workmanship of the products. Marginal per cent of the respondents were ready to give more than 40% profit. According to all respondents' views, developed house hold products would have enough buyers in the market.

Upadhayay, and Babel, (2013)adapted traditional designs from ***Aipan*** (floor painting) of ***Kumaon*** on Kuris using Textile designing software. Developed designs were printed on kurties through block printing with tamarind seed powder as a thickening agent. The finding of the study reveals that the developed eco friendly block printed kurties were innovative, creative have enough market potential and were highly appreciated by the respondents.

Conclusion:

On the basis of findings it can be concluded that according to all respondents views developed house hold products would have enough buyers in the market and majority of respondents would like to purchase this type of products. It has good & enough market potentials. Most of consumer happily agreed to give up to 40 per cent profit on the developed products. Developed designs for house hold furnishing items were extremely liked by consumers.

Recommendations:

- Textile and Interior Designers can help in restoring *Sanjhi* craft by implementing this in household furnishing products.
- Commercialization of *Sanjhi*folk arts and culture for their profitable running is one of the instrumental ways to survive the folk forms.
- Government schemes and laws may be set for welfare of folk artisans to produce the products of best quality.
- *Sanjhi*folk art should popularize because it leads to the mass attraction towards folk arts and thereby increase in sale of these artisans.
- It is therefore recommended to explore the usage of Sanjhi in its original form and make people aware of the same in order to raise its demand.

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DP-17

DESIGN AND PRODUCT DEVELOPMENT: DIGITAL TEXTILE PRINTING INSPIRED BY SCULPTURES AND MONUMENTS OF SANCHI AND KHAJURAHO

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Abstract

Madhya Pradesh in India is a fine blend of architecture and sculpture. The gateways of Sanchi stupas contain ornamented depiction of incidents from the life of the Buddha and his previous incarnations. It is traditionally believed that Ashoka had got these stupas opened-up and taken out part of bone relics to build eighty-four thousand stupas in the kingdom during his rule including the one at Sanchi. Khajuraho is famous for its splendid temples. These temples are example of exemplary sculptural art and architecture. There are temples dedicated to Lord Vishnu, Lord Shiva, Goddess Parvati, the Sun God and the Jain Teerthankars. This study is a new-step towards enrichment of art and craft of Madhya Pradesh with new technology. Dress material for ladies Kurtis were designed and constructed by using motifs inspired by Sculptures and Monuments of Sanchi and Khajuraho through digital printing.Digital textile printing is the process of creating printable designs for fabric on a computer, which can be sent directly for the computer to fabric printing machinery without the use of screens and colour separations. The art of digital textile printing has influenced both the style and process of textile printing. Acceptability index and market potentials were find out from the college going girls and market personnel. The out-come of the study revealed that developed designs inspired by Sanchi and Khajuraho sculpture and monuments of Madhya Pradesh can be used for digital printing on dress materials as it has enough market potentials and great extent of acceptability among respondents.

Keywords:-Digital Printing, Art & Craft, Acceptability, Market Potential, Design Research.

Introduction

Madhya Pradesh, a large state in central India, retains landmarks from eras throughout Indian history. Begun in the 10th century, its Hindu and Jain temples at Khajuraho are renowned for their carvings of erotic scenes, most prominently Kandariya Mahadeva a temple with more than 800 sculptures.

Khajuraho is India's second biggest single tourist attraction, visitors from India and abroad visit Khajuraho to feel the artistic grandeur. The temples at Khajuraho are dedicated to various cult images of gods and goddesses, inseparably associated with the religious beliefs devotedly followed in India. There are temples dedicated to Lord Vishnu, Lord Shiva, Goddess Parvati, the Sun god and the Jain Teerthankars. Some shrines are named after and dedicated to sacred incarnations of these gods. These temples are example of exemplary sculptural art and architecture. The temples highlight the existential ethos in religion that venerates 'yoga' and 'Bhoga'. 'Yoga' is union of the self with the almighty, while 'Bhoga' is the path to God through physical pleasure.

The monuments of Sanchi are now included in the world-Heritage by the declaration to this effect by United Nations education, Scientific and cultural organization. The gateways of Sanchi stupas contain ornamented depiction of incidents from the life of the Buddha and his previous incarnations. The stupas, monasteries, pillars, temples, chaityas are archaeological called Buddhist monuments. The Buddhist carvings on both faces of the architraves and all sides of the uprights of these gateways are remarkable for their crowded scenes, perspective and pictorial effect in stone. Lord Buddha is shown here symbolically, through chhatra (parasol), house, elephant, throne, chakra (wheel), Tri-ratna, monastery-site, Bodhi-tree, etc. the Sanchi hill was variously known as vedisagiri, chetiyagiri, Kakanaya from ancient times.

Traditionally, to create printable designs for fabric, colour separations and screens or rollers had to be used for the transfer of designs to fabric. Digital textile printing is the process of creating printable designs for fabric on a computer, which can be sent directly for the computer to fabric printing machinery without the use of screens and colour separations. Digital textile printing technology is sparking a fundamental change in the textile and apparel industry. This revolution in digital image processing has necessitated new ways of thinking about textile design and production. It is a skill that prints the design on fabric, immediately from computer, without extra efforts just like printing and designing a paper. Digital textile printing is a flexible tool and a key acceptable to the vision of mass customization. It permits the user to evade the screen making process, offering the chance for quick changes to colour or design elements prior to printing. It is a fact that the new latest methods of digital printing on fabrics have exposed new horizons to the designers and manufactures. Digital printing methods have facilitated manufacturers to make a digital sampling and have advantages of change in designs before engraving. Digital textile printing has re-aligned conventional textile printing processes with innovation, and technological advancement.

Architecture and Sculpture heritage of Madhya Pradesh was used in digital world to create different textiles/apparel designs. To achieve the results following objectives were set for this study:-

Objectives

1. To develop designs for digital textile printing inspired by sculptures and monuments of Sanchi and Khajuraho.
2. To develop products by using developed designs and digital textile printing.
3. To determine acceptance and market potential of developed product by the consumers.

Review of Literature

Tiwari Vinay Kumar stated that the credit of erecting Mahastupa goes to Ashoka, the great. The importance the building activity of stupas, pillars, monasteries, temples, chaityas from 3rd century B.C. to A.D. 12th century had in the contemporary society in ancient time.

Encyclopedia Britannica; 05: Khajuraho's name derives from the prevalence of khajur, or date palms, in the area.

Srivastava Alok in 1999 stated that the temples of Khajuraho constitute a phenomenon among old Indian monuments and mark the highest achievement of architectural and sculptural art of mediaeval Central India.

Khullar Rupinder in 2006 stated that Khajuraho, a quiet and unpretentious village in Madhya Pradesh in central India, is famous all over the world for its vast heritage of

medieval temples depicting a perfect synthesis of Hindu architecture and sculpture. Built nearly a thousand years ago by the mighty Chandels.

Kumari and Jacob in 2004 conducted a study on design development from Kondapalli toys and concluded that the consumer is interested to have new innovative and latest traditional designs.

Verma in 2004 adapted Aipan designs through computer aided designing for shawls, jacket and stole. The products were highly appreciated by the respondents. She recommended that aipan designs developed from CAD can be used for products using other technique like block printing, embroidery, painting etc.

Tim Greene in 2009 stated that Digital printing, and inkjet in particular, is moving into every aspect of the screen printing market, and textiles are no exception. The opportunity to (more cost-effectively) produce samples - and produce short textile runs for specific events- represents the "low hanging fruit" for digital printing. The theory was that the ability to print "on-demand" apparel would result in significant savings through less overstock and discounting of out-of-fashion goods.

Krishna stated that It has changed the way designs are created, reduced sampling time by more than 80% and given the much needed boost to designers by allowing them unrestricted creativity.

Methodology

Research is a part and parcel of human knowledge. It is scientific and systematic search for pertinent information on a specific topic. It is an art as well as science of investigation. Design research is foundational to creating products, services, and systems that respond to human needs. In the public and international development sectors, understanding and meeting human needs are critical for improved livelihoods and better governance. An organized course of action was followed for the study.

The study was conducted in 2 phases

I. Collection of motifs and their adaptation for Digital Printing through CAD
II. Assessment of acceptability and market potential

I. Collection of Motifs and their Adaptation for Digital Printing through CAD

1. **Collection of the Samples:** Desired information regarding sculptures and monuments was collected through physical photography. Other secondary sources of information were-

a. Samples displayed at museum
b. Literature
c. Public libraries
d. Internet

2. **Selection of the Samples:-**

i. Rating scales was developed for the selection from the collected motifs
ii. Evaluation of motif for its placement, arrangements and colour combinations.
iii. A panel of 5 judges from the Department of Clothing and Textile was constituted for the selection and evaluation of motifs.

3. **Product development through Digital Printing**

i. Ten Kurtis were made from the fabric printed digitally by using motifs selected from Khajuraho and Sanchi of Madhya Pradesh.
ii. Kurtis were constructed by using basic block of bust size 32and 34 inches.

4. Ranking

Opinion of the respondents about developed designs (panel of judges from Home Science Department) was recorded on separate Rating Performa. Total score obtained by each dress material made from developed designs was ranked in order of acceptance.

I. Assessment of Acceptability and Market Potential

i. 50 college going girls' from Sarojini Naidu Girls College, Bhopal was selected to study the acceptability of prepared products (Kurtis).
ii. 50 market personnel from New Market area of Bhopal was selected to study the market potential.
iii. To achieve the objectives of the study the data were transferred on the table and tally sheets and coded, tabulated and analyzed statistically.
iv. Frequency and percentage were used to analyze the data on the basis of information regarding different motifs, raw material etc. used in both paintings. The rating score obtained by developed design of each category was converted into percentage.
v. To access the percentage acceptability of the developed designs on dress materials an acceptability index is formed

$$A.I = \frac{\text{Total scores of each dress material}}{2aMaximum\ Score} \text{x } 100$$

Locale of the Study

The study was limited to the architectural and sculptures of Kahjuraho and Sanchi of Madhya Pradesh.

Results and Discussion

I. Collection of Motifs and their Adaptation for Digital Printing through CAD

Following 50 motifs from sculptures and monuments of Khajuraho (25 motifs K-1 to K-25) and Sanchi (25 motifs S-1 to S-25) were collected from-

1. Available literature Books and Catalogs
2. Internet
3. State museum of Bhopal
4. Archaeological Survey of India Museum, Bhopal
5. Physical Photography

Table No. 1 Selection of Motif from Khajuraho Temple

Rating Scale: - 5.Excellent, 4.Very Good, 3.Good, 2.Average, 1.Poor

Design Code	Judge no - 1	Judge no - 2	Judge no- 3	Judge no- 4	Total	Mean Score (Total/4)
K-1	16	15	16	14	61	15.25
K-2	17	14	15	12	58	14.5
K-3	19	17	16	15	67	16.75
K-4*	18	20	17	18	73*	18.25*
K-5	13	11	15	14	53	13.25
K-6	15	14	16	15	60	15
K-7*	19	18	20	17	74*	18.5*
K-8	15	12	14	11	52	13
K-9	18	17	15	14	64	16
K-10	16	14	13	14	57	14.25
K-11*	18	19	18	17	72*	18*
K-12	13	17	16	13	59	14.75
K-13	16	18	17	19	70	17.5
K-14*	20	19	20	18	77*	19.25*
K-15	14	15	12	14	55	13.75
K-16	15	14	12	15	56	14
K-17*	21	19	22	19	81*	20.25*
K-18	17	18	15	16	66	16.5
K-19*	19	21	18	20	78*	19.5*
K-20	18	19	17	16	70	17.5
K-21	17	15	17	14	63	15.75
K-22	15	13	15	16	59	14.75
K-23	14	12	13	14	53	13.25
K-24*	20	18	16	17	71*	17.75*
K-25	17	16	17	18	68	17

The mean score of each motif was calculated and converted into the percentage to get the ranking as shown in the table no.1

Table No.2 Percentage distribution of the selected Khajuraho Motifs

Selected Motif Code	K-4	K-7	K-11	K-14	K-17	K-19	K-24
Mean Score	18.25	18.5	18	19.25	20.25	19.5	17.75
Percentage	73%	74%	72%	77%	81%	78%	71%
Rank	V	IV	VI	III	I	II	VII

It is an evident from the table no.1 and table no. 2 that motif from Khajuraho temple K-17 got the highest mean score 20.25 with 81% and got first rank among all 25 motifs, followed by K-19 with 78% stood for second rank .Third rank was obtained by K-14 securing 77% score. K-7 scored 74% with the mean score 18.5 and securing forth rank. Were K-4 scored 73% for fifth rank. and K-11 scored 72% with mean score 18got sixth rank. K-24 got last rank in selected motifs with 71%.

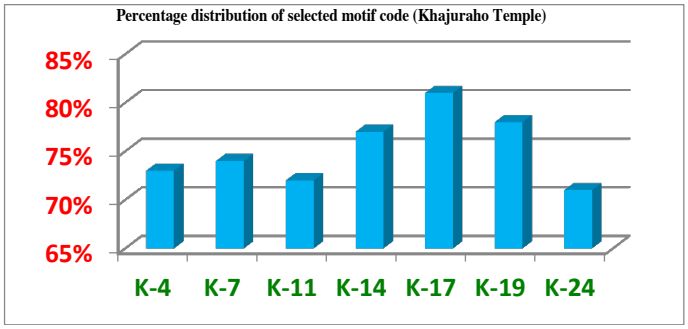

Fig.1 Percentage Distribution of Selected Motif Code (Khajuraho Temple)

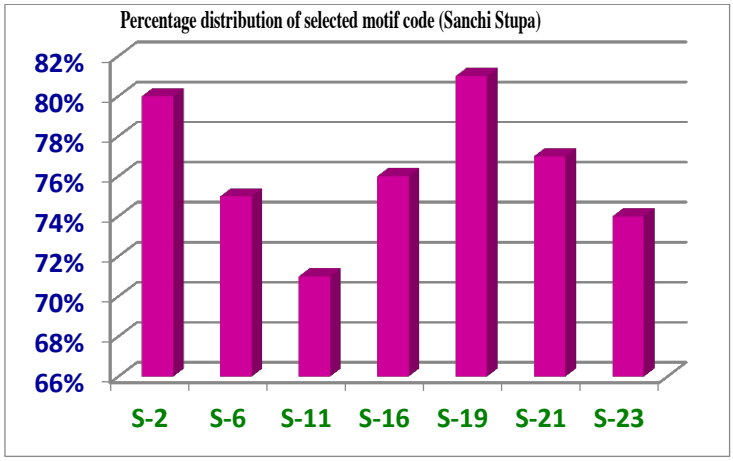

Fig.2: Percentage distribution of selected motif code (Sanchi Stupa)

Table No. 3 Selection of Motif From Sanchi Stupa

Rating Scale: - 5.Excellent, 4.Very Good, 3.Good, 2.Average, 1.Poor

Design Code	Judge no -1	Judge no -2	Judge no-3	Judge no-4	Total	Mean Score (Total/4)
S-1	17	15	16	15	63	15.75
S-2*	20	19	21	20	80*	20*
S-3	18	16	15	16	65	16.25
S-4	16	14	13	14	57	14.25
S-5	14	13	11	15	53	13.25
S-6*	19	18	20	18	75*	18.75*
S-7	16	18	15	16	65	16.25
S-8	15	14	17	18	64	16
S-9	13	15	16	14	58	14.5
S-10	17	18	15	17	67	16.75
S-11*	18	20	17	16	71*	17.75*
S-12	18	16	18	17	69	17.25
S-13	16	17	15	14	62	15.5
S-14	19	15	16	18	68	17
S-15	14	12	14	15	55	13.75
S-16*	20	19	18	19	76*	19*
S-17	16	14	15	15	60	15
S-18	15	13	14	17	59	14.75
S-19*	19	22	20	20	81*	20.25*
S-20	15	16	14	16	61	15.25
S-21*	20	20	19	18	77*	19.25*
S-22	17	19	16	14	66	16.5
S-23*	18	19	17	20	74*	18.5*
S-24	15	12	14	16	57	14.25
S-25	18	16	19	16	69	17.25

Table No.4 Percentage distribution of the selected Sanchi Stupa Motifs

Selected Motif Code	**S-2**	**S-6**	**S-11**	**S-16**	**S-19**	**S-21**	**S-23**
Mean Score	20	18.75	17.75	19	20.25	19.25	18.5
Percentage	80%	75%	71%	76%	81%	77%	74%
Rank	II	V	VII	IV	I	III	VI

It is an apparent from the table no.3 and table no. 4 that motif from Sanchi Stupa S-19 got the highest mean score with 81% and stood first among all 25 motifs, followed

by S-2 with 80% .Third rank was obtained by S-21 securing 77% score. S-16 scored 76% and obtained forth rank. With 75% and mean score 18.75, S-6 got fifth rank were S-23 got sixth rank with 74% score, and S-11 got seventh rank with scored 71%.

Placement and Arrangement of Motifs for Digital Printing

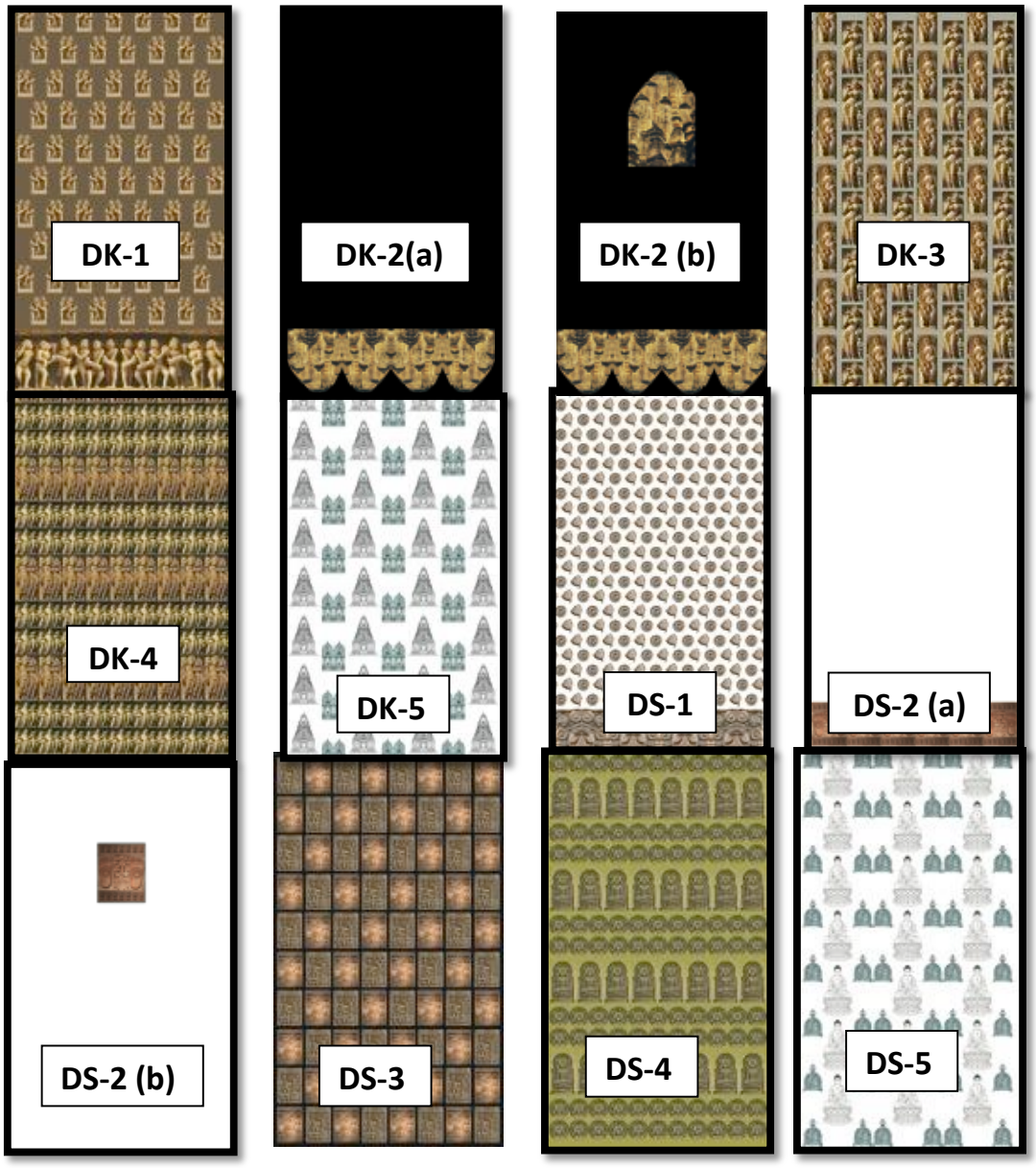

Table no. 5 shows that kurti DK-1 was highly accepted by respondents (88.9%) with a total score of 2667 out of 3000 followed by DK-3 with score 2622 and mean score 17.5. The acceptability index of kurti Dk-4 is 86.8% and was next favoured with a total marks of 2604 followed by kurti DK-2 with an acceptability index of 84.8% was next accepted with a total marks of 2544. Among all the developed Kurtis, kurti DK-5 was least liked by the respondents with a total score o2532 out of 3000

Developed Product: Kurtis from kahjuraho Temples through Digital Printing

Developed Product: Kurtis from Sanchi Stupa through Digital Printing

Table No. 5 Acceptability Index of Kurtis developed from Khajuraho Temple

Dress Code	Size of the Motif	Placement of the Motif	Color Combination	Overall Appearance	Total	Mean Score	Acceptability Index(%)
DK-1	669	657	675	666	2667	17.8	88.9
DK-2	633	621	648	642	2544	17	84.8
DK-3	645	645	666	666	2622	17.5	87.4
DK-4	654	648	645	657	2604	17.4	86.8
DK-5	636	627	624	645	2532	16.9	84.4

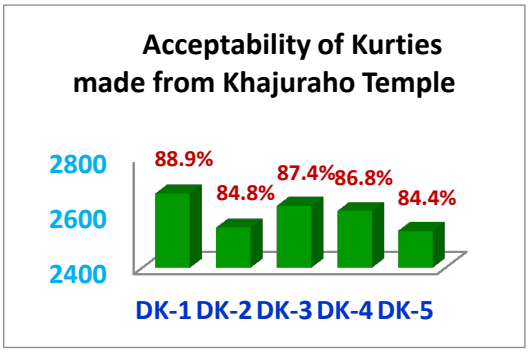

Fig.3:- Acceptability of Kurties made from Khajuraho Temple

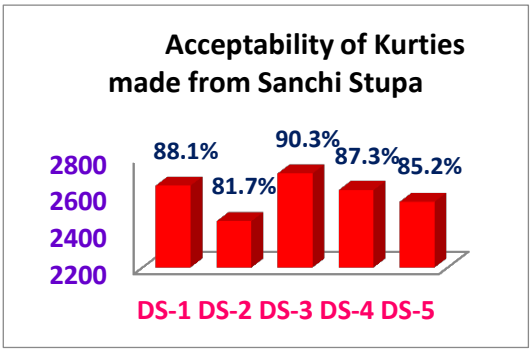

Fig.4:- Acceptability of Kurties made from Sanchi Stupa

Table No. 6Acceptability Index of Kurties developed from Sanchi Stupa

Dress Code	Size of the Motif	Placement of the Motif	Color Combination	Overall Appeara-nce	Total	Mean Score	Acceptability Index (%)
DS-1	675	639	654	675	2643	17.6	88.1
DS-2	618	600	606	627	2451	16.3	81.7
DS-3	675	669	672	693	2709	18.1	90.3
DS-4	645	636	660	678	2619	17.5	87.3
DS-5	648	636	636	645	2556	17	85.2

It is evident from the table that kurti DS-3 scored highest among all the Kurtis by respondents (90.3%) with a total score of 2709 out of 3000 followed by DS-1 with score 2643 and mean score 17.6. The acceptability index of kurti DS-4 is 87.3% and was next favoured with a total marks of 2619 followed by kurti DS-5 with an acceptability index of 85.2% was next accepted with a total marks of 2556. Among all the developed Kurtis kurti DS-2 was least liked by the respondents with a total score of 2451.

Table No. 7:- Market Potential of Khajuraho Kurties by College (S.N.G.G.P.G.) Girls

Design Code	Profit Percentage				
	10%	20%	30%	40%	50%
DK-1	51	60	15	13	11
DK-2	56	65	12	10	7
DK-3	53	62	14	12	9
DK-4	51	67	13	11	8
Dk-5	66	71	10	2	1
Total	277	325	64	48	36
Percentage	36.933	43.333	8.5333	6.4	4.8

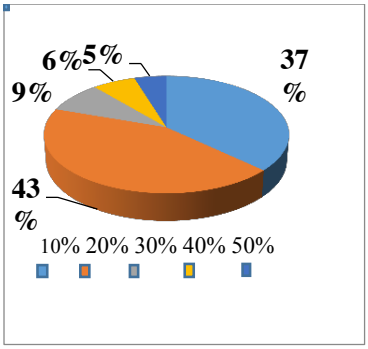

Fig.5:- Market Potential Of Khajuraho Kurtis by College Girls

It is inferred from the table no.7 that 43% of college girls were ready to buy Khajuraho Kurtis at 20% profit. Whereas 37% were ready to buy at 10% profit range. 9% of respondents were ready at 30% profit. 5% college girls were ready to buy at 50% profit range.

Table No. 8:- Market Potential of Khajuraho Kurtis by Market Personnel.

Design Code	Profit Percentage				
	10%	20%	30%	40%	50%
DK-1	20	13	11	4	2
DK-2	29	16	3	1	1
DK-3	23	17	5	3	2
DK-4	27	15	4	2	2
DK-5	34	11	3	1	1
Total	133	72	26	11	8
Percentage	53.2	28.8	10.4	4.4	3.2

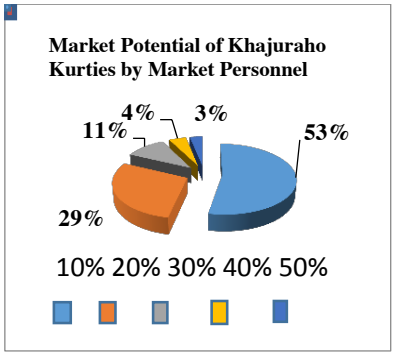

Fig.6:- Market Potential Of Khajuraho Kurtis By Market Personnel

It is an apparent from the table no. 8 that Khajuraho Kurties has enough market potential 53% market personnel were ready to buy 10% profit range. While 29% of respondents ready to but at 20% profit, 11% Market personnel were ready at 30% profit and followed 4% respondents were ready at 40% profit even 3% market personnel were ready at 50% profit range.

Table no. 9 shows that Sanchi Kurtis has enough market potential as 44% college girls were ready to buy at 20% profit range and 40% of respondents were ready at 10% profit. While 8% college girls was ready to buy at 30% profit. Even 5% college girls were ready at 40% and 3% respondents was ready at 50% profit range

Table No. 9:- Market Potential of Sanchi Kurties by College (S.N.G.G.P.G) Girls.

Design Code	Profit Percentage				
	10%	20%	30%	40%	50%
DS-1	56	62	15	10	7
DS-2	67	72	7	3	1
DS-3	50	59	16	14	11
DS-4	60	65	11	8	6
DS-5	65	70	9	4	2
Total	298	328	58	39	27
Percentage	39.733	43.733	7.7333	5.2	3.6

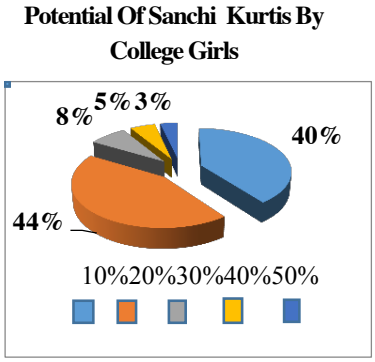

Fig.7:- Market Potential Of Sanchi Kurtis By College Girls

Table No. 10:- Market Potential of Sanchi Kurties by Market Personnel.

Design Code	Profit Percentage				
	10%	20%	30%	40%	50%
DS-1	21	18	7	2	2
DS-2	36	10	2	1	1
DS-3	19	14	10	4	3
DS-4	28	12	6	2	2
DS-5	37	9	2	1	1
Total	141	63	27	10	9
Percentage	56.4	25.2	10.8	4	3.6

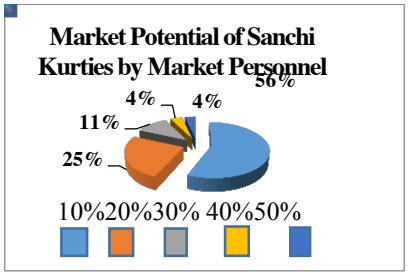

Fig.8:- Market Potential Of Sanchi Kurtis By Market Personnel

The above table shows that apparel of Sanchi has enough market potential 25% respondents were ready to buy at 20% profit and 56% market personnel were ready to buy at 10% profit range. Whereas 11% of respondents was ready to buy at 30% profit. While 4% of market personnel were ready to buy at 40% and 50% profit range.

Conclusion:

The study was conducted to develop designs for digital printing inspired by traditional art of Madhya Pradesh. It was concluded that adaptation of designs from selected architecture structures and sculptures of Madhya Pradesh make new innovations in design development which holds bright future in fashion and textile industry. It was also concluded from the study that consumers can yield higher market potential for different traditional art of Madhya Pradesh to be used in textile designing. Digital printing has many advantages other than conventional methods of digital printing.

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DP-19

KHADI- CIRCULAR INNOVATION AND SUSTAINABILITY

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Abstract

Circular innovation is a system that is restorative and regenerative by intention and design. Focusing on economic potentials of the available resources through a new business model that aims to restore the economic value and usefulness of material in a cycle that integrates local and foreign textile art to ensure acceptance and success in the national and international fashion market to meet the challenges of the digital age. This paper suggests the strategies for Khadi to remain viable and sustainable in an environment where fashion is driven by price and technology. Amalgamating the rich Zulu bead work from Africa and the exquisite Aari work from India to design waistcoat for men using Khadi fabrics. Fashion and innovative designing have always played a major role not only in bringing the art and culture to limelight but has ultimately made it to live and flourish for economic, social and environmental wellbeing. This study focuses on the development of these art forms and their impact on the fashion industry. Westernization, liberalization, globalization, digitization is changing the fashion and market status prompting the designers to be innovators. The designers have to adapt radical innovation and collaborative design processes at the same time maintain the cultural ethos.

Key words: Circular Innovation, Fashion, Khadi, embroidery, sustainability.

1. Introduction

The design for sustainability starts with the thinking of the product and its eco-impact. The eco impact is not only from environmental point of view but from the holistic thinking of sustainable development. The sustainable development definitions are environmental protection, economic development and social development.

Figure 1: Concept of "Think Globally, Act Locally" to Achieve Sustainable Development Goals

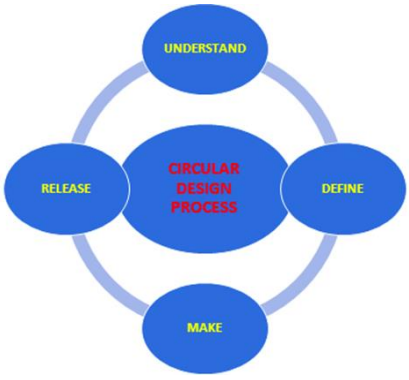


Figure 2: Circular Design Process- Understand, Define, Make, Release.

1.1: Circular Economy, Circular Design Process and Sustainability

The design for circular economy starts by focusing on optimizing the economic potentials of the available resources through a new model that aims to restore natural resources while system enhancing human health and quality of life (Andrews, 2015). Circular economy is a system that is restorative and regenerative by intention and design, which maximizes ecosystem functioning and human wellbeing with the aim to accomplishing sustainable development. It replaces the end -of-life concepts with closing, slowing and narrowing the resources flows in production, distribution and consumption processes, extracting economic value and usefulness of materials, equipment's and goods for longest possible time, in cycles energized by renewable resources. It is enabled by design, innovation, new business and organizational models and responsible production and consumption (Wastling , 2018).

Perfect sustainable product design needs to start with a circle. The four loops can be used to build new circular business models based on the four stages of design process: understand, define, make and release. (Figure 2).

- **Understand:** the designers and the stake holders to understand the different products and why the consumers need the product. Then brainstorm the different solutions that can be adopted to deliver the same.
- **Define:** To define the business goals and form a multidisciplinary team. It provides a plan for production process and create a brand promise for the product.
- **Make:** The team to create a user-centered research to understand the process of conceptualization of the product and creating the product prototype and defining the materials that is required for the production.
- **Release:** The product is launched to the market in order to learn the consumer experience and tools to get consumer feedback and building partnership.

Circular innovation is a system that is restorative and regenerative by intention and design. Focusing on economic potentials of the available resources through a new business model that aims to restore the economic value and usefulness of material in a cycle that integrates local and foreign textile art to ensure acceptance and success in the national and international fashion market to meet the challenges of the digital age.

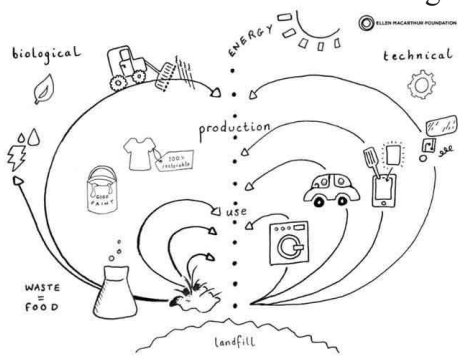


Figure 3: The Butterfly Diagram for the Circular Design.
Source: ellenmacarthurfoundation.org)

This paper suggests the strategies that can be adopted for Khadi to remain viable and sustainable in an environment where fashion is driven by people, price and technology (Figure 4).It aims to promote a wider sustainable strategy and the circular

design thinking is playing an essential role in building a brand image and a business model for the Indian Khadi fabrics that forms the basis for sustainability.(Figure 5).

Figure 4: Design for Sustainability Evolutionary Frame work

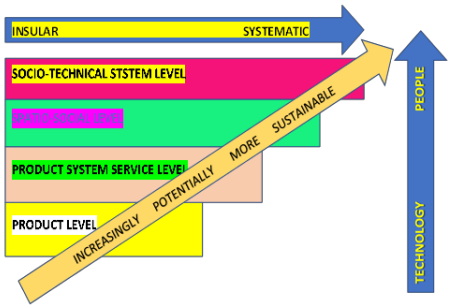


Figure 5: Circular Design -Innovative Project Design Rationale

1.1: The Indian Khadi

The clothes we wear have played an essential role throughout history. The art of hand spinning and hand weaving have been from thousands of years. The craft of making cotton fabric dates back to the Indus civilization around the 2800 B.C. The excavation at Harappa and Mohan-jo-dare reveal that the charkha was a part of the Indian household. The Vedic Aryan used the charkha and during the Buddhist age also the charkha continued to be plied. During the Mauryan period, there existed a large organization to deal with matters connected with spinning and weaving. The spinners were women who did the work at home in their spare time.The Father of the Nation, Mahatma Gandhi, urged the people of India to wear Khadi garments. It was not only a call to create self-reliance but also a call to wear something that could demonstrate the unity of India. Khadi was given an important status by Gandhiji after his return from South Africa. While in search of the Charkha, Gandhiji felt that for a nation to turn to mass production, it had to return to indigenously produced goods. Most of the Khadi cloth is of pure white (bleached or unbleached), and most of the people wear them based on their "ideology". Khadi has an extremely important connection with Indian freedom movement, and has become virtually symbolic of the struggle for freedom. (Balasubramanya,2015).

1.2: Zulu Bead Work of Africa

According to Bhatt, Medha, (2016),beads were highly valuable in traditional African society.Even today they are used for different purposes. Most societies in Africa use them for adornment and various forms of artwork. Besides being used for fashion as value addition, some of the African communities in the past used special types of beads as currencies for exchange of goods and services.

Biyela N. G, (2015) narrated that the significance of beadworkZulu beadwork determined by limited number of symbols in the form of colours and geometric designs. The values assigned to the geometric designs are constant and do not change from one alternative to another as do the symbols

Figure 6: a. Zulu Culture

Figure- 7 b: Zulu Bead Accessories

The significance of beaded objects is influenced by various factors, the most important of which are the following:

- The combination and arrangement of colours;
- The nature of a particular object;
- The use to which an object is assigned;
- The deliberate negation of standard rules governing the operation of these factors.

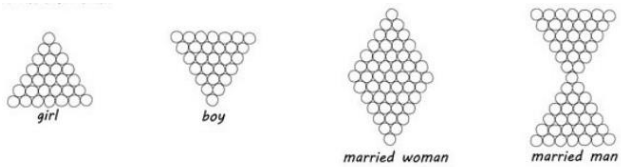


Figure 7: **Zulu symbols**

Combination of colour and symbols are the primary modes of communicating feelings and ideas. Each colour has its own meaning and their combination express negative or positive expression that has to be conveyed relating to the context (Table 1).

Table 1: Colours Used and Its Meaning

Colour	Positive	Negative
Black	Marriage, Rebirth	Death, Sadness
Blue	Faithfulness, Request Hostility	Dislike
Yellow	Wealth, Garden	Badness, Thirst, Withering
Green	Contentment	Discord, Illness
Pink	Promise, High Status Poverty	Laziness
Red	Love, Strong, Emotion	Heartache
White	Spiritual Love, Purity	(None)

1.3: Waistcoat and Its Styling

A gentleman's attire was considerably elaborate, incorporate the finest silks and lace, buttons and trims and embellishments. The term 'waistcoat' is derived from the cutting of the coat at the waist as it was used to make them. Since previous to its invention British tailors would cut the cloth for a coat much longer than that of a waistcoat. Another difference in terms of colour is that the waistcoats were often incredibly bright in colour and highly decorated, making it the centrepiece of a gentleman's outfit. The nineteenth century saw a significant increase in the popularity of the waistcoat but colours were more subdued and

they became somewhat shorter than their earlier counterparts and a little tighter too acting a like a corset for men to suckin those extra inches. This evolved further to the point that gentlemen did wear true whale boned corsets under their waistcoats which followed a fashion for men to have small waists just as their wives and mistresses did, making them appear wider at the shoulders giving a masculine impression but with a small and elegant waist. During the 20th century it remained a well-loved and accepted part of most men's wardrobes. It was most popular as part of a 3-piece suit and made from wool, since it kept men warm ,when heating in homes was scarce and coal was relatively expensive for the average worker on a budget (Loba ,1996)

Objectives

The specific objectives selected for the paper are as follows: -

- To create waist coat styles for menusing Khadi fabrics.
- Application of Zulu bead work and Aari workon components of waist coat.
- To evaluate acceptance of the designed products among the targeted customers.

Designing for sustainability is essential for the designers and the use of surface ornamentation plays a very important role since the consumers from the current generation are becoming increasingly sensitive to Fashion, environment and price.

2. Methodology

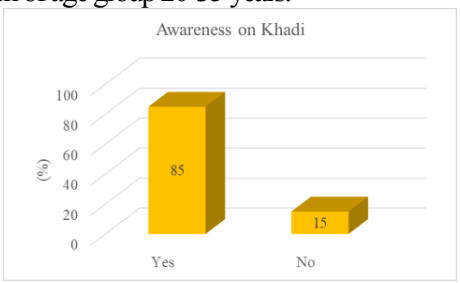
The methodology of the study is divided into 3 phase.

Phase-1- Observation study- offices in Bangalore were visited to know the professional works choice of the Fashion category for men and about the awareness on Khadi.

Phase-2- Experimental- this phase includes selection of fabric, style, colour, Zulu bead art and finishing of waistcoats.

Phase-3- Acceptance study- this phase speaks about the survey that was conducted to know the acceptance of the designed waistcoat by the targeted customers men of age group 20-35 years.

Figure 8: Systematic Plan for the study.



Graph 1: Awareness on Khadi fabric

3. Findings and Discussion:

3.1: Awareness on Khadi fabric

The findings of the survey indicated that85% of the respondents were aware about Khadi woven fabrics this is because of the digital media and interest of young generation for natural and eco-friendly products.(Graph 1)

3.2: Designing and development of Waist coat styles.

Style 1- Vintage Collared Waist Cost

This vintage collared waist cost with muslin (eight ply) Khadi fabric. Sleeveless style with embellishment of Zulu bead embroidery on collar lapel and pocket.

Table - 2 Garment Specification Sheet: Vintage Collared Waist Cost

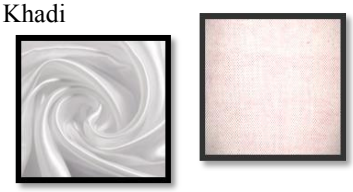
<table>
<tr><td colspan="5">Garment Specification Sheet</td></tr>
<tr><td>Style # 01</td><td>Description</td><td>Order #</td><td>Season</td><td>For all season</td></tr>
<tr><td>Size</td><td>L</td><td>Category</td><td>Party Wear</td><td></td></tr>
<tr><td colspan="3">Measurements (UOM – Metric)</td><td colspan="2"></td></tr>
<tr><td>POM</td><td>L</td><td colspan="3">Fabric</td></tr>
<tr><td>Cheat Round</td><td>40.05</td><td colspan="3" rowspan="5">Khadi  </td></tr>
<tr><td>Waist Length</td><td>20.00</td></tr>
<tr><td>Arm hole</td><td>40.00</td></tr>
<tr><td>Full Length</td><td>130.0</td></tr>
<tr><td>Shoulder</td><td>18.00</td></tr>
<tr><td colspan="5">Photo Sketch</td></tr>
<tr><td colspan="2">Front View</td><td colspan="3">Back View</td></tr>
<tr><td colspan="2">  </td><td colspan="3">  </td></tr>
<tr><td colspan="5">Trim Details</td></tr>
<tr><td>Sl. No</td><td colspan="2">Particulars</td><td colspan="2">Qty.</td></tr>
<tr><td>1.</td><td colspan="2">Show button</td><td colspan="2">03</td></tr>
</table>

Figure 9: Vintage Collared Waist Cost- Appearance and value addition

Figure: 10: Double-Breasted Stand Collar-Appearance and Value Addition

Style 2: Double-Breasted Stand Collar:

It's a double-breasted stand collar waist cost with spun-silk Khadi fabric. A Zulu design was applied collar and front left panel.

Table:3: Garment Specification Sheet: Double-Breasted Stand Collar

<table>
<tr><td colspan="6">Garment Specification Sheet</td></tr>
<tr><td colspan="2">Style #: 02</td><td>Size</td><td>L</td><td>Party Wear</td><td>All season</td></tr>
<tr><td colspan="4">Measurements (UOM – Metric)</td><td colspan="2"></td></tr>
<tr><td colspan="2">POM</td><td>L</td><td colspan="3">Fabric</td></tr>
<tr><td colspan="2">Cheat Round</td><td>40.05</td><td colspan="3" rowspan="5">Khadi  </td></tr>
<tr><td colspan="2">Waist Length</td><td>20.00</td></tr>
<tr><td colspan="2">Arm hole</td><td>40.00</td></tr>
<tr><td colspan="2">Full Length</td><td>130.0</td></tr>
<tr><td colspan="2">Shoulder</td><td>18.00</td></tr>
<tr><td colspan="6">Photo Sketch</td></tr>
<tr><td colspan="3">Front View</td><td colspan="3">Back View</td></tr>
<tr><td colspan="3">  </td><td colspan="3">  </td></tr>
<tr><td colspan="6">Trim Details</td></tr>
<tr><td>Sl. No</td><td colspan="3">Particulars</td><td colspan="2">Qty.</td></tr>
<tr><td>1.</td><td colspan="3">Show button</td><td colspan="2">04</td></tr>
<tr><td colspan="6">Description: Men’s waistcoat with sleeveless with embellishment of Zulu bead embroidery on collar and pocket.</td></tr>
</table>

Graph 2: Respondents feedback on Vintage Collared Waist Cost

Graph 3: Respondents Feedback on Double-Breasted Waistcoat

Graph (2) shows the respondent’s positive feedback on the colour combination and value addition technique used. The comfort and style features were also rated as excellent (percent 53 and 55 respectively). These features have prompted the respondents to consider the product best suited for all occasions.

Graph (3) gives the feedback of respondents on colour combination and value addition used. Positive feedback is indicated and the value addition is highly rated (67%).

The details and style features are not marring the comfort. The buying criteria of the targeted customers greatly depends on their response to suitability and the result indicate that the respondents consider the product completely suitable and versatile. Emphasis on styling and colour is no longer limited only to women but stylised and colourful clothes are accepted as fashionable by men as well and this valuable feedback provides tremendous scope for the designers to explore.

4. Summary, Conclusion and Implications:

In the design process there is no beginning or end. The trend forecasts are the inspiration and the inspiration are derived from art and culture that forms the basis to formulate the Trend. The latest 2020 trend forecasts also suggest inspirations from African motifs, embroidery, colours and styles for the development of new fashion products. (Figure 11&12,13). From the finding of the research,2020 trend forecasts, current news, well as the new initiatives taken by the government it is evident that there is tremendous scope for the development of Khadi as a fashion product to meet the requirements of the Indian as well as global market. (figure 14 & 15).

Figure 11: Trends Forecast2020: African Queen

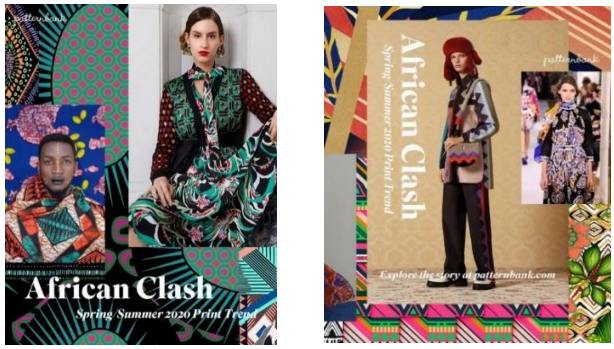


Figure 12: Trends Forecast 2020: African Clash

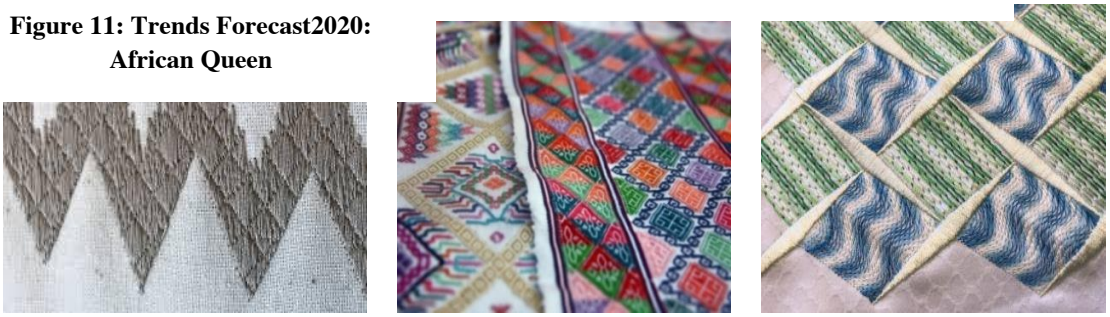


Figure 13: Embroidery Trend 2020

Market diversification becomes relevant to highlight the importance of product diversification.Market diversification is essential for sustainable growth. The ready-made garment (RMG) sector is an emerging market having immense potential. The popular Export items has been trousers-shirts, sweaters, shirts and jackets and in the recent years export is being expanded to other items like -suits, blazers, lingerie, active wear, sportswear, and outwear. World clothes export are going to be critical to pursue next big opportunity.Significant improvements have taken places in exports to Chile, China and Russia. (TAI 2019).

FEATURE

BY REVIVING KHADI, THE GOVERNMENT AIMS TO GENERATE EMPLOYMENT FOR FIVE CRORE WOMEN AND MEN IN RURAL INDIA BY 2025.

By installing solar charkhas in their houses, the skilled artisans will get to work from the comfort of their home; through this they can easily work and earn as well as do their household chores. With solar charkhas of 10 spindles, the skilled artisans can earn ₹6000 to ₹9000 if they produce up to 38 kg of yarn in a month.

According to the estimates of the Ministry, the solar spinning wheels will also generate large scale employment. Estimates say 10 people are engaged on every solar spinning wheel. Thus in the village alone 10,000 jobs would be created. By reviving khadi, the Government aims to generate employment for five crore women and men in rural India by 2025.

SUN-KISSED FABRICS

The solar charkha is now successfully implemented in various institutions, clusters and business models all over the country and the products developed from this system are gaining wide acceptance in national and global markets.

With the use of the solar charkha, the production of khadi which had dwindled over the years has increased by a great degree. With a new-found sustainable market for khadi, this homespun cloth is now being promoted as the 'Green Fabric of India' due to its features like bio-degradability and zero-carbon footprint. Today, brands like W and many online shopping portals have an array of fashion clothes in green khadi. The solar charkha activity is now given the 'Village Industries status' by KVIC and a special 'Solar Vastra Cell' has been initiated for the development of such projects in various parts of the country. ■

MAJOR MOVEMENTS

- Union Cabinet Minister Nitin Gadkari initiated the implementation of solar charkha project in the Vidarbha region of Maharashtra. He asked Welspun India Ltd. to assess the yarn quality and to propose a suitable business model for the Vidarbha region.
- The solar charkha projects initiated at Amravati, Wardha and Yavatmal Districts of Vidarbha, as well as Beed are the outcome of the above initiative.
- A cluster of 500 solar charkhas each in Varanasi and Nawada, and about 50 Solar powered peddle looms have been implemented by this initiative.

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Figure 14: Print media on Khadi and Technological Innovation

Sale of khadi increases during Indian polls

The demand for khadi apparel has witnessed a surge due to elections, with its sale registering a record high of ₹3,215 cr, up 29 per cent, in the fiscal ended March compared to the previous fiscal. According to Khadi and Village Industries Commission (KVIC) Chairman Vinay Kumar Saxena, the khadi business registered a four-fold growth in the last five years. The sale figure was ₹811 cr in 2013-14. During summers, politicians and their supporters have to spend a lot of time under the sun because of which they prefer khadi. He said the demand for khadi is growing across the country, especially in Delhi National Capital Region, Uttar Pradesh and Bihar. Out of the total sale in the last fiscal, 40 per cent was of raw cloth, while the rest was of readymade apparels, he added ■

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Figure 15: Growth in Sales of Khadi.

India and its Khadi (Figure 14 &15) is being constantly featured in national and international media and its growth potential is projected. The ancient concepts, beliefs and practices is being accepted all over the globe as evident of its mention in the Trend Forecasts of 2020. 1(Figure 16). Today India is pursuing a higher value addition and product diversification and it is important to contribute to research for innovation and sustainable design since it also validates and supports the thought process of famous global brands like Nike. (Figure 17).

Figure 16: Trend Forecast 2020 - Karma.

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AIPAN: ADAPTATION OF FLOOR ART FOR TEXTILE DESIGNING

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Abstract

Uttarakhand is largely a hilly state, located at the foothills of the Himalayan mountain ranges comprised of snowy mountains, luxuriant green valleys, sparkling rivers and picturesque landscapes that have always inspired artisans, writers and poets. The serenity and peace of state have allowed the ethnic communities residing in the state to practice diverse folk arts as *Aipan*- floor painting, wood and stone carvings, etc. to put up with their cultural significance. The social, technological, economic changes had made negative impact on the traditional crafts of the state too. These are losing significance despite being legacy of our past and making significant contribution to the economy of India through providing employment opportunity to a vast section of artisans. The commercialized crafts have fast, regular and low cost production that impacts negatively the forte of hand craft resulting in faded interest of consumers in hand made quality products. Hence an approach is needed to adapt such crafts for its application on varied media using diverse techniques of application. Several projects had been undertaken for adaptation of *Aipan*, floor painting for textile designing. Textile is one such material known to and is produced since antiquity. It has been a means of disclosing the histories of different civilizations. Hence textile media was chosen as the media for adapting floor art of state to promoting the crafts existence as well as to communicate the cultural implication of craft to consumers. This paper is an attempt to communicate the process of adaptation of floor art designs for its application on textile through different surface enrichment techniques. Distinct designs and range of diversified products were made to showcase the possibility of developing contemporary products with distinctive ethnic designs. Such efforts if transferred to artisans of the areas through training or schematic interventions will enable them to get economic and social empowerment through promotion of craft forms and their skills. This will further result in sustainable development in hill areas of the state by generating employment possibilities for local youth and women comprising major population section in the state.

Keywords: *Aipan*-floor painting, adaptation, textile designing, needle craft

The dynamic fashion industry has offered great opportunities to designers in present day global context prevalent all over the world. The fashion consumers, young or old, consistently desire for distinct but classic products across the universe. Further competitiveness prevailing in fashion sector frequently demands for low cost technologies and divergent designs suitable for merchandise. The varied range of crafts and arts prevalent throughout the India not only represents the rich cultural heritage but also offers a reservoir of design base for inspiration to the designers.

Uttarakhand, largely a hilly state located at the foothills of the Himalayan mountain, is abode to snowy mountains, luxuriant green valleys, sparkling rivers and picturesque landscapes that have always been source of inspiration to artisans, writers

and poets. Various folk arts like wood and stone carvings as well as folk paintings like *Aipan* had been practiced here by many generations as means of their livelihood. This scenario got changed due to variable social, political, economic and technological developments that had changed the livelihood scenario in the state. Besides education and migration of young generation due to their occupations, the climate changes had played havoc in the state. Owing to these reasons the traditional crafts are at the verge of extinction in the state.

Aipan is a form of *rangoli* (floor paintings) having great religious significance to people of *Kumaun* region of state. The present generation and the people outside Uttarakhand do not know the traditional significance of *Aipan*. Hence it is losing its cultural relevance that needs attention to prevent its disappearance. So the sustenance of traditional crafts need to be ensured through collaborative efforts of government and general masses. In this direction the perpetuation of craft practices in a form with which young generation in India can connect efficiently could be a relevant step to ensure meaningfulness and survival of craft. *Aipan* designs could be preserved for future generations by its application on the media that can withstand the winds of change.

The modern consumer wants functional articles or artifacts that have high aesthetic value besides exclusivity in design and style. It has given a new direction in fashion and has driven for integration of local practices, values and skills with latest technologies. These days in India the love and appreciation for the crafts is reviving and spreading throughout the country as evident by the latest collection by Indian designers based on traditional arts and crafts of India. Adaptation is a common practice in creation of novel ideas and articles. This adaptation of a traditional art upsurges the design base for textiles in fashion industry empowering local artisans as well.

Textiles have always been principal media for preserving ancient evidences of civilization, the development of global products based on textiles using local designs will not only promote preservation and correspondence of traditional crafts but would also generate employment avenues for local people of the state. There had been researches wherein different traditional art forms and crafts were adapted for development of designs to enrich textile surface through various techniques namely, heat transfer printing[6&7], resist printing[9], weaving[10], embroidery[11]and screen printing[5]. Inspired from these research efforts towards rejuvenation of traditional Indian crafts, *Aipan*, floor painting of Uttarakhand was explored by many researchers to develop design base for textile designing through various surface enrichment and structural techniques[1,2,3,8, 12,13,14,15].The objective of the present study was to adapt *Aipan* motifs for design development for application on textile surface using different surface enrichment techniques. Hence the present study was conducted with the objectives to study prevalence of Aipan folk art amongst *Kumaonis*; to collect motifs of *Aipan* designs representing *Kumauni* culture, discuss their significance and to develop and apply design patterns suitable for apparel and household articles.

Methodology

The *kumaoni* region of Uttarakhand state was locale of study and four districts namely, Udham Singh Nagar, Nainital, Almora and Pithoragarh were covered under the study. The respondents (200 women) were selected through snow ball technique. The study was conducted through survey using self-structured interview schedule on selected 200 women who practiced *Aipan* in their household and data was collected on

practice/prevalence of *Aipan* folk art during present times and adaptation of its designs for application on textiles through different techniques for diverse product range used in household or as apparels.

The *Aipan* motifs were collected from primary (floor and wall paintings) and secondary sources (books, cards, stickers) available in household as well as in museum. The points kept in mind were the cultural significance of the designs and true representation of the *Kumauni* culture. Thereafter, adaptation of the selected motifs was carried out using simplification and exaggeration principle taking into consideration the technique of enrichment to be used for their application on textile surface. Design arrangements were developed for household and apparel articles (cushion covers, wall hangings, bags, kurti and ceremonial veil) wherein colour schemes were applied to add aesthetic value to products. Final selected design arrangements were applied on articles through specific surface enrichment techniques such as screen printing, block printing, tie and dye, batik, embroidery, applique and heat transfer printing. The selection was done at each stage on the basis of weighted mean scores obtained by calculating the responses of members of panel collected on 5- point rating scale (Table 1) for overall appearance. The panel comprised of experts in field of art and design and product development. Finally the prepared articles were exhibited to the prospective consumers and got assessed on 5-point rating scale for three parameters viz., suitability of design arrangement on article, suitability of technique for development of design and overall appearance of article. The weighted mean score was the statistical tool used to draw meaningful inferences from scores of each articles on different parameters.

Table 1 Five-point rating scale used in assessment of designs and articles

Preference order	Rating/score
I	5
II	4
III	3
IV	2
V	1

Findings and discussion

The selected respondents in present study were women and the survey of such women from identified locales in *Kumaoni* region of Uttarakhand state revealed following aspects on practice/prevalence of *Aipan* folk art during present times and adaptation of its designs for application on textiles through different techniques for diverse product range:

- It was found that *Aipan* is practiced more in rural areas than in urban areas as 64 per cent women proficient in this folk art belonged to the rural area whereas 36 per cent women belonged to the urban area.
- The use of *Aipan* folk art was more prevalent amongst Brahmins (42 per cent) followed by Rajputs (38%), Vaishaya (7%), schedule caste (11%) and other backward caste (2%). Further it was found that drawing of *aipan* in the households prevailed in Brahmin and

Shah (business) community owing to customs. Rajput families used to apply only red *geru* on the floors.

- All the respondents were conscious of the traditional folk art of *Kumaon*. *Aipan* was made in most of the households and readymade *aipan* stickers were found to be used extensively in the households of Uttarakhand.
- Only females were involved in drawing the *aipan* in households. It was traditionally known as the art of women and this art was passed by mothers to their daughters. This depicts that females are more artistic and involved in the folk art. They used to draw *aipan* as customary tradition that had religious and cultural purpose.
- *Aipan* was found applied in households on place of worship, main entry doors of house and front courtyard. Besides this, 82 per cent households had the *aipan* made on *Tulsi* pot found in almost every house.
- All the respondents were not in favour of *aipan* design based clothing/apparels and furnishing. Only 77 per cent respondents were in favor of its use and among them 26 per cent respondents showed interest for floral designs and 19 per cent for geometric designs. The designs from *dehli ke aipan* were preferred by 22 per cent and only 10 per cent showed preference for designs from *chowki* with slight modification in terms of designs and colours.

Nine motifs of *Aipan*, representative of *Kumauni* culture selected from collected designs included *sua* (parrot), *Laxmi pau* (Goddess Laxmi feet), *nata* (geometric human figure), *naag phani* (snake head), *bhadra* (geometric shape using lines), *shankhi* (conch shell), swastika, *ghanti* and *ghiroli*. Table 2 shows the selected motifs and their origin.. Table 2 shows the selected motifs and their origin. The significance of these motifs in day to day life of Kumauni community of Uttarakhand is as follows:

1. *Sua*

This is a stylized design inspired from parrot which is locally known as *sua* in Kumaun region. This design is associated with the arrival of beloved ones hence drawn on the floor in form of creeper as well as *chowki* during festivals and religious occasion. It is essentially drawn in *Vivah chowki*.

2. *Laxmi pau*

This *aipan* design has been enthused from the footprint of the Goddess *Laxmi*. This is a stylized design and is used in both the styles of floor paintings i.e., creeper and worshiping seat. On Diwali festival, this motif is essentially drawn at the main entrance of the house and at different places in *Mahalaxmi chowki***.**

3. *Nata*

This is a figurative style of *aipan* which is drawn on the walls of the dining room which is considered as temple in household on Diwali festival where the basic need of life i.e., food is fed to the people. The figures used in *nata* represent the Goddess of wealth, *Laxmi* and God of wellbeing and protection, *Narayan*.

4. *Naag Phani*

This is the stylised version of snake's hood and it symbolizes the Lord *Shiva*. This design is found drawn on the paper or cloth in the form of creeper which is used during worship on *Nag Panchami*.

5. *Bhadra*

It is form of Aipan drawn at the place of yagya. It is further subdivided into several forms, based on the number of dots it comprises.

6. *Shankhi*

This stylized design has its origin from the conch shell which is associated with the creation of first sound, *Om*. It is also considered a symbol of purity and auspiciousness. This is drawn on the *chowkies* as well on the paper and cloth. It is essentially drawn in the *Khodas chowki* used on ceremonial veil, *pichhora* worn by women during all religious events and in *Surya chowki* drawn on wood used during *naamkaran* ceremony of newborn.

7. *Swastik*

This is a geometric design that stands for auspiciousness, peace and prosperity in Hindu religion. It is the most commonly used religious symbol used in rituals performed by Hindus on different occasions in the life of an individual.

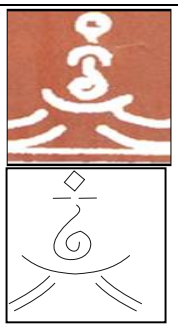
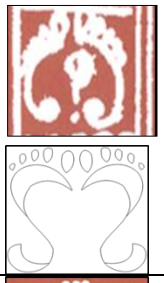
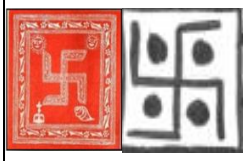
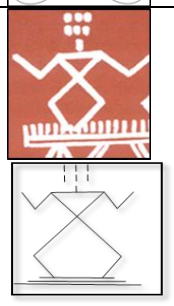
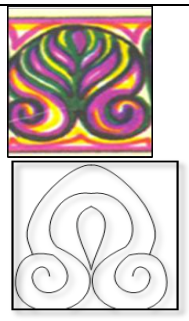
8. *Ghanti*

This is a stylised design which has been derived from the bell (*ghanti*) used during prayers in Hindu temples and in other cultural rituals. It is essentially drawn in *Surya chowki* as *asan* used for the worshipping of Sun God during *naamkaran* ceremony of newborn and in the *Khodas chowki* over the ceremonial cloth like *pichora*.

9. *Ghiroli*

This design has been enthused from a small sized reptile locally known as *ghiroli*. This is a stylised design which is drawn in creepers and *chowkies* (*Saraswati chowki*, *Mahalaxmi chowki*, *Dhuliargha chowki*, etc.) used during *pujas* and festivals.

Table 2 Prominent motifs based on *Aipan* craft of Uttarakhand

S. No.	Motif	Source/ origin	Illustration	S. No.	Motif	Source/ origin	Illustration
1.	*Sua*	Bird (parrot)		**6.**	*Shankhi*	Sea life (conch shell)	
2.	*Laxmipau*	Mythology (Goddess Laxmi feet)		**7.**	Swastika	Ritualistic	
3.	*Nata*	Human		**8.**	*Ghanti*	Manmade object (religious)	
4.	*Phani*	Animal (snake)		**9.**	*Ghiroli*	Animal (reptile)	
5.	*Bhadra*	Ritualistic					

The articles prepared using the design arrangements based on adapted aipan motifs are shown in Figures 1 to 9. The details of the material and technique of surface enrichment used are given in Table 3.

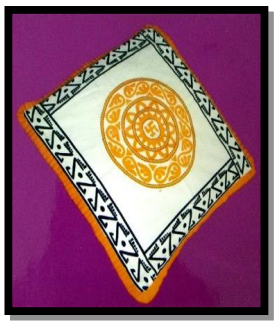


Fig. 1. Cushion cover, screen printed using adapted *Laxmi pau*

Fig. 2. Cushion cover, prepared with tie and dye technique using adapted *shankhi*

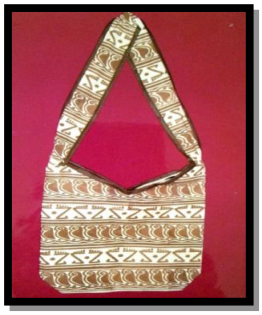


Fig. 3 Sling bag prepared with screen printing technique using adapted *Laxmi pau*

Fig. 4 Sling bag prepared with batik technique using adapted *Laxmi pau (Aipan)* motif

Fig. 5 Shoulder bag prepared with heat transfer technique using adapted *bhadra (Aipan)* motif

Fig. 7 *Kurti* prepared with block printing using adapted *Laxmi pau (Aipan)* motif

Fig. 6 Wall hangings prepared with different

Fig. 8 Draw string back pack bag prepared with

Fig. 9 *Pichhora* (ceremonial veil of *kumaoni* women) prepared with screen

Table 3 Details of materials and surface enrichment techniques used in prepared articles

S. No.	Article	Material used	Surface enrichment technique used
	Cushion (Fig. 1)	Khadder casement	Screen printing
	Cushion (Fig. 2)	Cambric	Tie and dye
	Sling bag (Fig. 3)	Khadder casement	Screen printing
	Sling bag (Fig. 4)	Poplin	Batik
	Shoulder bag (Fig. 5)	Polyester	Heat transfer printing
	Wall hanging (Fig. 6)	Khadder casement	Embroidery
	Kurti (Fig. 7)	Cambric	Block printing
	Drawstring back pack bag (Fig. 8)	Khadder casement	Applique
	Pichhora (Fig. 9)	Chikan cotton	Screen printing

Table 4 Consumer acceptability of the articles on selected parameters

N= 30

Article (Technique used)	Suitability of design arrangement on article (WMS)	Suitability of technique for development of design (WMS)	Overall appearance of article (WMS)	Mean of WMS
Sling bag (Batik)	4.30	4.00	3.95	4.08
Wall panel (Embroidery)	4.30	4.03	4.06	4.13
Cushion cover (Tie and Dye)	3.95	4.45	4.43	4.27
Back pack drawstring bag (Applique)	4.96	4.90	5.00	4.95
Hand bag (Heat transfer printing)	3.50	3.80	3.80	3.70
***Pichhora* (Screen printing)**	2.93	2.80	2.86	2.86
Cushion cover (Screen printing)	4.03	4.40	3.76	4.06
***Kurti* (Block printing)**	4.00	4.23	4.23	4.15

Table 4 shows Weighted Mean Scores (WMS) obtained on different parameters on which the articles were assessed by the consumers (*Kumaoni* girls and women). It can be envisaged from the data that all the articles were acceptable amongst consumers as depicted by weighted mean score that was above 2.50, the mid value of WMS, on all parameters on which the articles were assessed.

Further it can be deduced from Figure 10 that the articles *Pichhora* and hand bag finished with screen and heat transfer printing were less accepted as compared to other articles finished with divergent surface enriching technique. The least acceptance of *Pichhora* might be due to more cultural significance of the traditional veil as compared to other items that find regular use in our day to day life. The social consequence of the using a specific traditional veil could also be the possible factor that affected its acceptability while other items are those wherein the women consistently desire change as well as distinctiveness from others in the society.

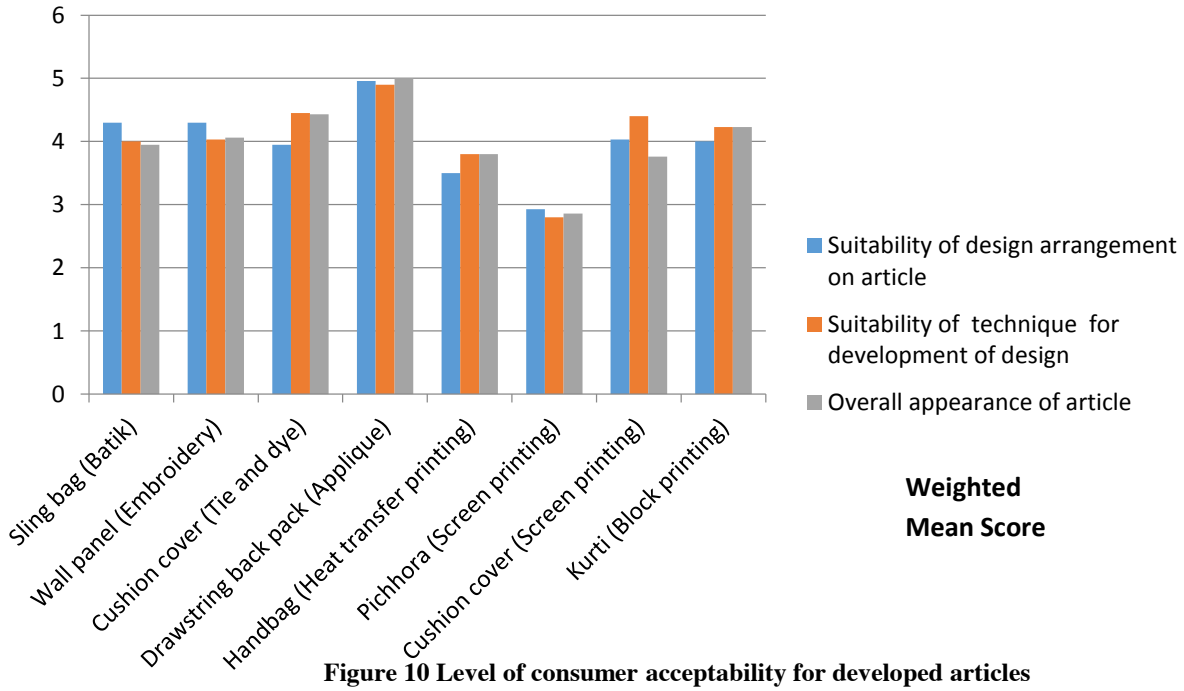


Figure 10 Level of consumer acceptability for developed articles

Summary, conclusion and implications

The study revealed that it is possible to develop designs through use of *Aipan* motifs for textile designing. The developed designs can be applied on fabric surface through embroidery, dyeing and printing techniques. The range of articles prepared using adapted *Aipan* motifs attracted the consumers reflecting acceptability of merchandise inspired from traditional crafts. The adapted *Aipan* motifs created value addition and diversity of local resources through sustainable design practices.

These efforts if transferred through training to local artisans will play significant role in craving out a distinct identity in global fashion arena. Along with revenue generation, this attempt would support preservation and communication of a traditional art form needed

to highlight Uttarakhand state as a major tourist spot at national and international platform.

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SUSTAINABLE PRODUCT DEVELOPMENT THROUGH CREATIVE UP-CYCLING OF INDIAN BROCADES

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Abstract

Sustainability of products has become an important concern in this era of technological advancement. Textile and apparel sector, because of its environmental and social impacts, is a focus of sustainability movement (Eco and sustainable textiles for society, 2016). The textile industry is one of the most ecologically damaging industries in the world. Due to the rapidly increasing production, purchase and disposal of fashion objects, consumers are putting a strain on natural and human resources at unparalleled levels. This is because, not only production, but also consumption produces a lot of fabric waste. In response to the waste management issue, the approach of 5 R's *rethink, reduce, reuse, recycle and reintroduce* has been quite prevalent. Lately, however, the concept of up-cycling has been introduced, as one of the key drivers of sustainability. Up-cycling, also known as creative reuse, is the process of transforming by-products, waste materials, useless, or unwanted products into new materials or products of better quality and environmental value.India is known globally for her rich heritage of textiles and handcrafts. Indigenous textiles production has been identified as a key facet of sustainable development, as it can provide opportunities for employment, especially in rural communities, and contribute to economic growth and environmental stewardship. Therefore, this research explores the possibilities of sustainable development by development and promotion of creative up cycled and handcrafted innovative and exclusive fashion designs products increase its consumption with collaboration of technology up-gradation, fusion of traditional and contemporary styles. The present study thus focuses on utilizing pre and post-consumer brocade fabric wastes to develop more sustainable and ethical up-cycled products, which can be better solutions and opportunities for sustainable fashion. In this study, up-cycling techniques were explored and adopted to create a range of apparels and accessories for women from brocade waste. The later section of the paper presents key findings related to evaluation and acceptability of sustainable products developed from brocade fabric waste through craft-design up-cycling approaches that are congruent with the principles of sustainability.

Key words: Sustainability, Brocades, Fabric waste, Up-cycling, Craft - Design.

1.0 Introduction

Sustainable fashion is a largely a part of sustainable design where a product is created and produced with minimum environmental and social impact throughout its production and consumption lifecycle, including its "carbon footprint" (Anon 2008). Thinking green and keeping green are the slogans for the citizens of the twenty first century, in order to maintain a good and healthy environment. Some of the other forms of sustaining the environment include *reuse*, *recycle and reintroduce* fabrics and materials for "eco-fashion"(Anon 2009).

The inclination of manufacturers and consumers toward designing, manufacturing and purchasing green fashion is increasing. Lately, many designers are leaning towards the concept of green in their fashion collections, right from using fabrics and to the processes used in making of the clothing. By all accounts the fashion industry is just as enthusiastic in their efforts to heal the planet as all others (Anon 2011).

On the other hand, the popularity of fashion accessories is increasingly growing in the fashion world, to the extent that sometimes, it even outweighs fashion. Fashion accessories is becoming a major source of revenue for companies and many investors are willing to invest in more than accessories than in apparel. In addition, fashion accessories as a complement and can completely change the appearance of an individual. It can also be found in a varied sizes, shapes, colors and materials which change with time, culture and individual. The handmade unique accessory is a hot trend in high demand (Leung Yee Man 2011).Sustainable fashion accessory is now being designed by designers which is potentially supporting the environmental cause. accessories. (Anon 2010b).

The three R's are commonly used terms in waste management; they stand for "reduce, reuse, and recycle". As waste generation rates have risen, processing costs increased, and available landfill space decreased, the three R`s have become a central tenet in sustainable waste management efforts. There is a high degree of consensus amongst researchers working in the field of waste management that there is a clear hierarchy amongst the approaches that might be adopted to the management of waste within the fashion industry (El-Haggar et al., 2007). For proper management of textile waste recycling, reclamation and reuse have become pertinent indeed. These provide substantial profitability by reducing the cost of raw materials apart from being environment friendly.

The idea of recycling and reuse of both pre and post-consumer textile waste has always been fascinating. In the recent years, recycling has grown rapidly as a large component of environment. Interest in recycling is a result of many aspects, including green consumerism, rising waste disposal problems and raw material costs, legislative mandates and the evolution of waste into a smoothly running commodity industry. Fabric is a great resource and used fabric in clothing has so many possibilities for being reused and up-cycled again. By using pre-consumer and post-consumer fabric waste and up cycling them into hair bands, bracelets, necklace, belts, hats, scarf and gloves is an innovative way to create eco fashion.

Although handmade production saves energy, it cannot be a requisite method for sustainable production in contemporary, mass-market manufacturing. However, on the symbolic level, it can strengthen appreciation and attachment towards a product. Handcrafting can be a good way of adding unique details to a product/article, thus emphasizing its

individuality. Many utility articles can be made from the usage of different material through appliqué work or patch work by using the printed fabric, denim, and brocade designs etc.

Brocade is one of the traditional textiles of India which is now used lavishly in making apparel products at large scale level. Thus, a great amount of brocade waste is generated which could be creatively up cycled to produce eco fashion accessories.

1.1 Brocade

Brocade is a woven fabric having a raised floral or figured design that is introduced during the weaving process, usually by means of a Jacquard attachment. The design, appearing only on the fabric face, is usually made in a satin or twill weave. It is considered as one of the several shuttle-woven fabrics that come with intricate patterns, which often includes a selection of flowers, plants and other natural images. It is usually woven using a selection of various types of silk that are accented with metallic threads as a means of adding texture and visual interest. More so, this fabric is used in several of different applications, such as formal wear and stage costuming.

1.2 History of brocade

Brocade originates from Byzantium, where the Byzantine weaved the silk which they traded with China, who jealously guarded their secrets of silk making. Before the dawn of velvet in northern Europe, brocade was the most noble of fabrics due to the primary element, silk, which was hard to come by and its extravagant embroidery using gold and silver thread as well as jewels. The weaving industry of Brocade textile reached its peak during the Mughal period due to the patronage of Akbar. The Persian patterns and motifs were prominent in this period due to the influence Persian artisans in the court of Emperor Akbar. The embroidery has also been talked about in the Vedic literature.

The art of Brocade spread through Gujarat and nearby areas from Banaras which has a rich history of Muslim weavers. Banarasi brocades are composed of gold patterning known as ‘Kalabattu’. These gold threads have become a signature for the Brocade Indian Fabric.

Brocades also caught the eye of Britishers, but they found it heavy for clothing. So they started using the Brocade textile on curtains in the late nineteenth century. The brocade designs came from the Middle East, where the craftsman had adept at designing textile prints, yet the manufacture was eventually monopolized by Italy, especially once the discovery and breeding of the silkworm became publish knowledge. In the late middle Ages and the Renaissance, Italy was the most renowned producer of brocade with nobles and royalty from all of Europe paying extraordinary amounts to be cloaked in the fine Italian fabric.

In modern times, Brocade fabrics are mostly for upholstery and draperies. It is also used for evening and formal clothing, for vestments, as well as for costumes. The use of precious and semiprecious stones in the adornment of brocades is not common but has been replaced with the use of sequins and beading as decoration. Brocade fabrics are now largely woven on a Jacquard loom that is able to create many complex tapestry-like designs using the jacquard technique. Although many brocade fabrics look like tapestries and are advertised by some fashion promotions as such, they are not to be confused with true tapestries. Patterns such as brocade, brocatelle, damask and tapestry-like fabrics are known as jacquard patterns.

In an effort to appease western tastes, certain designs of the textile have been modified. European wallpaper designs were combined with the famous design of bouquets tied with ribbons.

Brocade fabric was initially limited to haute couture or fashionable magazine covers, but due to its increasing use by designers and craftsmen in Brocade Sarees and home decor products, it moved into the mainstream fashion and became a popular fabric.

Floral patterns are often seen in Brocade fabric. It looks brilliant on bridal attires as it provides a contrasting texture effect in a garment. The fascination for bridal embellishment has led to a revived interest in this beautiful weave.

The changing profile of the lifestyle and taste influences the trends that guide the design development of textiles. The rich textile traditions of the handloom and handicraft sector with its distinctive looks, processes, textures and colours, are exclusive to India and have been modified in a selective manner to add to the rich repertoire of Indian home textile. No trends can compete without experimenting with new innovations. After all, superiority of human intellect and emotions attached to such achievement result sometimes in really creative development. Different traditional techniques, motifs and designs if adapted to the contemporary use, would be helpful in incorporating diversification in the product in order to sustain the interest. The designers are always fascinated and inspired by the traditional designs of India and have thought to bring their designs in the world market as a diversified product. In this modern era, designers and researchers are trying to create new products but at the same time keeping the charm and life of traditional textiles (Kaur 2008).

Therefore, keeping in mind the above facts, this study has been planned to design and create up cycled fashion accessories with brocade fabric waste to sustain the environment and creative utilization of our amiable Indian brocades.

1.3 Objectives of the Study

1. To develop suitable up-cycled accessories from waste/leftover brocade fabric.
2. To check awareness of the respondents about up-cycled accessories.
3. To assess the consumer acceptance of the developed eco-fashion accessories.

2.0 Research Design

This experimental study was conducted to develop up-cycled fashion accessories using waste, discarded or used brocade on the basis of consumer preferences for designs, texture, and embellishment. The methodology employed in the investigation is as follows-

- **Collection of waste fabric**

The researcher collected brocade fabric waste from boutiques, tailors, friend, shops and relatives.

- **Selection of fashion accessories**

On the basis of information collected from the respondents regarding the development of various accessories, designs features for the accessories and embellishments, the researcher selected two types of accessories to be designed and created.

a. Jewellery
b. Bags

- **Creating fashion accessories**

The researcher used the collected waste fabric scraps and old brocade saree to create various new value-added fashion accessories.

The creation of these fashion accessories was done in the following stages:

Stage I –Cutting

The created patterns were placed on these fabric scraps for cutting. While cutting the fabric the researcher kept in mind the concept of sustainability of environment.

Stage II- Stitching and tucking

After cutting the fabric, the researcher constructed and created these accessories. The accessories were stitched or tucked using appropriate seams, finishes and fasteners.

Stage III- Adornment

After creating the accessories, the researcher used different types of Button, Buckle, Embroidery, Frills, and Lacing etc. for making these accessories attractive and elegant.

2.1Locale of the study

To carry out the present study, Dayalbagh Educational Institute, Agra, was conveniently selected.

2.2 Sample selection

Sample selection was done on the basis of convenient access to the investigator from the area of study i.e. Dayalbagh Educational Institute. 50 under graduate and post graduate students' female respondents were selected who are having a background in clothing and textiles.

2.3 Evaluation of the created accessories

The created fashion accessories were analyzed by 50 respondents who are aware of latest fashion trends. The accessories were displayed, and respondents were asked to evaluate each design on the basis of their design, attractiveness, elegance and appearance.

For this, an interview schedule was constructed to study the response of respondents regarding the fashion accessories on the basis of suitability of design, embellishments and overall impact.

2.4 Statistical Analysis

Ranking method was used by the researcher as a tool for visual analysis of designs of the created accessories. Percentage and averages were used to analyze the results. The data pertaining to the present study entitled, "Sustainable product development through creative up-cycling of Indian brocades" were coded, tabulated, analyzed and have been presented in this chapter. The results of the study were as follows-

- In the present study, 10accessories were created based on two different accessories selected with brocade waste. These designs and patterns were created using cutting, stitching, adornment by using collected fabric waste. These accessories were created into two categories -Thus, 5 Jewellery (Necklaces), 5 Bags were created. In total 10 different accessories were designed and created. The creative up cycled accessories are shown in table no. 1.1 & 1.2
- In the present study, a self-made questionnaire was prepared for 50respondentsstudents, to evaluate the acceptability of the created fashion accessories designed by the researcher. The questions included were related to assessing the awareness of respondents regarding up-cycling, the acceptance of these accessories.

Brocade Fabric Waste Jewellery

Table 2.1 Showing The Jewellery Of Brocade Waste

 BJ1	 BJ2	 BJ3
 BJ4	BROCADE FABRIC WASTE NECKLACES	 BJ5

Brocade Fabric Waste Bags

Table 2.2 Showing Hand Bags Created With Brocade Waste

 BB1	 BB2	 BB3
 BB4	BROCADE FABRIC WASTE BAGS	 BB5

Table 2.3 Showing Willingness To Buy Creative Up-Cycled Fashion Accessories

Item	N=50		
Willingness to buy creative up-cycled fashion accessories	Always	Sometimes	Never
	8(16%)	41(82%)	1(2%)

- Around most of the respondents 82% were sometimes willing to buy creative up-cycled fashion accessories, 16% respondents were always willing to buy whereas 2% respondents were never willing to buy creative up-cycled fashion accessories.

Table 2.4 Showing Up-Cycling Help To Reduce The Waste And Save Our Environment

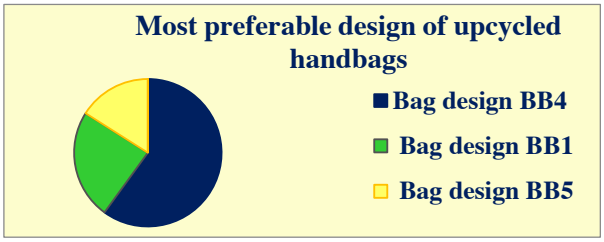
Item	N=50		
Up cycling helps to reduce the waste and save our environment	Agree	Neutral	Disagree
	39(78)	7(14)	4(8)

- About 78% respondents were agree that the concept of up-cycling if introduced effectively, would help to reduce the waste and save our environment whereas 8% respondents were not agree that up-cycling would help to reduce the waste generated at industrial level and at domestic level to save our environment from pollution, soil irrigation and disposable of waste into water bodies.

2.4.1 Ranking for the most preferable design of hand bags:

Table 2.5 showing ranking for various designs of up-cycled hand bags.

Items	No-50		
Accessories	Rank-1	Rank -2	Rank-3
Up-cycled bags			



With the table and figure, it can be observed that bag design BB4 got 1st rank, design BB1 got 2nd ra

Figure 2.1 Showing the most preferable handbag design amongst respondents

2.4.2 Ranking for the most preferable design of neck pieces

Table 2.6 Showing Ranking For Various Designs Of Up-Cycled Neckpieces.

Items	N=50		
Accessories	Rank-1	Rank -2	Rank-3
Neck Pieces			

With the below table it can be figured out that for the jewellery, design BJ1 got 1st rank, design BJ4 got 2nd rank and design BJ5 got 3rd rank amongst the 5 jewellery so, design BJ1 was the most preferable design amongst all neckpieces.

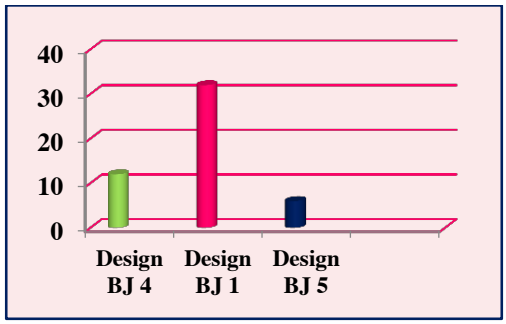


Figure 2.2 showing the most preferable handbag design amongst respondents

3.0 Conclusion

Fabric waste is a better option compared to recycling of garment waste wherever possible. Though, Up-cycling is done in India, the products are sold in local lower end of the market as the quality and finishing of the products is low and does not match the requirements of current trend and market.

The use of fabric waste as raw material for making accessories has attracted a real interest from private entrepreneurs, artists, designers, hand makers or folk. In the past two years the market of handmade products made out of leather and leather waste has increased so that today there are hundreds of artisans who live only from this activity that brings them a steady income.

4.0 Limitations

1. The study was limited to Dayalbagh Educational Institute, Agra only.
2. Only 10 women accessories were designed and created in this study.
3. Only waste fabric of brocade was used to create eco-fashion accessories.

Acknowledgement

This is acknowledged that the work presented in this study was done by Mrs. Praveen, student of Master of Vocation (Apparel Design) in Home science department of Dayalbagh Educational Institute, Agra.

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DP-25

TRANSFORMING TRIBAL WALL PAINTING SOHRAI OF JHARKHAND ON TEXTILES

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Abstract:

Jharkhand "a land of unexplored opportunities" is home to 30 different tribal communities. The state is rich in forests and minerals complementing its vibrant tribal cultures, arts and crafts. The uniqueness of natural resources existing in the state has supported many crafts which are being traditionally practiced. " Sohrai" wall painting is one of the oldest painting which was lost in course of time. The motifs, its placement to form design and its use are the drawback source where it is losing grounds for popularity. The research was taken up to study Sohrai painting in detail and revive it.Traditionally tribal people used to paint mud walls during harvest festival with self imagined themes portrayed through motifs without any prior sketching. The motifs used were inspired by environment around them which included animals, flora and fauna. Gradually they shifted to canvas and concrete walls. For its revival, the painting has been tried on textiles. The motifs for the design were selected according to the themes. Three themes were chosen:- 1.Nature, 2.Livelihood, 3.Devotion. To keep the essence of this painting, traditional colours were used:- yellow, maroon & black. Silk fabric for saree was chosen as the colour of silk is quiet similar to the walls on which artisans paint. Three layouts in three different techniques each were developed. Feedback was taken from the consumer. The concept was highly appreciated. This work will help in reviving the Sohrai painting and sustaining it with its commercial viability too.

Keywords: Wall painting, Sohrai painting, Jharkhand, Tribal arts & crafts,

Introduction:

India is a country which expresses itself through many traditional art forms. It is intimately linked with religion, literature and mythology which formed the rich cultural and traditional heritage of Indian making it diverse still united under one umbrella.

Tribal art in India is found in every state and each region has developed a distinct style of its own local traditions. An underlining feature of all tribal arts is that its form is simple, bold and clear. One such representation is the traditional art of Sohrai paintings from the tribal state of Jharkhand. It is a form of art which was used to elicit the creative expression of the tribal village people. The painting which has its beginning as cave painting found its place on the walls of the huts of the tribal village. The significance of the painting was a ritual of thanksgiving to the lord for harvesting as the agriculture being the sole occupation. The woman in the house would paint the wall using their imagination and indigenous painting material which included mud and rocks in powdered form. Themes and motifs used were never planned or sketched but artist would paint whatever comes to their mind. Motifs used were taken from day to day life of the tribal like animals, flora and fauna.

Pashupati, the harvest God was the most commonly used motif in the painting along with other elements like animals, birds and vegetation. Two rows of the border was the distinguished feature of the painting. Three colours white, maroon and black prepared from stone and mud available locally were used. This painting could not find its place as commercial and remained as household art only. It was lost in course of time till Mr. Bulu Imam has taken it with other tribal craft for its recognition and popularization. The present study was taken up to revive the Sohrai wall painting and medium selected was textiles so that it can reach to wider population and market.

Objectives

1. To design using traditional motifs from Sohrai painting for its application on sarees .
2. To paint the sarees with above designs using screen, block and digital printing method.
3. To analyse the consumer acceptance of designs and methods by data collection through exhibition

Methodology

Experimental method was used wherein five techniques – hand painting, embroidery, stencil, screen printing and digital printing were experimented and three techniques were selected. Three layouts i.e. knee length pattern (L1), plain (L2) and all over drop design (L3) with border were planned with three themes livelihood; devotion and bonding respectively were used for designing. The selection of motifs was done by keeping in mind (i) the product (ii) consumer acceptance (iii) frequency of use of the motif (iv) design configuration (v) reproduction by the artist. Colors selected were the original colors used in wall painting. For hand painting acrylic colors, screen printing pigment dyes were used. The display was done and visitors were asked to give their opinion regard different aspects of the product through questionnaire. The data thus obtained was analyzed to see the feasibility and acceptance of the product (sarees).

Results And Discussions

For experimenting on textile five different techniques were experimented.

Hand Painting **Embrodiery-Kantha** **Stencil Printing** **Screen Printing** **Digital Printing**

Plate 1. Experimenting with different techniques

Out of which three techniques hand painting, screen printing and digital printing were selected.

The designs were influenced by the artisans lifestyle and the activities in their day- to- day life like hunting in the jungle , caring their pets, agriculture and also expressions like love, affection amongst people, positivity and negativity in society. The

females paint animal, flora and fauna, their association with each other and paint them on wall with their imagination.

As the findings revealed that the life of the artisan revolves round the workship, hunting-landscape of jungle and the food the developed designs also depicts the same.

Plate 2Knee length layout with Livelihood theme

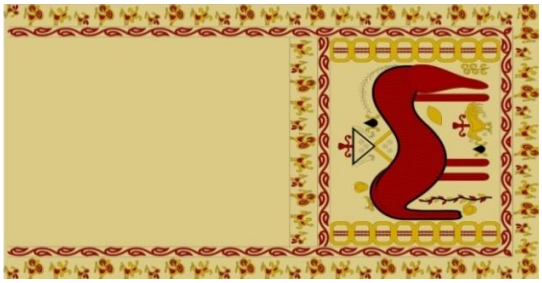

Plate 3 Plain Layout with Devotion theme

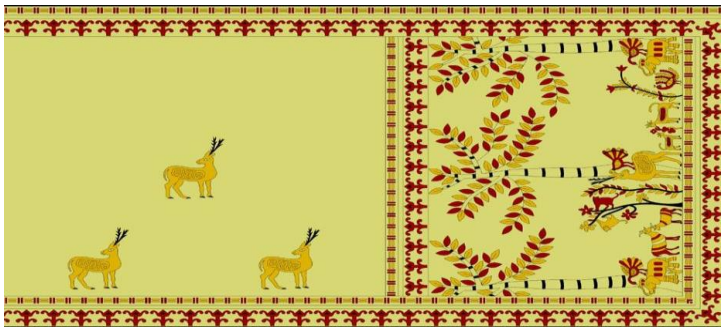

Plate 4 All over drop layout with Bonding theme

Layout1

Layout 2

Layout 3

Plate 5 Display of saree

Analysis of products by consumer acceptance

Total nine sarees in three layouts were displayed with three different techniques. Total of 43 respondents gave their response.

To find the overall appeal of the displayed sarees, respondents were asked to evaluate on four(4) point scale of fair, good, very good and excellent. On total score the overall appeal of the displayed sarees was calculated.

Table 1: Overall Appeal of the displayed sarees N=43

Layout	Techniques	Fair		Good		Very Good		Excellent			Rank
		N	N*1	N	N*2	N	N*3	N	N*4	Total	
L1											
L1.1	Hand Painting	1	1	11	20	19	48	14	56	127	V
L 1.2	Screen Printing	1	1	6	12	11	33	24	96	142	III
L1.3	Digital Printing	18	18	20	40	6	18	1	4	80	IX
L2											
L2.1	Hand Painting	2	2	12	24	15	45	13	52	123	VII
L2.2	Screen Printing	2	2	2	4	11	33	28	112	151	I
L2.3	Digital Printing	5	5	22	44	10	30	5	20	99	VIII
L 3											
L3.1	Hand Painting	1	1	13	26	17	51	12	48	126	VI
L3.2	Screen Printing	1	1	4	8	18	54	20	80	143	II
L3.3	Digital Printing	3	3	11	22	26	78	8	32	135	IV

The most preferred technique in all the three layouts L1, L2 and L3 was the Screen printing. More than 90% of the respondents felt that there was proportionate use of the traditional features in the displayed sarees. These designs were liked by both the groups: one who wants to wear the sarees and more attached to keep tradition alive & second group who want to reflect modernism through the garments. The outcome of the study revealed that newly developed designs of Sohrai painting can be used for hand painting, screen printing & digital printing on textile materials as it has enough demand & great extent of acceptability among the respondents.

Conclusion

The present study is an endeavor to revive, preserve and popularize the marvelous Sohrai painting which is almost disappearing. Attempts should be made towards drawing attention of the young generation of artists toward this painting to save it from extinction.

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ANALYSIS OF DABU PRINTING IN DIFFERENT PRESPECTIVE SKILL, GENDER AND INNOVATIONS

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Abstract

Tarapur print is least kenned craft of hand block printing unique technique practiced by craftsmen of Tarapur Village. It is resplendent coalescence of alizarin hand block printing and dabu resist handblock printing. In this technique fabric first printed with syahibegar (natural red and ebony colour) then dyed with dabu utilizing indigo resist for blue background. To get green and yellow shade, indigo dyed fabric again dyed with pomegranate peel dye.Nanadana Hand block printing process is dying craft of hand block printing only practiced in Tarapur Village situated on the banks of Ghambhiri River in Madhya Pradesh. Nandana is having 16 steps going through cumbersome process of printing and dying. Virtually 100 families and ummedapur village of javed tehsil were involved in the craft. Now only 3 families are doing traditional handblock printing because of its tedious, time consuming process and no market reach.Traditionally Nandana process involved utilization of 4 designs namely, Mirch, Champakali, Amba &JalamButa. Later on one more design "Dholmuru" introduced in the craft. To engender a single design 4 different blocks utilized in the Nandana Technique. Fundamentally market for nandana printing was circumscribed to tribal people of Jhabua, Ratlam, Mandsaur, and Neemuch district of Madhya Pradesh only.

Keyword: Handblock Printing, Tarapur, Dabu, Dyed, Nandana, Buta.

Introduction

Twin village of Madhya Pradesh near "Maa" Gambhiri famously known as Ummedhpur. Tarapur are known for Nadana hand block. Community of Muslim Nilger and Hindu Chippa are famous for indigo dying for Nadana Hand block.

Main features of Nadana print involves tribal market laborious process, limited designs and colour combinations increased the demand of Nandana print. Many families drop this business. But still some of them follows them follows the same as their traditional Business.

This period struggled for 3 decades but some explores meet Late Shri Purushttomji Jhariya for indigo and different colour combination of dye. Through they were doing it since ages but not commercially market is not developed and not much popular and it is how a new technique of block printing evolved. In this technique they started use of Alzarinprint (red and black) combining with Indigo Dabu work to get a red and indigo blue colour combination with Different block of designs.

a) Process of Dabu Printing

In dabu printing process fabric is pre-washed and soaked for 24 hours to remove all starch, oil, dust, or any other contaminants. The fabric is block printed with Dabu, which is a mud resist paste made from clay and gavar gum and sprinkled with saw dust (so the fabric will not stick to itself), and laid to dry in the sun. The Dabu mud makes the printed area resistant to dyes, and therefore will remain unaffected when it is later dye.

Once the mud is dry, the fabric is immersed in a dye, usually indigo, and again laid to dry in the sun. The printers may repeat the dabu printing on top of the dyed fabric to create further layers of resist and again dye it in darker shades of the dye. Finally the fabric is washed to remove all traces of the dabu mud, and revealing the resist area to be the original white (or other colors depending on how many times the fabric was dabu printed). The fabric is again dried in the sun and is ready to be packaged and sold.

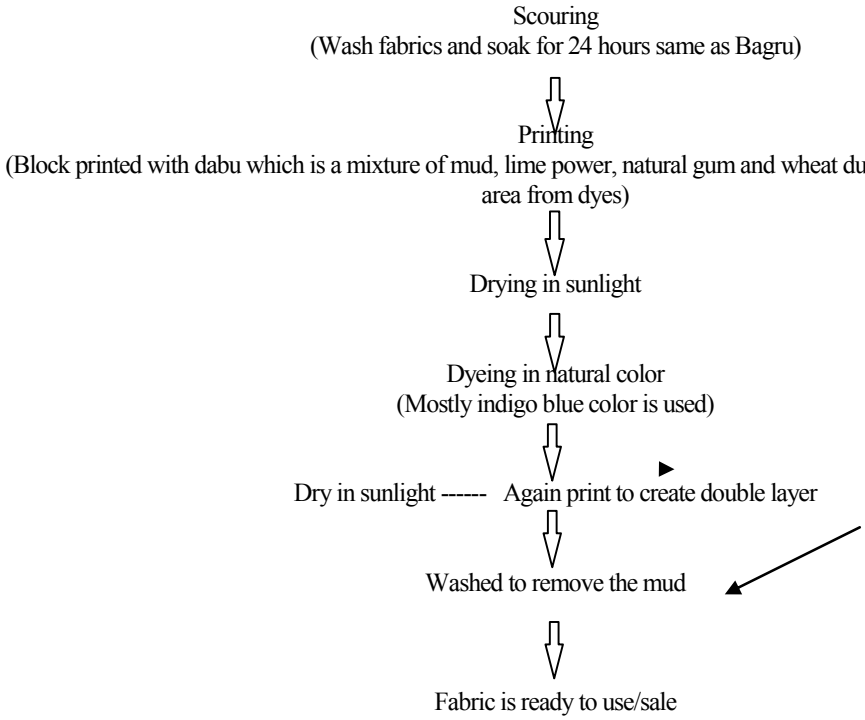

Figure 1.8: Dabu Printing Process

Sources: Based on interview of Director of Bagru Textiles Pvt. Ltd.

Figure 1.9: Dabu Printing

b) Motifs

The typical motifs used are nature-inspired ones of peacocks, mango, leaves, cornstalk (called boota), sunflower and animal figures. Geometric Shapes, dots and wavy lines may also be used.

The designs thus created are print all over the fabric. Sometimes, the mud paste cracks and bleed colour and create different look and gives aesthetics sense of vibrating dyes look like batik also.

Objective

1. To study skilled and unskilled works impact on product quality.
2. To study about sex discrimination affects the Dabu printing.
3. To study new innovations in Dabu printing.

Hypothesis

The main theme of the study is overall development of dyeing and printing industry

1. There is no significant difference between skill and unskilled workers.
2. There is no significant between male and female workers and quality of fabrics.
3. There is no significant between innovation and quality printed goods.

Methodology

For achieving of the objectives, secondary and primary both type of data was used. Secondary data collected from published journals, articles, books and e-source. For collection of primary data convenience method were used.

Sampling is the process by which a relatively small number of individuals or measures of individual, objects or events is selected and analysed in order to find out something about the entire population from which it was selected. Based on obtained list 85% fabric printers are selected randomly (by Random method)

Findings and Discussions

The same sample is subjected for the keen study of fabric printing of Neemuch Dabu printing. Various matter of study are considered and the issues raised by this study is related the skill, Gender and innovation.

1. Area wiseand Gender wise distribution of fabric printers

In Neemuch region 21 male fabric printers and 9 female fabric printers are selected, and their percentages are 20.2 and 23.7 respectively. We can say that in Dabu printing male workers are more and good entrepreneur. they develop every day new designs.

2. Skill wise fabric printers

In Neemuchno. of traditional and technical male fabric printers is 13ie 20.6% and 8 i.e. 19.5% respectively while the no. of traditional and technical female fabric printers is 7ie. 25% and 2 i.e. 20% respectively. The highest no of male technical fabric printers is found in Neemuch. they daily developed new colour variation in Dabu that why indigo Dabu of Neemuch is famous.

3. Innovation in Dabu printing

Dabu printing is very laborious intensive and involves several stages of printing and dyeing; the end result is therefore very unique and beautiful. Daub printed fabrics display a subtle and extraordinary beauty, and which is appreciated around the world. It has captured the imagination of modern-day designers.

Innovation in Dabu is mainly developed by male fabric printers. Female workers involve in other craft also. Innovation done by male printers who are interested in preparing bed-sheets, sarees, salwar kurta and sarees in new innovative fabrics like that jute, silk, Maheshwari sarees georgette etc.

In Neemuch region out of 21 selected fabric 14(66.7%) has been preparing sarees21 (100%) are designing and innovate salwar kurtas and 16(76.2%) are preparing other materials in Neemuch region, out of 30 fabric printers 14(46.7%) forecast new creations while 16 (53.3%) was not forecast new creations.

Conclusion

In Dabu printing only 52% designers forecast new techniques and innovations belived that forecasting new creations get them more profit by selling the products. Marketing process including fashion fulfill the responsibility of profit production. Government provides training for innovations and support for fundings.

Dabu fabric printers of new age group take interest in technical efficiency and selling their product through modern technical way. Thus, they provide specific brand name to their website for marketing of prepared fabrics and garments 69% Dabu fabric printers prefer to bear computer website of their brand name this concludes a technical turn in fabric printing industry showing a positive sign for growth of small-scale industries.

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DP-29

A STUDY ON THE DEVELOPMENT OF RECYCLED PRODUCTS USING DISPOSABLE DENIM FABRICS

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Abstract

Denim is a heavy woven fabric made of strong cotton. It is a cotton warp-faced textile in which the weft passes under two or more warp threads. A diagonal ribbing is produced from this twill weaving. Denim, one of the most widely used material in the world, has significant impact on environment in manufacturing and waste management stage. Denim recycling has opened vast opportunities for savings in the use of raw materials, energy and water consumption, chemicals and auxiliaries and waste water treatment. Raising the awareness of the consumer's contribution toward sustainability and environment safety has paved the increase in recycling of not only denim but also many other materials that are used today. In the present study the researcher has recycled denim waste into useful products. The samples selected for the present study were the females of age group between 20 yrs to 25 yrs in Ernakulam City as it is found that this age group can make purchasing decisions of their own and also are mature enough to think about environment friendly processes like textile recycling. Based on the survey conducted using a questionnaire five products were selected to be designed and constructed using waste denim. The five products are lampshade, laptop bag, cushion cover, organizer and floor mat. 50 designs were developed for the above mentioned five products (10 designs of each product). The designs were hand drawn and rendered. For each designs, the utility purpose, the aesthetic value and appropriateness was considered while designing the product. Paper patterns of the selected designs were developed by flat pattern making method. The designs were cut on the disposed denim clothing and these were constructed to make the selected products. Feed back was taken on the final products from the target sample. Thus it can be concluded from this study that various utility products can be developed by individuals by themselves using disposable denim and can contribute to the environment protection in a smaller way.

Key Words :- Denim, Recycling, Utility Products

Introduction

Denim, the favorite fabric of the youngsters has indeed come a long way. The consumer's choice, although unstable and unpredictable, it has remained almost the same while selecting denim for their fashion item. The scope for denim wear is increasing tremendously every year and its worldwide market share has increased unpredictably in the last few decades. Recently the fashion trend is moving from denim to stretch denim. Stretch denim usually incorporates an elastic component into the fabric to allow a degree of stretch ability in garments.(5)

Denim is a heavy woven fabric made of strong cotton. That is, from 100% cotton coarse indigo dyed warp and grey weft yarn. Denim is a cotton warp-faced textile in which the weft passes under two or more warp threads. A diagonal ribbing is produced from this twill weaving which distinguishes it from cotton duck. The traditional denim is rather hard and high density fabrics with high mass per unit area. Twill weaves such as three-up-one-down and Two-up-one-down are predominantly used for denim construction. Denim is available in attractive indigo blue shades and is made for a variety of applications and in a wide range of qualities. Denim is durable, comfortable, stretchable, fashionable, affordable and durable for which it is popular in all the age groups.(2)

Denims are blue in color because of its indigo dyeing. Here the warp thread is dyed, while the weft thread is left white. As a result of the warp-faced twill weaving, one side of the textile is dominated by the blue warp threads and the other side is dominated by the white weft threads. This causes the wrong side of the blue jeans to be white. Nowadays denims are available in different colors. (5)

Uses of denim:

Clothing - Boots and athletic shoes, Capri pants, Dresses, Hats, Jackets, Jeans, Overalls , Shirts, Shorts, including Skirts, Sneakers Suits.

Accessories - Belts, Handbags**,** Tote bags

Furniture - Bean bag chairs, Lampshades, Upholstery (5)

Textile Recycling

Textile recycling is the method of reusing or reprocessing used clothing, fibrous material and clothing scraps from the manufacturing process. Textile recycling equipment plays an important role in the textile recycling industry - Standard and high-efficiency textile recycling equipment is quite important for supporting the textile industry. The most popular and widely accepted clothing recycling bin, uses a high safety chutes that are easily opened and closed. Some textiles can be remade into other pieces of clothing, while damaged textiles are sorted out to make industrial wiping cloths and other items.(4)

Reduce, recycle, and reuse are the three words to limit waste generation and the human footprint on the environment. It is also called the “waste hierarchy” or “waste management”. It is the order of priority of actions to be taken to reduce the amount of waste generated, and to improve overall waste management processes and programs.

The three R’s – reduce, reuse and recycle, help to cut down on the amount of waste we throw away. They conserve natural resources, landfill space and energy.

The concept of reducing what is produced and what is consumed is essential to the waste hierarchy. That is, if there is less waste, then there is less to recycle or reuse. Fashion doesn’t have to be expendable; instead by purchasing high-quality pieces less frequently and being creative with the wardrobe we already have can reduce the wastage. Materials like Jeans can be converted to an excellent stuff. A dress can be re-purposed into a skirt, cut into scraps to make patchwork or to give a shirt an artisanal twist.

Learn to reuse items, or re-purpose them for a use, different than what they are intended for. There is also a growing market for sustainable fashion brands that offer affordable and attractive garments made of recycled fabrics. Rather than heading to the landfill, unwanted clothes can be donated to a variety of specialized organizations.

To recycle something means that it will be transformed again into a raw material that can be shaped into a new item. Choosing the products carefully, can be a first step towards efficient recycling. Fibers taken from unmarketable textile waste are converted into low-end materials such as stuffing, automotive components, and low-end blankets. (1)

Purpose of Study

Jeans are the ultimate masculine, casual garment, and mostly, men own them and wear them. They have a rich history, but navigating today's world of ripped, faded and embellished jeans to find a pair that suits classic yet modern tastes can be tough.

While denim was exceptionally popular for many articles of clothing on both men and women back in the 1980s and '90s, today the most common apparel found utilizing the cotton warp-faced twill textile is the standard blue jean. One of the most versatile and diversely popular trousers available on the market, it's worn by everyone from Hollywood's leading men to small town farmers in Montana. From designer brands sold for hundreds of dollars in posh department stores to the bargain bin brands sold in supply stores, it's one item of clothing that is popular with just about every demographic.

Sustainability and recycling is the buzz word today, and all stake holders in the apparel supply chain, right from manufacturers to consumers are working toward this cause. This focus has called for research and development all over the world to undertake many issues related to denim recycling to make the best use of used denim materials for new product development. Manufacturing compostable jeans without the use of nylon threads and rivets shows the change in the manufacturing process, and new technologies are in the pipeline to recycle fibers from denim with unchanged quality. The governmental support has also been extended by means of many programs on solid waste management, reduction of load to landfill by reuse and recycling and laws and regulations for environmental protection. Denim, one of the most widely used material in the world, has significant impact on environment in manufacturing and waste management stage. Denim recycling has opened vast opportunities for savings in the use of raw materials, energy and water consumption, chemicals and auxiliaries and waste water treatment. Raising the awareness of the consumer's contribution toward sustainability and environment safety has paved the increase in recycling of not only denim but also many other materials that are used today. The focus should move toward manufacturing products without waste, and if waste occurs, it should be recycled to lead to a zero waste economy. This research deals with the different denim brands and its impact on society, manufacturing and landfill issues, the methods involved in the reuse and recycling of denim, the review of work done to recycle denim into new products in terms of sustainability. (4)

Objectives of the study

The researcher with the purpose of recycling denim waste into useful products has framed the following objectives:-

- To study about different brands of denim in Ernakulum city
- To collect information about the most moving brand in the existing market
- To conduct survey and understand the product preferences of reused denim
- To design and construct products from waste denim fabrics.
- To collect feedback on the finished products from the targeted group.

Methodology

In order to accomplish the objectives of the present study, the researcher has conducted the following methodology:-

1. Selection of sample:-

The samples selected for the present study was the females of age group between 20 yrs to 25 yrs in Ernakulam City as it is found that this age group can make purchasing decisions of their own and also are mature enough to think about environment friendly processes like textile recycling. So more precisely the Post Graduate students of St. Teresa's College, Ernakulam were selected as the target sample.

2. Survey to collect information about the awareness on the different brands of denim and the recycling methods

A questionnaire was developed to collect information about the awareness on the different brands of denim, the most moving brand and the application of the recycling of denim if any. Also 10 numbers of products were suggested to be made from used denim.

3. Design development

Based on the survey five products were selected to be designed and constructed using waste denim. The five products are lampshade, laptop bag, cushion cover, organizer and floor mat. 50 designs were developed for the above mentioned five products (10 designs of each product). The designs were hand drawn. For each designs, the utility purpose, the aesthetic value and appropriateness was considered while designing the product.

4. Evaluating the designs and selecting the final products

The first evaluation was done by the 13 teachers of Women's Study Centre, St. Teresa's College, Ernakulam. All designs were ranked according to their preferences. The attributes assigned for evaluation of design were aesthetic appearance of designs, utility of the design and appropriateness of pattern. Points assigned were 1,2,3,4 and 5 indicating unsatisfactory, satisfactory, Good, Very good and Excellent respectively. Five designs from each category were selected based on the highest marks scored. Here Utility of the design was given more weightage and the selection was done accordingly.

The selected designs were rendered according to the fabric that was to be used for construction. A PowerPoint presentation was prepared and was shown to 35 students of the target sample in order to finalize one product in each category.

Plate 1 : Survey conducted using ppt presentation

Plate 2 : Survey conducted using ppt presentation

5. Development of products

Paper patterns of the selected designs were developed by flat pattern making method. The designs were cut on the disposed denim clothing and these were constructed to make the selected products.

Plate 3 : Pattern making done manually

Plate 4 : Product stitching

6. Collecting feedback

The final developed products were shown to the same 35 students of the target sample and the feedback on the products were noted down in terms of utility, aesthetic appearance and cost effectiveness.

Results And Discussions

The results obtained from the study are discussed under the following headings:-

Survey to collect information about the awareness on the different brands of denim and the recycling methods

The questionnaire was distributed to 250 Post Graduate students of St. Teresa's College, Ernakulam. As per the information availed from the survey it was found that the target group were aware of the denim brands like Levi's, Denizen, Wrangler, Jack and Jones, Lee etc and the most moving denim brands in Ernakulam are Levi's, Lee cooper and Wrangler.

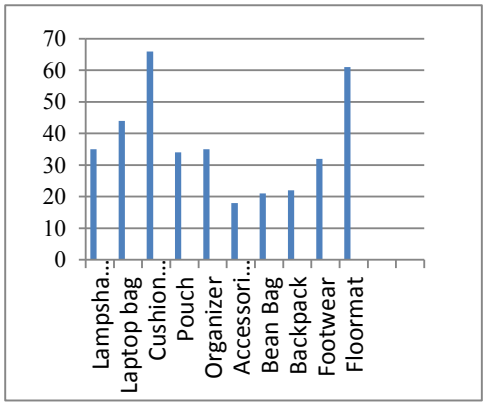
Recycling methods

Most of the students gave away their denim clothing to their younger ones. The total percentages of students who recycle their denims are very low (3 out of 10) even though they are interested in using denim products. From the 10 products suggested for making, using disposable denim, 5 products were selected as per the preference of the target group. The products suggested were lampshade, laptop bag, cushion cover, pouch, organizer, accessories, bean bag, backpack, footwear and floor mat.

The score obtained by the products are shown in the table 1.

Table 1 – Product Preference

Sr no:	Product	Points
1.	Lampshade	35
2.	Laptop bag	44
3.	Cushion cover	66
4.	Pouch	34
5.	Organizer	35
6.	Accessories	18
7.	Bean bag	21
8.	Backpack	22
9.	Footwear	32
10.	Floormat	61



Graph 1 – Product preference

Product No: 3 (Cushion Cover) obtained the highest score i.e., 66, Product No: 10 (Floor Mat) obtained 61, Product No: 2 (Laptop Bag) obtained 44, Product No: 1(Lampshade) obtained 35 and Product No: 5 (Organizer) obtained 35. Therefore these were products were selected for designing and construction.

Design development

10 designs were developed for each of 5 products. Totally 50 designs were hand drawn. Design code was given to each design. Some of the designs are given below:-

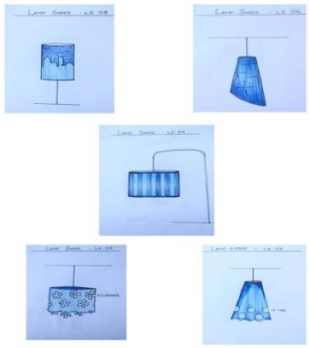


Figure 1: 5 Designs of Lampshade

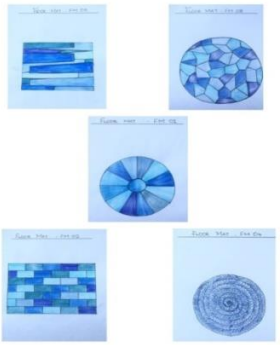


Figure 1: 5 Designs of Floor Mat

Figure 3 : 5 Designs of Laptop Bag

Figure 4 : 5 Designs of Organizer **Figure 5 : 5 Designs of Cushion Cover**

Evalua **nal products**

50 designs were evaluated and 5 designs of each product were selected by 13 teachers of Women's Study Centre, St. Teresa's College, Ernakulam on the basis of the utility of the product.

The scores obtained for the selected designs are shown in the table 2.

Table 2- Design Evaluation

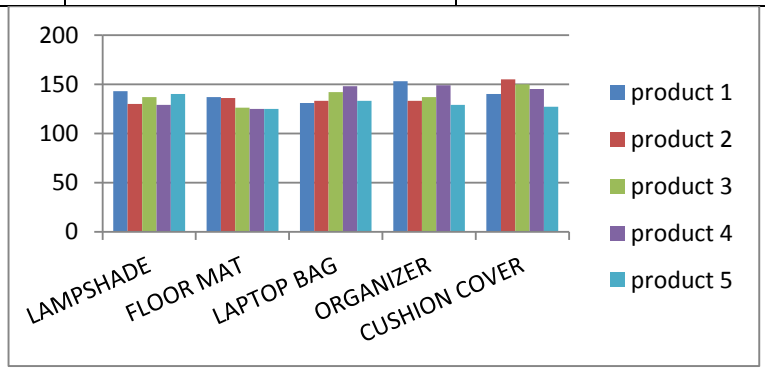
SL NO	PRODUCT	POINTS (UTILITY)
	Lampshade	
1	LS 05	57
2	LS 08	54
3	LS 01	53
4	LS 06	52
5	LS 07	46
	Floor mat	
6	FM 04	54
7	FM 08	49
8	FM 02	45
9	FM 05	44
10	FM 01	44
	Laptop Bag	
11	LB 05	57
12	LB 04	56
13	LB 07	55
14	LB 06	52
15	LB 01	51
	Organizer	
16	OR 05	59
17	OR 06	55
18	OR 07	52
19	OR 08	50
20	OR 02	48
	Cushion Cover	
21	CC 01	53
22	CC 06	52
23	CC 02	51
24	CC05	48

These 25 designs were designed and rendered according to the colour of the fabric going to be used and these were again evaluated by the 35 Post Graduate students. Final 5 designs were selected on the basis of its utility and aesthetic appearance (1 design from each product category).

The scores obtained for the finally selected 5 designs are shown in the table 3.

Table 3- Product Selection

SL NO	PRODUCT	POINTS (UTILITY)
	Lampshade	
1	LS 05	143*
2	LS 08	130
3	LS 01	137
4	LS 06	129
5	LS 07	140
	Floor mat	
6	FM 04	137*
7	FM 08	136
8	FM 02	126
9	FM 05	125
10	FM 01	125
	Laptop Bag	
11	LB 05	131
12	LB 04	133
13	LB 07	142
14	LB 06	148*
15	LB 01	133
	Organizer	
16	OR 05	153*
17	OR 06	133
18	OR 07	137
19	OR 08	149
20	OR 02	129
	Cushion Cover	
21	CC 01	140
22	CC 06	155*
23	CC 02	150
24	CC05	145
25	CC 08	127



Graph 2 - product selection

The selected designs are Lampshade LS 05, Floor mat FM 04, Laptop bag LB 06, Organizer OR 05 and Cushion Cover

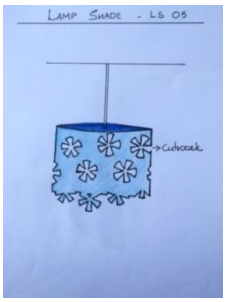


Figure 6 : Lampshade LS 05

Figure 7 : Floor Mat FM 04

Figure 8: Laptop Bag LB 06

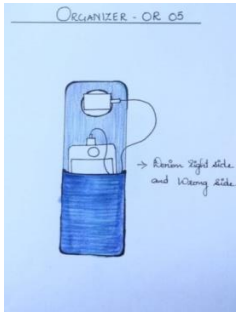


Figure 9: Organizer OR 05

Figure 10: Cushion Cover CC 06

Development of products

Used Denim fabrics were collected from friends and family members. Trims were purchased according to the patterns and selected designs. Different embellishment methods like Appliqué work, piping, quilting and cutwork were applied.

The following products were developed:-

Plate 5: Lampshade LS O5

Plate 6: Floormat FM 06

Plate 7: Laptop Bag LB 06

ORGANIZER OR 05

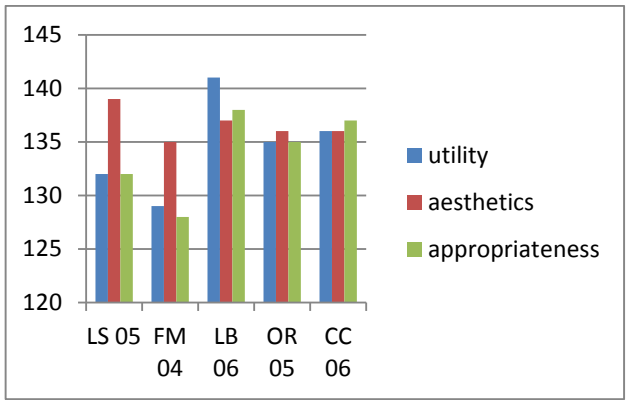
Plate 8: Organizer OR 05

CUSHION COVER CC 06

Plate 9: Cushion Cover CC 06

Collecting feedback

The final developed products were shown to the same 35 students of the target sample and the feedback on the products were noted down in terms of utility, aesthetic appearance, and appropriateness



Graph 3 – Feedback of developed products

LAMPSHADE LS 05 obtained 132 points for utility, 139 points for aesthetics and 132 points for appropriateness.
FLOORMAT FM 06 obtained 129 points for utility, 135 points for aesthetics and 128 points for appropriateness
LAPTOP BAG LB 06 obtained 141 points for utility, 137 points for aesthetics and 138 points for appropriateness.
ORGANIZER OR 05 obtained 135 points for utility, 136 points for aesthetics and 135 points for appropriateness.
CUSHION COVER CC 06 obtained 136 points for utility, 136 points for aesthetics and 137 points for appropriateness.

Summary and Conclusion

In the current scenario there will be atleast one member in the family who would be using denim fabrics. And so the problem of disposing denim will arise in every household. Since denim is a sturdy fabric it is easy to recycle denim to other utility products. Thus it can be concluded from this study that various utility products can be developed by individuals by themselves using disposable denim and can contribute to the environment protection in a smaller way.

Recommendation

A study can be conducted to develop various other utility products from disposable denim.

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DP-06

WEAVE THE CRAFT TOGETHER-IKAT AND DAANA

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Abstract :

Tangalia weaving (daana weaving) is origin of Surendranagar District in Gujarat and mainly practiced by the Dangasia community. Tiny dots of extra weft are twisted around a number of warp threads, giving an effect of bead embroidery to the fabric. The essence of Tangaliya weaving is the compositions created by colourful dots with extra weft, which creates reversible fabric. Traditionally only hand spun sheep wool was used for weaving Tangaliya. One of the challenges that the weavers face in procuring raw material is limited availability of certain coloured yarn in small amounts, used for making dots. However the creation of the colourful dots is an intricate skill and as the number of dots on the fabric increase, so does its cost. The main challenge in design application lies in understanding and coming up with new compositions without losing the character of a dot. In order for the craft to be sustainable, the product should come out with new designs as per market trends and requirements and create its own space in the export market. Another lesser known craft of Surendranagar is the Single Ikat fabric which is created by interlacing tied and dyed warp with plain weft or resisted weft yarns inserted in plain warp. This Patola is a low-cost variation of the traditional technique of Patan Patola, using the single ikat technique leading to an affordable range of products. Traditionally Ikat is synonymous with Patan Patola, which is a double Ikat craft and quite popular in the market. However attempting to combine the single ikat along with daana weaving will make the product more sustainable. Therefore in order to make the craft economically viable, this paper explores the design collaboration of single ikat and daana weaving, which both are incidentally from the same district.

Keywords: Single Ikat, Daana weaving, reversible fabric

DP-18

PICHWAI: REDISCOVERING THE GLORY OF A TRADITIONAL INDIAN ART

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Abstract:

Indian culture and its rich & royal heritage of tradition are reflected in many ways like paintings, architecture, art, music, sculpture, folklore, traditional costumes and embroideries of various region of the country. People express their emotions and feelings through various media, their emotions and visual expressions, are termed as art. Pichwais are paintings made with reverence and love for Srinathji, a seven-year-old manifestation of Lord Krishna. They have been well-preserved in the hallowed precincts of temples in Nathdwara near Udaipur. Traditionally, done on textiles using pigment and natural dyes. The name 'Pichwai' literally defines its meaning, with 'pichh' meaning back and 'wai' meaning textile hanging and these paintings are theme based on Krishna leelas. These paintings were traditionally used as cloth hangings at Vaishnava temples. The artist who works on them considers himself to be the servant of the Lord krishana and puts in devotion on each Pichwai that he paints. Now, as the traditional textiles are widely used and adopted as per the latest trends, the designers and researchers have begun to explore more and more traditional motifs in the modern style textiles, home furnishing and dresses, costumes. Since the pichwai paintings currently don't find much usage on textiles/ fashion apparel, except as a few decorative painted wall panels, greeting cards etc. this art needs to be popularized in order to preserve its reminiscent beauty by adapting it on textiles. The folk art and the traditional ideas that are the glitters of our culture, when applied on apparels, by a commercial aspect is gaining popularity. Pichwai painting can be used for interior decoration of residence (Home textiles), Apparels (Garments) and other house hold furnishing articles.

Keywords: Themes, Traditional, Design, paintings

DESIGN INNOVATION : COMBINATION OF KANTHA AND PATCHWORK

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Abstract

India has a long history associated with incredible and inspiring embroidery. Embroidery is one of the ancient technique of surface ornamentation for textile decoration. It is a beautiful thread work on a variety of fabrics, which makes the fabric more attractive. There are many ways in which embroidery may be used to add a personal and decorative touch in the home. Thus, the present study, is the exploration of combining two different techniques together i.e. patchwork and *Kantha* embroidery, for different shapes of cushion covers. For this research, the researcher developed a total of thirty designs of cushion covers for different shapes *viz rectangular, triangular, square, oval, star and heart* , with the help of Corel Draw X3. These developed designs were shown to the 90 female (25-35 years) respondents from three different localities of Ludhiana city. On the basis of the preferences of respondents, six most preferred designs were selected for preparation of cushion covers. After constructing the selected designs of cushion covers, the data were collected from a sub-sample of 30 respondents to assess the consumer acceptance for prepared cushion covers. These designs were assigned code numbers for taking preferences of the respondents. The data pertaining to the present study were coded, tabulated and analyzed statistically by using percentages, scores, mean scores and Z- test. The data regarding acceptance of constructed cushion covers showed that majority of the respondents preferred, design RE1 for rectangular shape, followed by design TR2 for triangular shape, design SQ5 for square shape, design OV5 for oval shape, design ST2 for star shape and design HE1 for heart shaped cushion covers with highest mean scores, respectively.

Key words: Patchwork, *Kantha* , Cushion covers ,Design

DP-24

REFORMATIONS FROM SCROLL PAINTINGS TO CONTEMPORARY FASHION TEXTILES

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Abstract :

This paper attempts to reveal conceptual approaches and traditional functions of the languishing tribal painting of Santhal Pargana called the **Jadupatia Paintings**. From the initial days of barter system to the recent trend of crypto currency, the humankind has treaded a long way. The former tradition of singing songs for completion of funeral rituals got transformed into the design interpretation for the Santhal tribal's women residing in the one of the oldest districts of Jharkhand. The Jadupatia paintings were vertical scroll paintings that were performed on cloth and were prepared mainly for Santal audiences by a special Hindu painter caste known by their surnames as **chitrakars**. Using the naturally extracted organic colors like soot, vermilion, leaves and stone crushed powder the chitrakars have made an effort to bond with the villagers in various ways to expand their knowledge about the creation myth and life after death orally or through their scrolls. In this article, I have tried to narrate the journey by exploring some contexts, visiting the areas of only surviving family of Sidhu chitrakar in Masalia block of Dumka district, researching the areas of revival of this languishing crafts and then interpreting these tribal scroll motifs on the contemporary fashion products. I have also explored various themes on which these scrolls were presented, the most important being the Santal myth of creation . These themes have been played beautifully by the survivor artists of Santhal district to present contemporary products. The superior objective here is to explore some implications of the various adaptations of the oral and written forms of the Santal painting in the wake of modernity, and then connect these insights to some aspects in the field of contemporary fashion and textile Design.

Keywords- Languishing art, oral tradition, pictorial representation, organic colors, ethical Fashion

THREADS & ROOTS: DESIGNING AN INDIAN ETHNIC WEAR COLLECTION FOR MEN

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Abstract

Threads; a symbol of hope and faith when woven together formed the fabrics that told tales since time immemorial. The present paper focuses on designing a collection of Indian ethnic wear for men taking "Threads around my tree, soil under my roots" as an inspiration. The collection brings the history, it's influence on our rooted craft and its evolution over the centuries. The methodical approach was followed for designing the collection. The market survey as well as brand research and designers' research helped the designer to design a collection that created a bridge between traditional crafts and contemporary silhouettes. The explorations were made for embroidery techniques and silhouettes with modern touch. The results revealed that the designed ensembles with a unique aesthetic which connects the east and west sensibilities could be worn as separates or layered, each involved craftsmanship along with extensive development with traditional textile techniques. The collection celebrates the essence of old tradition and craft with new outlook through young clientele.

Keywords: Crafts, Culture, Ethnic, Threads, Traditions.

A COMPARATIVE STUDY OF MOTIFS OF PAINTINGS OF BIHAR AND JHARKHAND: MADHUBANI VS. SOHRAI

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Abstract

Jharkhand state got separated from Bihar in 2000. Both states have rich tradition of entirely different form of painting known as Madhubani (Bihar) and Sohrai & Khobar (Jharkhand) wich are being used on fabrics and apparels. Madhubani Painting of Madubani district has acquired popularity since sixties of nineteenth century and its application has been well diversified and commercialized from paper wall panel to different apparels. In textile they have also been explored in printing. On contrary Sohrai and Khober of Jarkhand state dates back to pre historic time but lacks commercialization. It's only since 1990-93 this local tribal art of the area of Hazaribagh districts of Jharkhand has started gaining popularity. Now it is gaining attraction and attention for its diversified application in areas and products other than mere walls of tribal houses. They are basically wall paintings (Bhitti-Chita). Though both the form of painting comes from the two different parts of undivided Bihar, the people who practice this art, their natural, social, cultural background are so different from each other and are clearly visible in their paintings. The form of motifs, selection and availability of colours used are so different that they look entirely different. Both the paintings uses motifs as their deities, elephant, fish, deer, lotus, snake, cow, Murgi, peacock, etc. but their intricacies and the ways of formation varies. In addition Sohrai uses some other natural motifs inspired by their local environment and nature. The ultimate impact of Sohrai is earthy where as that of madhubani is colourful. Khovar of Sohrai and Kohbar of Madhubani have same objective of making but varies in motifs. Mythological believe of Madhubani revolves around God Rama, Krishna, Goddess Sita, Durga where as Sohrai follows their tribal God. Both are sacred, ritualistic, cultural and natural. This paper focuses on the comparative study of the motifs of the two painting.

Keywords- Sohrai, Madhubani, Daties, Pashupati, natural motifs

DP-31

PATCH AND SEW- FROM LOCAL STREETS TO FASHION RUNWAYS

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Abstract

India with a unique creative inheritance, stretching back thousands of years ago has its rich and diverse crafts that are regionally spread with their distinct traits. India has been known throughout history as a place that produces beautiful textiles. One of these being the multi layered Quilts from various regions of India, made of layers of cloth with a filling are stitched together in line or pattern. The Quilts have not only been a technique of surface ornamentation but also a skill that has helped to sustain the people in the rural areas. Also these quilts are a beautiful example of upcyled products as these are made from waste. Traditionally quilts were used to mark important life events like birth of a child, marriages and death ceremony. Fashion has taken its place as a mediator between tradition and modernity. Historically they were often used as bedcovers; floor covering and as wall art and many more; but with the changing times quilts have had a shift in their usage from just a home utility to a fashion technique in apparels. The current paper explores the colorful Ralli quilt of Kutch as surface ornamentation technique to a high fashion smart casual collection with khadi in subtle color palette which caters for the contemporary fashion tastes.

Key Words: Craft, Quilts, tradition, modern, Fashion, khadi

DP - 32

DOCUMENTATION OF BOMOKOI SAREE OF ODISHA

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Abstract:

India has a diverse and rich textile tradition. The origin of Indian textiles is hidden in the mists of prehistory, exactly how ancient; the textile tradition is a matter for speculation. What is sure, however, is that by the time of the Indus Valley civilization – about the third millennium BC, the first literary information about textiles of India was found in Rig-Veda, which refers to weaving. The Indian epics- Ramayana and Mahabharata did speak about variety of fabrics of those times. The traditional textiles and weaving practices have survived the eons of time and are an integral part of the Indian culture, however many a textile traditions are facing the wrath of modernization, with the changing lifestyles and the world becoming a global village.The present paper enumerates the result of the study undertaken with an objective to document the traditional Bomokoi saree of Odisha, which is facing the threats of extinction in this era of modernizing and industrialisation. Purposive sampling method were used, 100 weavers were selected 6 from traditional weaving and 94 from contemporary weaving these weavers selected from different districts of Odisha traditional weavers were Bomokoi village and contemporary weavers were selected from Buttupali, Sarsara, Bajpur and Sonpur. Data was elicited through interview schedules with the help of a structured questionnaire to record data. Results revealed that only 6 weavers were engaged in traditional weaving and contemporary saree were totally different from design perspective as well as technique.

Keyword: Traditional weaving, Contemporary weaving, Bomokoi weaving.

DP-33

DOCUMENTATION OF PATACHITRA OF WEST BENGAL FOR ITS APPLICATION TO GIFT PRODUCTS

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Abstract

The word *Pata* derived from the Sanskrit word *Patta* means cloth. The Painters are called *Patuas*. *Patuas* do not just paint, they also sing as they unfold the painting scroll to show the audience. These songs are known as *Pater Gaan*. The songs are of wide variety ranging from traditional mythological tales and tribal rituals to stories based on modern Indian history. The *Patua* sing the song from the painting and explain the whole story of the theme. *Kalighat* painting is not a different painting form from the *Patachitra*. The '*Kalighat* painting' got the name and popularity near *Kalighat* temple Kolkata in 18th -19th century. The study was undertaken with the objective to document the art of *Patachitra* with its different themes, process and the method of painting. To achieve the stated objectives of the research, an exploratory and descriptive approach was taken with snowball sampling technique and the data was collected with the help of interviews, questionnaires and observation method. The researcher concluded that there are varieties of themes in *Patachitra* of West Bengal, such themes can be taken on textiles as well as garments in large scale. Thus lending a distinct identity to regional style and making it suitable to wider consumer reach, through a methodological approach. The practice of *Patachitra* paintings still continues in the Naya Pingla village of West Bengal where the *Patuas* are free to create their ideas into the form of paintings with new and innovative concepts. This paper explores the application of the evolutionary patachitra paintings into articles of corporate gifting.

Keywords: Painted textile craft, textile madeups, patachitra.

DP-34

THE IMPORTANCE OF CRAFT EDUCATION IN CHILDHOOD

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Abstract :

Education at all stages has been regarded as a powerful instrument for social transformation. The major task of education in India today is to usher in a democratic, socialistic, secular society, which removes prejudices among people. Craft as a subject on the curriculum, is generally taken for granted as an entitlement for children and young people in formal education. But within the context of formal education the subject (craft) supports personal, social, moral spiritual, cultural and creative development. These opportunities enable them to work with tradition and new media, so they develop confidence, competence, imagination and creativity. Art has the role in education of helping children become like themselves instead of more like anyone else. Crafting has so much strength when it comes to portraying creativity and our heritage. Craft is not only about its mesmerizing design. Every great piece of craft tells a story itself because craft has both cultural and environmental conceptual background. It is truly amazing to see the intricate works printed, embroidered or sewed on a cloth. Or maybe even pottery and made of clay. Besides, with today's increasing market demand, handcrafts are now very valuable piece of arts. And therefore it is more important to insist on craft education now.

Key words: secular society, curriculum, competence, mesmerizing design

Technology & Trends (Oral)

TO-01

BUILDING SUSTAINABLE ECOSYSTEMS – CONNECTING THE DOTS - EMPOWERING THE ARTISANS

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Abstract

Craft is a very complex unorganised sector within industry. Many crafts originated with the need for objects of daily use and were made out of materials available within close proximity. Locally sourced raw materials with a consumer and end use in mind were made at their pace. Craftspeople hence saw the process from the beginning till the end of the product's life cycle. Today the craftsmen are losing faith and pride in their own work as they are alienated from the customer. Many designers of repute are collaborating with artisans and Khadi to revive and transform the aesthetics to appeal to a wider audience. In spite of this, every year, thousands of traditional artisans migrate to the city in search of daily-wage labour so that they can feed their families. With that migration, centuries-old knowledge that has been passed down generations dies in the urban slums. Due to the breakdown of the historic artisan-consumer relationship, and the increasing urbanization and globalization of markets for crafts, artisans have difficulty understanding how to tailor their products to changing demands. Weavers and artisans are encouraging their children to take up other professions where it is monetarily beneficial. Weavers do not want their children to weave. Education on craft skills is a must if we want to keep them alive. Technology can be used to connect the artisans directly to the end user/buyer. We need to build an ecosystem that connects the dots and which the artisan is in control. Creating just beautiful fabrics is not rewarding- the end product is what gets a good price. Clusters like Bhuj where fabrics are created need conversion garments/made ups/products by artisans. Endangered crafts like Chamba Rumal; Shaphee Lamphee need revival and not just by using them in designer collections but by enabling the artisans to continue their craft which is financially viable. Digital tools can be a powerful enabler for artisans to connect directly with markets and access affordable credit. An emerging ecosystem of online marketplaces, affordable communication tools, online consumer communities, entrepreneurship programmes, crowd-funding for artisan entrepreneurs and local digital design archives holds promise for change.

Key words: Craft; connect; skill; technology; relationship

Introduction

Handicrafts are a symbol of India's cultural Plurality. Craft product covered all spheres of life and activity from brooms to shawls; from toys to utensils. India is a Nation that has the most amazing crafts and textiles in the world and most Indians say we are proud of our heritage without actually knowing what this heritage is all about. It is really ironical that this country was the pioneer of what is being called Circular Economy. Up cycling and recycling were practised long before we knew the meaning of these words and rural India with no formal education practised this. The craftsman used local materials to make everything from houses to clothing and everything was sustainable and eco-friendly and zero waste. We are talking about slow fashion and "Renting Clothes" and vintage

stores etc. where you can go and buy second hand clothes; this was what most of us grew up with. We were all given hand me downs from our older siblings and cousins and extended family members. We practised all of this without fancy jargons being used and now we are going back to learn what we had already practised in the past. Over the decades somehow we have lost sight of what we have as our heritage and what made the Western World look to India for. In our eagerness to ape the West we have lost ourselves and our identity along the way. Our crafts used and reused materials that was available. An old sari was adorned with embroidery to give it a new look; when it ceased being used as a sari it would be made into a quilt with other saris and running stitch was used decoratively to keep the layers together and afford warmth. There was no waste. Our traditional pattern making was almost zero waste and if you look at the skirts and kurta's that were worn they used the gore and godets and gussets and kept wastage to a minimum.

Some years ago while working on a project to develop home linen I worked with someone who was using technology that spun yarns in the same place / field where cotton was being grown. The idea behind this venture was to enable the cotton grower be independent and the village become self-sufficient to weave their fabrics without having to transport their cotton to a spinning mill and then bring it back to have the fabric woven in the village. The cost of transportation was high and the villagers were not making any money out of this. This pilot was done in a few villages in Andhra Pradesh and the fabrics that evolved looked really amazing with natural slubs and a handloom feel to it. The machine was simple and small enough to be set up in a room and could easily be handled by anyone. The process of spinning was of course totally simplified and steps were excluded but it enabled the farmer to spin his yarns and weave his own fabrics. This is what came to my mind while visiting a few craft clusters in Bhuj and Kutch.Itreally came as shock that weare actually losing our craft and it is vanishing before our eyes despite the fact that a number of NGO's and designers and other bodies are working in their revival. I saw many Ahirs families walking away with their livestock from where they were settled and looking for new pastures. You see them on the streets of big cities like Bangalore begging and not using their craft. They need money for survival and to fill their stomachs. They cannot practise their craft because the environment is not conducive to it and hence with time they will move away from that and pick up new skill sets and we would have lost something so valuable and a part of our heritage along with it. They will gradually change the way they dress and live and adapt to the new place. So while some call that progress I call that a loss of identity.

Objectives of this paper

To understand the challenges that the craft sector is facing currently. The review is not of any one craft but of the craftspeople across crafts.
To review how technology can be used to help retain and revive our crafts.

Challenges faced by craftsman

The craft industry is very complex and extremely unorganised. Part of that stems from the fact that it is still a cottage industry in many ways. The crafts originated from a need – simple daily use items that could be made from material locally sourced within close proximity. The raw materials; the making and the subsequent use all happened literally in the neighborhood. This was sustainable; did not cause pollution; kept the women folk busy and yet working from within the confines of their home; no travel for either material or the workers and no middle man. The products were sold in local

markets and the most important thing was the craftsman was in touch with the end user and saw the process from the beginning till the end – the entire product life cycle. So if one examines the big factories today- the source of the raw materials; the long production queues; and the fact that the worker is part of a long process as just a cog in the wheel- totally detached from the product can show us what is going wrong. The lack of natural resources; financial crisis and migration patterns are leading to the change in the structure of our societies and a slow demise of tradition. There are numerous reasons that this sector is facing hardships.

Faceless customer - With the entire globalisation and the advent of the middle man the person who is making the products – the artisan - has never interacted with the end consumer of the product. He has no clue what the end use of his product is going to be. He interacts with the middleman who conveys to him what the buyer has conveyed to him. The information that trickles down is third/ fourth hand and hence there is this entire void between the craftsperson and the consumer. So while products get churned out based on what the market seemingly needs a lot is lost in translation. Design developed through interaction with the customers wherein the socio cultural context was also understood as well as the aesthetics and taste. In the absence of understanding the needs there is difficulty in making appropriate products which are exported all over the globe. While the designers are trying to bridge this gap; it still exists.

Raw materials – Traditionally Crafts used to be made with materials sourced from within the vicinity. Today the raw material has to be procured from a distance which involves transportation costs as well as settling for poor quality as they can ill afford the costs of quality material. The competition is also with larger organizations and in the case of textiles with mills. It is a case of hand loom versus mill made. Customers today do not see merit in paying for the products that are made by artisans when they can get cheaper stuff made by machines.

Lack of Facilities – The sad truth about rural India is the lack of proper infrastructure and no distribution channel s for the artisans to market their products to the masses. They have to travel miles to reach a place where they can sell their products and then travel back. They usually land up selling at the craft bazaars or melas where the foot fall may be high but purchasing may not happen to the expectations of the artisans.

Dire straits financially - The artisans are financially cash strapped and there is no help at hand. They again depend on the middle man. Who is turn makes his money but the artisan is not paid handsomely. This becomes a vicious cycle.

Low self esteem- The artisan's morale and self-esteem take a beating and the pride they have in their craft is lost in making ends meet. Their children suffer and cannot study.

Next generation – is not interested in taking up the craft having seen their parents struggle and toil with no result. They are also attracted to the bigger cities where they feel they will earn more money and lead a better life than in their own village. With no one in the family continuing / learning the skill the craft would definitely perish. There are a number of crafts in India which are on the verge of vanishing simply because the artisans are not getting value for their skill and we are not building an environment that enable them to sustain themselves. This is where technology could help them and make them independent of any middle man. They have to be enabled to use technology as their springboard and function independently of anyone. A report published in 2003 by the World Bank Titled Handmade on India – Preliminary Analysis of Craft Producers and Craft Production estimated that 50% of households of the craft producing families had no

education and 90% of the women in these households were completely uneducated. Though this report was out in 2003 there have been no phenomenal changes in the percentages. Lack of Education leads to lack of technology; and also lack of learning something new in your trade / keeping up with the market trends and the requirements, which in turn lead to products that are then not viable or are not useful to the buyer. The cycle is vicious and becomes a self-fulfilling prophecy for failure. Where the children are educated they do not see value in continuing the craft of their parents and the system they have studied does not include the craft.

Crafts in danger

Ajrak prints that can be traced back to Indus Valley Civilisation that existed around 2500BC-1500BC, is a craft from Kutch in Gujarat. The methodology and the techniques are eco-friendly and sustainable and totally harmonious with nature. However today there are only 60 families that are still practising this craft in Kutch. Water is very essential for this craft and hence they moved from Dhamadka to Ajrakpur. Due to the long process of preparing the fabric and then printing the same, the traditional craft is being replaced by cheaper fabrics using modern methods of printing and bright chemical dyes. The silver lining is that the master craftsman and other agencies are bringing awareness of this craft and making people aware of the beauty of the original Ajrak; the craft is slowly starting to gain momentum. As of now they are only producing yards and yards of fabrics that are being sold alongside their cheap imitations. Numerous students go and work with these artisans and produce beautiful items that are fashionable as well as for home accessories. If their families were trained to convert the fabrics into articles that are aesthetic and useful, and more appealing the artisans could actually earn twice the amount they do today. It would mean a strong intervention by not individuals but by the government to enable this to happen. They could be trained in designing; colour; trends and stitching and this small lot of 60 families could be running two businesses from the same place.

Kasam and Juma have worked with mocha aari embroidery since their teens. They are the last family that is practising this embroidery in Mandvi in Kutch. Originally practised without a frame; the two brothers use adjustable frame. They also use a thick needle instead of the aari. When using a needle the process is even slower and this causes problems because they cannot do bulk orders and therefore there is loss of sale. Due to this they do not make enough money to survive and have also worked in the shipyards to supplement their income. This really does not augur well for a craft that is dying. Although their work is in high demand, there is little consistency. Though the family has trained several others in the craft very few have shown interest as the work requires a lot of patience and the art also needs several years of apprenticeship to produce work of high standard. The costs of training are also high. Through an initiative that could offer training and apprenticeship to other people with a funding could revive this craft. Using Technology and platforms their work could be showcased all over the world and they could benefit by orders. They need help to train people and for that they need funds. If they are funded many more could become Mochi aari artists and we could save this craft. They could perhaps be helped to use technology to make their tools so that it does not rust and also saves time to make.

The Patola sarees from Patan takes the combined effort of 4 weavers and takes 4-6 months and even more to weave a single sari. It is a unique weave usually made from silk; it is a double ikat and combines the techniques of tying; dyeing and weaving. It is a

testament of perfection as even one thread displaced can result in a deformed pattern. The dyeing and weaving is also complicated and requires precision as well as imagination.

"Patola weaving requires a lot of mental calculations, patience, undivided attention and dexterity of the hand. A computerized machine or power loom cannot be of much help here," (Rohit Bhai Salvi)

Rohit Bhai Salvi belongs to one of the two families that are currently practicing the art of weaving the double ikat saris. He belongs to the 16th generation of a family that has been practicing this art. While originally 700 families came to Patan to weave these saris only 2 are sustaining the craft. The family is high on education and yet they all are passionate about this craft and participate in weaving. The truth is with just two families how can this craft be kept alive and for how long? The saris are a collectors delight and expensive. Of course look alike patolas are also flooding the markets which are much cheaper and easily bought from stores. Maybe the need is to have a small institute where this craft can be taught to people so that it does not die.

In Varanasi which is famous for its Benares saris thousands of looms have fallen silent. The beautiful saris that were worn with so much pride by women in India lost its battle to cheap imitation silk sarees that were cheaper than the original. Bad quality cheap imitations have flooded a market which sold premium saris. 85% of the weavers and the families have moved away to other cities and trades in order to earn a decent living. This has resulted not only in the economic struggle for the weavers and artisans but also a possible extinction of millenary traditions that has been recognized worldwide as patrimony of humanity. Thanks to efforts of an organization called Upasana there has been some revival but to bring it back to the glory it had is a humanitarian job and effort.

We have lost the NAARA PATTU sarees and dhotis made from plant fibres to cotton and silks. These were traditional textiles made from the fibres of the inner bark which surrounds the woody stem of numerous plants. The fibre is supposed to be like silk!

Chamba Rumal from Himachal Pradesh is also an endangered craft. It is embroidery done using naturally dyed floss or silk threads on mulmul or khaddar fabrics such that both sides of the fabric look the same. Almost like a painting! A double satin stitch in different colours is done and that's why it is also called Doruka or two faced.

Co- creation and Technology Conclusion and Implications

What is written about above are a few of the crafts that need attention but like them there are many more. This is a National Crisis and needs to be dealt as such. There are also some success stories like Anita Dongre's Label Grassroots which works with Artisans from Gujarat and Rajasthan. She has used technology like Whatsapp to connect with the artisans but feels that it can be used much more to drive their craft to a larger audience. As per her there is a story behind every garment that has been made. The story of an Artisan! This is a start. It would take many more people who would like to go and work selflessly with the artisans to start the revival crusade. There are many other NGO's who are also working tirelessly with this sector and doing amazing stuff.

Microsoft India has launched a new E- Commerce platform for the handloom weavers from Telengana Andhra Pradesh under its project Reweave part of the Philanthropic initiatives. The platform can help connect artisans to the buyers directly enabling themto expand their customer base and markets where they can sell their products. The new e market place helps sell to a broader audience and helps them earn a sustainable livelihood while reviving forgotten craft.

Technology can help not only in connecting the dots but also perhaps in cutting down time whether it is to make implements/tools or to get orders and transact. This tool can also be used to scale up operations. Today almost every village in India has gone digital where transacting cash is concerned. This helps them get cash faster without any hassles. With a little help they can also send shipments from where they are based. Ideally they should start functioning without the middle man.

Our Curriculum in College has a module only on Craft and sustainability. How we can design sustainable products along with the crafts people? Can we start looking at the Circular Design Process that was once practiced in our country and is probably still being used by the artisans? The curriculum in schools and colleges should also teach about craft and the artisans. They should be taught to feel proud of our heritage and how important it is to us. They have to respect the artisans and their craft. Sustainability is a big topic and all students need to be sensitized to it and also to our heritage and how we can preserve it. Free Education should be provided by the governments to the children of all artisans where they not only learn to read and write and do maths but also learn the skills of the family. It is only if they are educated that they would be in a position to start taking over from their parents. They would be able to communicate with the buyers; host products on the websites and come up with newer ways to maximize output without diluting the craft. The world is being disrupted and technology is all pervading. So if we can harness its power we could use it to our benefit. There are countries like South Africa that have managed to protect their crafts by reconciling to the new reality and working within it. Design students and designers need to go out and live and work with these artisans – not to exploit them but to encourage them through intervention to co-create. Just visiting villages and writing about craft will not help the artisans much. We need to work side by side with them. They can share with them the new trends; the new products; how they can be current in their offer to the market.

What they need is not our sympathy but our encouragement. We need to build ecosystems using technology and knowledge that we have to empower them. We should start using the products produced by artisans and pay them a value for it. Anything handmade is expensive all over the world. We have to start respecting that. The day we respect their work and them; things will get better for them. Their children will not give up on their parent's profession to pursue something else but will gladly continue in their father's footsteps. They will be proud to display their wares on international platforms and sell them. The Global handicraft market is estimated at $ 400bn and India contributes just 2% of it; though having 40% of the global artisan workforce. These numbers are self-explanatory and need all of us – governments; bureaucrats; technocrats; academia and all Indians to come together and work together to ensure we do not lose what we have; rather that we multiply what we have. Unless the artisans get paid for their labour; and they can live a respectable life without fear the younger generation will not want to take up their parents profession.

The objective of this review and paper was not to focus on one craft; but to generally awaken all of us to a reality that is staring us in our face. We are a land rich in craft and design and we are spectators watching it gradually fade away. All of us have a role to play in keeping this alive; all of us have the power to help the craftsman and make it worthwhile for their next generation to continue the practise of their parents. Technology can be used as a tool to achieve this.

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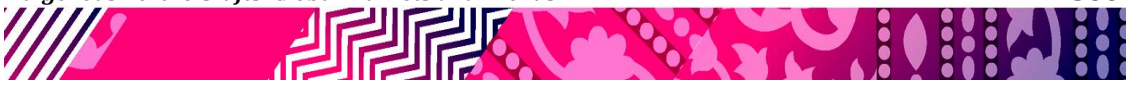

TO-02

AI TECHNOLOGY HELPING INDIAN TEXTILE ARTISANS COMMUNITY: A CASE STUDY ON MICROSOFT'S RUUH AI

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Abstract

In today's world, humans can make intelligent communication with machines. With the help of AI technology human's direct machines to perform certain tasks using their intelligence. Many sectors like transportation, healthcare, logistics, finance, industrial manufacturing, etc. will undergo an immense transformation in the future due to AI influence. AI application in the Textile industry is still at a nascent stage but yet it is being used at many places.Recently Microsoft's Artificial Intelligence (AI) system 'Ruuh' was launched which is meant to help handloom and handicraft artisans in India. These artisans have limited access to designs and to tackle this drawback AI solution through 'Ruuh' could help the weaver's community. 'Ruuh' helps artisans by creating customizable design instead of just selecting designs. This gives the artisans more (thousands) options for aesthetic contemporary designs. 'Ruuh' along with Indian Ikat artisans from Koyalagudem, Telengana had created new designs that are being called as AI Ikats. AI Ikat is first of its kind to impact the Indian handloom industry. 'Ruuh had also collaborated with traditional Block Printing artisans of Sanganer, Rajasthan to convert AI - generated designs into physical products. Certainly, like other fields, AI has the potential to increase design opportunities for the craft artisans' and thereby increasing their revenue, by producing improved the marketable product as per the needs of contemporary market and thereby, save the ancient Indian art forms from fading out.

Keywords: AI, Artificial Intelligence, Creative AI

Introduction:

Humans are the most intelligent creations across the planet.Due to their cognition they have the ability to learn, understand, reason, comprehend things and solve various problem and make decisions. Artificial Intelligence is the process of simulation of human intelligence by a machine. It is basically machines doing things in a human way. AI enabled machines has the capability to learn things, to logically and sensibly reason things that they have learned and to self-improvise and correct them. AI can be enabled in a computer machine, in a robot or in a software program.AI's are mainly of Two types: 1. Week or Narrow AI (which performs only specific set functions and cannot perform tasks beyond its limitations) 2. Strong AI (which are smart and perform intellectual tasks like humans). The main motive of developing AI's is to solve various simple to complex problems around us. The initial concept of AI was originated in 1945 when the computer scientists were trying to understand whether the computer's intelligence can be measured up to human intelligence. Over the period of time works of various computer scientist's and cognitive experts have led to enormous development and this field. Still in today's

time research on AI continues to grow and major areas of research are Neural networks, machine learning and probabilistic reasoning and computer vision. AI works beyond human capacity of manually processing the data. It can learn from a very large amount of data and can reason it to develop useful insights. Because of such high potential of doing things AI probably finds or will find its application in every sphere of life. Today AI is benefiting the humans in some of the major domains like marketing, banking, finance, agriculture, healthcare, gaming, space explorations, Autonomous vehicles, Chabot's, Artificial creativity etc.

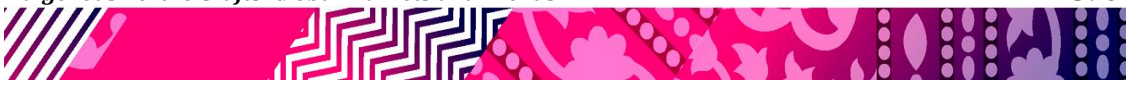
AI can simulate human traits and develop human like skills of doing things. One of the skill 'being creative' is more unique to humans. Creativity is basically imagining new ideas and making them into reality(Kurt, 2018). Creativity is a way by which humans express themselves. Creativity is characterised by the ability to perceive the world in new ways, to find hidden patterns, to make connections between seemingly unrelated phenomena, and to generate solutions (Naiman,2019). Creative AI aims to generate creativity of human level i.e. it develops algorithms for what the humans think is creative (Elgammal,2019). Companies that make creative tools like Adobe and Celsys has already started incorporating some AI features in their software programs to speed up the artistic work. Sensei, Google Creative Lab: AutoDraw, Google quick draw, Aiva, Amper Music, etc. are few examples of creative AIs. Creative AI finds its application in many fields related to humans (Miller 2019).

India has a rich heritage of traditional art and craft. Indian traditional textiles have boastful legacy which comes to us from our previous generations. Over past few decades with mass production and machine manufacturing there has left very little space for traditionally handmade textiles in the market (Kaushik, Khanna & Sah, 2019). Due to availability of variety of products at cheaper price artisans have to face fierce completion in the contemporary markets. The traditional products as such does not suit to the taste of modern consumers and are perceived as old fashioned and antithetical (Kumar & Kaur, 2018). There are few instances of design interventions to where traditional textile products are contemporized to suit to modern consumers. This requires lot of creativityto finally develop new designs. Today AI technology has enabled us to develop unlimited numbers of design options.Microsoft's'Ruuh' AI is one of the artificial intelligent system which has collaborated with the traditional textile artisans of India and have developed new designs for the market.

This paper attempts to understand how 'Ruuh' AI works and processes itself to develop textile designs which can be used by artisans in making various textile products. The data collected for the research comes from various journal articles, books, internet sources, etc. which was subjected to analysis and finally to draw conclusions.

Background of Ruuh Ai:

Microsoft is working towards development of AI for each and every individual and organisation to solve various problems (Godebole, 2018). Through their AI innovations they are continuously trying to empower human capabilities. The AI discoveries of their products and services comes from their team of Scientist's and experts from various other fields working in their dedicated AI research Labs. One of the experimental project that have shaped up in Microsoft India is Ruuh AI. Microsoft launched Ruuh AI in early 2017 to test it among Indian population. Ruuh is a conversational AI with socio cultural understanding and EQ through text and images.



The core of Ruuh is big data of internet which was used to train the AI. Initially Ruuh was a chat bot meant solely for entertainment purpose targeting the youth population of India. Since early 2017, Ruuh has been chatting 1:1 on Facebook Messenger, Skype, Skype Lite and on Ruuh website with social profiles on Facebook and Instagram. Ruuh discontinued posting to Facebook and Instagram and discontinued chatting on Facebook Messenger Skype, Skype Lite and this website as of June 21st, 2019 (Let's talk about Ruuh, n.d.).

Ruuh AI and its artistic works:

As per Microsoft - EQ, Human Behaviours, Senses, Cultural Understanding and Creativity are the ingredients which make Ruuh to behave human like (Titus & Magapu 2018). The first four things Ruuh have continuously learned and improved on by chatting with Ruuh users over the period of time. Concurrently Ruuh was also equipped with 'image sense' so that the AI can see the images in human way and respond to it with empathy. This entire thing works on concept of human or biological neural networks which is simulated in developing artificial neural network (ANN). ANN is basically a computer system or a programme modelled on human brain or nervous system. An artificial neural network doesn't need any programming to learn explicitly rather it learns on its own just like human brain. Microsoft's idea of bringing Machine learning and Art together have abled Ruuh to develop its artistic abilities (Titus, 2018a).

Two Step Design Generation Approach: Experiments were carried out by the Microsoft team to make Ruuh learn about how to paint and create different artworks. The AI was trained to paint a black motif using primary colour scheme. After that the AI Painted the same motif in a different colour scheme. For painting in different colour scheme input colour scheme picture data has to be learned by the AI. Step 1: Ruuh used pix2pix, a Conditional Adversarial Network to help AI colour a black motif. Trained using a set of 1000 simple paintings from a famous European artist, Piet Mondrian, AI was able to learn primitive colourisation of motifs *(Refer Image 1.1)*. Step 2: AI was made to learn to recolour the primitive-coloured motifs by transferring colours from vivid photographs using a Statistical Global Colour Transfer technique (Titus, 2018a). *(Refer Image 1.1 1.2,1.3* Image Source: Menon 2018a*)*

Image 1.1Image 1.2Image 1.3

In initial exercise not every artwork that Ruuh created was perfect or was aesthetically appealing. Most of the time it was due to AI's poor choice of colour combinations or uneven colour filling in the motifs. It was a challenge for Ruuh to differentiate between good and not so good artwork because the AI was not able to analysis the design created by itself to product tasteful artworks. The reason for this was that the idea of beauty is

subjective to humans. Hence it required human intervention where all the artworks were judged by a large number of people to eliminate biases in understanding the most liked or good artworks. By this two-stepprocess Ruuh can create thousands of new artworks quickly without constraint of material and manpower (Titus, 2018).

RUUH AI'S IKAT ARTWORKS:

In next progression of Ruuh's artistic ability was to add some value to the AI created artwork. Today Indian artisans are mostly producing textiles using conventional motifs, shapes and colour schemes which does not suit to the taste of modern young generation and in the contemporary market. Microsoft's team for Ruuh collaborated with Ikat weavers of Koyalagudem, Telangana by providing them a variety of AI generated aesthetic artworks. Ikat is a textile technique in which warp or weft threads, or both, are tie-dyed before weaving. Based on the artworks developed by Ruuh the yarns were tied, dyed and woven to form Ikat designs on the fabric (Titus, 2018a). Below is the step by step process followed by Ruuh in creating AI Ikats:

The first step involves placing black motif on a grid and painting it in a colour scheme. The grid pattern guides in marking threads from where they have to be tied *(Refer Image 2.1*Image Source: Menon, 2018b*)*.

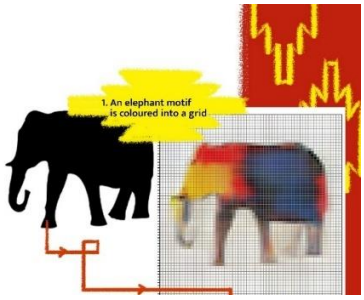
1. 

Image 2.1

Image 2.2

2. Secondly threads (warps/wefts) are tied securely at the marked places with rubber tapes to resist the dye from penetrating inside the fibres while dyeing process *(Refer Image 2.2*Image Source: Menon, 2018b*)*.
3. As per the design the tied threads are dyed in a dye bath of required colour *(Refer Image 2.3*Image Source: Menon, 2018b*)*.

Image 2.3

4. The dye resist material i.e. the rubber is removed and the yarns are arranged to set into a handloom. The place where the rubber was tied is left undyed due to resisting rubber tie *(Refer Image 2.4*Image Source: Menon, 2018b*)*.

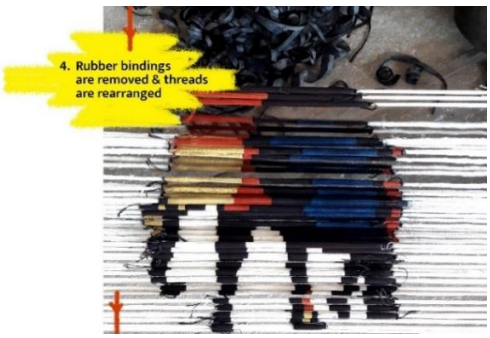


Image 2.4

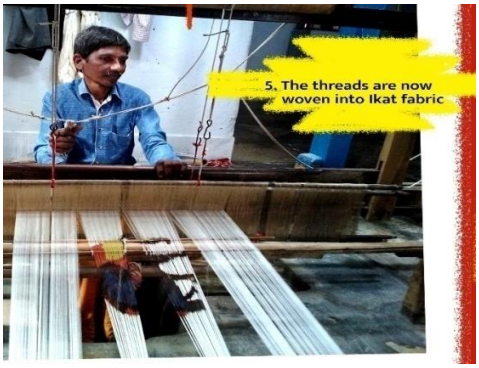


Image 2.5

5. Finally, the dyed yarns as per the design from the AI art work are set into a handloom for weaving of a AI Ikat Fabric *(Refer Image 2.5*Image Source: Menon, 2018b*)*.
6. At last the Ikat woven fabric was converted into some value-added beautiful product such as Ikat cloth bags, cushion covers and framed fabric art *(Refer Image 2.6*Image Source: Menon, 2018b*)*.

Image 2.6

RUUH AI'S BLOCK PRINTING ARTWORKS:

Ruuh's collaboration with Hand Block printers of Rajasthan has led to development of a new possibility of AI helping the artisan's community. Block printing is an ancient technique of producing hand printed Textiles. In this technique wooden blocks are carved in designs. The block is pressed on a colour tray from which the carved design picks the colour and then it is stamped on a fabric piece. This process is done repeatedly to create beautiful patterns (Titus, 2018b). Below is the step by step process followed by Ruuh in creating Block Printed textile products:

1. The first step involved making Ruuh learn and train in drawing geometric patterns or shapes. Rule based approach was used to form basic block designs with shapes like

square, triangle, hexagon or abstract ones by joining any two points on distinct edges by a straight or curved line. Moreover, the AI was also trained to rotate and repeat these block designs to form some interesting geometric outcomes *(Refer image 3.1and 3.2*Image Source: Menon, 2018c*)*.

2. Secondly Ruuh developed various colour palette which were derived from picturesque photographs of nature. The AI used these colour palettes to paint the geometric pattern that it haddrawn *(Refer Image 3.3*Image Source: Menon, 2018d*)*.

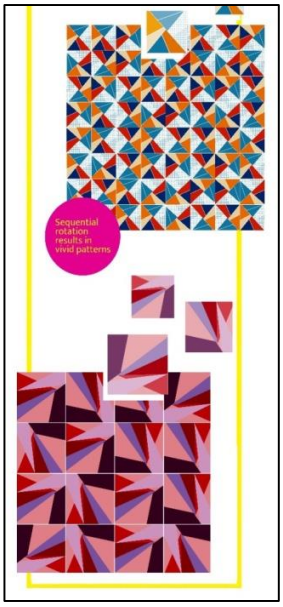


Image 3.1

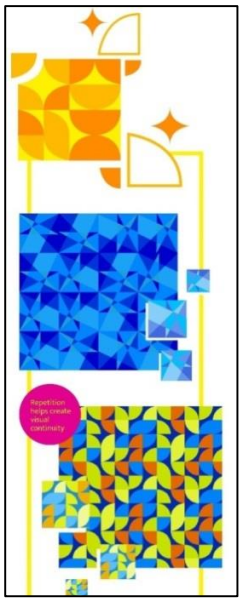


Image 3.2

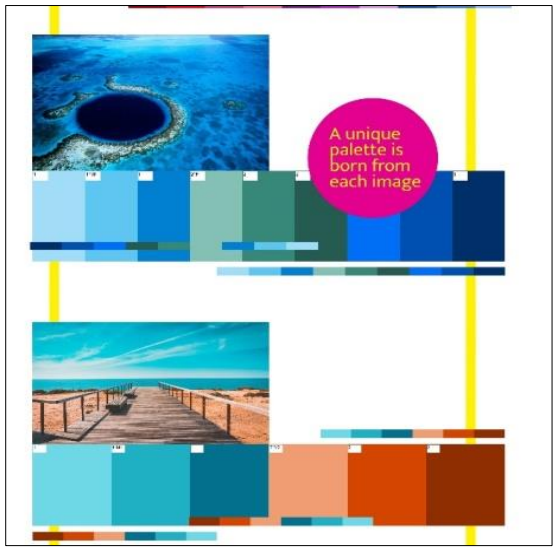


Image 3.3

3. At last a pruning model was developed to eliminate bad artworks from good artworks. A dataset of 1100 patterns were annotated by 3 judges on basis of their liking of each design. Using a set of rules on colour theory and statistics, some parameters were set to train Ruuh to remove bad designs based on poor colour combos, extremely low/high contrast and a couple of other aesthetic metrics. Ruuh was trained and tested with samples to help AI evaluate the iterated designs to pass the artistic test
4. The selecteddesigns were traced on wooden blocks for carving *(Refer image3.4* Image Source: Menon, 2018)

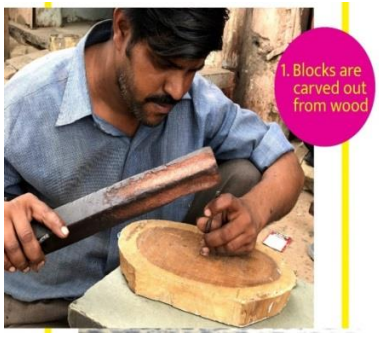


Image 3.4

Image 3.5

5. For each different colour a different block was carved *(Refer image 3.5* Image Source: Menon, 20)

Image 3.6

7. Colour trays are prepared by laying mesh and pouring dye liquid on the trays as per the colours in the design*(Refer image 3.6*Image Source: Menon, 2018e*)*.
8. The Blocks carrying differing colours are stamped on the fabric to create a complete motif and pattern on the fabric *(Refer image 3.7*Image Source: Menon, 2018e*)*.

Image 3.7

Image 3.8

Image 3.9

9. The printed fabric is ready to be converted into value added products *(Refer image 3.8*Image Source: Menon, 2018e*)*.
10. A range of value added products like cushion covers, backpacks, laptop sleeves and pencil pouches were finally developed for the contemporary markets by the Block Printers communities*(Refer Image 3.9*Image Source: Menon, 2018f*)*.

Discussions

Today we have acquired the ability to make machines do things for us in a most human way but still there are places where AI has not been able to fill the Void completely. To create AI art, AI experts write algorithms not to follow a set of rules, but

to "learn" a specific aesthetic by analysing thousands of images. The algorithm then tries to generate new images in adherence to the aesthetics it has learned. Ruuh used advanced algorithms to create Artworks but not autonomously. Ruuh cannot create line drawings on its own except the few shapes that has been developed from the set of training data.The colour filling of a motif also comes from some set of training data that Ruuh has to learn. Most importantly the biggest challenge which still exits with the AI is that it does not have a strong sense of differentiating between a good and a not so good design. This requires human intervention in final section of designs. Computational Creativity is no doubt helpful in creating digital artworks specifically where the task is repetitive in nature but still the outcomes from it cannot be called as truly creative. Moreover, the basic human aspect of self-expression while developing some creative work is lacked in a Machine generated work. Certainly Ruuh has been able to develop some interesting artworks to produce textile products but still it's a matter to understanding how it will be able to connect with our traditional and cultural contexts which defines an Indian artesian community through its crafts.

Conclusion

No doubt AI is the future of the world but still a lot of research has to happen to understand the similarity between human and computational system and develop technology to bridge the things that machines can't do in a human way. The current state of AI technology is not sufficient and still requires human supervision and inputs to generate true creative works. The present technology can be certainly useful for Indian textile designers in developing some artworks which are repetitive in nature and are just aesthetically appealing. With the help of present technology, the textile designers can work many number of design options. But still the research in the field have to go long way in order to model human creativity.

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TO-04

FIBER FROM LOTUS PETIOLE: INNOVATION IN TEXTILES

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Abstract

Lotus is an aquatic perennial plant that grows on variety of wetlands across the globe. Amongst many species of lotus, Nelumbo Nucifera Gaertn. Pink form is widely distributed in India from Kashmir to Kanyakumari and used in some or other forms for different purposes. Due to the huge economic importance of flowers, cultivators cut the flowers with little length of stems leaving the rest entire stem in the wetland. This stem is called petiole which needs to be fished out for next cultivation. It was found that petiole contain two types of xylem cells – tracheids and vessels. Both consist of lignified cell wall and the fibres are assembled in these cells in the form of "Helix". In this study, precious fibres from lotus petioles was tested, hand spun yarn was prepared on Box (peti) charkha and further tested as per ASTM test standards. The results revealed that fibre is rich in cellulose and lignin, strength of the fiber is more than cotton whereas elongation is less, length to breadth ratio is comparable to silk. Union fabric samples were prepared on handloom using 100 % lotus hand spun yarn as a weft and cotton and silk as a warp. To compare the properties, the fabric with cotton (warp and weft) was also prepared. It was found that lotus fiber can be used with cotton for apparel and household textiles. Bulk production of this fiber will help the textile industry in developing eco-friendly textiles.

Keywords: Lotus, Petiole, Cellulose, Textile fibre, Eco-friendly.

Introduction

India has a rich variety of wetland habitats due to varied topography and eco-climatic regimes. Types of wetland plants are also remarkably diverse owing to the large scale variation in topography, huge climatic gradient across the country and due to the local variation in rainfall. All wetland plants have been grouped under following broad categories that is free-floating hydrophytes (*Eichhorniacrassipes*, *Leminaperpusilla*, *Pistia stratiotes*etc), suspended hydrophytes (*Hydrilla sp*., *Utricularia sp*., etc), submerged anchored hydrophytes (*Aponogetonappendiculatus*, *Vallisneriasp*, *Potamogitum sp*. etc), anchored hydrophytes with floating leaves (*Nelumbo nucifera*, *Aponogeteusnatans*etc), anchored hydrophytes with floating shoots (*Ipomoea aquatica*, *Trapamaximowiczii*) and emergent anchored hydrophytes (*Bacopimonnieri*, *Eleocharis spiralis*, *Hydroceratriflora*, *Linnocharis flava*, *Limnophila aromatic*, *L. heterophylla*, *Monochoria vaginalis*, *Typha spp*.etc). (Saha G & Mazumdar S, 2017).

Lotus is an ancient aquatic perennial plant that is widely distributed across the globe in China, India, Bhutan, Malaysia, New Guinea, Japan, Pakistan, Philippines, Russia, Srilanka, America, Australia and Thailand (www.bsienvis.nic.in/kidscentre/Nationalflower-

17056.apx). There are wide species of Lotus such as Nelumbo, Nymphaea, Bird foot trefoil, Snow lotus, Ziziphus Lotus and Diospyros lotus. (Gardetti M, 2016) reported that fibresof *Nelumbo nucifera Gaertn* an aquatic perennial plant more commonly known as lotus with its pink and white flowers are sacred in parts of Asia . (Myint et al., 2016) also reported stems of pink colour lotus submerged in the water are perfect to produce strong and durable fiber. Fiber producing species *Nelumbo Nucifera Gaertn*occurs widely from Kashmir to Kanyakumari showing huge phenotypic diversity with different shapes, sizes and shades. It is widely cultivated in Thirunavaya which is the largest lotus farming site in Kerala, Dal Lake and Wullar Lake of Kashmir, Medinipur districts of West Bengal, Dhamtari village of Chhattisgarh and also in Punjab and UttarPradesh.

Different parts of *Nelumbo nucifera Gaertn*like seeds, rhizomes, flowers, stamens, roots have numerous applications. The flowers have a most economic importance across the country used as a festive occasions and offerings to god and goddess. Due to the wide usage of flowers, the petioles are cut with the little length of petiole leaving the entire petiole in the pond as a waste. This petiole contains precious fibers that is hidden in the water. People often confuses between the petiole and rhizome. In normal colloquial language people speak petiole as a stem. But scientifically both the parts are different. The petiole is the stalk that supports a leaf in a plant and attaches it to the stem. (https://biologydictionary.net/petiole/).And the rhizome (also known as rootstocks) is a type of plant stem situated either at the soil surface or underground that contains nodes from which roots and shoots originate. Rhizomes grow perpendicularly, permitting new shoots to grow up out of the ground. When separated, each piece of a rhizome is capable of producing a new plant(https://biologydictionary.net/rhizome/).

The rhizome is used for food purpose and petiole contain precious fibres. Inside the petiole there are two kinds of xylem cells: tracheids and vessels. Tracheids are elongated narrow tube like cells with hard thick lignified wall with large cell cavity. Vessels are cylindrical tubular structure with thin lignified wall. These cells helps in transportation of water and some nutrients to plant from roots to leaves and also provide mechanical support to the plant(http://www.differencebetween.net/science/difference-between-vesselelements-and-tracheids/). Lotus fibers are arranged in these cells in the form of "Helix" which is hidden in the water. The aim of the study was to test the precious fiber extracted from lotus petiole waste, check the spinability of fibre on box/peti charkha and construct union fabrics on handloom

Objectives of the study:

- To extract the fibers from the waste lotus petioles and test its properties.
- To experiment the extracted fibers for making yarn and test its properties.
- To construct union fabrics.

Methodology

The experimental procedure of the study was undertaken in following section:

1. Testing at Fiber stage
2. Testing at Yarn stage
3. Testing at Fabric stage

1. Testing at Fiber stage:

a. Fibre identification

Identification of fibers through Microscopic appearance, burning and solubility test.

- Microscopic test: Longitudinal view of the fibers was observed under the compound microscope with the magnification of 10X and 45X.Cross-sectional view of the fiber was tested at Bombay Textile Research Association (BTRA), Ghatkopar Mumbai. For the cross section, fibers were first coated in JEC gold plated twin coater and cross sectional view was observed in JSM scanning electron microscope from the magnification of 50X to 3500 X.
- Burning test: To recognize the fiber by burning test, the fiber was moved slowly towards flame and the reaction of heat was observed. One end of the fiber was put directly into the flame to determine the burning rate and characteristics. The burning odour was noticed.
- Solubility test: For the solubility test fibres were treated with acids and alkalies in both hot and cold conditions.

b. Determination of Chemical composition of the fiber: Chemical constituents of the raw fibers were determined as per the scheme suggested by Turner and Doree.

c. Determination of fiber diameter:

Compound microscope with micrometer lens was used to measure the fiber diameter.

An average of 50 readings was taken to determine the fiber diameter.

d. Determination of fiber strength:

Following ASTM D 3822 standard, single fibre strength was tested. LLOYD tensile testing instrument was used. The sample length was 10 cm. Instrument worked on constant rate of elongation principle (CRE). Capacity of the instrument was 2500 N. Pulling speed was 100 mm/min.

e. Moisture Testing:

To determine the moisture content and regain, fibers of 10 gm were kept in oven for 4 hours. After 4 hours, sample were taken out from oven and weighted. From the two weight differences, moisture content and regain were calculated using formula: (Booth J.E, 1996).

Moisture regain (R) = $\frac{100 \text{ X } W}{D}$ Moisture content (M) = $\frac{100 \text{ X } W}{D + W}$ = Where, Oven Dry Weight = D

Weight of Water = W

Regain = R

Moisture content = M

2. Testing at Yarn stage

- Standard Conditions maintained for testing:-
  Relative Humidity: 65± 2
  Temperature: 20± 1ºC
- Conditioning:-

Yarns exposed to above laboratory conditions for 24 hours

Standards Followed for tests: ASTM D 885

a. Determination of Yarn fineness:Using direct and indirect system (using Beesley's yarn balance) of yarn numbering, fineness of the yarn was determined.

b. Determination of Yarn strength:Tensile strength of the yarns was determined on Instron Universal tensile tester. The instrument work on constant rate of elongation principle (CRE). For the test the yarn of known denier was clipped between two jaws with the gauge length 500 mm (50 cm) and the pulling speed was 500mm/min. Average of 10 readings was taken.

c. Determination of Yarn Twist:The amount of twist was calculated on Alfred suter twist tester. The sample length was 10 inch test length with tension arrangement. An average of 10 readings was taken.

d. Yarn Moisture: For determining the moisture of the yarn, 10 g of yarn was initially weighted and kept in the aluminum dish. Then it was kept in an oven for 4 hours at 105°C± 2°C. After 4 hours, sample was taken out and the moisture regain in yarn was calculated

3. Testing at Fabric stage

a. Determination of fabric Count: Fabric count (the number of yarns/inch) helped to describe the closeness of the weave. Following ASTM D 3775-98, fabric count was determined by counting number of threads in one inch in warp and weft direction using pick glass. Average of 10 readings were taken.

b. Determination of fabric thickness: Following ASTM D 1777-96, fabric thickness was measured on Universal thickness tester.10 readings were taken from the different places of the fabric. Average of these 10 readings were taken.

c. Determination of Fabric weight per unit area: Sample of 5 X 5 cm. were cut and weighted. GSM was calculated using formula:

$$GSM = \frac{\text{Weight in grams of the sample x 100 x 100}}{5 \times 5}$$

d. Determination of tensile strength of the fabric:Tensile strength of the fabrics were tested on Universal tensile tester (UTM) by ravelled strip test method using ASTM D 5035- 95. Specimen size of 150 mm x 25 mm (15 cm x 2.5 cm) was cut. Gauge length was kept 75 mm ± 1 mm (7.5 cm) with the speed of 300mm/min. Average of 5 readings from both warp and weft direction was taken.

Results and Discussions:

a. Fiber testing

Plate1: Longitudinal section of lotus

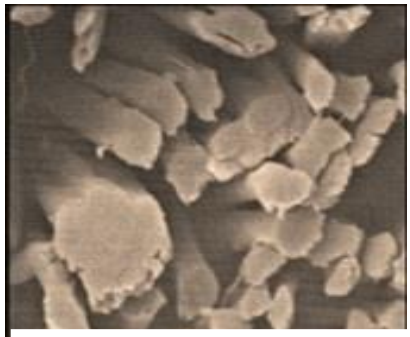

Plate 2: Cross- section of lotus

1. **Microscopic Structure of lotus fiber:**

In the longidunal section, it was observed that bundle has a wavy structure. Several individual fibers are conglutinated together into one bundle. From the cross-sectional view it was observed that fiber was circular or similar to circular shape.

2. Burning and solubility test exhibits the characteristics of cellulosic fibre.
3. The chemical composition of the fiber:

Table **1: Chemical composition of fiber**

Sr. No.	Chemical constituent	Percent Value (%)
1	Water soluble impurities	11.35
2	Cellulose	74
3	Hemicellulose	1.1
4	Lignin	8.1
5	Pectin	0.5
6	Fats and wax	4.9

From the results, it was observed that the major component in the fiber is 74 % cellulose and 8.1% lignin.

3. Physical properties of the fiber:

Table 2: Physical properties of fiber

Property	Measurement
Fiber Length	60 to 105 cm
Fiber Diameter	2-6 µm
Length to breadth ratio	269000:1
Fineness	
Denier	32
Tex	3.5
Cotton count	166s
Strength	
Maximum load (gf)	161.5
Extension at maximum (mm)	1.5589
Stress gm/den	5.0476
Fiber Moisture	
Moisture content	10.6 %
Moisture regain	11.8 %

From the above table for different parameters following were the observations:

- Fiber Length: Length of the lotus fibre was recorded between 60 to 105 cm and the average length was 80.70 cm. Hence it has enough length to be twisted and converted into yarn structure. (Gohl E&Vilensky L, 1987).
- Fiber Diameter:Diameter of the lotus fiber was observed between 2-6 µm and the average diameter was 3.5 µm. Hence it indicates that lotus fiber is too delicate for ready conversion into yarn structure (Gohl E&Vilensky L, 1987).
- Length to breadth ratio: Average length of the lotus fibers observed was 80.70 cm and average diameter observed was 3.5 µm leading to length to breadth ratio2690

00:1. A ratio of 1000:1 or more indicates a fibre which should readily spin into a yarn structure. (Gohl E&Vilensky L, 1987). Hence the high length to breadth ratio of lotus fiber indicates that it can readily be spun into a yarn.

- Fibre fineness: The values obtained indicates that lotus fibre is fine in character.
- Fiber strength: It was observed that lotus fiber has poor elongation property.
- Fiber Moisture: Moisture content of the lotus fiber was 10.6 % and regain was 11.8 % which was more than cotton and close to silk and viscose rayon fiber.

B. Yarn Stage

Table 3: Physical Properties of yarn

Property	Measurement
Yarn fineness	
Denier	108
Tex	12
Count	49.21
Yarn Strength	
Maximum load (gf)	233
Extension at maximum (mm)	1.7
Stress gm/den	2.15
Yarn Moisture	Moisture content 10.6 %
	Moisture regain 11.8 %
Yarn Shrinkage	0 %
Yarn Twist	1.66 tpi

From the above table for different parameters following were the observations. Fineness of the yarn is important to obtain a soft, smooth and uniform fabric. (Mishra S.P.2000). The values obtained shows that it was fine yarn. It was also observed that lotus yarn has a low twist of 1.66 tpi. The extension of the lotus yarn was low as compare to cotton hand spun yarn. But the load and stress value of lotus hand spun yarn was higher than cotton hand spun yarn. Lotus yarn has 0 % shrinkage which has an added advantage over the other natural fibers like wool and cotton where there is the problem of shrinkage.

C. Fabric Stage

Woven fabric samples were prepared from 100 % lotus hand spun used as a weft and cotton as a warp. To compare the properties, fabrics with cotton warp and weft was also prepared.

Table 4: Yarn specifications of constructed fabrics:

Sr. No.	Fabric sample	Warp yarn		Weft yarn	
		Fiber content	Yarn count	Fiber content	Yarn count
1	Cotton	Cotton	2/80's	Cotton	2/80's
2	Cotton: Lotus	Cotton	2/80's	100 % Lotus	3/50's

Table 5: Properties of constructed fabrics

Sr.No.	Properties	Fabric samples			
		Cotton		Cotton-Lotus	
1	Fabric Count	50x42		50x44	
2	Fabric thickness	0.28mm		0.29mm	
3	Fabric weight per unit area	70.8 GSM		80.8 GSM	
4	Tensile Strength	**Warp**	**Weft**	**Warp**	**Weft**
	Max Load (Kgf)	6.45	3.69	7.75	7.49
	Max Extension (mm)	6.41	3.21	6.79	4.6
	% Strain	8.52	4.28	9.05	6.13

It was observed that there was no major difference in thickness between the cotton and cotton: lotus fabric sample. GSM of cotton: lotus fabric was more than 100% cotton fabric. Fabric samples fall under the category of light-weight fabrics. From the table, it was concluded that load and extension values increased in cotton: lotus fabric as compare to 100 % cotton fabric.

Conclusion

The study was done to explore the lotus petiole (that is the part between flower and rhizome) of the lotus plant that goes as waste after cutting the flower. The petiole contain precious fiber that has a potential to be textile fiber.It was concluded from the study:

- Except human energy no other form of energy was used for the extraction of fiber. Being manual in nature the process is time-consuming.
- Cotton: lotus fabric have given good results. Also the strength of cotton: lotus fabric in both warp and weft direction was found higher than 100 % cotton fabric.
- Results revealed that lotus fiber can be used in yarn and fabric stage for preparing union and blended fabrics. As the waste is abundant so, raw material even for its use on larger scale will not be a problem. The process from extraction to weaving will not require use of any chemical which will be an added advantage to green environment.

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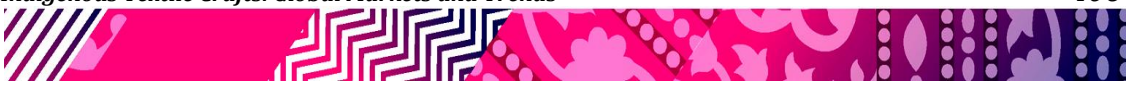

TO-05

FUNCTIONAL FINISHING OF TEXTILES WITH BANANA PSEUDOSTEM SAP

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Abstract

In India, banana is cultivated on 5.65 lakh ha area. In addition to fruit production, huge quantity of biomass (pseudostem, leaves, suckers etc.) is generated. Presently, this biomass is discarded as wastes, which not only occupy the land and also create pollution to surrounding environment as well as to the human life. There are other organic by product other than agro-residue obtain from plants is Sap. Sap is blood life of a plant filled with nutrients which are carried from root to stem to leaves for photosynthesis then glucose is formed which is transported from leaves to various part of the plant. Banana pseudostem sap is filled with many marco and micro nutrients but not properly disposing it can cause adverse effect. Hence, this study was carried out with an aim of exploring the banana pseudostem sap and utilizing it for textile processing.In the present study researcher experiment with mature banana pseudostem sap to use it as pre-treatment, mordant, flame retardant, ultraviolet protective and antibacterial. All the aqueous extracts of sap have been found to contain iron, copper, zinc, phosphorus, reactive silica, magnesium, calcium, nitrogen and sodium minerals. The photochemical screening and analysis of Banana pseudostem sap indicated the presence of alkaloids, flavonoids, tannins, saponins, steroids, glycoside and phenols compounds. Finishing was applied through pad-dry-cure method. For finished sample two sets of treatment was given one set was only pre-treatment with mature banana sap and second set was pre-mordanting with alum along with mature banana sap. Finished samples were evaluated for flame retardant, UV protection and antibacterial activity. For flame retardant LOI index and vertical flammability test was carried out , for UV protection % UV transmission and UPF rating and for antibacterial activity zone of inhibition against gram negative (E. coli) and gram positive (S. aureus) bacteria were tested. All the finished sample at 2% add-on showed good protection against UV radiation, flame retardant and antibacterial (no growth below the fabric). After analysis of result percent add-on was increased by 6%, the higher add-on gave better result as compared to 2% add-on. The finished samples with 6% add-on were categorized as flame retardant and very good UV protective property.

Keywords: Bananapseudostemsap, Phytochemical screening, % UV transmission, Flame Retardant, LOI Index

Introduction

Today's modern lifestyle has changed the aim of the textile from simple protection to essential functionality. Consumer are getting aware and their demands are been increasing day by day they want their textiles not only durable, comfortable, easy to maintain but instead, to have high performance (Nayak, R. et., 2008). In last few years, consumers are concern over hygienic lifestyle, effects of global warming, chemicals, pesticides and pollutants. They want their textiles to be waterproof, flame resistant, self-cleaning, insect repellent and antimicrobial to protect human beings from infection, UV light and biological agents (Gulrajani, M.L. and Gupta, D. 2011).

Wet processing of textile substrates starting from its preparatory to coloration followed by finishing is important for its value addition in terms of aesthetic value, removal of impurities, colour shade, colour pattern and requisite functionality. However, some of the traditional processes are water, energy and chemical intensive. Recently, due to global awareness on environmental pollution, and sustainability, both the academic research and textile industrial product development have been intensified to seek for sustainable dyeing and finishing processes, using plant waste and non-food plant extracts, (Samanta.*et al*, 2017). Based on environmentally friendly plant-based products characterized by biocompatibility, biodegradability, non-toxicity, in addition to their recently discovered properties such as insect repellent, deodorizing, flame retardant, UV protection, and antimicrobial activity are gaining popularity all around the world for producing more appealing and highly functional value-added textiles. Natural bioactive compounds as promising alternatives to synthetic finishing agents have recently gained increasing attention in the textile industry due to their eco-friendliness, low irritation, and biocompatibility, antibacterial activity, antioxidant, and UV-protective properties, (Yuyang. and Cheng, 2017).

Various plants are cited as sources of natural dyes such as Teak, Mahogany, Ketapang, Tamarind, Mangosteen, Mango, Suji, Pandan, Indigofera, Guava, Banana and Onion. Plant parts including roots, leaves, twigs, stems, heartwood, bark, wood shavings, flowers, fruits, rinds, hulls, husks, and the like serve as natural dye sources. In addition most of the natural dyes have inherently antimicrobial properties and consequently, could possess high medicinal potential properties, (Sujata, and Raja, 2014). Among these plants banana extract is used in various applications for dyeing and finishing of textile. Consequently, researchers have begun to search in its eco-friendly utilization for functional finishes. The purpose of this paper is to over view and focus on papers about extraction application and utilization of banana plant for functional finishing of textile substrates.

Banana is a tropical fruit grown in over 122 countries worldwide (Ehiowemwenguan G et al 2014).Banana is the second largest produced fruit after citrus,

contributing about 16% of the world's total fruit production (FAO, 2009). Banana production is estimated around 72.5 million metric tonnes as fruits, (Ramesh, 2017).
Almost all part of banana plant from fruit, fruit peel, leaf, pseudo-stem, stalk, and inflorescence (flower), can be utilized. Presently, the banana pseudo stem is hazardous waste, it has been used in several countries to develop important bio-products such as fibre which is spun to make yarn, which is woven or knitted to produce fabric, apparel, as well as fertilizer, bio-chemicals, paper, handicrafts, pickles ,candy, (Mohiuddin, 2014). There are other organic by product obtain after extraction of banana fibre from pseudostem one is sap. Banana sap consists of different chemical constituents like carbohydrates, cellulose, lignin, ash, coloring matter and portentous material. (Barhanpurkar, 2015.

Among all the available textiles, cotton is considered as important textile fibers, and has been widely suitable for various applications such as sportswear, functional wear, leisure wear, inner wear and other garments. It is non- allergic doesn't irritate sensitive skin and preferred to worn next to skin 9 (Jeyakodi, J.M. and Venkataraman, V.K. 2016).The research work focuses on the treatment of cotton fabrics with banana pseudostem sap. Then the treated fabric samples are tested for multifunctional activities like flame retardant, UV properties and antimicrobial activity. The broad aim of this work was to reduce the waste and utilization of bananapseudostem sap for textile finishing.

Material and Methods

2.1 Selection of the Raw Material

The fabric selected for this study was 100 % cotton fabric. For the study mature banana sap were procured. The preliminary data of the fabric and mature sap were tested as per the standard methods and given in table 3.1.

Table 2.1: Sourcing of Raw Material

Sr. No	Raw Material	Procured
1.	Cotton Fabric	Friendship Shop, Alkapuri, Vadodara
2.	Mature Banana Sap	Happy Faces Foundation A NGO, Maninageshwar

2.1.2 Extraction of the Banana Sap

The **mature sap** was prepared by storing the fresh sap for a about a month the colour changes from light muddy colour to dark brown due to ageing and oxidation of fresh sap.

2.2 Composition of Mature Sap

Mineral analysis of banana pseudostem sap is carried out by PolytestLaboraties, Pune by using standard procedure. For metal analysis for Iron (Fe), Copper (Cu), Zinc (Zn), Phosphorus (P), Reactive Silica (SiO_2), Magnesium (Mg), Calcium (Ca), Total

Nitrogen (N) and Sodium (Na) has carried out . Banana pseudostem sap was considered into the water category for testing.

Table 2.2: Minerals Analysis as per Standard Method

Sr. No	Test	Method
1	Iron (Fe)	IS 3025 (part 53)
2	Copper (Cu)	APHA 23d Edition, 3111 B
3	Zinc (Zn)	IS 3025 (part 49)
4	Phosphorus (P)	APHA 23d Edition, 4500-P D
5	Reactive Silica (SiO_2)	APHA 23d Edition, 4500- SiO_2 D
6	Magnesium (Mg)	IS 3025 (part 46)
7	Calcium (Ca)	IS 3025 (part 40)
8	Total Nitrogen (N)	APHA 23d Edition, 4500-N A
9	Sodium (Na)	IS 3025 (part 45)

2.3 Preparation and Application of Finishes

The first set was treated with 100% mature banana sap using a padding mangle with keeping the material to liquor ratio of 1:20, 2 nips 2 dips and pressure was maintain at 1 bar for 2% add-on.

The second set was first treated with 4% alum at boiling temperature for 45 mins and thereafter with 100% mature banana sap using a padding mangle.

In second set two different add on 2% and 6% were carried out which were further followed by curing for 5 mins at 110 ^{0}C in oven. To achieve 2% and 6% add on on fabric the following condition were maintained.

For 2% add on:-5 mins (treatment time) 2 dips 2 nips at 1 bar

For 6% add on:- 15 mins (treatment time) 6 dips 4 nips at 1 bar

2.4 Testing for Functional Finish

2.4.1 Antibacterial Test:

Antibacterial activities of the treated fabric with antibacterial extract will be evaluated by qualitative (AATCC147) and/or quantitative (AATCC100)methods against ((Gram + ve and Gram − ve bacteria) and fungi), before and after washing**.**

2.4.2 Ultraviolet Protection Factor (UPF)

Spectrophotometer from CIRCOT Mumbai was used for the testing of the percent UVR transmission.

Transmitted radiation from the sun that reaches the skin causes the adverse effect on the skin. The transmission of UV-R through specimen is measured on a spectrophotometer. The per cent blocking of UV A and UVB radiation is calculated.

2.4.3 Evaluation of flame retardants:

Many factors influence the flammability of textiles, including the fiber type, the fabric weight and construction, the method of ignition, the extent of heat and material exchange, and the presence or absence of flame retardants. A measure that enables an

obvious assessment of flame protection properties is the limiting oxygen index (LOI), determined according to ASTM D-2863.

Vertically held specimens, determination of the ease of ignition/the flame spread properties, were evaluated using AATCC test method 34- 1969.

For LOI analysis, IS 13501 test method was used. The LOI is defined as the content of oxygen in an oxygen/nitrogen mixture that keeps the sample at the limit of burning.

$LOI = 100 \times O_2 : (O_2 + N_2)$

Results and Discussion

3.1 Preliminary data of the Fabric

The cotton fabric was chosen for the study. For its preliminary data following parameters: fibre content, fabric count, weight per unit area, and thickness of the fabric were studied

Table 3.1: Fibre Identification of the selected fabric

Sr.No	Microscopic Analysis	Chemical Solubility Test	Burning Test	Fiber confirmed
1	Flattened with frequent convolutions that change directions.	Dissolve in 75% sulphuric acid (at 25^0 C)	Burns with little ash Odour similar to burning paper	Cotton

The selected fabric was scoured and then after drying kept in a desiccator. To confirm the fibre content three tests were conducted i.e. microscopic analysis, chemical solubility test, burning test as shown in Table 3.1.

After, the microscopic analysis, chemical solubility test, burning test it was confirmed that the fibre type tested was 100% cotton.

Table 3.2: Preliminary data of the selected fabric

Sr. No.	Fiber content	Fabric count		Weight/Unit area (Gms/mt^2)	Fabric thickness (mm)	Weave
		Ends Per cm	Picks Per cm			
1	100% cotton	98	62	92	27	plain

The results showed that the selected plain weave cotton fabric was an unbalanced fabric with count of. 98 ends per cm and 62 picks per cm. The weight per unit area of cotton fabric was 92.4 gms per unit area. Thickness of the cotton was 27 mm.

3.2 Preliminary data of the Banana Pseudostem Sap

Banana pseudostem sap is a watery liquid present in the xylem cell and phloem vessel in the banana's trunk. It contain nutrients and mineral which flows from the root to trunk

then to leaves to carry out the photosynthesis on the same time glucose start getting formed which travels from leaves to various other plant.

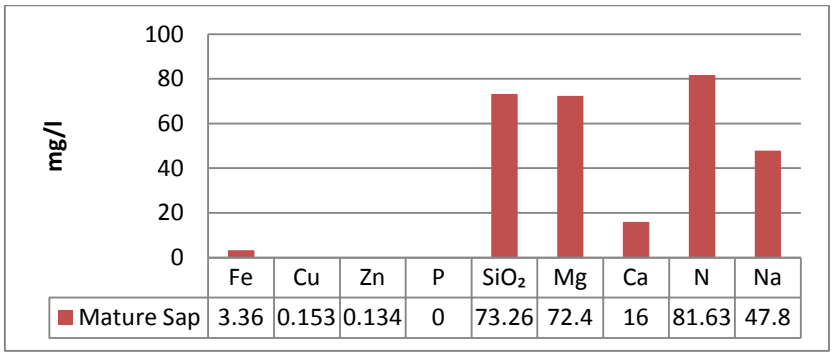
Table 3.3: Preliminary data of Banana Sap

Sr.No	Banana saps	Color	Odor	pH
1	Mature sap	Dark brown	Pungent	6

Different concentration of minerals present in mature banana pseudostem sap is shown in Table 3.4. In mature banana pseudostem sap nitrogen has highest concentration (81.63) follows by followed by reactive silica and magnesium (73.26 and 72.4) then by sodium (47.8). The calcium concentration is (16) and least concentration was of phosphorus (<0.02).

Table 3.4: Mineral analysis of fresh, mature and purified banana Pseudostem Sap

Sr. No	Metals	Unit	Amount
			Mature Sap
1	Iron (Fe)	mg/l	3.36
2	Copper (Cu)	mg/l	0.153
3	Zinc (Zn)	mg/l	0.134
4	Phosphorus (P)	mg/l	<0.02
5	Reactive Silica(SiO_2)	mg/l	73.26
6	Magnesium (Mg)	mg/l	72.4
7	Calcium (Ca)	mg/l	16
8	Total Nitrogen (N)	mg/l	81.63
9	Sodium (Na)	mg/l	47.8



Graph 1: Minerals Composition of Mature Banana Sap

3.3 Evaluation of the Antibacterial Properties of treated Cotton Fabric

S. aureus are gram positive and commonly found in the nose and on skin. It can cause illness ranging from pimples, boils, scalded skin syndrome, pneumonia, meningitis, osteomyelitis, bacteraemia and sepsis. E. coli are gram negative commonly found in small intestine of warm blood organisms. Most of E. coli strains are harmless but some can cause food poisoning. It is expelled into environment through faecal matter.

The samples were qualitatively evaluated for their antibacterial property following the zone of inhibition method. The present study reveals the antibacterial property of different banana pseudostem sap against gram positive and gram negative bacteria. Two sets of sample were prepared with 2% add on, one with only pre-treated with 100% mature banana pseudostem sap and other set was pre-mordanted with alum (4%)and thereafter treated 100% mature banana pseudostem sap.

Table 3.6: Antibacterial activities of samples finished with different treated cotton fabric against S.aureus and E.coli

Sr.No	Samples	Growth below the fabric		Zone of inhibition (in mm)	
		S.aureus	E.coli	S.aureus	E.coli
1.	Control	Dense Growth	Dense Growth	None	None
2.	Mature sap	Dense Growth	Dense Growth	None	None
3.	Alum+ Mature sap (2%)	No Growth	No Growth	None	None

The result gives the comparative study of the antibacterial activity of each sample against both the test organisms namely *S. aureus* and *E. coli*. Two parameters were observed in antibacterial activity growth below the fabric and zone of inhibition. It was observed that some of the treated samples are showing effective against both gram positive (S. aureus) and gram negative (E. coli) bacteria. It can be seen fabric samples treated with banana pseudostem sap has dense growth below the fabric but when it is treated with alum along with banana sap it was observe that there was no growth of bacteria below the fabric. Treated samples are not showing inhibition zone however there are strict reduction in the growth of bacteria below the fabric surface.

Due to present of phytochemicals (tannins, phenols compound etc.) which act as antibacterial and antimicrobial.

3.4 Evaluation of %UV Transmission of Treated Samples

UV radiations are harmful to both humans and textile material. UV rays are comprised of UVA, UVB and UVC. Among three only UVA and UVB reaches the earth

surface. UV rays cause several skin problems such as skin cancer, sun burns or erythema, tanning etc. UVB changes the DNA structure cause DNA damage. In textiles UV rays damage and degrade the textile material and life span of textile material decreases fast. In below table 3.5 percent UVR transmission, UPF value and UPF rating of finished sample are shown below

Table 3.5: Percent UVR Transmission for Finished Cotton Samples

Sr. No	Samples	UPF	UVA Transmission %	UVB Transmission %	UPF Rating
1.	Control	18.72	4.27	5.21	15
2.	Mature sap	18.02	5.01	5.78	15
3.	Alum+ Mature sap (2%)	23.09	3.68	4.30	20
4.	Alum + Mature sap (6%)	30.70	2.60	3.70	26

It was observed that UPF ranges from 18.72 to 30.70, among all the treated cotton sample the highest value was achieved by alum+ mature sap 6% (30.70). UPF range from 15 to 24 is considered good protection with effective transmitting UV % ranging between 4.2 – 6.7 and UPF rating having 15-20. As it can be seen that all samples were giving good protection even the control sample itself has some amount of UV protective but due to less add on % when add on % is increased samples can achieve UPF rating of 25,30.

In UVR % transmission lesser the transmission % better at UV protective. Among all 6% add on showed the best result where the transmission % is 2.60-3.70 with UPF rating 20 which means having good protection.Due to presence of zinc, copper in mature sap enhance the strength properties, UV protective properties

3.5 Evaluation of Flame Retardant finish of cotton fabric

Cotton textile is flammable and easily catches the fire readily. Phosphorus based flame retardant along with nitrogenous base and sulphur compound are effective reported.As we see the chemical composition of banana pseudostem sap is rich in magnesium, nitrogen, potassium and phosphorus which can help in imparting flame retardancy in textile material (Basak S. et al, 2018). The flame retardance of both control and treated samples was evaluated by standard methods. For the limiting oxygen index (LOI) analysis, IS 13501 test method is used. In vertical flammability different parameter were measured as per IS 1871 method.

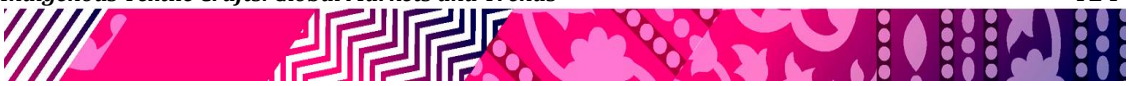


Table 3.7: Flammability Parameter of the Control and Different Treated Cotton Fabric [Vertical Flammability for both Control and Treated Fabrics]

Flammability Parameter	Control	Mature sap	Mature sap +Alum (2%)	Mature sap + Alum (6%)
LOI	18	20	20	27
Add on %	-	2	2	6
Occurrence of flash over the surface	Yes	Yes	Yes	yes
After flame (s)	60	50	10	5
Burning with afterglow time (s) after flame stop	50	75	Nil	nil
Total burning time (s) (flame length +afterglow time)	60+50	50+75	10+0	5+0
State of the fabric in contact With flame	Completely burnt with flame (grey ashes)	Completely burnt with flame (black ashes)	Completely burnt with flame	Burnt initially with flame followed by afterglow

Evaluation of flame retardant finished cotton fabric is given in above table that shows the LOI value and vertical burning behaviour of control and treated cotton samples. Textiles having LOI value more than 26 are considered as a fire retardant material (Basak et al, 2018).In above table it was observed that as we compare with control fabric which has LOI value of 18 with treated fabric sample seem to increased in LOI value i.e. 27. According, Basak S. et al, at % 5 add on the LOI value is 28 which make it as fire retardant but as we can see in above table 3.7 when add on % is less than 5 therefore effectivity is not much to restrict the flame catch up. Due to presence of minerals like phosphorus, magnesium nitrogen enhances the flame retardant property of the treated sample.

Therefore, when we further have increases add on% then LOI value increase to 27. When it was compared between add on 2 % and 6% , sample with 6% add on obtained best results.

Conclusion

Use of chemical finishes has led to effluent pollution problems and some are even toxic for human health. In this study an attempt is made to utilize the banana pseudostem sap, an organic waste as a functional finishes. Banana sap used for this study is not only biodegradable but also a field residue which is burnt, causing air pollution and toxicity in the environment and human life which is not an eco-friendly. It was observed that among

three banana sap mature sap gave the best results in terms of mineral analysis and even when applied as functional finish on the cotton fabric. The finished sample showed good result as an antibacterial property there were no growth under the fabric but the zone of inhibition was not seen due to uneven finish applied. The mature sap plus alum showed good UV protection range of 20 but due to less % add-on less than 5% similar in case of LOI index. Further increase in add on 6% it showed the LOI value 26 and UPF 26 which act as flame retardant and very good protective against UV with UVR % transmission 2.6-3.7.

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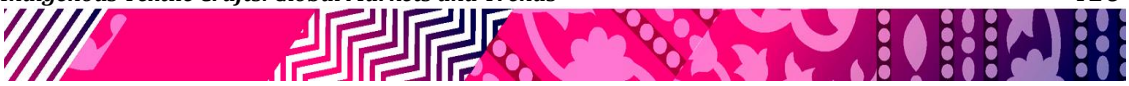

TO-06

NEED ASSESSMENT OF THE DESIGN PROCESS IN HANDLOOM CRAFT OF GUJARAT.

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Abstract

The handloom sector is the second-largest employment provider for the rural population in India after agriculture. Handloom weaving is time consuming activity which takes the great efforts and patience of the craftsman. In the world of changing fashion every day, the craftsmen are leaving the profession as it requires higher labour and the income is not sufficient. For sustaining the craft and with the increasing demand of the consumers new products, the craft require up gradation.The improved tools as a part of design intervention can be extremely meaningful to bridge the gap. Through the introduction of improved craft tools and simple machines, artisans can greatly improve their performance and their finished products can compete well in the market.The objective of the study was to know the design process in detail for motif development and identify the need and gap in design development process of Handloom Craft of Gujarat. And to give useful solution for the identified gap. The study was conducted on the Single Ikat Craft of Gujarat. The need analysis was done by observation and interviewing the craftsmen. The data regarding tools and equipment used to develop design was collected. The criteria to make designs and repeat pattern and its application on textile were recorded in depth. The further solutions were provided by developing instructional material to use Computer Aided Design (CAD) for design development process.On the basis of this study the researcher further plans to cover more handloom textiles and develop instructional material for the individual craft. And, also planning to train the craftsmen as well as design students to use CAD for developing handloom designs.

Keywords: Handloom, Need Assessment, Ikat, Motif, CAD

Introduction:

The old age craft of Khadi and Handloom is contributing even today in the Indian Economy. Gujarat is the hub of handicraft and traditional textiles which is making remarkable impact not only the in India but across the globe.

The textiles and dress of Gujarat are remarkably diverse. They are part of an expansive material culture that is the product of local ingenuity, religious diversity and a long history of cross-cultural influences, the result of international trade, conquest, colonization and diaspora.

The production of woven textiles in western India, notably cotton, goes back to the early civilizations of the Indus Valley. By the first century cotton textiles were an integral part of the sea-going trade via the Indian Ocean which finally petered out in mid-twentieth century. The Gujarati ports were pivotal in the movement of cotton cloth which

went to the Arab world and the Mediterranean region and east to Southeast Asia. Gujarat has also been the source of some of India's most highly prized handloom silk textiles. (6) The famous Handwoven Textiles of Gujarat were famous from centuries. The Kutch Shawls and Mashru is woven in Kutch District. Patolas is produced by Salvi weavers in Patan where as single Ikat Patola is produced in Surenranagar and Rajkot district. The Tangaliya is woven in Surendranagar district. The Ashavali brocade was produced initially in Ashaval, Ahmedabad. As the only weaver left of this craft is now in Gandhinagar District. The tribal Cloth is woven in Chhota Udepur district by Vankar Community but only two weavers are there who are practicing this craft. Others have shifted to different other economic activities.

The design process in textiles is actually symbolic forms rooted in Indian wisdom. It was found that the motifs used in handwoven textiles were derived from nature-flowers, tree, leaves, and animals, and also from household environmental objects such as ropes and baskets but they had no particular meaning other than being representational. Some textiles depict mythological designs inspired from Ramayana and Mahabharata Stories, where as tribal textiles were always found in geometrical patterns either shapes, lines or dots. The tools used for designing the motifs were graph paper, pencils or chalks. Sustaining craftsman is possible when a craftsman is satisfied with the craft and he will teach that craft to his children.

With the view of technological changes and future aspects, the craftsmen also require tools up gradation to meet new challenges of the market. Hence, a study was undertaken with the objective to know the design process for motif development and identify the need for up-gradation of the design process. Further, provide technological solutions for the design development process of Single Ikat Craft of Gujarat.

Methodology

The focus of the study was on motif development process practiced by the craftsmen. The need assessment was done through field visits. The data was collected through observation and interview. Photographic evidences were collected from the randomly selected craftsmen from Somasar and Kataria villages of Surendranagar district, Gujarat. The instructional material was prepared using Photoshop CC 2014 by the researcher as a guidebook and a blog was created on www.wordpress.com for open source usage.

Results And Discussions

Design Details:

In Single Ikat Craft, Most of the weavers were practicing new and contemporized designs, but some of them were working with both traditional as well as contemporary designs.

The saris made by the craftsmen were in silk which measured 45 inches width. The fabric count was usually 75 x 48. The sari of 45 inches would have approximately 3400 warps, 36 inches width of dupatta would have approximately 2800 warps and 28 inches of stole would have approximately 2000 warps.

One design unit would repeat 4 times width wise in 45 inches width of sari and 24-28 times length wise. The repeat would also differ according to the yarn diameter and number of ply used. On Sari, One repeat would measure in size 10 x 8 inches. The Single Ikat craft of Gujarat that is has distinct feature in designing- "The grid based pattern". The grid based pattern was obtained by dividing the whole motif into smaller unit as that on a graph sheet.

A bunch of yarns (weft) when tied was termed '*bhaag'* and it was represented by the smallest square on a graph sheet. This bunch when on loom was termed as ribbon. 61 *bhaag* made one repeating unit and similarly, one border consisted of 31 x 61 *bhaag*.
The new designs they made on their own. The inspiration of the new designs was embroidery books, newspapers, puzzle graphics, magazines, periodicals, any other textile, prints (Plate2)

Plate 1: Single Ikat Patola Sari

Plate 2: Inspiration for design

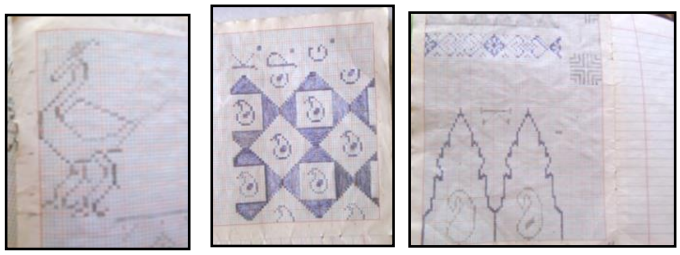


Plate 3: Design worked by the weavers on a paper marked with gridlines

The researcher collected designs from the craftsmen during the field visit. It was observed that the craftsmen would record the motifs with pencil/pen/colour pencil or pens on graph paper locally available to them which included A4 size graph paper or graph book with five boxes per cm. One motif occupied 61 x 61 boxes on a graph paper which was nearly 12 cms x 12 cms (Plate 3). The time were invested to make a single graph was approximately 1 hours depending upon the intricacy of the design.

The craftsmen did not have any catalogue for their collection. They showed their graphs to the one who gave them order. The buyer would select from these and mention colours as well as their requirement of number of pieces. Sometimes the buyer would bring his own design and give to the weaver (Plate 4).

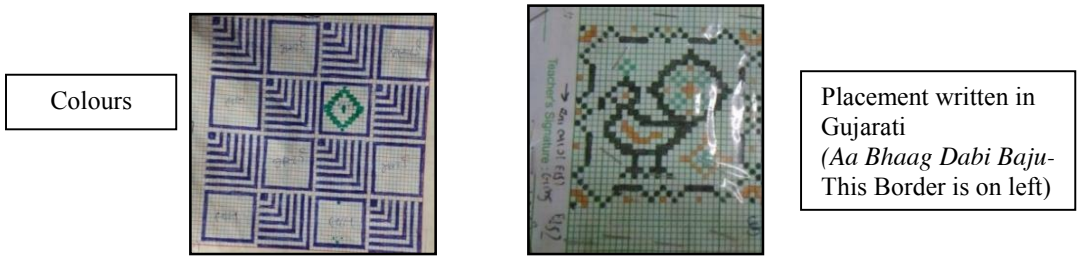
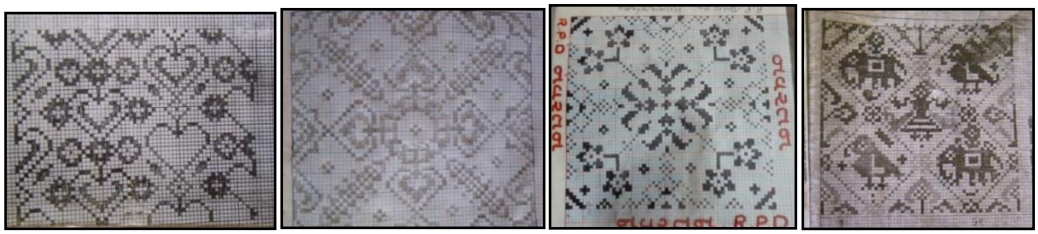


Plate 4: Sample graph showing design details mentioned by the buyer

In last five years they had experimented with metallic warps, and new designs. They were ready to experiment with new designs but only for bulk order



Paanbhat **Voragaji bhat** **Navratna bhat** **Nari-Kunjar**

Plate 5: Traditional motif record on graph paper available with the craftsmen

Plate 6 : Border motifs recorded on a graph paper by the craftsmen

Need Analysis:

The need analysis was done by visiting the craftsmen. By visiting the craftsmen, the researcher got to know that the craftsmen are using traditional techniques of design development. It was observed that the craftsmen would record the motifs with pencil/pen/colour pencil or pens on graph paper locally available to them which is time consuming activity apart from weaving.

The traditional technique of design development was time consuming. The layouts were difficult to develop without the help of Computer softwares.

The handloom weavers wanted to learn to make the designs layouts, so that the colour combination, which they had to imagine and was only possible while the weaving of the fabric. Which would be seen easily with the help of CAD without the loom process.

The motifs placements would also be possible on the layout development through CAD.

The weavers were not having any catalogue to show to their clients. They showed either graphs or their actual product to the customer. The catalogue or swatch file can improve

the communication process. Instead of visualization, the consumer and weavers both can see the end product before manufacturing.

Plate 7: Record of Contemporary Designs in the craftsmen's collection

Development of Instructional Material to use CAD

The learning material was devised to link up design and craft education. The objective of building the content was to make it relevant to the context. The context here is bridging the gap between design educators, students and the practitioners. It is the need of the hour that a cultural belonging and sensitivity to the needs of the craft community is integrated in the education system.

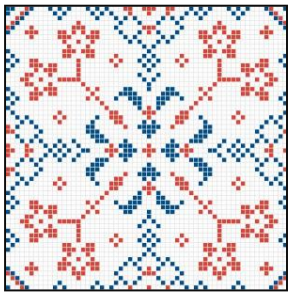
The content of the Teaching Learning Material was planned in the following manner -

a. Brief of the Ikat textile, technique and its use in it.
b. The salient feature of Single Ikat of Gujarat
c. The equipment required for teaching-learning
d. Steps in Ikat Patterning using image editing software

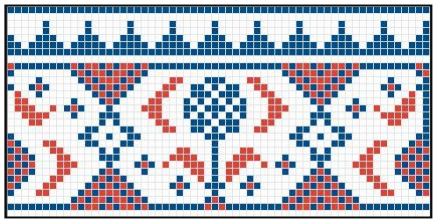
Ikat Patterning

Ikat designing is done in grid pattern, with bold floral or geometric motifs. The design might change but the format for designing remains the same for all motifs. Given below is an example of creating a design unit of size 10" x 8" and 10" x 4" used for the field and border respectively.

- 1 grid = 6 weft yarns
- 1 Motif unit is made from 61 x 61 grids



Motif unit = 61 x 61 grids



border repeating unit = 61 x 31 grids

Plate 8: Repeating unit development in Photoshop

Ikat Designing on Photoshop

For designing in Photoshop tools required are a Computer with Photoshop CC installed and a mouse for designing easily.

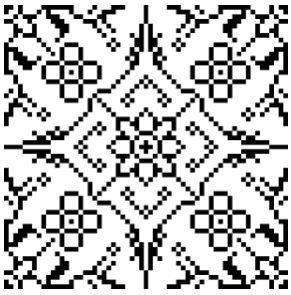
Step 1 : For single motif

1. File → New → set width 61 pixels → length 61 pixels → resolution 61 pixel/inches
2. Edit → Preferences → Guides, Grid & Slices → Grid → by Pixels → OK
3. View → Show → Grid
4. Pencil tool → Size → 1px → Hardness → 0%
5. Select Colour
6. Draw design into 61 x 61 grid box

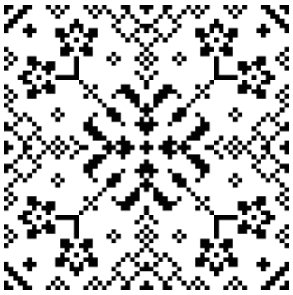
After completing one motif, change the colour of foreground and background and make a pattern ready for filling the area.

Step 2: Fill Pattern: Edit → Define Pattern

Nari-Kunjar



Chabdi Bhat



Navratna Bhat

Plate 9: Traditional design units developed on Photoshop

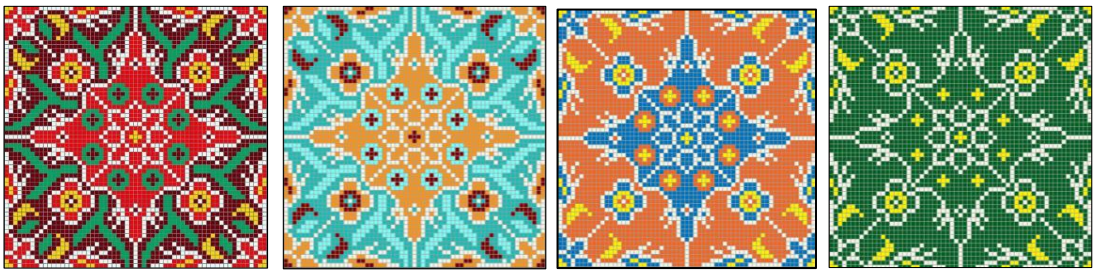


Plate 10 : Motif Development and Different Colour ways

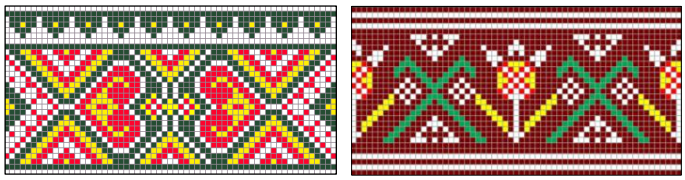


Plate 11 : Border Designs

Step 3 : For repeat pattern

Fill Pattern → Paint Bucket → Pattern → Select pattern →fill

Step 4 : For Layout Development

Fill Pattern → Paint Bucket → Pattern → Select pattern → Select the area on Layer →fill

How to arrange motifs?

Select the area on the layer and select paint bucket, add swatch of pattern and fill pattern to the selected area. The sectioning lines of the layout would make work easier for designing.

Plate 12: Saree Layout Development

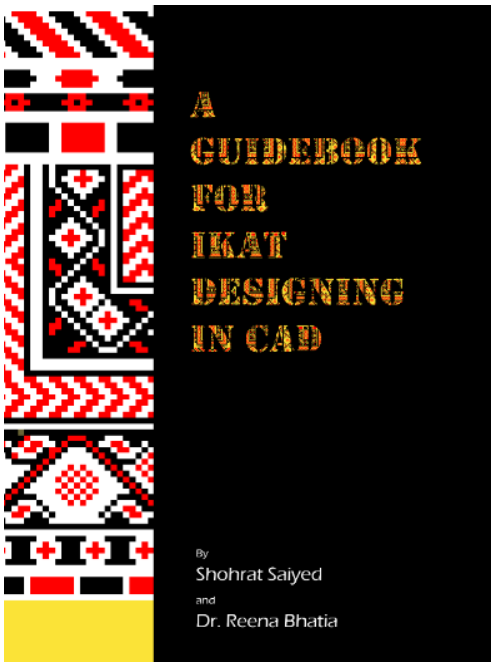


Plate : 13 Guidebook for Ikat design development in CAD

The prepared material was printed as a guidebook for wider circulation and easy access. (Plate 13) It was also placed on a blog post as an open educational resource so that it is widely available; on the premise that knowledge is to be shared. The blog was developed on word press for open excess for everyone. (Plate 14)

Plate 14: Blog made on www.wordpress.com

Conclusion

The Single Ikat craftsmen were using traditional method for motif development. The designs developed by them were traditional as well as contemporary. The products were saris and dupattas.

The Handloom weaving is time consuming activity which takes great efforts and patience of the craftsman. With the increasing demand of the consumers, the craft required up-gradation which was fulfilled through this research.

Computer Aided Design will make the design process faster and gives more freedom to play with the designs, colour-combination and will also helpful to create layouts as per the product which reduces the work. This will further help the craftsmen to greatly improve their performance and their finished products can compete well in the market due to greater design possibilities offered to the consumer in a short period.

Implication of the Study

Through the conducted research the weavers were motivated to learn and adopt the CAD technology which they were convinced, will help them to compete and survive in the present and future market.

Further Plan

The researcher is under the process to cover more handloom textiles and develop instructional material for the other woven crafts of Gujarat, followed by training the craftsmen as well as design students to use CAD for developing handloom designs.

Acknowledgement

The researcher would express deep gratitude towards the Single Ikat Craftsmen Mr. Vitthal bhai Vaghela, Somasar village, Mr. Sanjay bhai Gohil and Mr. Keshav bhai Gohil, Katariya village (Surendranagar district, Gujarat) for willingly sharing their valuable time and knowledge.

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TO-08

ITAJIME: DIGITAL INTERVENTION

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Abstract

The lesser known *Shibori* technique of clamped resists of*Itajime* or *Kyokechi* as it is more commonly known by in Japan and *Jiaxie* within China, has been perfected over time and reinvented throughout its long history. Clamped resists have been discovered worldwide but its unsure as to where the technique first originated, the history of the technique is an enigma as examples have been found in China, Japan, India, Central Asia and southern Europe. Research into the technique's origins indicate within Chinese records that *Jiaxie* was produced between the Qin Dynasty (778-206 BC) and the Han Dynasty (206 BC -AD 263) but today, however, production through this resist method of patterning is nearly extinct despite efforts by the Chinese Government in the 21st century to help preserve this ancient folk craft practice from vanishing all together. In Japan example sexist that date from the 8th century but subsequent examples are scarce until a re-appearance of the technique in the 1800 but by the later 20th century to the author's knowledge, a single designer was employing the process then. Nowadays, in the textile/craft sector, there are examples where such a patterning technique is successfully being re-employed through the integration of CAD/CAM into the process. Advances in laser cutting, CNC Woodworking, 3D, and digital design manipulation and printing, create an interesting opportunity for its revival again. Digitally controlled machines that engrave an image in a hard surface with exact precision replace the woodcarvers' skill originally needed for creating the matching wooden plates/blocks, whereas the process of coloration and patterning of the fabric returns to the skill of the Dyer/Craftsperson. Digital printing can reproduce the randomness and the soft-edged, but precise motifs that have a ghostly image as described by Larson in the 'The Dyers Art, ikat, batik, plangi' (1976) which embeds a degree of imperfection in the resulting print. It is a case of technology meets hap tic to inventing a unique form of patterning to create unique fabrics. The juxtaposition where precision digital cutting, forming, and printing, and the hand process of dyeing unite.

Keywords: Clamped resists, Ikat, Itajime, Jiaxie, CAD/CAM.

Introduction

The lesser known shibori technique of clamped resists or *Itajime* or *Kyokechi* as it was historically known by in Japan and *Jiaxie* in China, has been perfected over time and reinvented throughout its long history. According to Wada (1983)Clamped resists have been discovered worldwide but it is unsure as to where the technique first originated, the history of the technique is an enigma as examples have been found in China, Japan, India, Central Asia and southern Europe.

Research into the technique's origins indicate that within Chinese records the use of the technique of *Jiaxie* as patterning technique was known to be in existence between the Qin Dynasty(778-206 BC) and the Han Dynasty (206 BC - AD 263) but today, however although the ancient technique still exists, production through this resist method is nearly extinct despite efforts by the Chinese Government in the 21st century to help preserve this ancient folk craft practice from vanishing(Fig.-1).

Figure 1: China: *Jiaxie* folk textile dyed in Indigo.
a. Torimaru, T &Hedstrom A. L. *Folk Tradition of Carved Board Clamp Resist Dyeing in Zenjiang Province* 2010
b. Examples photographed by Author at International Shibori Symposium 2013

In Ahmadabad, India; around 1970, a discovery of carved blocks that had been used as house decorations also indicate the existence of this resist dyeing technique within this province of India. Bühler & Fisher (1941) whom documented the use of clamped resist dyeing taking place in the early 1600. The majority of blocks that exist are that are now held at the Calico Museum of Textiles in Ahmadabad (Fig.-2) alongside an illustration of part of a lining from a

Chinese bedspread, that has design details very similar to the carved patterns of certain blocks thus indicating that silks made in India during this period were exported as far as China.(Bühler, A & Fisher, E.,1941)

Figure 2: a. Front of a clamping block, Ahmadabad.Bühler, A & Fisher, E. (1941
b. Part of a lining of a Chinese bedspread, the design is very similar to patterns of certain blocks from Ahmadabad.

Figure 3: An example of *BeniItajimi.* Date Unknown. Surface Design Association. (Sinner, L. 2017)

In Japan, examples exist that date from the Nara Period (AD 710 to 794)but subsequent examples are scarce until a re-appearance of thetechnique in 1800, the older resist dyeing technique of *Kyokechi* or *Itajime*that is sometimes termed *BeniItajimi* (named after the benibana or safflower originally used to create bright red designs on silk) was created using carved boards. According to Arai & Wada (2010) these silks were used exclusively for under layers, or *shitagi*– an under-kimono worn by women in latter Edo Period (1603-1867) through Meiji Period (1868-1912) and into early Showa (1926-89). (Fig._3) Today *Beni Itajime* has disappeared and little technical information has survived. Furthermore, because they were under-layers, these textiles were overlooked and given little documentation or serious study – until recently in research carried out by Arai, Wada and the Takasaki Beni-no-Kai research group.

The Japanese term, *Itajime* literally means 'board clamping' (Wada,Y., Kellogg Rice, M. & Barton, J.,1983) *ita* (slab) and *shimi* or *jime* means clamp. This technique involves the process of folding cloth in two or more directions and clamping it between boards or sticks. In its simplest form, the boards and sticks remain plain and the pattern created is caused by the penetration of dye into the exposed folds of cloth. In its more advanced form, thin wooden perforated boards or blocks, carved with identical patterns are employed, but not in the way as wood block printing, where the raised area takes the colour which indirectly transferred to the surface of the cloth creating appositive' image. This technique utilises a 'negative' method where folded fabric is laid in-between two carved boards or blocks in which the design on each board matches the other precisely.

During the dyeing process, great pressure is applied to them through various clamping techniques, which prevent any dye penetrating the raised areas of the design. The dye instead seeps through the lower levels producing mirror image patterns on a dyed ground. (Leighton–White. 1994).

Boards still survive in Japan;a large collection is held within the Yoshimura Dye-works archive. (Arai & Wada. 2010) These are normally found to be one of three common forms; all are rectangular slabs between 27- 47 cm long and22cm wide and no more than 1cm thick. They are made out of a hardwood that does not warp and has usually been lacquered to prevent dye penetrating the wood. Some are carved on both sides, some only on one (which necessitates twice the number of boards). Some have no carving on the edges, which give a characteristic line of plain dyed fabric from the space created between the two boards. Others have carved edges, or were dyed with a separate edge piece added. Each board is carved on one side with a mirror image of pattern that exactly matches the carving on another board thus acting as a pair, in the areas of carving; holes are drilled through the boards facilitating the passage of the dye to the clamped fabric held between the boards. (Fig.-4.)

Figure 4: Front and Back of old *Itajime* (Carved Clamping Boards) Japan 1996. The Shigeki Fukumoto Collection September 1996. *Photograph by author*.

Figure 5: a. The placement of warp yarns within *Itajime gasuri* boards prior to dyeing. Japan. b. *E-gasuri* created by *Itajime* boards note white/grey identifying board marks on selvage. Krauss 2006

A deviation of this technique is the Japanese resist technique, *Itajime gasuri* today almost extinct but was originally employed to pattern warp yarns by clamping them between two boards engraved in high relief with stripes or simple designs or images known as *e-gasuri*. When the clamped bundle of boards and yarn was then immersed in a dye-bath, the dye was unable to penetrate the areas under pressure, and the resulting pattern dyed warp and finally the woven cloth produced an *ikat* like pattern. According to Krauss(2006) One way to identify an *e-gasuri* piece that was made using carved boards is by looking near the selvage. A white/grey bar indicates the use of *itajime*, because sections of the board near the edges remained uncarved and formed ridges, so as to ensure stability.(Fig.-5.)

A process revived or reinvented by Tomoshicihi Miura in Yamato near Nara, in 1837 to copy and increase the production of the labour-intensive textile dyeing technique

*Ikat*or *Gasuri*but by 1958, this technique, in turn, was almost extinct was re-discovered by the highly skilled Craftsman and Japanese weaver Norio Koyama, who in 1996 when visited by the author was the only remaining craftsperson to still employ on a semi-commercial level, the traditional process of *Itajime gasuri*:the utilization of identically carved wooden boards but at this time to resist pattern fabrics not yarns returning to the older technique of *Itajime*. (Fig.-6.)

Figure 6: Norio Koyama dyeing silk organza in Madder with *Itajimegasuri* in 1996, Tokyo, Japan

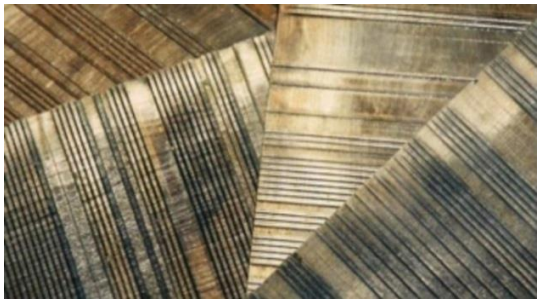

Figure 7: A Collection of *Itajime gasuri* boards gifted to the author in 1996

As a silk weaver, Norio Koyama, became interested in the process of *Itajimegasuri* having purchased the last remaining full set of traditional clamping boards, teaching himself the intricate and precise processes involved with the technique and required to produce lengths of fabric with patterns similar to double *Ikat*. A present of eight old boards to the author (Fig.-7.) enabled the technique to spread to Europe and has enabled further research to be carried out into the processes involved and along-side advancements in digital technology provided an opportunity to reinvent the process by employing old or newly digitally machined boards to produce modern versions of such textiles, which when combined with digital technology in the form of, image manipulation and digital printing both onto prepared fabric bases and warps prior to weaving has enabled the process to reinvent itself and design qualities achieved with such a technique evolve into a patterning method for the 21st Century.

Objectives

The initial objective of this research was to understand the process, dyes, and techniques involve to produce lengths of *Itajime* dyed or inspired cloth (limited reproduction) that although almost repeatable and extremely similar, each length is totally unique in the way the dye penetrates and the design is created. By considering current digital technologies that are today applied to other 'Craft' practices, could these digital applications be applied to the resist dyeing process of *Itajime* for either the creation of contemporary designs or replicate historical examples, through machined, laser-cut or printed boards/blocks designs Although this is possible, it was observed that in order to increase production, there needed to be a successful digital copy intervention within the patterning process which could be applied to either mimic the original qualities of the

designs created via this ancient technique or create new qualities within the designs with the added properties of colour change, scale and material variety.

In the textile/craft sector, there are examples where such a patterning techniques are successfully being re-employed through the integration of CAD/CAM into the process. Advances in laser cutting, CNC woodworking, 3D printing and digital design manipulation and printing thus creating an interesting opportunity for its revival again. Digitally controlled machines that engrave an image in a hard surface with the exact precision replace the woodcarvers' skill, a subtractive process originally needed for creating the matching wooden plates/blocks whereas 3D-printing can build up layered surfaces in various materials to create an additive process of creating these blocks or plates.

Through these digital interventions the process of colouration and patterning of the fabric returns to the skill of the dyer/craftsperson. It is a case of technology meets hap tic to create unique fabrics, a reinvented form of patterning emerges. The juxtaposition where the precision digital cutting, forming, and printing, and the hand process of dyeing unite to create something new and unique.

Hypothesis

The assumption being that the integration of digital technologies can replace the hap tic skills of the woodcarver and dyer and that through the process of digital printing one can reproduce the randomness and the 'soft-edged, but precise motifs that have ghostly image' as described by Larson in the 'The Dyers Art, ikat,batik, plangi' (1976) that embeds a degree of imperfection in theresulting print and provides an undescribed quality and uniqueness to this technique of fabric decoration often referred to as Wabi-Sabi.

The limitations to 'digital intervention' through Computer Aided Manufacture (CAM) and how we create new boards is one of the material selection and its suitability to undergo either/or hot and cold exhaust or dyeing processes and the penetration of indigo and other dyestuffs via submersion or pouring techniques. Will the clamping boards distort through pressure, heat, and wet; will the materials disintegrate when wet or bend with heat less that the dyeing temperatures?

The limitations to 'digital interventions' through Computer Aided Design (CAD) and the digital printing and copy of existing *Itajime* and other *Shibori* designs simplify the quality and modify the unique qualities of the original design as this is created by the penetration of dyestuffs into the structure of the material fibres through wicking and not simply superficial surface colouration. Some dyestuff will penetrate at different time and temperature variations. Through an application of scanning, image manipulation and image repetitive tools enhance the final designs or lose some of the original qualities unique to this dye patterning process?

Advancements and Developments using Computer Aided Design Processes:

In 1996, the Japanese designer Norio Koyama made a gift of eight boards to the author (Fig.-7.), this gesture has ensured that the knowledge of such an ancient technique continued to be developed as a resist patterning technique into the 21st Century. These boards formed a major contribution to the PhD 'Resist patterning for Contemporary

Fabrics' (1998) and were employed for the production of a unique body of resist patterned design work as part of this research degree. By applying the technique to very thin but stable silk organza, both the penetration of synthetic dyes and the compression of different thicknesses of cloth enabled striped and geometric semi-translucent designs to be created. That although similar to each other, every length processed its own unique design identity.(Fig.-8.)

Figure 8: Design work, part of the PhD 'Resist Patterning forContemporary Fabrics' 1998. Author RCA, London

Figure 9: Digitally created clamping Boards: Jo Newton, University of Derby. 2013.
a. CNC Routed MDF b. Laser-cut plywood
c. Laser cut Perspex sheet

With advancements in digital technology and CAM (Computer Aided Manufacture) new life could be brought to such a traditional patterning technique. These technologies can be employed to create precision clamping boards that have absolute accuracy in the matching of pairs and can be carved in a matter of hours rather than days. Laser cutting and CNC woodworking machines combined with vector digital software provides the opportunities to bring such an ancient technique into the 21st Century. Such technology can be used to accurately cut marine and laser plywood, medium density fibreboard (MDF), acrylic sheet and Perspex that can then be used as clamping boards.(Fig.-9)

One of the main drawbacks is that the plywood and MDF composites which are readily available and are easy to digitally cut, do not retain the stability properties of the slabs of wood that were originally employed with the technique. The glues that are employed in their construction can cause problems with the laser cutting process limiting the selection of materials to the ones that do not possess the water-resistant properties required for hot submersion exhaust dyeing and acrylic sheet and Perspex will often distort with the heat of the bath. If replaced by cold dyeing such as an indigo vat, the dyes do not saturate the fabric between the clamping boards to the same extent as dyeing for longer periods with synthetic dyes as the short period this class of dye requires to colour the fabric does not enable full penetration of dyestuff into the folds of material. To create successful patterning better results have always been achieved with hot dye processing.

Further experimentation could take place with the use of 3-D printing technology to produce the boards but as with acrylic or Perspex material distortion may take place

during the dyeing process. Experiments have been made by Tyler Peterson and recorded in the article by Lauren Sinner 'Hybrid Transitions: Collaborative Itajime' in the Surface Design Journal, Tyler experienced the predicted problems of distortion through heat as he used PLA plastic for the printing of the board, which had been chosen for its strength and durability but distorted with the heat of the dye bath. (Fig.-10)

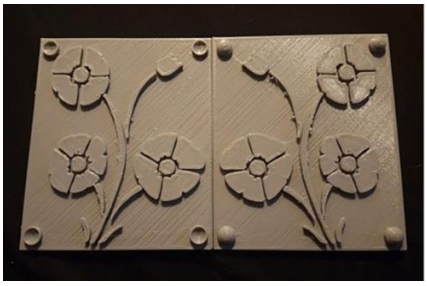

Figure 10: PAL 3-D Printed made by Tyler Peterson(Sinner, L. 2017)

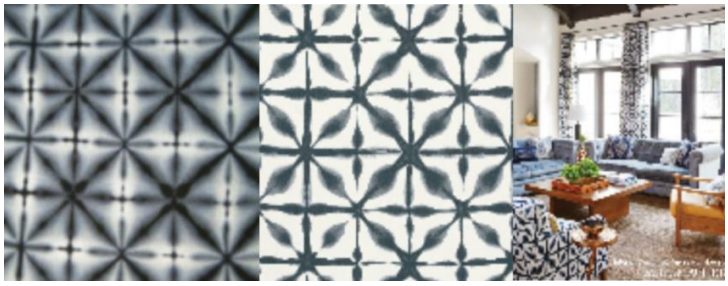

Figure 11: 'Andromeda'F. Schumacher& Co. 2019
a. Original design Itajime on Wool. Author 1998
b. Design interpretation
c. Printed Material in situ marketing image.

This problem could be overcome by using a different plastic material to print with such PETG, which have a much higher melting point that would withstand having boiling water poured over them. It would then be possible to make advancements in the technique with digital creation of clamping boards.(Sinner, L. 2017)

With an ever-increasing demand from the consumer within the textile retail industries; in both the fashion and interior markets, for greater lengths of cloth to be produced, new digital technologies such as scanning and image manipulation through affordable software such Abode Photoshop, Illustrator has led textile print manufacturers and designers to employ such technologies as a method of increasing the availability of textiles that give the impression of being handcrafted but much of the original dye qualities that created the design are lost through this process. As stated in marketing literature of a design sold by the author to the Interior Fabric Manufacturer Schumacher 'This printed linen evokes the traditional Japanese dye technique of shibori. With its soft, blurred edges, Andromeda offers a splash of colour and pattern.' (Schumacher 2019.) (Fig.-11)

The researcher and designer Melanie Bowes in her work makes parallels between traditional craft and new technologies by translating and reinterpreting the traditional Itajime clamping and dyeing techniques within digital software such as illustrator, the results illustrating the transition between the old and new processes being adopted in design today. She manipulates complex mathematical graphic geometrics to createlight effects, folds, and blends that partly retain the original essence of*Shibori*. The result is then digitally printed onto fabric. (BrandonXTextiles. 2017) (Fig.-12)

Other software designers are creating tools to mimic the patterning effects of *shibori*. Diane Pascual is one such person with the creation of digital shibori tie-dye patterns in Photoshop with this brush set. (Fig.-13) Her YouTube video states that 'Shibori tie-dye is a Japanese dyeing method that has been modernized.' Through

payment of a licence Which allows both personal and commercial applications of such Add-on tools to Photoshop software, which can then be altered in scale larger or smaller than the actual hand produced technique can achieve with the choice of any colour although the video shows a tradition 'Indigo Blue' inspired effect. (Pascual. 2019)

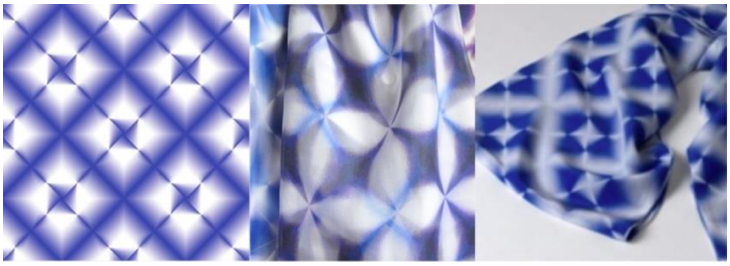

Figure 12: Melanie Bowles: Digital Shibori 2010.
Craft council 2019

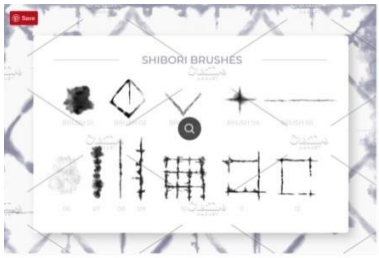

Figure 13.Digital shibori tie-dye patterns brush set for Photoshop. Pascual (2019)

Wide ranges of fabric bases are now manufactured for digitally printing, and the technology has improved with faster printing speeds and colour matching from screen to cloth. Every textile/fashion course at Universities and Colleges now have the capacity to digital print designs that in the past would have been hand-crafted.(Fig.-14)

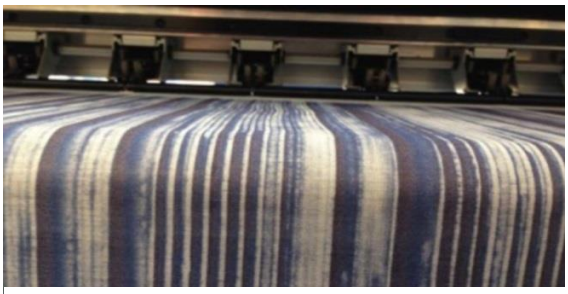

Figure 14: Digitally Printed Copy of Indigo Dyed Itajime gasuri.Author 2014

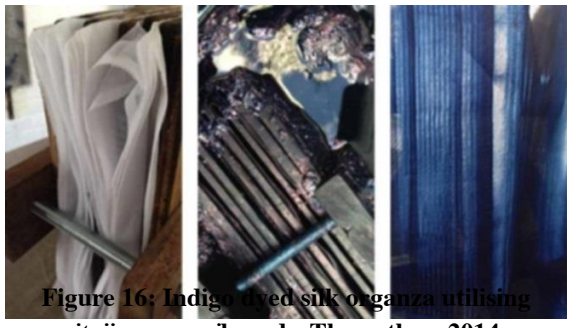

Figure 16: Indigo dyed silk organza utilising *itajime gasuri*boards. The author. 2014

Digital fabric printing technologies create their own problems such as lack of colour depth, colour matching and balance and dye penetration through to the fabric to the back. Most digitally printed fabrics becomes one faced with imagery on the front surface only and appear flat with little depth and do not reflect the colour nuances resist dyeing creates within the fibres and interior of the cloth.

Advancements in the technique with Digital Printed Warps.

Innovative advances in digital technologies led by a small traditional textile printer: Paul Turnbull Design that still create fabrics that employ the skill and handicraft of wooden block, hand-screen printing but push the boundaries of digital technologies to deliver the qualities often missing in contemporary digital printed textiles. In its Thailand factory, the company have become a world leader in developing methods of digitally printing natural fibre warps that once hand woven begins to reflect the softness of *Ikat* in a contemporary way. (Fig.- 15)Previous *Itajime* and other shibori patterning samples that have been produced scanned and digitally manipulated demonstrate that the use of digitally printing

warps as a new technique provides a new dimension to a very old process. Paul Turnbull Design go further than using digital technology to mimic the traditional, but look at the soul of the handicraft to create new and exciting hybrid textiles.

Figure 15: a. Turnbull-Designs. July 2019. Digitally Printed Warp being woven for *ikat* effect. b. Shibori samples. Digitally printed and woven warp. Designed by the author 2007

Findings and Discussion

Case Study: From itajime gasuri to digital ikat.

The author working closely with Turnbull-Designs after having visited their factory in 2013, created a series of resist patterned fabrics using old *itajime gasuri* boards and Indigo dyeing methods. (Fig.- 16) with a variety of fabrics.

The old *itajime gasuri* boards, originally utilised to dye the warp and weft threads were employed with a fine silk organza cloth. The cloth was folded in half, down its length to the width of the board. It was then placed between the boards in a continuous zigzag until the full length is placed between the boards. This technique produced translucent cloth with horizontal*moiré* patterning effect. This fabric was scanned and digitally modified in Photoshop in order to maintain some of the feel of the original resist dyed textile, once a final digital modified design was agreed upon that included the horizontal bars created by the plate edges, it was agreed to be printed onto a linen warp with a silk viscose weft to be woven through. (Fig.- 17)

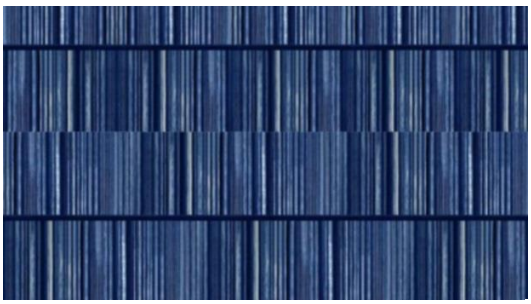

Figure 17: Digital image. Turnbull-Designs, 2014

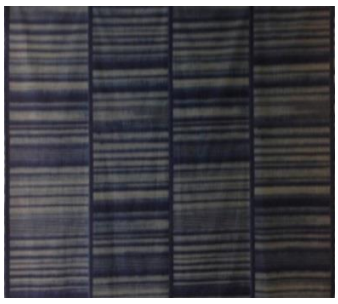

Figure: 18. Final woven digital *ikat*. *The author 2014*

Figure 19: Detail of woven digital *ikat*, showing slight yarn slippage for *ikat* effect. *The author 2014*

The final results once woven created a fabric that reflected the qualities of the old technique of *Itajime gasuri*but was not an exact replication but a very contemporary

interpretation of such an old technique. (Fig.-18) (Fig.-19)

Summary, Conclusion, and Implications

Across the world, the ancient technique of *Itajime*(board clamping),as a patterning technique for silk fabric has been constantly invented and reinvented, but over the last few centuries its use has declined.

Digital fabric printing technologies create their own problems such as lack of colour depth, colour matching and balance; and dye penetration through the fabric to the back the majority of digitally printed fabrics become one faced and do not reflect the depth of colour resist dyeing creates. But this technology will not replace the aesthetic qualities of a fabric created by resist dyeing. The use of digital software with so many brushes, tools, filters, and simple repeating methods such as 'double-mirror repeat' often causes overworking of a scanned design. The success of translation from the actual resist dyed fabric to its digital representation requires digital photographing or scanning, CAD manipulation and finally printing, each stage reducing the resolution of the image and quality of the pattern. Often designs become so overworked that the initial qualities of a dyed fabric are totally lost and flattened.

Digital Processes are facilitating the revival rather than the survival of the handmade process and the excitement occurs when a process initially invented in 1837 to copy and increase the production of the labour-intensive textile resist dyeing technique *Ikat* can be once again employed to create designs that if digitally printed onto a warp will once woven produce a *Ikat* effect that can be repeated infinitely due to advancements of digital technology. Turnbull-Designs go further than using digital technology to mimic the traditional, but look at the soul of the process employing handcrafted skills to create new and exciting hybrid textiles where a complete cycle of creativity and innovation is achieved. A case of technology unites with the hap tic, to createuniquely patterned fabrics and summarized by the quote from JunichiArai (1998) at the International Shibori Symposium in Ahmedabad,India in 1998.

'What use is high technology if you do not know the soul of theCraft.'

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TO - 10

STUDY OF COMPATIBILITY PARAMETERS OF MIXTURE OF NATURAL DYES

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Abstract

Eco-friendliness is the essential requirement of the present world of textiles and textile processing and its absence is the major cause of various types of pollution. Before the invention of synthetic dyes, natural dyes were the only medium for textile colouration. Natural dyes can contribute towards achieving the eco-friendly textiles. Natural dyes can be used with a completely harmless procedure and give soothing colours on textiles. In spite of many advantages, it has many limitations related to fastness, lengthy dyeing procedure, limited shade range, etc. The issue of limited colour range can be overcome by the use of binary and tertiary combination of these dyes to produce a wider shade range. The combination of natural dyes can be done based on their compatibility with each other. The compatibility of dyes depends on parameters such as optimum dyeing conditions and procedure, colour strength and related colour interaction parameters, metamerism index, etc. This paper presented various factors responsible for the compatibility of natural dyes and reviewed the compatibility aspects of certain natural dyes.

Keywords: Compatibility, Natural dye mixture, Textiles

Introduction to Natural Dyes

Textile materials (natural and synthetic) used to be coloured for value addition, look and desire of the customers. Anciently, this purpose of colouring textile was initiated using colours of natural source, until synthetic colours/dyes were invented and commercialized. For ready availability of pure synthetic dyes of different types/classes and its cost advantages, most textile dyers/ manufacturers shifted towards the use of synthetic colourant. Almost all the synthetic colourants being synthesized from petrochemical sources through hazardous chemical processes pose a threat towards its eco-friendliness.

Hence, worldwide, growing consciousness about the organic value of eco-friendly products has generated renewed interest of consumers towards the use of textiles (preferably natural fibre product) dyed with eco-friendly natural dyes. Natural dyes are known for their use in colouring of food substrate, leather as well as natural fibres like wool, silk, and cotton as major areas of application since pre-historic times. Although this ancient art of dyeing textiles with natural dyes withstood the ravages of time, due to the wide availability of synthetic dyes at an economical price, a rapid decline in natural dyeing continued. However, even after a century, the uses of natural dyes never erode completely and they are being still used in different places in the world. Thus, natural dyeing of

different textiles and leathers has been continued mainly in the decentralized sector for specialty products besides the use of synthetic dyes in the large scale sector for general textiles/apparels.

There are many advantages of the use of natural dyes on textiles including eco-friendly nature, unsophisticated and harmonized with nature and many more. Besides advantages, there are certain disadvantages also such as reproducibility of shade, colour fastness issues, and limited shade range.

Limited shade range issue can be dealt with in different ways. Dyers have been doing the two-step process to get newer shades which is time-consuming and affects the fiber properties as well. In line with synthetic dyes, mixtures of natural dyes in the single bath may be used with several challenges. The essential element for this is that the dyes should be compatible with each other. In this paper, various factors responsible for the compatibility of natural dyes are discussed along with compatibility aspect of some synthetic and natural dyes have been discussed. The compatibility status will determine whether the combination of dyes will be suitable to use and what type of problems can arise. This paper will give insight on the colour parameters like colour fastness properties, exhaustion-fixation and adsorption isotherms for combination of natural dyes. Few examples of compatibility check with newer method for binary combination of natural dyes has also been discussed.

Methodology

Methods to find the compatibility of combination of dyes need to check different aspects of colour parameters. Various methods have been developed to check the compatibility by different authors. These include methods as dip test, plotting ΔL versus K/S or Δ C versus K/S, using diffusion coefficient values and by finding relative compatibility rating (RCR) which is newer method for compatibility check. Also, the proper methods to assess the compatibility of wide range of natural dyes are yet to be studied in detail.

Compatibility of Dyes

Most of the dye producers are providing the different tones and hues of three basic colours. They try to provide as many as tones possible by changing the structure of the dye. To dye a piece of fabric for any given colour standard, three colours are generally required. If the dyer is lucky enough, the same tone may be obtainable by single or combining two dyes but this is a rare phenomenon. Mostly, the dyer would require three primary colours. For the dyer to mix the dyes and bring a shade out of it is not an easy task. The dyer has to check the compatibility of the dyes being mixed. The optimum dyeing conditions may be different for different dyes. The fastness properties for the different dyes may be different or the mixture may change the tone during the dyeing cycle. Reproducibility of the shade is a very crucial matter of concern for the dyer. There is the scope of improvement through using better compatible dyes (Sivaramakrishnan, 2014). All the dyes in the mixture should have the same rate of dyeing. They should have similar rates of exhaustion when used in mixtures under the given dyeing conditions. During dyeing, the colour of the goods will then gradually become deeper, but, since the dyes are absorbed in the same proportions throughout the process, the hue does not change and the goods will always be on shade (Broadbent, 2001).

In this way, several dyeing parameters are mentioned in the literature, which defines the compatibility of dyes. Many researchers have attempted to define the qualitative and quantitative methods for compatibility.

Methods to Assess the Compatibility of Dyes

One of the conventional methods to check the compatibility of dyes is the dip test. In this test, small pieces of cotton of equal weight are dyed in the same bath with a mixture of dyes. At various intervals, a small dyed sample is removed from the bath and replaced by an identical piece of undyed fabric. A series of dyed samples arranged in order of increasing dyeing time will have gradually decreasing colour depth, but the invariant hue, when the dyes used are compatible (Sultana & Uddin, 2007)

Degree of on-tone build-up, rate of dyeing, half-dyeing time, diffusion coefficient, change in hue angle are also used to check the compatibility of binary and tertiary mixtures of dyes (Beckmann, Hoffmann, & Otten, 1972).

Plotting ΔL versus K/S or Δ C versus K/S is generally used for compatibility check of two dyes for two sets of the progressive depth of shade developed for a binary mixture of dyes. It is done by varying the temperature and time of dyeing for one set and varying total dye concentrations of the binary mixtures of dyes in another set to judge whether the two sets of curves for shade buildup run alike or not.

A plot of ΔL versus ΔC and/or ΔL versus K/S gives better results than other methods assumes that the there is no interaction in dyes with no change in the rate of dyeing in presence of another dyestuff which is not true. For a plot of ΔL versus ΔC and/or ΔL versus K/S would require a precise temperature-controlled machine for progressive shade buildup. This method is time-consuming and is subjective nature (Hoffman, 1988).

Dye compatible matrix (DCM) can be used to define the optimum dyeing profile for exhaust dyeing of dyes, understanding dye migration behavior, level dyeing check and the degree of process control required to achieve shade reproducibility. A simple dip test can check the compatibility of dyes by dyeing the several pieces of cloth dyed successfully for short times in the bath containing dyes. The changes in the hue between the first and last samples are visually judged (Sivaramakrishnan, 2014).

The determination of compatibility in exhaust dyeing has been reported in different ways. A study was done where the dyeing process is interrupted at regular interval and degree of exhaustion is assessed visually. As the visual evaluation gives a qualitative evaluation, photometric methods are necessary for quantitative evaluation of compatibility (Hoffman, 1988). Some of the photometric methods have used theoretical compatibility values and others have evaluated by either extinction coefficient of the dye liquor or reflectance values of the dyed materials when dyeing binary combinations. HPLC combined with spectrophotometry has also been used for improvement in accuracy (Schlaeppi, Wagner, & McNeill, 1982). Harnrnoudeh et al introduced a 'Kombi-Test' by which the dye penetration into a film roll by single dyes is evaluated. This method can be used to determine diffusion values and on-tone diffusion.

Special tests have been developed compatibility check for the continuous dyeing process. In the case where the interaction between the dyes is negligible, tailing indices can be considered as the guidelines for dye selection. A dip test was developed for the continuous dyeing of nylon carpets. The compatibility of dyes is also examined during fixation by measuring fixation curves in combination dyeing for pad-steam dyeing of acrylic fibers.

Compatibility of Synthetic Dyes

Direct dyes vary widely in their dyeing behavior giving compatibility problems. The compatibility of direct dyes depends on the rates of dyeing and migration and the salt sensitivity of the dyes. Hue differences as dyeing proceeds are much more apparent than depth differences. Incompatible dyes also tend to give unlevel dyeings. They have different rates of migration, different degrees of fiber penetration because of dissimilar diffusion rates, and give a change of fabric hue during dyeing because of differences in their overall rates of absorption. For reactive dyes, we need to mix dyes with the same type of reactive group having about the same substantivity. For cationic dyes, the key parameters determining the compatibility of dyes are the fiber saturation value and the combination of constant or compatibility value (Broadbent, 2001). One standard test (AATCC Test Method 141) evaluates a dyes combination of constant or compatibility value (Beckmann, Hoffmann, & Otten, 1972).

The compatibility of certain reactive dyes on cotton in the different textile industry in Bangladesh. Three steps process was used which includes the measurement of the extinction coefficient, measuring the concentration at a different stage of dyeing and measuring the colour strength before and after wash (Sultana & Uddin, 2007).

Determination of compatibility of reactive dyes was done using the chromatic diagram. It was assessed qualitatively from the nature of plots of Chromaticity Co-ordinates (y against x). Compatibility is observed if the dominant wavelength of all the dyed samples taken out at various time intervals during dye fixation falls between 10 or less than 10 nm (Singh, Bhattacharyya, & Gupte, 2006).

The auxiliaries present in the dye bath may also affect the compatibility of dyes. Compatibility analysis of reactive dyes is done by exhaustion-fixation and adsorption isotherm on knitted cotton fabric. Red RR, Blue RR, and Yellow RR dyes were analyzed. The exhaustion % of Red RR and Blue RR was uniform but exhaustion % of Yellow RR was decreasing with the increase of shade %. The difference in their fixation was significant in deeper concentrations. Increasing the amount of electrolyte gives better results especially for deeper shades. It was also found that a decrease in alkali amount in a dye bath and reducing the washing temperature increases the compatibility of these dyes (Naser, Haque, Hannan, & Rana, 2015).

Compatibility of Natural Dyes

The compatibility of natural dyes on Aluminum pre-mordanted woolen yarn, diffusion coefficient has been calculated and compatibility was checked. The dyes were a walnut green shell, cochineal, and weld. The following equation has been used to check the compatibility:

$$log\ \frac{C_{t,1}}{C_{0,1}} = K.log\ \frac{C_{t,2}}{C_{0,2}}$$

Where, $C_{t,1}$ and $C_{t,2}$ denote the concentration of each dye in the dye bath at time t. Besides, $C_{0,1}$ and $C_{0,2}$ show the concentration of each dye in the dye bath at the beginning of dyeing or time=0, respectively. K is a constant that defines the degree of compatibility and ranges between 0 and 1 with 0 as incompatible and 1 as excellent compatibility. It was found that the

exhaustion of each dye in single dyeing is different from the exhaustion in the dyeing mixture. The order for compatibility is as follows: cochineal-weld > walnut green shell-cochineal > walnut green shell-weld (Shahparvari, Safi, Safapour, & Gharanjig, 2018).

It was observed that the use of a mixture of turmeric and madder on cotton in case of simultaneous mordanting shows a synergistic effect in colour development than that for single dye application; 50:50 ratio of turmeric and madder gives the best results (Singh, Jahan, & Gupta, 1996). For the combined dye application, it is observed that in the case of simultaneous mordanting method, turmeric when combined with either madder or red sandalwood gives better colour strength, while myrobolan shows the reverse trend (Samantaa & Agarwal, Application of natural dyes on textiles , 2009).

Single and binary and mixture of aqueous extract of red sandalwood with aqueous extract of the other five natural dyes in different proportions are applied on bleached jute fabric. The other five dyes used are Manjistha (MJ), Jackfruit wood (JFW), Merigold(MG), Sappan wood (SW) and babool(BL). These were used in different proportions with Red Sandalwood (RSW). Colour parameters, colour fastness, and compatibility were checked for these combinations of dyes. In this study, the author has not used the conventional methods of compatibility check but has formulated a newer method of assessing then compatibility using a newer index called CDI. On application of different proportion of binary mixtures of dyes on the same fabric, magnitude of respective ΔE, ΔC, ΔH and Metamerism Index (MI) values irrespective of their sign and direction have been utilized to obtain an empirical index called 'CDI' for the samples dyed with different proportions of binary mixture of dyes by the following relationship.

$$CDI = \frac{\Delta E \times \Delta H}{\Delta C \times MI}$$

The closer the CDI values for a different proportion of mixture of dyes applied on the same fabric under the similar condition of dyeing, the higher is the compatibility. A relative compatibility rating (RCR) is proposed in accordance with CDI values. The scale of compatibility (RCR) is 0-5, zero is the least compatible and 5 is excellent compatibility. As per RCR system, the order of compatibility was found to be as RSW:MJ>RSW:MG>RSW:JFW>>>RSW:BL>>>RSW:SW (Samanta, Agarwal, Singhee, & Datta, 2009).

In a similar study as above, varying proportion of binary mixtures of aqueous extracts of jackfruit wood (JFW) with other natural dyes, like manjistha (MJ), red sandal wood (RSW), marigold (MG), sappan wood (SW) and babool (BL), have been used to dye bleached jute fabric pre-mordanted with 20% myrobolan followed by 20% aluminium sulphate. The compatibility was found by conventional as well as the newer method (by finding RCR). The order of relative degree of compatibility of these binary pairs of natural dyes applied on pre-mordanted jute was found to be JFW:RSW ≥ JFW: BL ≥ JFW : MJ >>> JFW: MG >>> JFW : SW (Samantaa, Agarwal, & Datta, Dyeing of jute with binary mixtures of jackfruit wood and other natural dyes — Study on colour performance and dye compatibility , 2008).

Conclusion

Dyers using natural dyes currently either produce shade with single dye or apply different dyes in multi-stage application technique. For the application of more than one dye from single bath require compatibility analysis of the dyes. The study of the compatibility of

natural dyes has been done for a few dyes only. Extensive research is required for other dyes and their combinations. On finding the compatibility of dyes, the optimum dyeing/mordanting conditions can be found out. Natural dye combination for producing combination shade is currently a challenge. Proper methods to assess the compatibility of wide range of natural dyes are yet to be studied in detail.

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TO-11

SCREEN PRINTING ON BAMBOO FABRIC WITH RUBIACORDIFOLIA AND ACACIA CATECHU USING GUAR GUM AND CHITOSAN AS THICKENING AGENT

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Abstract

Today, consumers are frequently transforming from synthetic to nature-based products**,** they are demanding eco-friendly, non-toxic and hygienic textile and the consumption of antimicrobials is increasing day by day. Precise research and development activity are trying to keep steps for developing various and effective solutions which are safe for the human being and environment. Vegetable dyed and printed materials is not extensively available to the mass consumer. Use of indigenous method of printing with natural dyes and natural fabric problem of sustainable development can be solved and can take a good pace in global textile market. In the present work the natural madder dye (RubiaCordifolia) and Kattha (Acacia catechu) was applied on the cellulosic fabric- Bamboo through hand screen printing method. In the first part of the study printing paste was developed, using various ratios of guar gum and chitosan for printing with Madder and Kattha. The printed fabric was then characterized with respect to colorfastness and antimicrobial activity against *S. aureus* and *E. coli*. For durability tests, both the dyes showed a moderate to good light fastness and fastness to perspiration and good to excellent fastness to washing.

Key words: Rubiacordifolia, Acacia catechu, Bamboo, guar gum, chitosan, indigenous art, global market.

Introduction

The worldwide demand for natural dyes is nowadays of great interest due to the increased awareness on therapeutic properties of natural dyes in public. Consciousness towards the eco-friendly products also ranks high on the selection criteria of the consumer with high buying potential. All these leads to and increased demand for dyes and finishes which are multifunctional and are preferably obtained from natural and renewable sources. (Gupta et.al.2004) Most of plant materials used for the extraction of dyes from a part plants are credited with medicinal properties and also inherently antimicrobial properties and could consequently possess high medicinal properties.(Kesari. et.al. 2014)

Textile materials are coloured for value addition, looks and fulfilling the desires of the customers. Anciently this purpose of colouring textile was initiated using natural sources. However, worldwide environment protection and safety renewed the interest of the people on natural products like natural fibers and natural dyes. (Teli 2006) Many of the plant used for dye extraction have recently been shown to process remarkable antimicrobial activity(Merfort.1997). Many common natural dyes are reported to have high medicinal and anti-microbial activity. In the present context of eco-preservation, the

use of natural dyes has been revived in the coloration of textile and food material (Mac Dougall,2002)

One of the dye used in the present study, RubiaCordifolia belongs to the family Rubiaceae, also known as Madder, belonging to the family known to contain substantial amount of anthraquinones, especially the roots. A study has been found on dyeing of woollen yarn with madder root extract with tin mordant was reported to have good fastness properties and antimicrobial activity (Yusuf et.al.2011). Acacia Catechu (Kattha) Catechu liquor, which is deep brown-red in color with medicinal properties has been used on dyeing of wool yarn and printing of cotton fabric for the assessment of its colour fastness.

In the present study fabric used for the printing was cellulose fabric (Bamboo fabric). Bamboo textile presents a noteworthy opportunity for providing sustainable textiles. Nevertheless, the renewable properties of bamboo itself do not add much to sustainable development if the textiles cannot serve a practical purpose. Cellulose fibres are aligned along the length of the bamboo, providing maximum tensile strength and rigidity in that direction. Thickener used for printing with these dyes in the present study was **guar gum and chitosan**. Guar gum is a novel agrochemical processed from endosperm of cluster bean. It is also beneficial in the control of many health problems like diabetes, bowel movements, heart disease and colon cancer. Guar gum is derived from the seeds of the drought tolerant plant *Cyamopsistetragonoloba*, a member of Leguminosae family. Guar seed endosperm is a source of water soluble gum which is used as stabilizer, emulsifier and thickener which are used in food and textile industries. Many studies have been review on use of guar gum as thickener for making printing paste with synthetic dyes and natural dyes. Reactive dye has been used with natural thickener (guar gum) on cotton fabric (Chintan R.,2016) It has also been used for making paste with natural dye Alkanet on natural fabric (silk, wool and cotton) through screen printing. (Rekaby 2016)

Second thickening agent used for printing in the present study was chitosan. Chitosan (biopolymer) is extracted from by-product (crab shell) and has numerous applications in textile industries. Recently, there was an attempt to used Chitosan as a binder and thickener for the pigment printing of both polyester and polyester/cotton blends. (Abdou et.al, 2016)

As most of these sources of dyes have not been used for printing purpose on the particular cellulose fabric (bamboo) with guar gum and chitosan, therefore all these elements have been used together to develop a final eco-friendly product having an medicinal and antimicrobial properties.

Materials and Method

Selection of Fabric and Dye: For the present research work natural cellulose- Bamboo fabric procured from Krishna Silk House Bhagalpur, Bihar was used. RubiaCordifolia and Acacia Catechu natural dyes were selected for printing was purchased in powder form, from SodhaniBiotique Jaipur

Selection of Thickening agent: Guar hum and Chitosan were purchased from sigma Aldrich for preparation of paste.

Development of Printing Paste: Chitosan was blended with guar gum on different ratio (50%gg+50%ch, 25%gg+75%ch and 75%gg+25%ch) Bamboo fabric was printed with above prepared paste through screen printing method, dried and then steaming process was done for the fixation of the print on the fabric.

Fastness Testing: Developed samples were evaluated for different properties by using different standards such as Washing (ISO 105 C06 (ISO test no. 3) Fastness to Sunlight (IS:

686-1957) Rubbing fastness (AATCC test method 8) and perspiration fastness (IS 971, ISO 105 E01) and antimicrobial properties (AATCC test method 30) Physical assessment of the fabric for Tearing ASTM D 1424 and Tensile strength **ASTM D 4595** was done.

Result and Discussion:

In the present research work, an attempt was made to prepare a total eco-friendly product using natural dyes and natural thickener. Assessment of the developed samples was done on various aspects such as antimicrobial properties of the printed fabric, and its fastness properties to washing, rubbing, sunlight and perspiration was done.

Antimicrobial properties of printed fabrics against both *Staphylococcus aureus* and *Escherichia coli* bacteria (Table no. 1) was analyzed. It was found that fabric printed with madder dye and the blend recipe (25%GG and 75%CH) had the antimicrobial activity in it with both the bacteria *E.coli* and *S.aureus*. Kattha dye also found to have the antimicrobial activity with all the three blend ratio developed for printing (50%gg+50%CH., 25%GG+75%CH., and 75%GG+25%CH) with *E.coli* bacteria and had such property with two of the ratio (25%GG+75%CH., and 75%GG+25%CH) with *S.aureus* bacteria.

Table no.1: Antimicrobial Testing

Sr.no	Guar Gum, Guar Gum: Chitosan ratio	Dye	Antimicrobial Activity	
			E. coli	*S.aureus*
		Madder		
1	75% (GG)+25% (CH)		-	
2	25% (GG)+75% (CH)		+	+
3	50% (GG)+50% (CH)		-	
4	75% (GG)+25% (CH)	Kattha	+	+
5	25% (GG)+75% (CH)		+	+
6	50% (GG)+50% (CH)		+	-

It was also observed that fabric printed with three of the ratios of **Madder dye** 25%GG+75%CH, 50%GG+50%CH and 100%GG has score (4) and was ranked as **I** which resembles good fastness in all category.

Whereas fabric printed with **Madder dye** with the ratio of thickener 75%GG+25%CH had score (3) therefore it was ranked **II.** It is clear from the table that three of the dyes among all the selected dyes for printing, **Katha dye** with all the ratio the thickener scored 4.

Table no.2 Assessment of color fastness of the Printed Bamboo Fabric

S.no	Recipe Prepared for Printing	Dye	Perspiration fastness						Washing Fastness			Rubbing Fastness		Light fastness	WMS	Rank
			Acid			Alkaline										
			CC	CS		CC	CS		CC	CS						
				W	C		W	C		W	C	Dry	Wet			
	Ratios	Madder														
1	75% (GG)+25% (CH)		4	4-5	4-5	3-4	4-5	4-5	1	4	5	4-5	2	4-5	3.98	II
2	25% (GG)+75% (CH)		4	5	4-5	4	5	4-5	1-2	4-5	5	4-5	4	4-5	4.46	I
3	50% (GG)+50% (CH)		4	4-5	4-5	4	4-5	4-5	1	4-5	5	5	4	5	4.32	I
4	100% Guar Gum		4	4	4-5	4	4-5	4-5	1	4	5	5	3-4	4-5	4.18	I
		Katha														
5	75% (GG)+25% (CH)		5	5	4-5	4-5	4-5	4-5	4	4-5	5	5	4-5	5	4.76	I
6	25% (GG)+75% (CH)		4-5	5	5	4-5	4-5	4-5	3-4	4-5	5	5	4-5	5	4.86	I
7	50% (GG)+50% (CH)		4-5	5	5	4	5	4-5	3-4	4-5	4-5	5	5	5	4.84	I
8	100% Guar Gum		4-5	4-5	4-5	4	4-5	4-5	4	4-5	5	5	4	5	4.74	I

- *CS- colour staining, CC- Colour Change, W- wool, C- Cotton WMS- weighted mean score*

- Table no.3 shows the tearing strength of the printed Bamboo fabric with selected natural dye and natural thickener. On grey fabric tearing strength was low as compared to printed fabric. It is clear from the table that fabric printed with **Madder dye** had best tearing strength with 25%GG+75%CH ratio in warp direction whereas in weft direction best result was found fit the ratio 75%GG+25%CH. For fabric printed with **Katha dye** it was observed that the ratio 100% Guar gum in warp direction and 25%GG+75%CH in weft direction shows best tearing strength.
- From the above table we can interpret the tensile strength of the printed bamboo fabric with developed recipes of natural dyes and thickener. It is clear from the table that fabric printed with **Madder dye** with the ratio 50%GG+50%CH ha best tensile strength in the warp direction while in weft direction best strength was of the ratio 75%GG+25%CH same result was found for the fabric printed with **Katha dye**.

Table no. 3 Tearing Strength (IS 6489-93, Re 2008, ASTM D 1424)

S.no	Recipe Prepared for Printing	Dye	Tearing Strength(gm)bamboo Instrument Capacity (6400 gm)			
			Warp	CV	Weft	CV
	Grey Fabric		2982	6.18	2662	17.36
		Madder				
1	75% (GG)+25% (CH)		3392	24.95	3328	26.92
2	25% (GG)+75% (CH)		3072	25	3200	2.69
3	50% (GG)+50% (CH)		2624	2.38	3072	6.79
4	100% Guar Gum		2240	1.63	3200	10.17
		Katha				
5	75% (GG)+25% (CH)		1621	6.02	1685	17.17
6	25% (GG)+75% (CH)		2080	3.07	2016	36.4
7	50% (GG)+50% (CH)		1888	1.96	2240	8.57
8	100% Guar Gum		2528	14.0	1504	6.54

GG-Guar gum, CH- Chitosan, CV- Coefficient Variation

Table no. 4 Tensile Strength of the Printed Bamboo Fabric (ISO 13934, ASTM D 4595)

S.no	Recipe Prepared for Printing	Dye	Tensile Strength Force (kg)			
			Warp	CV	Weft	CV
	Grey Fabric		25.77	8.10	8.71	24.85
	Ratios	Madder				
1	75% (GG)+25% (CH)		17.25	9.56	16.52	22.24
2	25% (GG)+75% (CH)		25.05	1.39	23.75	1.05
3	50% (GG)+50% (CH)		20.15	9.67	25.37	7.19
4	100% Guar Gum		13.75	0.72	23.01	2.06
		Katha				
5	75% (GG)+25% (CH)		12.85	4.66	17.57	4.97
6	25% (GG)+75% (CH)		17.65	4.53	15.97	2.97
7	50% (GG)+50% (CH)		16	6.25	18.47	4.46
8	100% Guar Gum		18.65	4.82	17.07	2.48

Conclusion

There is a vast resource of natural dyes, which can be used for imparting useful properties to textile substances. Natural dyes cannot be used as simple alternatives to synthetic dyes and pigments. They do however have the potential for application in specified areas to reduce the consumption of some of the more highly polluting synthetic dyes. It was also found that among the selected dyes for the study Kattha, had best fastness properties (rubbing, washing and perspiration). For the antimicrobial properties fabric printed with Kattha dye with three of the blend recipes had the best result. Therefore, it can be concluded that the dyes and the recipes which are found to have the good fastness and physical result can be used for various textile application

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TO-12

APPLICATION OF NATURAL DYES EXTRACTED FROM COCONUT CALYX (HUSK) ON SILK FABRIC

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Abstract

Color is one of the elements of nature that made the human living more aesthetic and fascinating in the world.

Dyeing is an area of human creativity whereby the first judgments by the naked eye can tell the success or failure of a procedure rapidly. From the ancient time India was known for dyeing textile materials with natural dyes. The resonance and richness of natural dyes are impossible to reproduce with synthetic dyes. It has been replaced by synthetic dyes because of its availability, range of colours and ease of application, but it has certain disadvantages such as it releases carcinogenic aryl amine which does not suit the human skin and affect the human life adversely. Recently greener and economically friendly, waste management has become a very important topic. As waste, which is not properly managed can create seriously health, environment and social problems in a community. Management of waste encompasses collecting waste material and processing it in some way, or trying to recycle it. Natural colours if extracted from waste will not only human skin friendly but also reduce the use of synthetic dyes and help in reducing pollution which is another problem related to environment. Coconut is one of the fruit which is extensively used across the country in some or the other form. Lot of waste is added daily to the land fill due to the use of coconut. So a study was carried out to extract dye from used coconut which is a waste after using its edible part. For this purpose dye was extracted from dry coconut powder. Dye solution was prepared and dyeing was done on Silk fabrics using pad, dry and cure method. Two natural mordants lemon rind and pomegranate rind and metallic mordant alum were used in the study. The L*a*b* values were measured using Spectrophotometer. On analysis, it was found that dye can be used effectively on Silk. This study was carried out to study scientifically the probability of using colours obtained from waste portion of the coconut on the textiles which will reduce waste thrown and reutilize them for the development of environment friendly colours for textiles.

Key words Natural dyeing, Coconutcalyx, Alum.

1. Introduction

Natural dyes are derived from naturally occurring sources such as plants (e.g., indigo and saffron); insects (e.g., cochineal beetles and lac scale insect); animals (e.g., some species of molluscs or shellfish); and minerals (e.g., ferrous sulphate, ochre, and clay)

without any chemical treatment. A spectrum of beautiful natural colours ranging from yellow to black exists in the all above sources.

With the influx of synthetic dyes for most of the traditional colours including blue in the nineteenth century A.D. the use of natural dyes has gradually gone out of existence from most parts of the country. However in a few places natural dyes continued to be used and in some places synthetic dyes are used in the old process particularly indigo and alizarin.

Almost all the synthetic dyes have their origin from coal tar. Many synthetic dyes may lead to various harmful by-products during their manufacture. A number of azo dyes which release carcinogenic harmful amines have already been banned by most of the countries. However the effluent discharged from dyeing units is also causing lot of concern. Hence there is an increasing realization in the textiles industry as well as among the textile consumers to develop and demand eco-friendly methods of dyeing textiles. Natural dyes offer an important alternative in these regards as these are safer in use with minimum health hazards have easy disposability are biodegradable and can be used for many purpose.

Since, the last few decades, the use of synthetic dye is gradually decreases due to an environmental awareness and harmful effects because of their toxic degrade products or their non-biodegradable nature also they causes the allergy and carcinogenic effect to skin and health. As a result people are became more concern with the natural product which is obtained from the renewable resources and they are biodegradable.

Coconut (Cocos nucifera) plays a significant role in the agrarian economy of India. The coconut is known to be a rich source of raw material for a variety of products. The calyxs of fully ripened coconuts yield brown coir. Strong and highly resistant to abrasion, its method of processing also protects it from the damaging ultraviolet component of sunlight. Dark brown in colour, it is used primarily in brushes, floor mats, and upholstery padding. The spongy material that binds the coir fibre in the calyx is the coir waste or coir pith. In the process of extraction of coir fibre from calyx generally about one third of it is obtained as fibre and two third of it is obtained as coir waste. Coir waste was once considered as a waste and the disposal of mounts of it was a serious environmental pollution. Dyeing can be possible by the use coconut calyx dyes. However, the natural dyeing is consider to be eco-friendly, the use of metallic mordants which are not eco-friendly and consider to be toxic, used to obtain different range of colour and deeper shade.

In the current study, the natural dyeing of silk with coconut calyx dye has been attempted using alum, lemon rind and pomegranate rind as mordant and range of the shades have been explored.

2. Materials and Methods

2.1 Materials

Silk fabric was used for the experiment. The silk fabric was scoured with non-ionic detergent rinsed and dried. For the dye coconut calyx was collected from the temple and the lemon rind and pomegranate were collected from the market, while alum used was of laboratory grade.

2.2 Methods

2.2.1 Treatment of mordant

The Mordanting treatment was given; the 2.5 gm of powder (lemon rind and pomegranate rind) was boiled in 250 ml of water till 45 min and then the solution was strained, the stock solution of alum was made by dissolving 2.5 gm of mordant powder in

250 ml water. And then the fabrics (silk) were treated for 45 min with each mordant separately.

2.2.2 Extraction of dye

The 1% stock solution of the dye was prepared by boiling 4 gm of dye in 100ml water for 45 min. The extract was filtered and made to 100ml and used for dyeing.

2.2.3Mordanting and dyeing of silk

The Mordanting of silk was carried out in openly in beakers keeping the liquor ratio 1:60. The fabrics were introduced at 60^0C and maintain the 60^0Cthroughout the treatment for the 45 min. After Mordanting the fabric was squeezed and dried. Then the mordanted fabrics were introduced to the dye bath prepared from the coconut calyx dye and dyeing was continued at 60^0C for the first 15 min. and then 70^0C for the 30 min. After dyeing, the fabric was squeezed and washed with cold water.

2.2.4 Effect of pH

In the case of pH sensitivity study of the natural dye, the fabric was mordanted with lemon rind, pomegranate rind and alum using coconut calyx dye at self pH that was 6

2.2.5 Evaluation of fastness

Each of the dyed samples was tested in the laboratory. The tests were carried out under standard atmospheric condition of 65% ± 2% and 27º C ± 2º C. The samples were conditioned in the standard atmospheric condition at least for a period of 24 hours, before the test were carried.

2. Results and Discussion

The colour of extract from the coconut calyx dye varies with mordants and pH.

3.1 Evaluation of the colour yield with coconut calyx dye

A gamut of seventy two shades was obtained; thirty six shades on each substrate. The **L* values** explain lightness and darkness in the samples. **a*** describe samples which are mordanted and dyed have red colour component, if values are positive while negative values shows presence of green colour component. **b*** exhibits samples which are mordanted and dyed have yellow colour component, if values are positive when negative values explains presence of blue colour component. c* value shows brightness and dullness present in sample, positive c* is brighter and negative c* if dullness. **DL*** value explains the lightness and darkness of the dyed samples. Value **DE*** differentiate the colour change of the dyed samples from the original one. K**/S values** depict the colour depth in the shade.

3.2 Effect of mordants and pH

Under acidic condition the colour of extract shows orange brown, at self pH the colour of dye extract shows brown shade, whilst in alkaline condition the colour of extract shows deep red brown shade. Alum shows pink to red brown shades on silk by varying pH. At acidic and self pH shades of red browns was obtained and at alkaline pH shades of pink was obtained. With mordant lemon rind shades of light brown to pink was obtained on silk at acidic and self pH light brown shades were observed, while at alkaline pH shades of pink were observed. Pomegranate rind developed light yellow brown to deep yellow brown shades on silk fabric. At acidic and self pH light yellow brown shades were observed, whilst at alkaline pH deep yellow brown shades were obtained.

3.3 Evaluation of wash, rub and light fastness

3.2.1 Effect of percent concentration of dye on CIELAB values of silk treated with Alum at different pH

3.2.1.1. 2% concentration of dye

Table 1: Effect of 2% concentration of dye on CIELAB values of silk samples treated with Alum at different pH condition

Samples	L*	a*	b*	c*	DL*	DE*	K/S
Control	69.497	-1.258	3.600	3.813	----	----	1.373
AD4pH	55.543	4.672	17.163	17.788	-13.954	20.343	10.266
AD6pH	56.740	4.396	17.600	18.141	-12.757	19.766	11.330
AD8pH	59.307	3.796	9.405	10.142	-10.190	12.770	6.784

Table 1 presented the data of CIELAB values at 2% concentration of dye on silk pre-treated with alum. From the table it was found that the higher L* (59.307) value showed on the sample dyed in alkaline condition and greatest a* (4.672) values was observed in acidic condition. Highest b* (17.600) and c* (18.141) value was found at self pH. The DL* (-13.954) and DE* (20.343) was observed highest in acidic condition. The K/S (11.330) was acquired maximum at self pH.

3.2.1.2. 4% concentration of dye

Table 2: Effect of 4% concentration of dye on CIELAB values of silk samples treated with Alum at different pH condition

Samples	L*	a*	b*	c*	DL*	DE*	K/S
Control	69.497	-1.258	3.600	3.813	----	----	1.373
AD4pH	53.979	5.580	19.652	20.429	-15.518	23.350	9.957
AD6pH	53.302	6.277	20.093	21.051	-16.195	24.312	11.969
AD8pH	55.457	6.840	9.992	12.109	-14.040	17.423	6.706

In the Table 2 discussion of the effect of Coconut Calyx dye combined with mordant alum at 4% concentration on silk was explained. From the table results were found that the higher lightness value in colour shade was found in alkaline medium (55.457). Greatest value of red was observed in alkaline medium (6.840). Whereas value b* and c* was found highest at self pH (20.093 and 21.051). The values showed darkness in the shade, highest values to be found on sample dyed at self pH (-16.195), also the sample dyed at self showed maximum percent of colour change (24.312) and K/S (11.969).

3.2.1.3. 6% concentration of dye

The **Table 3** conferred the result of 6% dye combined with mordant Alum on silk. The table denotes L* values which shows highest in acidic condition (53.449). The maximum a* (10.145) value was viewed in alkaline condition, at the same time as b* (19.507) and c* (20.567) found highest in acidic medium. Greatest DL* (-19.733) and DE* (24.932) values K/S (13.418) observed in alkaline medium

Table 3: Effect of 6% concentration of dye on CIELAB values of silk samples treated with Alum at different pH condition

Samples	L*	a*	b*	c*	DL*	DE*	K/S
Control	69.497	-1.258	3.600	3.813	----	----	1.373
AD4pH	53.449	6.518	19.507	20.567	-16.048	23.896	11.213
AD6pH	51.900	6.837	18.880	20.080	-17.597	24.671	12.445
AD8pH	49.764	10.145	13.708	17.054	-19.733	24.932	13.418

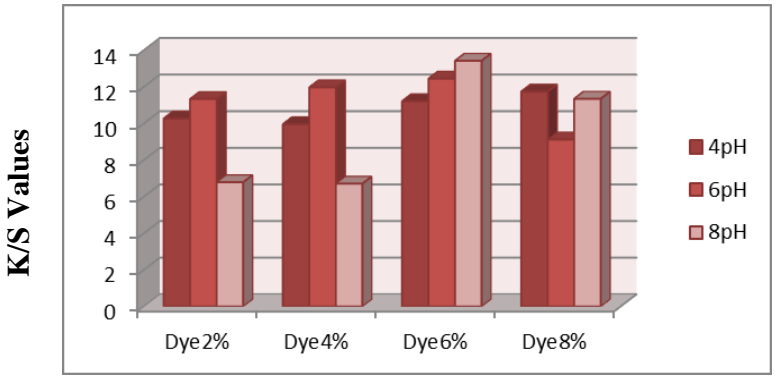
3.2.1.4. 8% concentration of dye

Table 4: Effect of 8% concentration of dye on CIELAB values of silk samples treated with Alum at different pH condition.

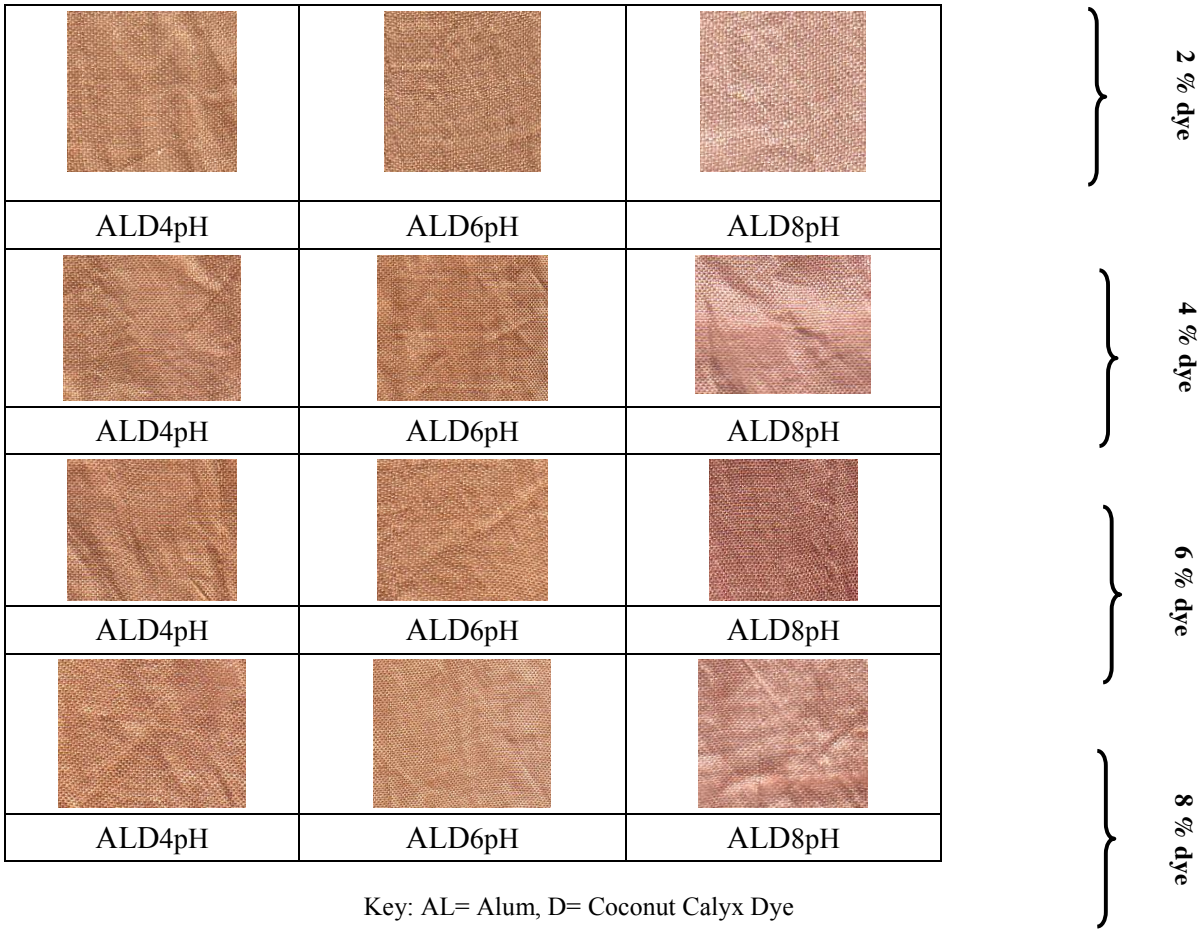
Samples	L*	a*	b*	c*	DL*	DE*	K/S
Control	69.497	-1.258	3.600	3.813	----	----	1.373
AD4pH	54.035	6.278	18.114	19.171	-15.462	22.506	11.739
AD6pH	53.937	5.031	16.631	17.375	-15.560	21.248	9.122
AD8pH	51.159	6.816	12.271	14.037	-18.226	21.739	11.345

The Table 4 explains the effect on the CIELAB values of 8% concentration of dye on silk. In this, maximum lightness value (54.035) was observed in acidic condition, maximum redness (6.816) was seen in alkaline medium, maximum yellowness (18.114) and brightness (19.171) was found in acidic condition, at the same time maximum DL* value (-18.226) was noted in alkaline condition along with DE* (22.506) in acidic medium along with depth of colour (11.739).

The graph 1 denotes the K/S of silk fabric treated with alum at different % shade of dye. From the graph it was noted that the higher colour depth was acquired by sample dyed with 6% in alkaline medium (13.418) followed by sample dyed at self pH in the same concentration (12.445) showed higher K/S value.



Graph 1: K/S of the silk treated with alum at various % shades



Key: AL= Alum, D= Coconut Calyx Dye

Plate 1: Colour palette obtained from the dye with alum on silk

3.2.2 Effect of percent concentration of dye on CIELAB values of silk treated with Lemon rind at different pH

3.2.2.1. 2% concentration of dye

Table 5: Effect of 2% concentration of dye on CIELAB values of silk samples treated with Lemon Rind at different pH condition

Samples	L*	a*	b*	c*	DL*	DE*	K/S
Control	69.497	-1.258	3.600	3.813	----	----	1.373
LD4pH	54.291	6.446	18.637	19.720	-15.206	22.731	13.973
LD6pH	56.869	4.561	15.157	15.828	-12.628	18.080	13.788
LD8pH	58.653	5.070	10.792	11.924	-10.844	14.469	12.250

Table 5 showed the effect of lemon rind (4%) on silk at 2% dye; highest lightness value was acquired on the sample dyed in alkaline medium (58.653). The maximum presence of red was observed in acidic condition (6.446) also maximum presence of yellow was found in acidic medium (18.637). The highest value of c* was seen on the sample dyed at 4pH (19.720). DL* (-15.206) and DE* (22.731) values was found to be

highest on the sample dyed at 4pH. Highest K/S was acquired on the sample dyed in acidic medium (13.973).

3.2.2.2. 4% concentration of dye

Table 6: Effect of 4% concentration of dye on CIELAB values of silk samples treated with Lemon Rind at different pH condition.

Samples	L*	a*	b*	c*	DL*	DE*	K/S
Control	**69.497**	**-1.258**	**3.600**	**3.813**	**----**	**----**	**1.373**
LD4pH	**54.660**	**5.443**	**18.654**	**19.432**	**-14.837**	**22.173**	**15.082**
LD6pH	**57.121**	**5.524**	**16.007**	**16.933**	**-12.376**	**18.791**	**12.402**
LD8pH	**57.128**	**7.159**	**12.325**	**14.253**	**-12.369**	**17.319**	**14.794**

As shown in **Table 6,** the results described that the maximum lightness value was observed on the sample dyed at self pH and alkaline medium. Maximum presence of red was observed in alkaline medium (7.159), while maximum present of yellow was observed in acidic medium (18.654). Maximum brightness was in acidic medium (19.432). Highest darkness (-14.837) and colour change (22.173) from the original samples was observed on the sample dyed in acidic medium. Higher K/S was noticed in acidic condition (15.082).

3.2.2.3. 6% concentration of dye

Table 7: Effect of 6% concentration of dye on CIELAB values of silk samples treated with Lemon Rind at different pH condition

Samples	L*	a*	b*	c*	DL*	DE*	K/S
Control	69.497	-1.258	3.600	3.813	----	----	1.373
LD4pH	54.460	5.956	20.185	21.045	-15.037	23.521	13.023
LD6pH	56.482	5.385	15.762	16.656	-13.015	19.011	12.132
LD8pH	57.677	6.053	10.324	11.963	-11.820	15.439	10.853

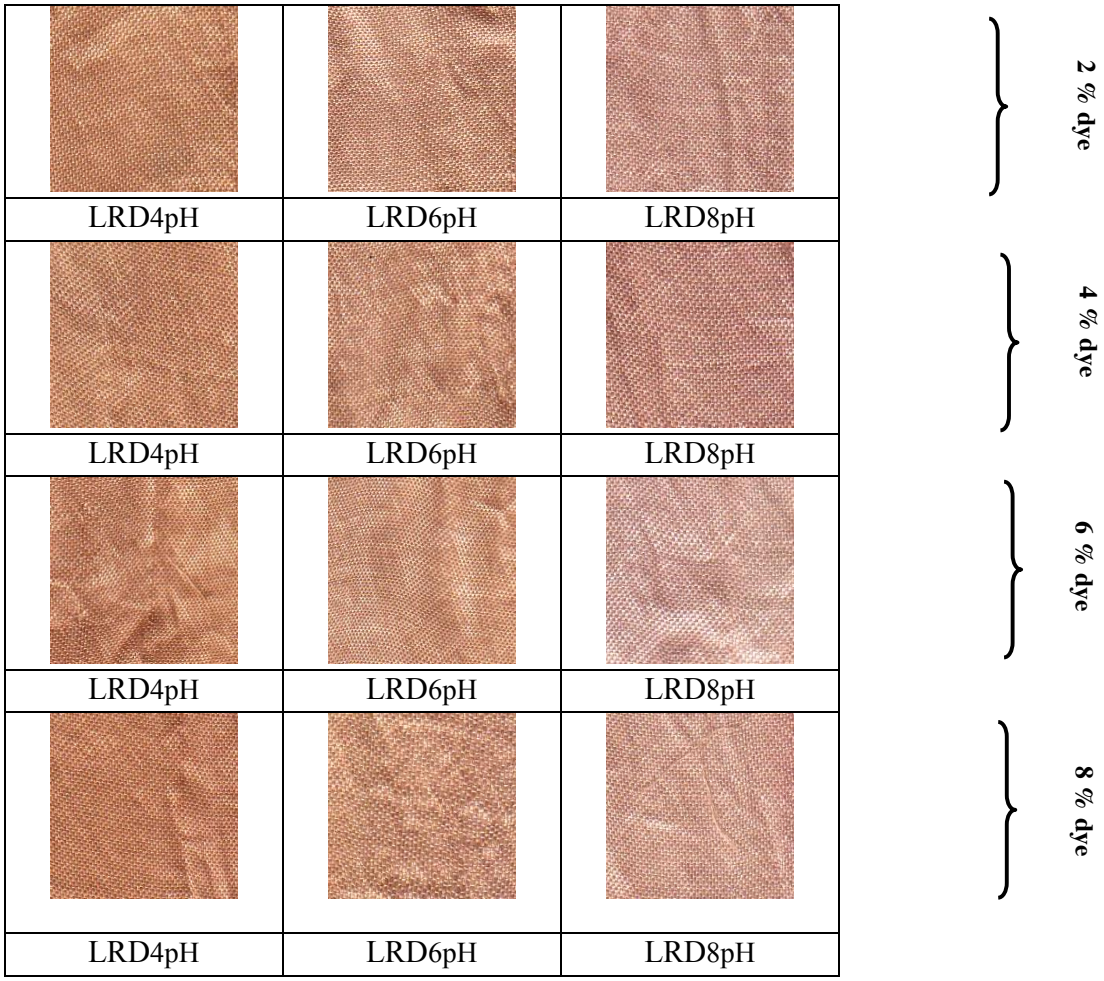
From the Table 7, the results showed that the higher L* value was observed on the sample dyed at 8pH (57.677). The maximum presence of red was observed on the sample dyed in alkaline medium (6.053) and maximum presence of yellow was found in acidic medium (20.185). The highest positive c* was seen on the sample dyed at 4pH (21.045). DL* values showed that the samples are darker and highest darkness was found in acidic medium (-15.037). Values of DE* showed that the colour change of the sample dyed 4pH at is maximum compared to other i.e. (23.521). Maximum K/S was seen on the sample dyed in acidic medium (13.023).

3.2.2.4. 8% concentration of dye

Table 8: Effect of 8% concentration of dye on CIELAB values of silk samples treated with Lemon Rind at different pH condition

Samples	L*	a*	b*	c*	DL*	DE*	K/S
Control	69.497	-1.258	3.600	3.813	----	----	1.373
LD4pH	52.320	7.099	18.538	19.851	-17.177	24.249	11.458
LD6pH	55.297	5.256	16.807	17.610	-14.200	20.457	15.403
LD8pH	58.628	4.627	10.347	11.334	-10.869	14.082	10.542

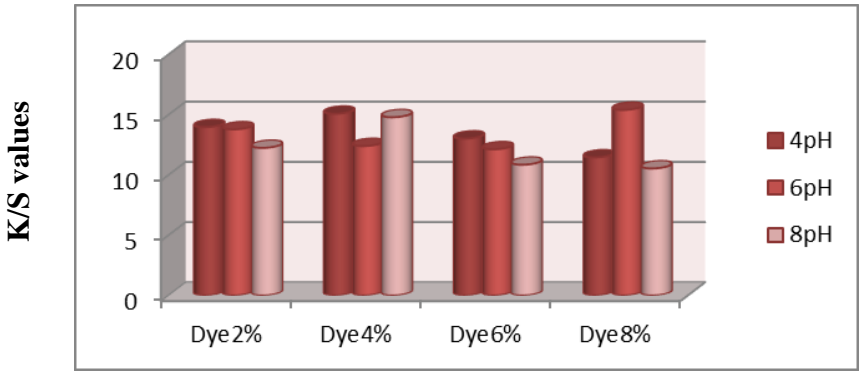
From the Table 8, the results were found that the higher value of lightness in colour shade was found in alkaline medium (58.628). Greatest value of red was seen in acidic medium (7.099). Whereas value b* and c* was found highest at 4pH (18.538 and 19.851). The values showed darkness in the shade, highest values to be found on sample dyed at 4pH (-17.177), also the sample dyed at self showed maximum percent of colour change (24.249) and K/S (15.403) at self pH



Key: LR= Lemon Rind, D= Coconut Calyx Dye

Plate 2: Colour palette obtained from the dye with different lemon rind on silk

Graph 2 represented the K/S values of lemon rind treated silk in various % shade; K/S values represent the colour depth in the samples, from the graph it was observed that the higher colour depth was acquired by sample dyed with 8% dye at self pH (15.402) also sample dyed with 4% shade in acidic medium (15.082) showed higher K/S value.



Graph 2: K/S of the silk treated with lemon rind at various % shades

3.2.3 Effect of percent concentration of dye on CIELAB values of silk treated with Pomegranate rind at different pH

3.2.3.1. 2% concentration of dye

Table 9: Effect of 2% concentration of dye on CIELAB values of silk samples treated with Pomegranate Rind at different pH condition

Samples	L*	a*	b*	c*	DL*	DE*	K/S
Control	69.497	-1.258	3.600	3.813	----	----	1.373
PD4pH	52.204	5.162	24.038	24.586	-17.293	27.531	18.768
PD6pH	53.348	4.996	24.126	24.638	-16.149	26.856	20.279
PD8pH	49.395	4.303	24.376	24.753	-20.102	29.439	24.559

Table 9 showed the effect of pomegranate rind on silk at 2% dye; highest lightness value was acquired on the sample dyed at self pH (53.348). The maximum presence of red was observed in acidic condition (5.162) also maximum presence of yellow and brightness found to be same in all the condition. DL* (-20.102) and DE* (29.439) values was found to be highest on the sample dyed at 8pH. Highest K/S was acquired on the sample dyed in alkaline medium (24.559).

3.2.3.2. 4% concentration of dye

Table 10: Effect of 4% concentration of dye on CIELAB values of silk samples treated with Pomegranate Rind at different pH condition

Samples	L*	a*	b*	c*	DL*	DE*	K/S
Control	69.497	-1.258	3.600	3.813	----	----	1.373
PD4pH	52.976	5.143	24.806	25.334	-16.521	27.634	20.038
PD6pH	51.955	4.925	21.861	22.409	-17.542	26.066	15.108
PD8pH	51.070	6.006	23.581	24.334	-18.427	28.135	14.884

Table 10 exhibits results of effect of 4% dye on silk (pre-treated pomegranate rind). The results described that the higher L* value was seen on the sample dyed in

acidic medium (52.976). Maximum presence of red (6.006) was seen in alkaline medium, while maximum present of yellow (24.806), maximum brightness (25.334) was observed higher in acidic condition. DL* values (-18.427) and highest colour change from the original samples (28.135) was observed in alkaline medium. Higher K/S (colour depth) was noticed in acidic medium (20.038).

3.2.3.3. 6% concentration of dye

Table 11: Effect of 6% concentration of dye on CIELAB values of silk samples treated with Pomegranate Rind at different pH condition

Samples	L*	a*	b*	c*	DL*	DE*	K/S
Control	69.497	-1.258	3.600	3.813	----	----	1.373
PD4pH	53.252	5.155	25.413	25.931	-16.245	27.943	15.867
PD6pH	53.396	5.337	21.474	22.127	-16.101	24.944	14.844
PD8pH	47.259	5.930	31.312	31.869	-22.238	36.251	26.802

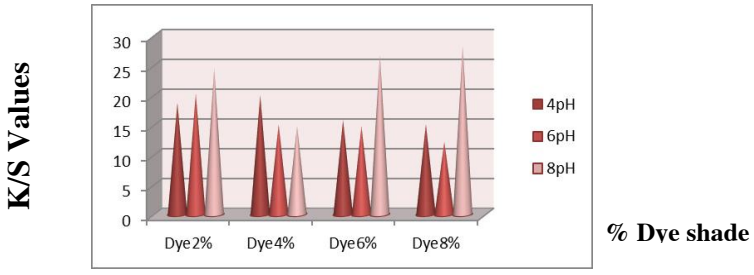
The Table 11 conferred the result of 6% dye combined with mordant pomegranate on silk. The table denotes L* value which shows highest at self pH (53.396). The maximum a* (5.930) value was viewed in alkaline condition, at the same time as b* (31.312) and c* (31.859) found highest in alkaline medium. Greatest DL* (-22.238) and DE* (24.932) values K/S (26.802) were also observed in alkaline medium.

3.2.3.4. 8% concentration of dye

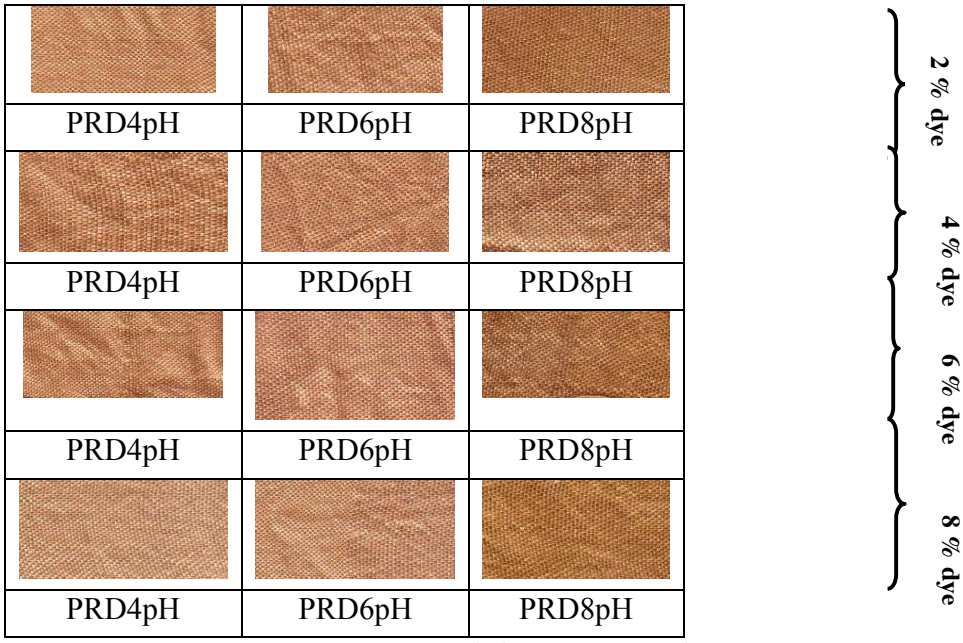
Table 12: Effect of 8% concentration of dye on CIELAB values of silk samples treated with Pomegranate Rind at different pH condition

Samples	L*	a*	b*	c*	DL*	DE*	K/S
Control	69.497	-1.258	3.600	3.813	----	----	1.373
PD4pH	56.348	2.788	22.548	22.720	-13.149	23.416	15.181
PD6pH	54.945	4.286	20.972	20.818	-14.552	22.887	12.225
PD8PH	47.570	5.285	29.935	30.398	-21.927	34.887	28.265

Table 12 represents results of pomegranate rind on silk in 8% concentration of dye. The results showed that the maximum lightness value was observed on the sample dyed in 4pH (56.348). Maximum value of a* and was observed in alkaline medium (5.285), while maximum value of b* and c*was observed in alkaline medium (29.935) and (30.398) respectively along with DL* (-21.927) which means the shade is darker and DE* value (34.887) was also seen higher in alkaline condition.. Colour depth was observed highest on the sample dyed in alkaline medium (28.265).



Graph 3: K/S of the silk treated with pomegranate rind at various % shades



PR= Pomegranate Rind, D= Coconut Calyx Dye

Plate 6: Colour palette obtained from the dye with different pomegranate rind on silk

Graph 3 showed K/S values of silk fabric with pomegranate rind, from the present graph it was noted that the maximum depth of colour was seen in sample dyed with 8% in alkaline medium (28.265) followed by sample dyed with 6% shade at in alkaline medium (26.802).

3.3.1 Fastness properties of the selected dyed samples on silk

Wash fastness, Light fastness and Rub fastness are the three key factors that fades colour of a textile for commercial use. Hence, the fastness of the dye to these agencies of fading was assessed according to the standard testing procedures discussed in the methodology chapter. The fastness to wash, light and rub was tested using grey scale and wash and rub was graded from 5-1 indicates excellent-poor fastness to washing and rubbing whereas light fastness was graded from 8-1 indicates excellent-poor fastness to light. The results of the fastness testes are discussed below.

Table 13: Fastness rating of coconut dyed silk fabric

Samples	Wash fastness		Rub fastness		Light fastness		
	Change in colour	Staining on white	Staining on white		Rating at 5 hours	Rating at 10 hours	Rating at 15 hours
			Dry	Wet			
ALD4pH	5	5	3	3	5D	5B	5DB
ALD6pH	5	5	4	3	5D	5DB	5DB
ALD8pH	5	5	4	4	5	5D	5D
LRD4pH	5	5	4	4	5D	5DB	5DB
LRD6pH	5	5	4	3	5D	5DB	5DB
LRD8pH	5	5	4	4	5D	5D	5D
PRD4pH	4	5	4	3	5D	5DB	5DB
PRD6pH	4	5	3	3	5D	5DB	5DB
PRD8pH	4	4	4	4	5D	5D	5D

Key: AL= Alum, LR= Lemon Rind, PR= Pomegranate Rind, D= Coconut Calyx Dye

Table 4.13explains that the silk fabric mordanted with alum, lemon rind and pomegranate rind gave very good to excellent fastness to wash after three cycle of laundering. The readings for wash fastness for all the parameters rated 5; except the sample mordanted with pomegranate at 8pH. The colour change was observed on silk dyed samples. The sample mordanted with pomegranate in alkaline medium was observed to turn towards light green shade and slight staining on white fabric and rated 4. Silk dyed results for rub fastness rating shows rating from 3 to 4 which indicate good to excellent fastness in both dry and wet rubs. However, excellent results goes to light fastness properties as the results shown in the rating was 5 when exposed for 5, 10 and 15 hours. The sample treated with alum at pH 4 turned slight brownish after exposure to light for 10 hours. Most of the samples on 10 and 15 exposures to light turned dark brown.

4. Conclusion

With coconut calyx dye, shades of light brown, light red brown, light yellow brown, deep red brown, deep yellow brown to pink were obtained on silk by using different mordants. On silk coconut calyx dye worked as acid dye which showed good results at acidic and self pH. The dye showed good results at 6% shade concentration. The dye possessed very good to excellent fastness to laundering, rub and light.

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TO-07

LOW-COST SUSTAINABLE CIRCULAR DESIGN INNOVATION IN TEXTILE AND FASHION

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Abstract

The alarming level of greenhouse gases in the environment, fast depleting natural resources such as water, petroleum products and increasing level of industrial effluents have made every single manufacturing activity come under the scrutiny of sustainability. When all kinds of waste such as clothes, old furniture, carpets, televisions, shoes, paper, food wastes etc. end up in the landfill, only a few of them are naturally decomposed and thus a large majority remains as non-biodegradable. It is for this reason, efforts are concentrated to reduce the burden on earth by this wastes, and as far as used textile products are concerned, there are now attempts to recycle or up-cycle. At the same time, people in third world countries do not have access to sufficient clothing whereas those in developed countries are following the policy of make-use and throw. Up-cycling is the process of converting products which have lost service life into materials of better quality and the present chapter deals with such attempt of converting once used clothing by refurbishing and value addition. The promising potential is observed with the use of natural waste biomolecules applied to the garments or fabric to provide value-added textile materials. Such value-added textile fabric is not only sustainable but also provides the choice of good clothing garments for the consumer while deferring the issue of disposal of waste materials. The concern and regard towards the environment, creating a sustainable circular design for the cost-conscious consumer of textiles and fashion is reflected in this paper.

Keywords: Sustainable textiles; Up-cycling; Value addition; Low-cost clothing; Natural resources.

TO-13

BHARASHAHI – LANGUISHED TRADITIONAL HAND WOVEN CRAFT OF KUTCH, GUJARAT

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Abstract

India occupies a unique position in world with regard to traditional textiles. Handicrafts largely are the visual manifests produced with remarkable fidelity to the historical continuance since centuries of Indian culture. Among all, one such craft is Mashru a hand woven textile craft. The present research was an attempt to resuscitate the lesser known relinquish Mashru design i.e. Bharashahi of Kutch region which is redundant since last more than two decades. Key objective of the study was design exploration employing computer technology for resurgence of Bharashahi. The relevant data was collected through multi-method approach.

Keywords: Bharashahi, Design, Handloom, Trends

TO-14

AMALGAMATION OF TWO DISTINCT CRAFTS: BANDHANI AND SHIBORI

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Abstract

India is a country that has been traditionally famous for an immense range of flourishing crafts and artworks since times immemorial. The one of the eminent crafts of India is Bandhani– the tie and dye craft which is majorly practiced in Gujarat and Rajasthan. Bandhani is the craft known for its vivid colours and intricate design patterns created by tie and dye technique. The design patterns included are mostly inspired from the nature and auspicious festive rituals. Resist dyeing has been a technique explored worldwide and has been practiced in India, Japan, Southeast Asia and various African countries. Shibori, the resist dyeing technique practiced in Japan is consists of beautiful design patterns which are created by different techniques. Hence, Bandhani and Shibori are two distinct crafts using resist dyeing techniques. Though Shibori has its origin in Japan, now it has been adopted by artisans in Gujarat and Rajasthan. Based upon the information gathered from preliminary survey, Gujarat is one of the centers for the traditional Bandhani craft where the artisans now have adopted Shibori. Artisans are amalgamating both the crafts to give limitless expressions to the cloth. Majorly, the Khatri community is practicing the art of combining these two crafts. Other communities involved are Ghanchi, Jadejas, Lohanas, Momins and Bohras. The Shibori techniques explored by the tie and dye artisans of Gujarat are clamp dyeing, pole wrapping and stitch resist. Hence, it is interesting to study the craft diversification through which the artisans are expanding their market and evolving the craft. Thus, the study focused on exploring amalgamation of the two resist dyeing crafts by the artisans in Gujarat. Primary information was obtained from artisans through semi structured interview schedules.

Key Words: Tie and Dye, Shibori, Craft, Bandhani, Resist dyeing, Design, Artisan

Technology & Trends (Poster)

TP-01

ASSESSMENT OF BLEND RATIO ON THE PROPERTIES OF BANANA/COTTON BLENDED HAND SPUN YARN

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Abstract

Natural fibers are renewable resources and have several advantages associated with them, such as desirable fiber aspect ratio, biodegradable, available from natural sources and low cost. Natural fibers and their blends have effective properties. So in the present study banana and cotton fibers were blended to form yarn at various ratio. Banana fibers are stronger than cotton and cotton is softer than banana. So these fibers were blended to improve properties of yarn as well as fabric and also enhance the performance of the fabric. The present study reveals a comparison of the physical properties of three sets of banana/cotton blended yarns ratio. Each set was consisted fiber blend ratio 67:33, 50:50, 33:67 (banana:cotton). TPI, CSP, and moisture regain were tested with these blends. The test results showed that 50:50 blend of banana & cotton have medium count and strength, 67:33 blend of banana & cotton have high strength and low count and 33:67 blend of banana & cotton have high count and low strength. Thus the properties of blended yarn depend upon the banana content in the blend.

Introduction

Natural fibers present important advantages such as low density, appropriate stiffness and mechanical properties and high disposability and renewability. Moreover, they are recyclable and biodegradable. There has been lot of research on use of natural fibers in reinforcements. It may be further defined as an agglomeration of cells in which the diameter is negligible in comparison with the length. Although nature abounds in fibrous materials, especially cellulosic types such as cotton, wood, grains, and straw, only a small number can be used for textile products or other industrial purposes. Natural fibres can be classified according to their origin. The vegetable, or cellulose-base, class includes such important fibres as cotton, flax, and jute. All fibers have their own characteristics, some are good and some are not good. So it is desirable to produce perfect fabrics resulted in the production of blended fabrics. An intimate mixture of two or more fibers spun together is a blend. The individual yarns contain two or more different fibers. In present study blending of banana and cotton fibre is done to improve the functional properties of yarn.Banana fiber, a ligno-cellulosic fiber, obtained from the pseudo-stem of banana plant (Musa sepientum), is a bast fiber with relatively good mechanical properties. Banana fiber has its own physical and chemical characteristics and many other properties that make it a fine quality fiber. Appearance of banana fiber is similar to that of bamboo fiber and ramie fiber, but its fineness and spinnabilty is better than the two. Banana fiber have some inherent deficiencies like hardness, lack of cohesiveness, straightness and to impart additional favorable technical

properties. Other reason of blending is to improve process performance of fabric. So it is needed to blend it with cotton.

Cotton fiber is natural hollow fibers; they are soft, cool, known as breathable fibers and absorbent. Cotton fibers can hold water 24–27 times their own weight. They are strong, dye absorbent and can stand up against abrasion wear and high temperature. In one word, cotton is comfortable. Cotton fibers present exceptional features like great flexibility, cohesiveness properties, high strength and wear resistance.

Blending, in yarn production, process of combining fibres of different origins, length, thickness, or colour to make yarn. Blending is accomplished before spinning and is performed to impart such desirable characteristics as strength or durability, to reduce cost by combining expensive fibres with less costly types, or to achieve special colour or texture effects. Fabrics made from such fibres are called blends. Blending also refers to the process of combining small amounts of the same fibre taken from different lots to achieve a uniform result. The most popular reason for blending is that of combining the properties of two or more fibers. Blending of different fibers is also used to increase aesthetic effects in the fabric. The blending of cellulosic fibers to produce fabrics with improved characteristics has long been accepted throughout the world.

Banana and cotton blended yarns are a key part of the 'natural product' theme and are recommended for use in wearable textiles, as well as in home textiles. Yarns of banana fibre provide the desirable properties of high absorbency and antimicrobicity in textiles and made-ups. The present study was conducted to find out the impact of the banana/cotton blend ratio on the quality characteristics of yarn and also to optimize the blending ratio that produced excellent quality yarn.

Objectives

- To blend two natural fiber cotton & banana.
- Blend in three ratio
- To check TPI, Count, and strength of blended yarn

Method & Material

Obtaining of Fiber:
Grand Nain (G9) variety banana fiber was obtained from banana psuedostem which were cultivars of Musa acuminate. It is one of the most cultivated and exported bananas. Cotton fiber S-6(Sankar – 6) was obtained from Nitra Ghaziabad.

Scouring: 50 gm of banana fiber was soaked for prepare two solution of NaOH (2% & 5%), 3% of Na_2CO_3, 1% wetting agent heated at 100°C for 60 min. Then the material was washed with over flowing tap water and then drying at room temperature. After scouring process banana fiber was neutralized with Acetic acid. Then it was softened with Silicon Softener. After drying banana fiber was blended with cotton.

Blending: Both fibers were mixed by hand in 3 ratio. First ratio of banana/cotton was 50/50, second was 67/33 and the third was 33/67.

Carding process: After blending the blended fibers were run on miniature carding machine. 6 lots of each ratio were prepared. Weight of each lot was 50 gms. Then fiber sheet was prepared. Weight of each fiber sheet was-

Banana/ Cotton
50 / 50 - 43gm.
67 / 33 - 40gm.
33 / 67 - 45gm.

Slivering: Slivering was done on draw frame. Sliver was prepared of each lot of fiber sheet. Then it was 6 doubling sliver and all 6 sliver was combined to form a sliver of each ratio. This was done on draw frame finisher.

Roving: Roving was done on speed frame. Roving was prepared by a sliver which was formed by combining 6 slivers.

Spinning: Amber Charkha was used for spinning.

Moisture Regain: Using air heated 110°C Oven drying process was acquired to check moisture regain. The samples were weighted two times first in condition state (W^1) and second oven dry state (W^2)

Count and Strength (CSP): CSP is the product of count and strength in pound. Count is the no. of hank of 840 yards length per 1 pound weight of yarn.
1 lea cotton yarn (1 lea = 120 yards).
Sample size =20 sample

Twist per Inch (TPI): Yarn twist is defined by the degree of tightness applied to the fiber and it is normally measured by the number of twist(1 twist is equivalent to 360° of travelled fiber) of unit length. Generally, the unit length for staple yarn is "10cm", and the length ratio is "1m".

Result & Discussion

In the present research work, an attempt to produce khadi yarn. The result is shown in the tables.

Moisture regain:
Using IS199 standard for testing moisture regain. The percent of moisture regain of banana/ cotton blends (50/50, 67/33 & 33/67) were respectively 4.5%, 5.0%, 4.5%.

S.No.	Samples	Moisture content (%)
1.	Banana / Cotton - 50/50	4.5%
2.	Banana / Cotton - 67/33	5.0%
3.	Banana / Cotton - 33/67	4.5%

Count and Strength (CSP):
Using ASTM D 1578 – 93 standard yarn Count and strength and actual CSP was tested and shown in the table –

S.No.	Samples	Actual Count (Ne)	Actual Strength (Lbs)	Actual CSP
1.	Banana / Cotton - 50/50	5.48	80.15	439
2.	Banana / Cotton - 67/33	5.52	64.48	356
3.	Banana / Cotton - 33/67	5.12	77.15	395

Twist per Inch (TPI):

Using ASTM D 1422 – 13/ 1423 -02 standard yarn TPI tested. TPI of the banana / cotton blends (50/50, 67/33 & 33/67) were respectively 13.67, 10.09, 09.59. it is shown in table –

S.No.	Samples	TPI
1.	Banana / Cotton - 50/50	13.67
2.	Banana / Cotton - 67/33	10.09
3.	Banana / Cotton - 33/67	09.59

Conclusion

Now a days people are focusing towards nature. The utilization of plants and trees in fabric formation is increasing because variation is needed in fabric properties also. Banana plant is very useful plant. Its every parts can be used. It has no harm to the environment so it is classified as eco friendly fiber. Banana is similar to bamboo fiber but its spinnability and fineness is better. It can be spun almost every method of spinning, but softening is needed for blending and spinning.

In the present study the moisture regain of 67/33 banana/ cotton blend was better than those two,CSP of 50/50 banana/ cotton blend was better than those two and TPI of 50/50 banana/ cotton blend was better than those two. Hence the property of 50/50 ratio is better than other blends ratio.

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TP-03

A STUDY ON THE CHARACTERISTICS OF WOMEN'S WESTERN JACKET FROM 17TH CENTURY TO 19TH CENTURY

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Abstract

The purpose of this study is to identify the historical western women's jacket silhouettes from the 17th century to the 19th century. Three jacket styles were selected from the following books: The Cut of Women's Clothes 1600-1930 (2013), Costume Close-up: Clothing Construction and Pattern 1750-1790 (1999), and Authentic Victorian Fashion Patterns: A Complete Lady's Wardrobe (1999). The selected historical jackets were similar to the modern woman's single breast jacket with a tight fit. Experimental patterns were developed for model measurements: height of 160 cm, bust size of 82 cm, and waist circumference of 62 cm. The experimental jackets were made with 30s muslin. The silhouettes of each jacket and the garment pressure were evaluated. The garment pressure was measured at nipple point, anterior midaxillary point, posterior midaxillary point, and lateral shoulder point using the 3D fashion design software CLO 5.0. Two 3D avatars of model size were developed, one with a normal posture and the other with an erect posture. The garment pressure of the historical jackets was evaluated based on the with 30s muslin like the experimental jacket. When the live model wore the historical jackets, the lateral shoulder point was pulled backward. This effect was greatest for the 19th-century jacket (6 cm). The garment pressure of the 30s muslin jacket was higher for the natural posture avatar than for the erect posture avatar. The study shows that the 19th-century western women's jacket significantly pulls the shoulders backward. The garment pressure may change by posture.

Keywords: Historical pattern, Women's jacket, Posture, Garment pressure, 3D CLO

I. Introduction

Aesthetic ideals about the body reflect cultural attitudes and so change over time. Fashion and ideas about beauty are mutually influential and both influence clothing trends (Yim & Kim, 2006). Understanding historical clothing trends informs understanding of contemporary fashion because fashion designers are often inspired by and reinterpret historical fashion in various ways (Mun & Lee, 2003). Jackets were originally worn by men, but women began to wear them for horse riding or hunting in the 16th century. In the late 19th century, jackets came to be worn more casually during walking or work (Waugh, 2013). Despite the significant changes that have occurred in women's fashion since the introduction of jackets in the 16th century, jackets have remained a part of and evolved with women's fashion trends because they are more functional than traditional one-piece dresses which historically served as the base of women's fashion. Modern fashion is typically more form-fitting and comfortable than in the past when clothes were designed to exaggerate and distort the shape of the wearer's body.

Changes in European women's clothing reflect changing economic, social, and political conditions. Spain accumulated a great deal of wealth through its discovery of the Americas led changes in fashion in the 16th century. In the beginning of the 17th century, Spain's political power began to weaken, leading to the independence of the Dutch Republic, the present-day Netherlands, from the Spanish Empire. The Dutch Republic's power grew and with it the popularity of the practical style of clothing worn in the Dutch Republic (Payne, 1992).The size and intricacy of women's clothing peaked in the early 18th century with the appearance of the Robe à la Françoise, but after the French Revolution in the late 18th century, dresses became simpler and began to be produced two separate pieces. In the mid-19th century, dresses again became bulkier, leading to the crinoline style, the largest in history. In the late 19th century, as a result of the Industrial Revolution, women started to participate in social and athletic activities and so began to wear more comfortable and practical clothing (Kim & Kim, 2001).

Most studies on historical fashion conducted in South Korea have focused on the aesthetics of 19th-century clothing (Park, 2001; Kim & Kim, 2001) or on reinterpreting historical clothing to suit modern body types (Moon, 2007; Lee & Lee, 2006; Chung & Park, 2000). Many studies have analyzed the construction (Ryu & Kim, 2015; Mun, 2006; Kim, 2001; Park & Chun, 2014) and identified the ergonomic features (Kwon & Chun, 2017; Cha & Chun, 2011) of historical clothing. Cha (2011) found that 19th-century Western women's jackets pushed wearers' upper bodies forward. Kim and Lee(2013) showed that riding habit jackets of the late 19th century straightened and stabilized the spine when worn with a corset. However, there have not been any studies that focused on empirically examining the ergonomic effects of 19th century Western women's jackets.

Clothing is developed in consideration of the ergonomic features of the human body. Women's body sizes and shapes have changed over time along with how bodies and clothing are measured (Guerre, 1892; Harris, 1999; Waugh, 2013). Harris(1999) found that fashion pattern drafting has also changed over time, so it can be difficult to reproduce historical clothing based on original patterns due to a lack of information and to determine how such clothing would fit contemporary wearers. Today patterns are made according to precise measurements of macro body features, such as the waist and bust, but historically patterns were drawn by hand to reflect the wearer's body shape (Harris, 1999). Chun(2012) found that data which is critical today for producing clothing, such as sleeve top and underarm points, were not part of historical clothing production methods.

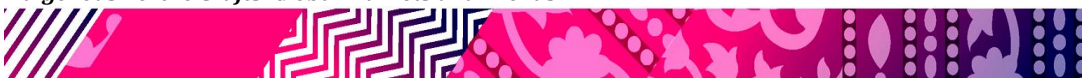
This study reproduced one popular female jacket style from the 17th, 18th, and 19th centuries, the origin of contemporary jackets, to determine how they affected women's posture and comfort by comparing the changes of posture and garment pressure.

II. Methodology

This study consisted of two experiments. The first experiment measured the effects of three types of historical jackets on a fit model's posture. The effect was determined by the difference between key points on the fit model's body in natural and erect postures. The second experiment used a computer simulation to measure the pressure that those same jackets placed on various parts of the fit model's body.

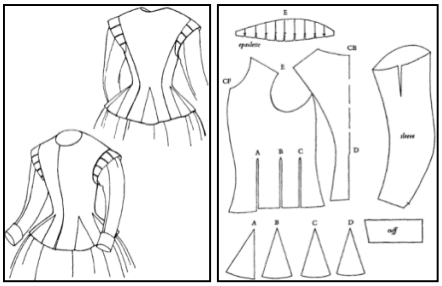
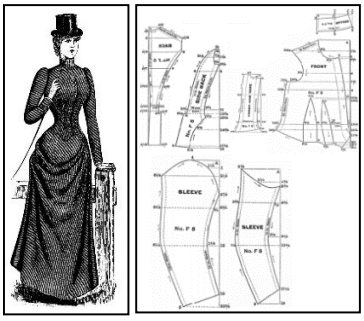
1. Style Selection

The styles analyzed in this study were similar to the close-fitting single-breasted modern jacket style and were selected from The Cut of Women's Clothes 1600–1930



(2013), Costume Close-up: Clothing Construction and Patterns 1750–1790 (1999), and Authentic Victorian Fashion Patterns: A Complete Lady's Wardrobe (1999). The features of the selected jackets are presented in Table1.

Table 1. The experimental jackets and their features

Model and Pattern	Design Features	Pattern Features
Embroidered Jacket  Figure 1. Embroidered jacket from 1610 (Waugh, 2013, p.38).	-Jacket features embroidery applied after construction - Epaulettes around armhole -Waist line is just below the rib line -Round neck line without a collar -Silk ribbons used as fasteners	- The bodice is composed of one front and one back piece.-Abasqueis formed by slitting the bottom and inserting triangular gussets. -The over- and under-sleeves have similar shapes. - There are dartsat the underarm point on the sleeve.
 Figure 2.Callico Jacket style in use from 1775 to 1785 (Baumgarten, Watson, &Carr, 1999, p.41)	-Printed with wood block on plain-woven cotton -Fully lined with linen -Waist level is the slimmest part of the jacket, similar to modern jackets - Round neck line without collar -Fastened with lace over the triangular stomacher	-Jacket bodice is composed of one front and one back piece- The center back seam is open below waist line. -There is a deep vent on the side seam and slit on the front panel below the waist line. -There is a separate shoulder panel. -Sleeves are composed of a single piece feature and the seam is cut diagonally inside the elbow.
 Figure 3. Riding habit from 1891 (Harris, 1999, p.127)	-Front bodice is shorter than back bodice -Waist level is at the rib line -Two darts on front bodice create the S-shaped silhouette -Train on the center back -Fastened with buttons up to the neck with standing collar	- Bodice is composed to one front piece, one back piece, one underarm gore piece, and one side back piece. -Two darts on the front piece - Diagonal darts create a more acute angle between shoulders and waist -There are vents on the center back and between the back and side back panels. -Sleeves are composed of two pieces of different widths.

The 17th-century jacket was affected by Dutch fashion which was practical and folksy. It featured with long sleeves, a narrow waist, and flared around the hips at the bottom (Fig. 1). It is constructed by inserting triangular gussets into vertical slits under the ribs which run down to bottom edge on the front and back of the bodice. The gussets flare from under the rib line to fit easily over the hips. The neckline is round and does not feature a collar. Sleeves are sewn in a bent shape and are composed of over- and under-sleeves of the same width with darts on the underarm point. There were epaulets around the armhole.

The 18th-century jacket is composed of separate center front and shoulder panels (Fig. 2). The front panel is separated in the middle and closed with string run through eyelets on each side. It was designed with a close-fitting waist line with a deep vent on the center back and side seam under the waist line. Sleeves are 3/4 length and feature a cut over the inside of the elbow to prevent wrinkles when the arm is bent.

The late 19th-century jacket features a close-fitting waist line made by two darts in the front bodice panel (Fig. 3). The back-bodice panel is composed of three panels which further tighten the waist line. There is a train on the center back under the waist line. It has a high neck line and an attached standing collar. Sleeves are in two pieces with different widths and feature the same bent elbow as the 17th-century jacket.

2. Experimental Garment Development

The experimental garments were made from 30s muslin according to the original patterns. Before sewing machine has been invented in 19th century, all garments were made with hand sewing and there are some books mentioning how to saw historical costumes(Stowell & Lauren, 2017;Baumgarten et al, 1999). However, as there are limitation to make all experimental garments with hand sewing, the experimental garments are made using sewing machine and all seams are all plain seam. After each garment was made, a fit test was conducted to determine whether any structural changes were necessary to ensure proper functionality, such as closing the jacket. No corrections were made to the 17th-century jacket. The 18th-century jacket's neckline circumference was reduced by 2.5cm on the center back because it was affecting the fit. The sleeves were shortened by 3cm because the sleeve cuts were not functioning properly. The 19th-century jacket was enlarged according to the pattern, but the underarms, the front neck, the waist, and the sleeves were too tight to wear. The underarm point of the bodice was lowered by 2.5 cm and the center front top edge of the bodice was lowered by 3.7cm.The width of the front darts were reduced by 6cm and the underarm gore panel was widened by 2cm to increase the waist circumference by 8 cm. The sleeve circumference was increased by 1cm (Table2).

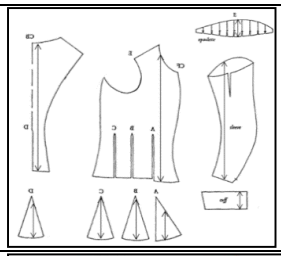
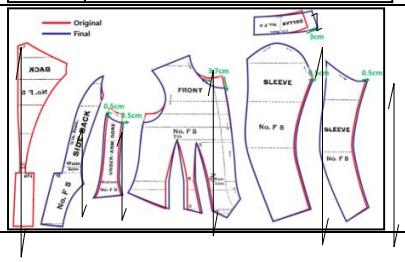
While the fit model was wearing the bodice, several points were marked on the 17th- and 19th-century jackets before attaching the sleeves. These points were not marked on the 18th-century jacket because they were included in the original pattern. The sleeve top and underarm points were the highest and lowest points of the sleeve pattern, respectively. The front and back sleeve top lengths were measured with respect to the underarm point. The bodice under armhole point was determined by first finding the difference between the circumference of the bodice arm hole and the circumference of the top of the sleeve that attaches to the bodice. The circumference of the top of sleeve was then shrunk to match the circumference of the bodice arm hole. The front and back of the sleeves were shrunk at a ratio of 1:2 given the mechanics of arm movement.

The experimental garments used in this study were custom made for the fit model. The fit model was 160 cm tall, with a bust size of 82 cm and a waist circumference of 62 cm.

3. Measuring Posture Changes

The experimental garments were uncomfortable to wear because of pressure on the anterior midaxillary point in a natural posture. Maintaining an erect posture relieved the discomfort. In this study, we photographed the fit model's natural and erect postures from the side wearing each jacket. According to study by Smith et al. (2008), photographs are viable tool for comparing the posture changes. The postures were analyzed according to the horizontal difference between the region and the lateral shoulder point. Even though it is easy to misplace the exact location depending on the chosen anatomical region, shoulder point is considered as a large measurement point and it may not suffer that much with error (Rosario et al., 2012).

Table2: Original experimental garments and their modifications

Style	Pattern and Correction	
1610 embroidered jacket		-No correction
1775–1785 calicojacket		-Back neck circumference: -2.4cm -Sleeve length: -3cm
1891 riding habit		-Armhole point: -2.5cm -Front neck point: -3.7cm -Bust circumference: +2cm -Waist circumference:+8cm -Sleeve circumference:+1cm -Collar seam:+3cm

4. Garment Pressure Measurement

Garment pressure was measured using the fashion design software package CLO 5.0. The fit model avatar was created based on the fit model's measurements. The avatar was given a natural posture using the programs default posture setting and was manipulated to mimic the fit model's posture for the erect posture condition. The garment pressure was measured at the nipple, anterior midaxillary, posterior midaxillary, and lateral shoulder points by styles and postures.

III. Results and Discussion

1. Changes in Posture

The fit model's natural postures differed according to jacket style despite the fact that she made no effort to correct her posture. The longest horizontal distance between region and lateral shoulder point was 2.9 cm produced by the 17th-century jacket, likely because the epaulets exerted a relatively significant amount of backwards pressure on the shoulders. The shortest horizontal distance between region and lateral shoulder point was 1.1 cm produced by the 18th-century jacket. This result was likely a product of the fact that the shoulder panels between the front and back panels of the bodice reduced pressure on the shoulders and so allowed the fit model to keep a relatively natural posture. The second-longest distance of 2.2 cm was produced by the 19th-century jacket, likely because it lacked epaulets but the angle of the shoulder seam on back bodice panel was fairly acute, pulling the shoulders back.

The horizontal difference between the trainband the lateral shoulder point increased by 5.6 – 7.1cm in the erect posture. The 19th century jacket produced the greatest difference in postures of 4.9cm, followed by the 18th century jacket at 4.5 cm, and the 17th century jacket at 3cm.Although each of these jackets provided some posture improvement and caused the fit model to adjust her posture further to avoid discomfort, the 19th-century jacket had the greatest effect while the 18th-century jacket had the least.

Table3. Experimental results

Posture	17th century	18th century	19th century
Natural posture	 2.9cm	 1.1cm	 2.2cm
Erect posture	 5.9cm	 5.6cm	 7.1cm
Difference	3.0cm	4.5cm	4.9cm

2. Garment Pressure

The simulation showed that the 17th-century jacket produced significantly more pressure than the other two jackets. The 17th-century jacket produced the greatest pressure on the lateral shoulder (Natural: 466.11Kpa, Erect: 394.46Kpa) and posterior midaxillary points(Natural: 430.41Kpa, Erect: 281.71Kpa) (Table 4).
The greatest difference in pressure of 148.7Kpa between postures was produced by the 17th-century jacket on the posterior midaxillary point. The 18th-century jacket produced the greatest pressure on the nipple point(Natural: 89.89Kpa, Erect: 37.97Kpa).The greatest difference in the pressure between postures was produced by the 18th-century jacket on the nipple point(51.92Kpa) and the lateral shoulder point(30.71Kpa). The 19th-century jacket generally produced less pressure than the other two jackets and the jacket specially produced the low pressure on the posterior midaxillary point(Natural: 2.64Kpa, Erect: 7.43Kpa).

Table 4: Simulated garment pressure

Units: Kpa

Part / Style	Posture	Nipple point	Anterior midaxillary point	Posterior midaxillary point	Lateral shoulder point
17th century Jacket	Natural	273.85	299.29	430.41	466.11
	Erect	207.81	254.52	281.71	394.46
	Nature-Erect	66.04	44.77	148.7	71.65
18th century Jacket	Natural	89.89	31.36	16.49	45.81
	Erect	37.97	23.88	9.01	15.1
	Nature-Erect	51.92	7.48	7.48	30.71
19thcentury Jacket	Natural	22.53	26.65	2.64	27.98
	Erect	34.58	12.03	7.43	19.00
	Nature-Erect	-12.05	14.62	-4.79	8.98

The difference in the pressure between postures was not that big, on the contrary, the pressure on the nipple and the posterior midaxillary point is increased in erect posture. Increasing the pressure on the posterior midaxillary point in erect posture is related to its circumference of bodice armhole. The circumference of bodice armhole is smallest on 19th-century jacket(36cm) comparing the 18th-century jacket(37cm) and 17th century jacket(38.6cm). The tight armhole of 19th-century jacket relieves the pressure on the anterior midaxillary point and increase the pressure on the posterior midaxillary point as the posture changed from natural posture to erect posture, because there is no room on the shoulder.

IV. Conclusion and Implications

This study compared the effect of 17th-,18th-, and 19th-century women's jackets on women's posture. These jackets were shown to fit tightly and put pressure on the anterior midaxillary point, pulling the shoulders backward when the fit model worn it. Each of the experimental designs included features that would facilitate the wearer's movement even though it is tight, in the form of either bent sleeves with two-pieces sleeves of 17th century and 19th century jacket or slits diagonally to create sleeve opening above the inside of the elbow of 18th century jacket.

The study is significant for comprehending the fit characteristic of the historical costume by analyzing the silhouette characteristics of Historic women 's costume. This study showed that historical women's clothing characteristics can have a significant effect on the wearers' posture.

Acknowledgements

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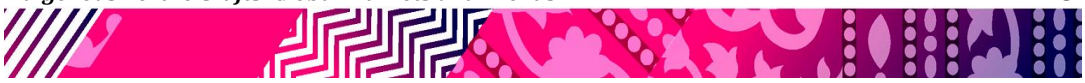

TP-04

FIT ANALYSIS OF 19TH CENTURY WESTERN MEN'S TAILCOATS USING A 3D VIRTUAL CLOTHING PROGRAM

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Abstract

The 19th-century men's tailcoat is worn as part of formal dress or opera stage costumes in modern times, but their wearers often complain of significant discomfort. This study evaluated the fit problems that modern Korean men would experience when wearing three types of 19th century Western men's tailcoats while assuming a natural posture. Fit problems were evaluated by analyzing garment pressure distribution. Each type of experimental tailcoat placed a significant amount of pressure on the lateral shoulder and axilla. This result was caused by the fact that men in the 19th century would have been expected to adopt a more erect posture when wearing tailcoats. Given that men today adopt a more natural posture than men did when tailcoats were designed, tailcoat designs should be updated to ensure wearer comfort.

Keywords: 19th century, tailcoats, historic pattern, fit evaluation, 3D virtual clothing program

1. Introduction

Historic costumes continue to influence modern clothing through historical investigation, imitation, and reinterpretation. Tailcoats were a popular men's garment in the 19th century but are still worn as part of opera or musical performance costumes or official ritual dress. Tailcoats were designed for a time when men would be expected to maintain a more erect posture. However, wearers today maintain a more natural posture regardless of their clothing and so find wearing tailcoats to be uncomfortable.

The 19th century saw the establishment of modern society through the Industrial Revolution and the French revolution. It also saw the foundation of costume culture. One of the characteristics of 19th century costumes caused by the Industrial Revolution was the systematization, unification, and universalization of production standards and norms (Jacques, 1964, 2011).

Tailcoats became popular in the early 1820s. They were adopted for all dress occasions, both day and evening, except for royal court attendance. They came in both single- and double-breasted styles, were fitted closely at the waist, and featured tapered leg-of-mutton sleeves that were long enough to graze the knuckles. Their high-rolled collars retained the "W" shape notch in the lapels which had been popular since the early 1800s. Men desired to create a full chest line that they wore double-breasted vests and cinched their waists with corsets. Tails originally went below the knee but began to shrink in the mid-1820s. Below-knee-length tails came back in fashion in the 1830s (Payne et al., 1992). Tailcoats could still be worn as part of formal day wear in the 1840s,

but they came to be seen as more appropriate for evening dress. By the 1860s they were worn exclusively as part of evening wear (Byrde, 1979) and remain a part of formal evening dress today (Waugh, 1964).

Studies reproducing Western men's historical costumes using original patterns and sewing methods have been conducted in South Korea (Ryu & Kim, 2015). There have also been studies about the redesign and adaptation of historical designs to suit modern tastes and needs (Ann, 2006). However, there has been significantly less such research on men's costumes than on women's costumes (Kim, 2006; Kim & Jung, 2007; Park & Choi, 2008; Kim & Ryu, 2016).

Historical costume manufacturing research can produce a detailed understanding of production techniques and their products. Unlike the current ready-to-wear clothing manufacturing system which relies on only a few body dimensions, historical garment production methods used substantially more dimensions (Ryu & Kim, 2015). Body shapes change across history such that modern people may have difficulty wearing historical costumes without adjustment.

Such adjustments can be made using a virtual fitting program in which historical costumes are digitally represented and adjusted to fit modern wearers before being produced. Virtual reconstruction using a three-dimensional ("3D") systems increases costume production precision and accuracy (Kuzmichev et al., 2018).

This study aimed to diagnose fit problems that modern Korean men experience when wearing historical Western men's costumes. This study compared the fit of three different styles of tailcoats popular during the 19th century. Fit problems were diagnosed by live model and virtual fit tests.

2. Method

2.1. Experimental garments

The patterns used in this study were selected from "The Evolution of Fashion: Pattern and Cut from 1066 to 1930" which is a standard source for historical men's clothing patterns (Hill & Bucknell, 1967).

This book featured three tailcoat patterns from 1805, 1830, and 1900, all of which were used to produce experimental garments. Tailcoat patterns for the live model fit-test were developed to fit the standard Korean man with a chest circumference of 96 cm, a waist circumference of 78 cm, and a height of 173 cm (Size Korea, 2015). The experimental garments were made from 30s muslin(Table 1).Each tailcoat had a tight waist which moved downward over time between the patterns. The 1805 and 1830 tailcoats had leg-of-mutton sleeves and the 1900 tailcoat sleeves had a narrow upper arm and a wide wrist (Fig. 1).

2.2. Fit Evaluation

The fit of the experimental garments was tested using live model and virtual tests. The live model was a man with approximately standard measurements. The garment pressure in the virtual model fit test was measured with the virtual model in natural and 19th century Western men's formal postures (Fig. 2). The virtual model fit test was conducted using the 3D CLO 5.0 program. The program measured garment pressure on the lateral shoulder, anterior axilla wall, anterior midaxilla, posterior axilla wall, and posterior midaxilla. 3D CLO 5.0 was also used to measure the similarity between the appearance of the live and virtual fit tests (Kim et al., 2014) and quantitative evaluation of reliability (Lee et al., 2016).

Table 2: Properties of muslin used for tailcoat patterns

Properties / Fabric	Composition (%)	Weave	Thickness (mm)	Density (ply/2.5cm)	
				Warp	Weft
30sMuslin	Cotton 100	Plain	0.43	71	70

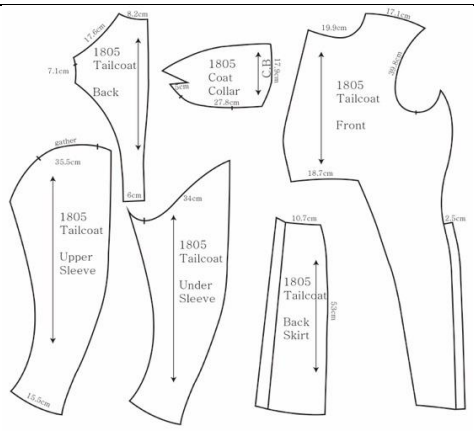
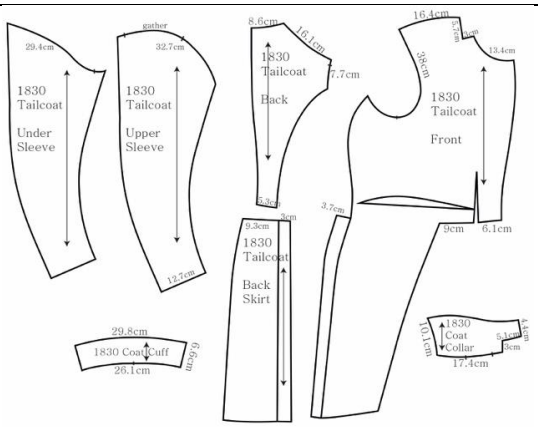
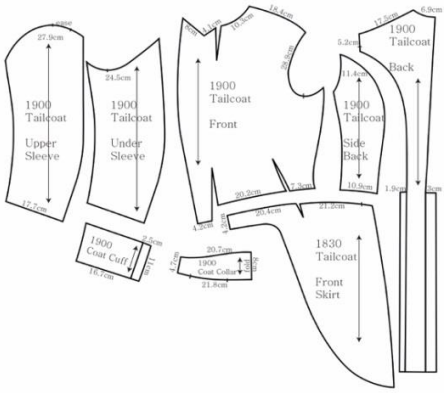
	Patterns	Live model fit	
		Front	Side
1805 Tailcoat			
1830 Tailcoat			
1900 Tailcoat			

Figure 1: The experimental garments

Modern men's normal posture of avatar	19th Century men's formal posture of avatar

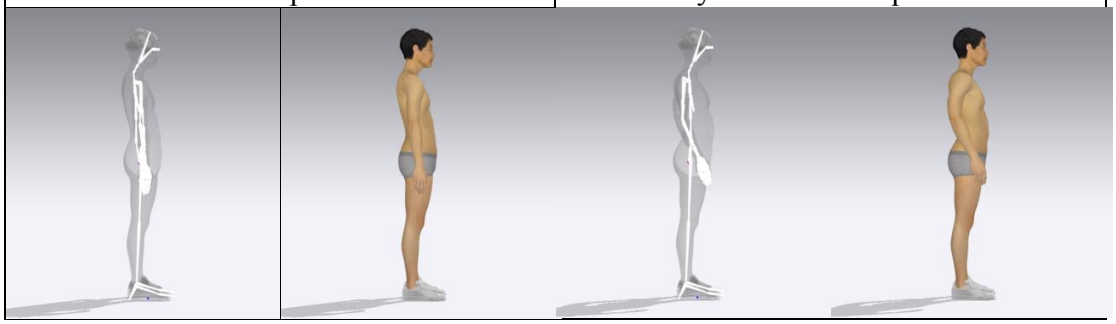


Figure 2: Postures for fit test

3. Results and Discussion

In the natural posture, the live model reported that the 1805 and 1830 tailcoats were tight around the shoulders and armpits and that the sleeve length was long. In the natural posture, the pressure on the shoulders and armpits limited motion and caused underarm discomfort. This pressure and resultant discomfort decreased in the formal posture. The virtual fit test showed that all three types experimental garments placed the greatest pressure on the anterior axilla wall (40.01–50.99 Kpa) and the second-greatest pressure on the lateral shoulder (20.01–24.64 Kpa) in both postures (Table 2). The 1830 garment placed significant pressure on the posterior midaxilla (18.96 Kpa). Both tests showed that the tailcoats placed significant pressure on the lateral shoulder and anterior axilla wall.

Table 2: Garment pressure of virtual model

Units :Kpa

Garment \ Body parts		Lateral shoulder	Anterior axilla wall	Anterior midaxilla	Posterior axilla wall	Posterior midaxilla
1805	Natural posture	24.62	40.01	11.18	4.96	8.80
	Formal posture	10.97	30.00	9.25	8.74	4.74
	Natural – Foramal	13.65	10.01	2.03	-3.79	4.06
1830	Natural posture	14.91	47.14	7.48	7.33	18.96
	Formal posture	12.51	32.14	11.32	20.13	15.14
	Natural – Foramal	2.4	15	-3.84	-12.8	3.82
1900	Natural posture	20.01	50.99	15.99	4.99	15.04
	Formal posture	16.93	26.95	9.25	4.70	7.13
	Natural – Foramal	3.08	24.04	6.74	0.29	7.91

Adopting a formal posture significantly reduced pressure on the anterior axillar wall (10.01–24.04 Kpa). The lateral shoulder experienced the greatest reduction in pressure when wearing the 1805 garment (13.65 Kpa). However, the 1830 garment increased pressure on the anterior midaxilla and posterior axilla wall

4. Conclusion

This study showed that 19th century tailcoats are uncomfortable for modern Korean men due to the pressure they place on the anterior axilla wall but that such discomfort can be relieved when adopting a formal posture characteristic of 19th century Western men. The body shape and size of modern Korean men might be different from western men in the 19th century. It is necessary to alter tailcoat patterns to better suit modern Korean men's habits and behaviors. In so doing, the fashion industry can ensure that a treasured historical garment remains relevant for two more centuries, creating a truly timeless classic.

Acknowledgement

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TP-05

A STUDY ON PROCESS OF BLACK NATURAL DYE OF RAJASTHAN AND ANDHRA PRADESH

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Abstract

India is famous for Indian Textiles, each region specialized in a different set of motifs, techniques, colours and in different trade routes- the western coast preferred the block-printing method, while the eastern coast preferred brush-painting (Kalamkari). India has a diversity of different cultural background where different methods are used for dying fabrics with natural black dye, in traditional handicrafts and also its variation on its application. It also reveals that black natural dyes can be used safely as they contain natural ingredients and metals because of their eco-friendliness and their various colour-fastness properties on different fabrics. This paper presents a comparative study of natural dyes and particularly on the area of black natural dye in Indian handicraft. The Purpose of the study was to document the process of manufacturing natural black dye in different regions and its application on different fabric & to study the effects of black natural dye in Rajasthan and Andhra Pradesh. The research is exploratory in nature and the data collected is both quantitative and qualitative. The samples chosen were Bagru near Jaipur, Pipad village near Jodhpur and Machilipatnam from Andhra Pradesh. The tools used were interviews, photography and informal discussions. Field trips were conducted in various clusters of Rajasthan and Andhra Pradesh. A market study was carried out to understand the demand of black natural dye in the market by studying its demand in the field of study as well as on online websites.

Keywords: Black natural dye, handicraft, eco-friendliness, colour fastness

Introduction

Natural dyes are traditionally used in certain parts of India. It is believed that out of 47,000 plant species occurring in India, over 500 plant species can be used as raw materials for the production of natural colouring matters. Besides animal and mineral, raw materials are also available in abundance of India for obtaining natural dyes. Colouring matter was extracted from the roots, stems, leaves, flowers, barks and fruits of plants and from certain insects and shellfish by an elaborate series of extraction processes (H & K, 2014)

Natural dyes can be categorized under vegetative or animal origin. Until the latter half of the nineteenth century, all dyes with the exception of few mineral colours were of animal or vegetable origin (H & K, 2014).

Black is one of the most difficult colours to reproduce, especially using natural vegetable dyes. It concluded that very few substances could produce a solid black. Natural black dyeing could be classified into four types: compound blacks formed from a combination of dyes such as blue indigo, red madder and yellow weld, astringent blacks

based on a source of tannin such as gall-nuts, sumac, or wood bark combined with an iron mordant; logwood blacks, based on logwood and a mordant of iron, and chromate blacks, produced with a chrome mordant such as chromate of potash

Perhaps the oldest way of obtaining black, and the most frequently used in India in the recent past, was by using a tannin-rich dye bath and then mordanting the tannis with mud taken from a stagnant pond, riverbed or wet rice paddy- the mud containing ferrous iron. Mud dyeing is considered to be one of the oldest dyeing techniques used by indigenous cultures (www.asiantextilestudies.com, 2019).

Colours associated with inauspiciousness such as black and blue were typically worn by the "lower" castes, a practice visible even today, in rural India. Curiously, the artisan who took on blue and black dyes was placed in a paradoxical relationship with the rest of early society (www.thecocompany.in, 2019). Each region in India specialized with a different set of motifs, techniques, colours and in different trade routes- the western coast preferred the block-printing method, while the southern coast preferred brush-painting dye (Kalamkari). Some used the brush such as at Kalahasti, while others used a block for the application of mordants. Popular colours like indigo (blue) were extracted from the bush Indigofera tinctoria and the madder root was used in combination with mordants to produce black (www.thecocompany.in, 2019).

This paper presents a comparative study of natural dyes and particularly on the area of black natural dye in Indian handicraft. The Purpose of the study was to document the process of natural black dye in two different regions of Rajasthan and Andhra Pradesh. To study its application and effects of black natural dye on different fabrics. Also, the significance of different fabrics and colour combination used in two different regions making the craft distinct with the same raw material.

Methodology

The research was the descriptive study which aims to document the process of black dye, raw material, different types of fabrics. The purposive random sampling method was used to collect the data. The data collected was qualitative. The first hand data was collected by documenting craftsperson from Bagru and Pipad village of Rajasthan and Machhalipatnam from AndhraPradesh. The tools used were questionnaire, observation and photography to document the craft. The craft was analysed by comparing the craft on the basis of raw material, Process, Effect on different fabrics of two different regions,

. This was done by visiting the workplaces of various artisans/craftsmen situated in areas of Rajasthan (Bagru near Jaipur and Pipar city near Jodhpur) and Andhra Pradesh (Machilipatnam)

Raw Material and Process for Rajasthan Region

In Rajasthan the washed fabric was treated with 15-20 percent Harda (Myrobalan) as a Pre mordant. The cloth turns yellow/off white after it has been treated with Harda. It is then dried and taken for further processing. The black colour is produced when ferrous (from rusted iron) combined with tannic acid (present in Harda). This paste is prepared with rusted iron (from horseshoe nails) and Jaggery.

The mixture is kept in earthen pots under shadow for 15 to 25 days depending upon the weather. The resultant paste that has been made by fermenting iron rust and jaggery is known as "Syahi". In case of block printing natural gum is added to this paste.

The raw material (Fig.1) needed for block printing of Bagru (Rajasthan) were:

1. Harda / Myrobalan (Fig.1-a): An amount of 25-30% Harda is used to give the tannin treatment. It is not possible to obtain black colour without tannin treatment. Half of the tannin is used in the first stage as in part of pre mordanting. Alum is also used as an Mordant.
2. Rusted iron(Fig.1-b) + Palm Jaggery (Fig.1-c): An amount of 2.5 kg Jaggery + Crushed tamarind seeds (as per the required density) and 3-4 kg iron pieces are roasted until they become red hot. They are then removed and washed thoroughly with cold water so that it gets rusted. Tamarind seed are required to extract tannin which acts as in natural mordant and is required according to density of the dye solution/paste.
3. Alizarin+ Purpurin flower (Fig.1-d): Used as a mordant in case of post mordanting. Dried purpurin flower is used along with alizarin in the post mordanting process. Where the dyed fabric is boiled in water along with alizarin and dried purpurin flowers.

Fig.1-a: Harda Powder

Fig.1-b: Rust Iron

Fig.1-c: Palm jaggery

Fig.1-d: Alizarin & Purpurin flower

Raw Materials (Fig.1)

Fig.2-a: Scouring & washing

Fig.2-b: Pre mordanting

Fig.2-c: Drying of fabric with Harda

Fig.2-d: Dyeing

Fig.2-e: Post mordanting with alizarin

Fig.2-f: Finished Fabric

Process (Fig.2)

Process:

(Note- Material to Liquor ratio will always be 1:20,which means 1 kg of fabric will be treated in 20 litres of water/dye solution/mordant solution)

In case of pre mordanted fabrics post-mordanting is optional.

1. The fabric is first soaked in water for about 2 days to remove all the starch and other foreign materials.This fabric is then boiled in water along with detergent for about an hour. The ratio was 1:20,which means 1 kg of fabric will be boiled in 20 litres of water.(Fig.2.a)
2. A solution is made using Harda (Myrobalan) and then washed fabric is first dyed in that solution, later attaining a pale-yellow colour. (Fig.2.b)
3. It is then dried under the sun. (Fig.2.c)
4. The dye solution comprised of the following process:100 kg of rusted iron is left in 200 ml water along with 15-18 kg of jaggery and is left to ferment. Another solution is prepared simultaneously consisting of crushed tamarind seeds made into a powder, soaked in water and boiled. Both the solutions are combined and mixed properly and left in that state. This solution is left in that state for about 20 days if its summers or 1 ½ to 2 months in winters. The time required for the fermentation process depends upon the weather conditions. The resultant black paste is known as 'Syahi'. Fixation process – the fabric is then dyed in the above made solution and then dried under the sun. (Fig.2.d)
5. Later the dyed fabric is put into boiling water containing alizarin and dried purpurin flower. (Fig.2.e)
6. The fabric is then naturally dyed black. This fabric is later boiled again to remove all the extra dye particles on the surface.
7. In case block printing has to be done using 'Syahi' natural gum is mixed into the dye solution to increase its density so that it becomes fit for printing. (Fig.2.f)

Motifs (Fig.3)
Image source – Titanwala Textiles, Bagru, Rajasthan

Raw Material and Process for Andhra Pradesh Region

1. Water: 1.5 litres + Harda (Myrobalan): 100 gm + Alum: 2 tablespoons :Pale yellow /greenish yellow colour is achieved from the fruits of Myrobalan. All the ingredients are used in textiles as mordants. The treated fabric also serves to absorb metallic mordants.
2. Cane jaggery (300gm) + rusted iron filings (2 kg) + water (12 litres):The raw materials are immersed in water for 15 to 20 days to stabilize. Ferrous acetate is the result of

reaction between iron and molasses. Then cloth is treated with Myrobalan. Then reaction between tannin and Ferrous Acetate gives black colour.

3. Indigo leaves & sand: Locally available sand near river banks is mixed with indigo leaves, allowed to settle and filtered. The solution is left for 21 days after mixing with indigo leaves. Dark blue or light blue is obtained by the time duration taken for the process. Indigo blue is obtained by proper 21 days of process.
4. Pomegranate: Persistent calyx is the upper part of the pomegranate is used. Making into fine powder and is then mixed with water. It is then heated at a very high temperature, converting it into a thick paste. Storing the paste for a week and crushing by hand produces yellow colour.
5. Catechu + Alum: For a minimum 3 days, catechu mixed with alum is soaked in water to soften it, then boiled. Stored for 8 to10 days before use.

PROCESS (Fig.4)

(Note- Material to Liquor ratio will always be 1:20, which means 1 kg of fabric will be treated in 20 litres of water/dye solution/mordant solution)

1. Required size of grey cloth is soaked in water for 1 hour and washed thoroughly to remove the starch and then dried. The prepared grey cloth is soaked in the myrobalan solution in the pot for ½ hour. The excess solution squeezed and the fabric in allowed to dried in open field. (Fig.4-a)
2. The outlining of the main theme and figure are drawn free hand with the help of charcoal twigs.The charcoal outline is traced with a kalam (massa/rekh) giving a permanent black outline. Finer details of the theme are also painted.(Fig.4-b)
3. The fabric is spread on a woollen rug and the portion which are to appear red are painted with the alum solution. The cloth is dried in shade for a day. (Fig.4-c)
4. The alum painted fabric is put into the red dye liquor and boiled for an hour. This gives a brownish red shade and the process may be repeated if a dark shade of red is preferred.
5. The cloth after developing the red on the alum painted pattern is to make the unpainted portion white, if desired.

Fig 4.a: Myrobalan treatment and drying of fabric.

Fig 4.b: outlining with kalam

Fig 4.c: cloth dried in shade

Fig 4.d: canal wash

Fig 4.e: Boiling in jaaji aaku

Fig 4.f: Washing in pits

Fig 4.g: Second color printing

Process (Fig.5)

6. After canal wash the fabric is boiled with jaaji aaku (*Holarrhena pubescens*) (Conessi) along with dyes, then boiled. This solution is done to prevent spreading of colour and making the surface leathery.
7. The treated fabric is spread on a blanket and the portions desired to be yellow, blue and green are painted with the help of kalam. Once painted, the fabric is allowed to dry in sunlight and washed the next day.

   To conclude, most of the ingredients used in Bagru and in Andhra Pradesh are almost same except for raisin which is used in Andhra to give an even more darker shade to the black natural dye.Black natural dye is more prominently seen in the border motifs of Kalamkari as compared to motifs of Bagru.

Paisley motif

Geometrical

Figurative motifs

Motifs (Fig.5)

Image Source- Prasad Kalamkari, Pedana, Machilipatnam, Andhra Pradesh

Results and Discussion

The comparative study of the two regions is written below under different headings.

Fabric:

In Pipad, Rajasthan the grey fabrics used for printing is normally cotton, cotton with silk or pure silk most and now they have also started printing on wool. The grey fabrics are primarily sourced from Ahmedabad, Kota and Mumbai**.** Another part of Rajasthan is Bagru there they use almost all kinds of natural fabrics which vary as per their count. In Machhalipatnam, Andhra Pradesh the most common fabrics used for Kalamkari were cotton, silk and Chanderi**.**

Black Natural Dye

The following image shows the employment of black natural dye in block printing (observed in Bagru, Jaipur, Rajasthan). Here black natural dye is used as a source of pigment material directly block printed using wooden blocks (traditionally)

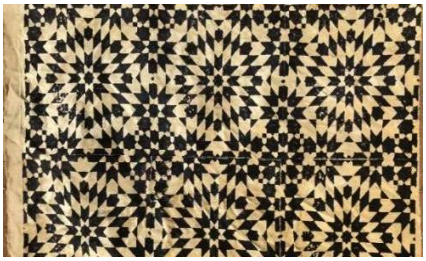

Image Source-Titanwala Textiles, Bagru

The below image shows the employment of black natural dye in Kalamkari (Pedana, Machilipatnam, Andhra Pradesh). Here black natural dye is used in drawing the outline of the motifs. It is done using a kalam and is hand painted. Block printed Kalamkari is also available nowadays.
These images hereby conclude the difference in the employment of black natural dye in two Traditional Indian textiles portraying a parallelism in the usage.


Kalam


Hand printed kalamkari


Block printed kalamkari

Image source - Prasad Kalamkari, Pedana, Machilipatnam, Andhra Pradesh

Motif:

The Bagru block print has a light brown background and it was initially made mainly for the peasants. But the block printed cloth loses its original glowing colour after number of washes. Hence, the dry-cleaning process is always suggested to retain its glow. Syhi-Begar prints and Dabu prints are famous in Bagru block printing. The first one has a combination of black and yellow ochre or cream. And in the second one, few portions of the cloth are hidden from the dye by applying a resistant paste.


Bagru Design with simple motifs


Kalamkari block with intricate motif

Image source – Bagru/Prasad Kalamkari, Pedana, Machilipatnam, Andhra Pradesh

The Barmer block print of Rajasthan is famous for its prints of red chilies with blue-black outlines and there are flower-laden trees in the surroundings. The other famous prints are of horses, camels, peacocks and lions, known as 'Sikar' and 'Shekahawat' prints whereas Kalamkari block prints are done with floral motifs and pastel colours. Traditional motif made at Machilipatnam in Andhra Pradesh, were very detailed and based on Hindu mythology, nature inspired flora and fauna but later they evolved with geometrical pattern under the patronage of the Mughals and the Golconda sultanate. Black colour which they essentially use for outlining the sketches. Also, various shades are obtained using natural colours and treated with a solution of alum, alizarin.

Conclusions

On the basis of the results of the present studies it can be concluded that,

1. Different-different methods are used to manufacture black natural dye, all these methods although being very similar but a change in one- two ingredients was

observed. Natural black dye is not available in the market unlike other natural dyes and it has to be manufactured

2. Usage of black natural dye varied in different crafts, them being used as a pigment in block printing to an outline material in Kalamkari it has made its own way through Indian Traditional Crafts.
3. Most of the ingredients used in Bagru and in Andhra Pradesh are almost same except for raisin which is used in Andhra to give an even more darker shade to the black natural dye. Black natural dye is more prominently seen in the border motifs of kalamkari as compared to motifs of Bagru.
4. Alum is used in both Bagru and Andhra Pradesh as a mordant but in kalamkari Alum is used after every step of dyeing and printing.
5. Motifs of Bagru print are mostly geometrical,floral and line are motifs and the base fabric is generally of a dark color whereas in Kalamkari along with geometrical and floral motifs, Figurative and tribal motifs can also be seen.
6. When different fabrics were dyed, they displayed different results based on their dye uptake. Experiments were conducted on various fabrics such as Cotton, wool, satin, velvet and Harda dyed fabrics. Differences were also observed in the fabrics which were pre-mordanted with Harda and the ones which were post-mordanted and also there was a variation in the colours/shades of the ones that were pre-mordanted with Harda and the ones which were not.

Figurative motif

Floral motif

Image source - Prasad Kalamkari, Pedana, Machilipatnam, Andhra Pradesh

Fabric dyed with black natural dye without then dyed with black natural dye

Fabric pre mordanted with harda and pre-mordanting it witharda(Myrobalan)

a) The above image shows the variation of shades obtained when different kinds of fabrics were dyed with Harda (Pre-mordant) + black natural dye. The fabrics being dyeable velvet, canvas and cotton of different GSMs.
b) The above image shows the variation of shades obtained while different kinds of fabrics were dyed without Harda and only using black natural dye. The fabrics

being dyeable velvet, canvas and cotton of different GSM. The ones dyed were not evenly dyed and the shades obtained were patchy (yellow, brown, grey, black and their tones)

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TP-05

A LIFE CYCLE ASSESSMENT OF NATURAL INDIGO

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Abstract

Natural Indigo a dyestuff extracted from Indigofera tinctoria, is known throughout the ancient world for its ability to colour fabric a deep blue. The raw materials used in the Natural production of Indigo are leaves from Indigofera. Since ages people were using natural indigo as dye stuff. Due to commercialization and technical development happened and some restrictions with natural Indigo textile industry shifted towards chemical dye stuff. Some small companies and artisans have been using natural indigo to make sustainable products. In recent fashion industry demand of Natural Indigo is increasing but major challenge for Natural Indigo is the cost and the quality. To compete the product made with synthetic indigo there must be some solid evidence to prove its preciousness. The study manifests the various impact of natural Indigo vs. Synthetic Indigo on the environment like Eco Toxicity Potential, Photochem Ozone Creation Potential, Acidification Potential, Human Toxicity Potential, Global warming Potential and Primary Energy Demand. The study is useful to understand the life cycle effect of Natural indigo vs. synthesized indigo. Observing the several results it is found that natural indigo provide ample of saving to the global warming and if natural indigo is used instead of Synthetic Indigo it will also reduce the different toxicity among the atmosphere. This life cycle assessment provides clear evidence of the advantages over synthetic indigo which is the current requirement of Textile world.

Keywords: Natural Indigo, Dyeing, Life Cycle analysis,

Introduction

The original vat dye is Indigo, once obtained from plants but now it is also produced synthetically. Synthetic indigo is derived in laboratories through chemical process and makes up the majority of commercially produced indigo dye in the denim industry. The chemicals used in producing synthetic indigo pigment, and throughout the manufacturing process include Aniline, sulphur, sodium hydroxide, hydrosulphate, formaldehyde, which can be harmful to both humans, through inhalation, and the environment where they are discharged after dyeing. The objective of this study is to conduct a Comparative Life Cycle Assessment of "Natural Indigo Dye with Synthetic Indigo Dye". The study will help to understand the various environmental impacts of the selected natural dye products which will then further be communicated to the stakeholders for prioritizing their purchase decisions based on the environmental friendliness of the product. The LCA will also help in differentiating the product from competitors. Life Cycle approach provides a framework and methods for identifying and evaluating environmental impacts associated with the complete life cycle of products and

services, i.e. from the product's raw material extraction to the disposal after useful life of the product. The basis of life cycle assessment is an inventory of all the inputs and outputs of industrial processes that occur during the life cycle of a product, i.e. cradle to grave.

Natural Indigo:

In recent years, there has been a revival of the use of dyes and colors of natural origin for textile products. Among the natural dyes which are becoming widely recognized throughout the world, indigo which is one of the oldest known natural dyes is a derivative of the colorless glucosides of the enol form of indoxyl, e.g. indican (indoxyl-D-glucoside). Indigo, after which this group of carbonyl dyes is named, is one of the oldest known natural dyes. It is a derivative of the colorless glucosides of the enol form of indoxyl, e.g.indican .Extraction of indigo from the leaves of Indigofera tinctoria Linn. investigated chemical constituents including the chemical structure of major components in the water extract from both kinds of plant to develop the extraction method for preparation of ready-to-use natural dyes .Coloring matter (Indigotin) from Indigofera tinctoria plant is usually present abundantly in flowers which give blue color mainly used to dye linen and hairs. Flavonoids, terpenoids, alkaloids, glycosides, Indigotine, Indirubin, rotenoids are the other related compounds abundantly present in the plant. These compounds were found to be responsible for many pharmacological activities such as antihyperglycemic activity, antioxidant, antiinflammatory activity, antibacterial, antihepatoprotective activity, antidiabetic activity and anticonvulsive agent .Classification of scientifically conducted on alkaloid content: indicant glycosides, non-protein amino acids, nitro-propionic acid esters, cyanogenic glycosides, guanidine alkaloids, phenolic acids, phenolic glycosides flavonoids, isoflavonoids. Types of indigo which containing alkaloid compounds as above indicated as a dye . The use of indigo as a dye should be depend on the color. The dye stability will be influence by pH and their chromophore certain in dye

Indigo dye usually has a contained of flavonoids, terpenoids, alkaloids, glycosides, indigotine, indirubin, rotenoids. These compounds were found to be responsible for many pharmacological activities such as antihyperglycemic activity, antioxidant, anti-inflammatory activity, antibacterial, antihepatoprotective activity, antidiabetic activity and anticonvulsive agent . Because of their functions, indigo dyes can be use as a functional food dye.

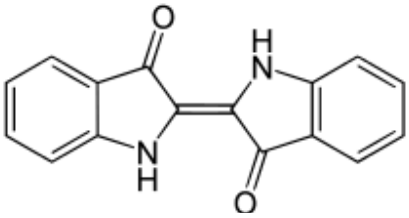


Figure 1: Indigo Tinctoferia Natural Indigo

Objective of the Study

The following section describes the general scope of the project to achieve the stated goals. This includes the identification of specific products to be assessed, the supporting product systems (e.g. materials, technologies, etc.), and the boundary of systems under study, allocation procedures, and cut-off criteria.

LCA Approach

The LCIA phase includes the following mandatory elements: x selection of impact categories, category indicators and characterization models x assignment of LCI results to the selected impact categories (classification) x calculation of category indicator results (characterization) Classification: a mapping of items in the inventory to known environmental effects or impacts (e.g. global warming, acidification, resource depletion, etc.).

Characterization: a calculation of scientifically-based indices; each index being an estimation of the potential impact of the inventory items contributing to a given environmental effect (e.g. global warming potential, acidification potential, resource depletion etc.).

The fourth step, Interpretation, consists of the interpretation of LCI and LCIA results which could be used to reduce environmental impact.

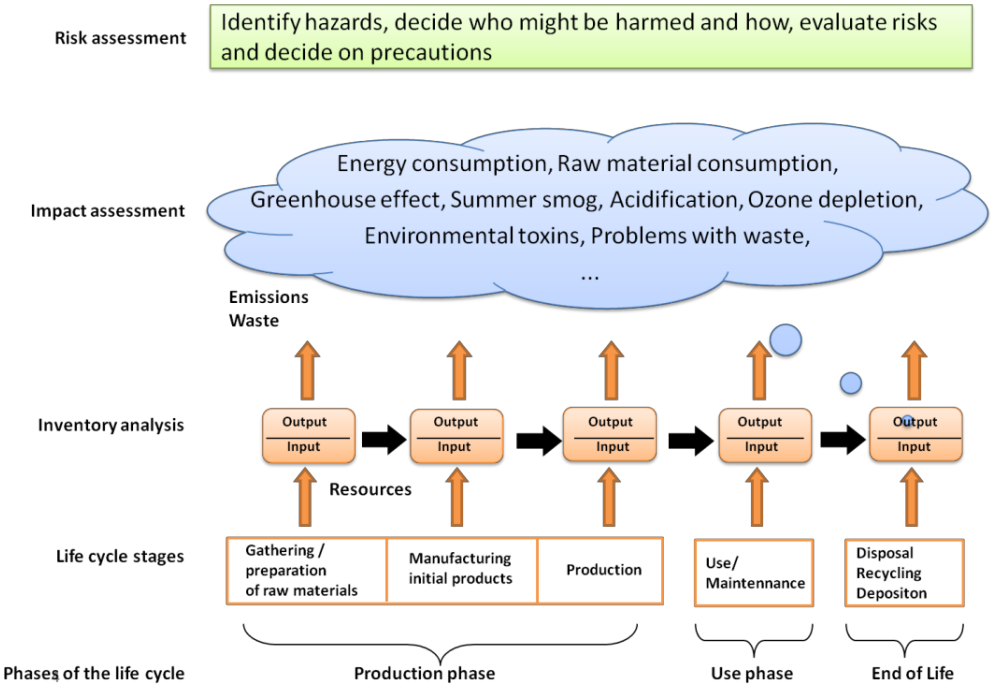


Figure 2: Presents the detailed framework applied to the life cycle assessment

System Description overview

Indigo Cultivation

The concept of Indigo plants farming and Natural dye extraction was the process of growing Indigo naturally- without the use of synthetic pesticides and chemical fertilizers. The only additives come in the form of organic manures, and the soil quality was controlled by means of rotational crops. The impact on the environment was reduced drastically, producing clean and safe Indigo while creating a sustainable cycle. General requirements for organic crop production are as follows:

1. The ideal climate condition for growing Indigo was hot and humid and seeds of Indigofera tinctoria are sown by hand in rich soil.

2. The Indigo dye seeds germinate in 4 to 5 days and the plants grow very rapidly, so there was little need for weeding.
3. No fertiliser was used in the Indigo fields, as this plant belongs to the legume family and captures atmospheric nitrogen for its growth.
4. The Indigo dye plants have grown into vigorous shrubs and are half a metre tall. It was now time for the first harvest to begin.
5. The cut plants are gathered in bundles which takes the freshly cut leaves to the processing plant nearby.

Indigo dye extraction

The Indigo leaves must be as fresh as possible when they are processed to produce high quality Indigo dye. The freshly cut leaves placed in a concrete tank for further processing of dye extraction.

1. Next step to produce Indigo dye was grinding process i.e. output of this process was Indigo powder and residual waste.
2. After the getting Indigo in powder form the further step was fermentation of Indigo power into Indigo water.
3. After the fermentation process, oxidation was the next step to get Indigo precipitate as output.
4. the final step was drying process of Indigo precipitate by using steam and Indigo dye was ready for dyeing process of yarn, fabrics etc.

Yarn dyeing process

Dyeing is the process of colouring textile products like fibers, yarns, and fabrics. It is normally done in a special solution containing dyes and particular chemical material. There are mainly two classes of dye, natural and man-made / synthetic. There are many forms of yarn dyeing of which rope dyeing is more common for Indigo dye. In this method ropes of yarn are then fed into the Indigo dye baths and skied after each dip. The ropes of yarn are rinsed in several water baths to remove any unfixed dye.

The dye is layered by using multiple passes of the rope of yarn into the soluble dye and then exposing it to the air for oxidation. This multiple passing of yarn into dye is called dips. Indigo dye in its normal form is a vibrant blue, it is insoluble in water, and it will not dye cotton fiber. In order to dye cotton, the Indigo must be converted to a water-soluble form and then applied to the cotton. This process is known as chemical reduction. Reducing agents such as sodium hydrosulphite with sodium hydroxide chemically convert the Indigo dye to its soluble form. After rinsing following Indigo dyeing, the yarn ropes pass through squeeze rolls to mechanically extract water. The yarns are then dried and coiled into large tubs. This provides dyed yarn which will further treated to get the right shade if required. In the current study rope dyeing method was considered for analysis of natural vs synthetic Indigo in dyeing of cotton yarn.

Functional Unit

A functional unit is a reference for the product whose lifecycle impact is being assessed. A common reference has been used as the functional unit for this study. The functional unit allows quantification of the environmental impacts of the production procedure for dye production.

The Functional unit for this study was

1 kg of cotton yarn dyed with Natural Indigo dye
1 kg of cotton yarn dyed with Synthetic Indigo dye
Also, for Comparison of dye across cradle to factory gate, the functional unit considered is 1 kg of dye manufactured.

Product System and System Boundaries

The LCA model for 1 kg cotton yarn dyed with Natural Indigo dye represents a cradle-to-gate system, starting from procurement of raw materials as well as cultivation of Indigo in Indian farms, its drying under the sun followed by manufacturing of dye and use in rope dyeing process. The scope covers the ecological information to be divided into raw material production, transportation and manufacturing with onsite utilities as well as the application of dyes in rope dyeing to colour cotton yarn. The material production includes the raw material extraction/procurement, production of the raw materials and auxiliary material production. The production contains the manufacturing and the in-house manufacturing processes and also the transport from supplier to site.

The figures given below show the system boundaries used for assessment.

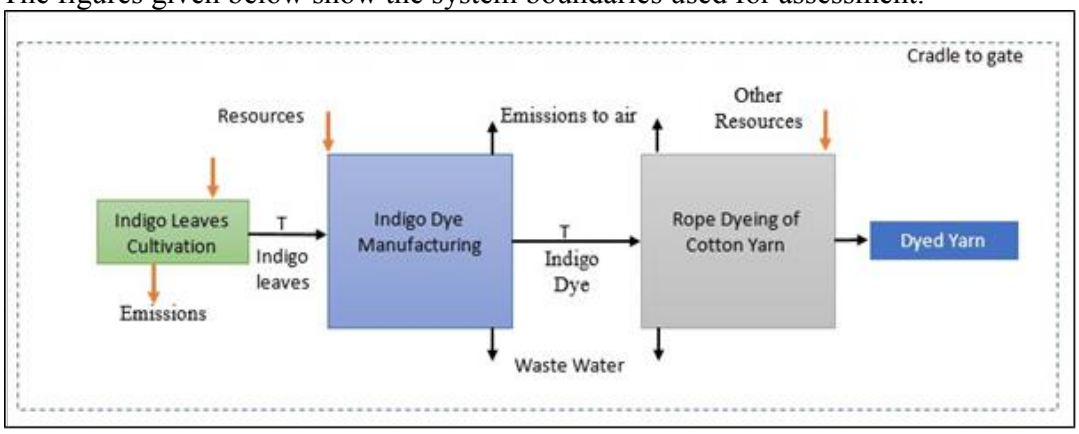


Figure 3: Cradle to gate system boundary of 1 kg of cotton yarn dyed with Natural Indigo dye

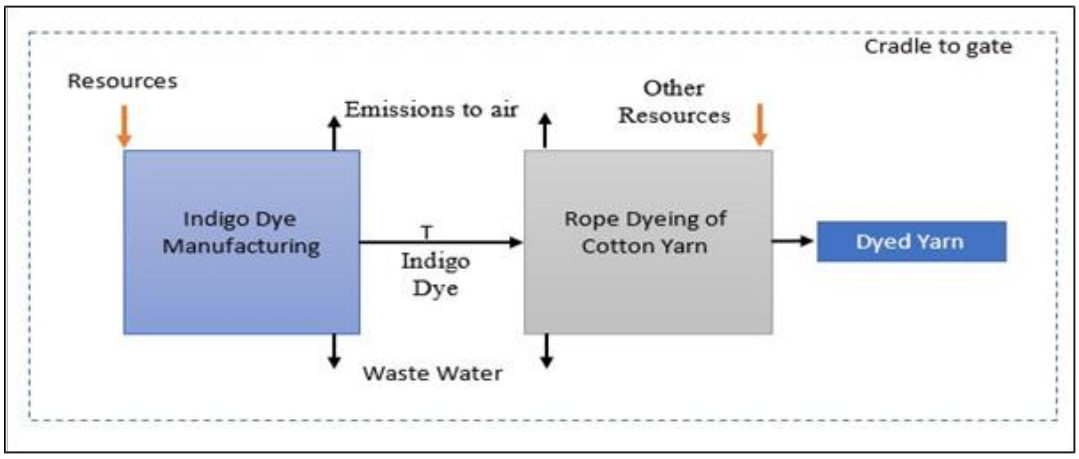


Figure 4: Cradle to gate system boundary of 1 kg of cotton yarn dyed with Synthetic indigo dye

Table 1 Details of System Boundary Included in the Study

Life Cycle stages	Life Cycle sub-stages	Definitions
Materials	Primary raw materials production	Cultivation of Indigo leaves, production of other raw materials used in process
Upstream Transport		Transport of the raw materials to factory gate
Manufacturing of Dye	Manufacturing	Manufacturing of Indigo dye
Manufacturing of dyed cotton yarn	Rope Dyeing Method	Use of dyes and other chemicals for dyeing of cotton yarn

Table 1 summarizes those processes that are included within the system boundaries of the study. In case of Synthetic Indigo dye manufacturing no cultivation phase in included as it is a chemical dye.

Characterization

Characterization involves the quantification of indicator results and conversion of inventory data to common reference units using characterization factors.

Once LCI results have been assigned to impact categories, characterization factors are applied to the relevant quantities, converting the results to reference units. For example, for the impact category Global Warming Potential, the LCI results would give an amount of a greenhouse gas per functional unit. Relative to its contribution to its contribution to the category, each greenhouse gas has an assigned global warming potential (GWP100) characterization factor, which converts the LCI results to the reference unit, kilograms of CO_2 equivalents per functional unit (ISO, 2006b). Figure 5 represents the characterization approach for calculating the life cycle impacts from the life cycle inventory.

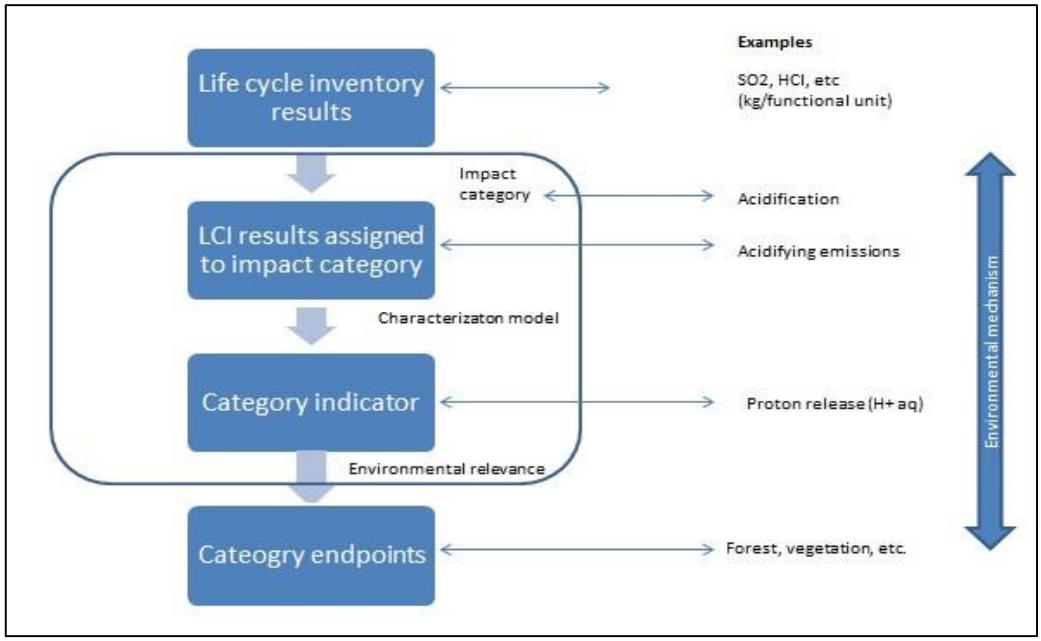


Figure 5 LCI to LCIA Characterization Approach

Software and database

The LCA model was created using the GaBi ts Software system for life cycle engineering, developed by thinkstep AG. The GaBi database provides the life cycle inventory data for several of the raw and process materials obtained from the upstream system.

Life Cycle analysis:

To understand the life cycle of Natural Indigo various parameters related to the study was collected. For this study AMA Herbal has done remarkable work. All data were collected and provided for Indigo dye by visiting the various sites. Site specific data collection questionnaire were prepared and distributed to the coordinators at various sites with the help of the AMA Herbal. In addition upstream data are used for all production and transportation processes. For other systems viz. Synthetic dye, yarn dyeing process data have been collected from industry as far as possible and otherwise from secondary sources such as bibliography, inventories data and literature. In addition to primary process data, each model utilizes GaBi upstream data.

Life Cycle Inventory was list of input and output flow which documents qualitative and quantitative value of material and energy used (as input) and products, by-products and environmental releases (as output) for the product system being studied. LCI was used to understand total emission, waste and resources associated with input and output, which were further analysed using GaBi Software.

System description overview The life cycle of 1 kg of cotton yarn dyed with indigo dye was divided into 3 parts as given below

1. Cultivation of Indigo leaves
2. Manufacturing Indigo dye
3. Rope Dyeing of Cotton Yarn

1.Cultivation of Indigo Leaves

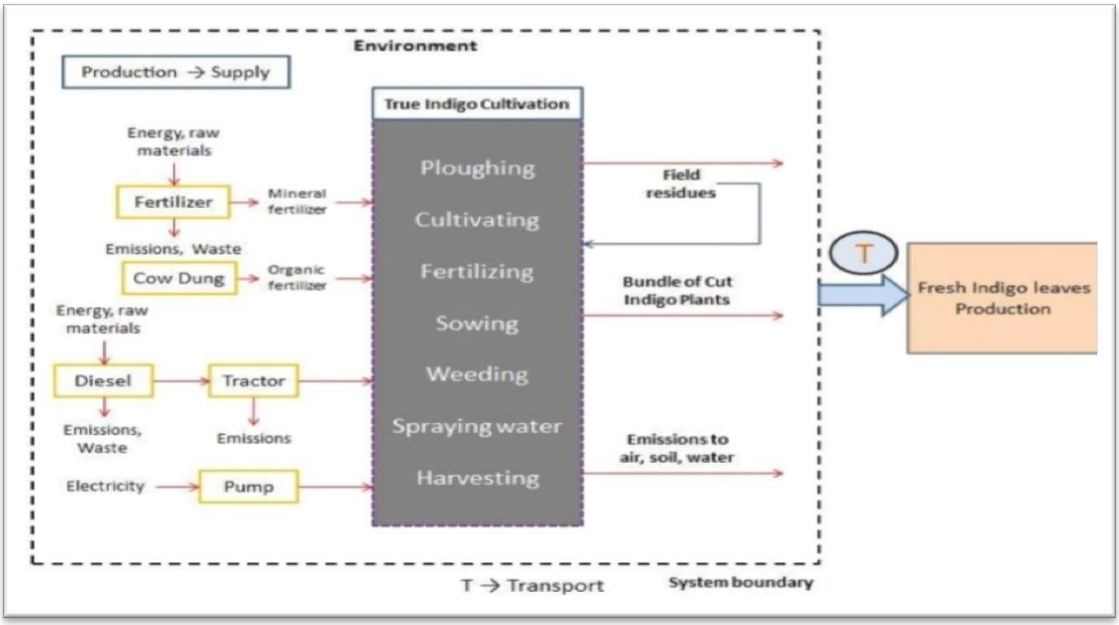


Figure 6: Schematic of System boundary of Indigo Leaves cultivation

2. Manufacturing of Natural Indigo Dye

Rope dyeing consists of twisting the yarn into a rope that was then quickly dipped into Indigo baths. This dyeing was considered a superior dyeing technology where better dyeing uniformity achieved. The system was built using average industry data provided in Annexure A: Data Inventory. The amount of dye consumed differs. The natural dye consumed was @24 gm per kg of cotton yarn whereas synthetic dye was consumed @15 gm per kg of cotton yarn.

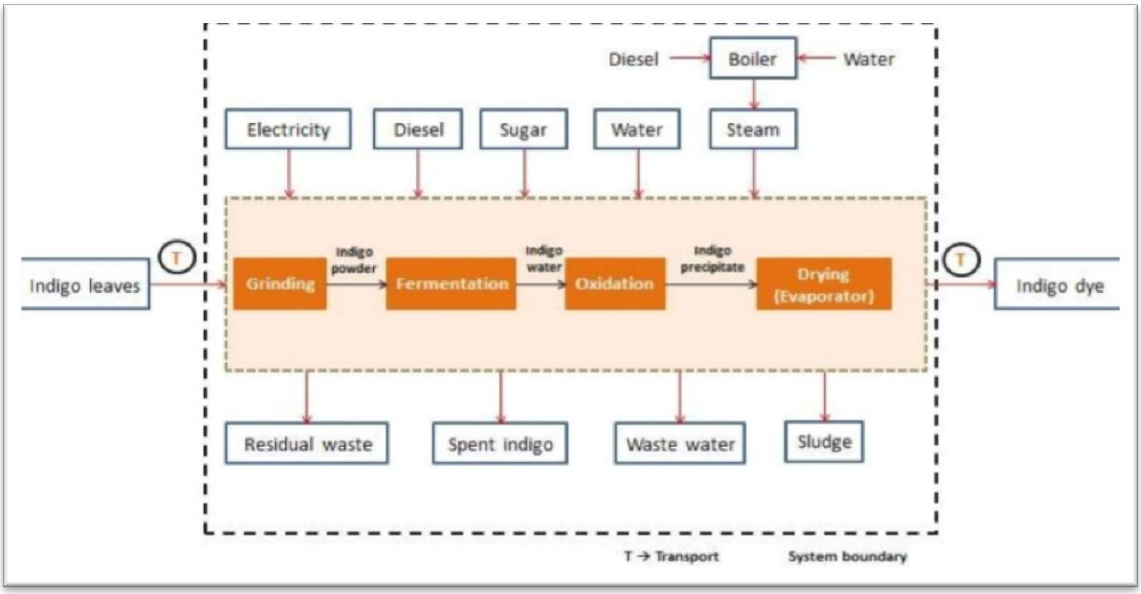


Figure 7: Schematic of system boundry of Indigo leaves cultivation

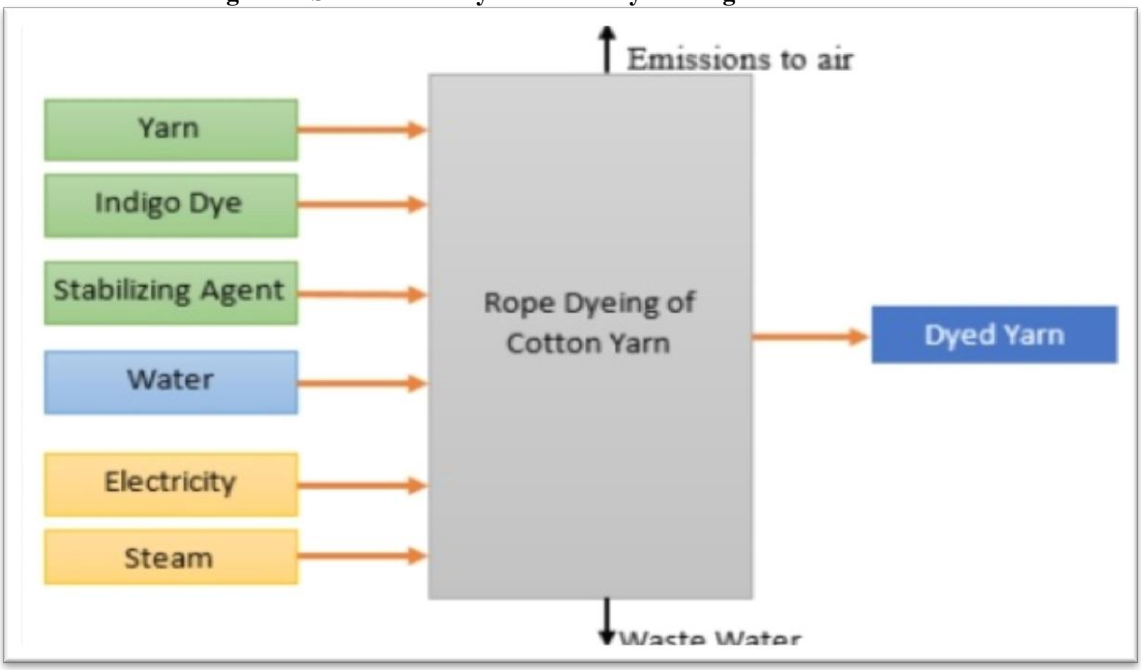


Figure 8: System boundary of Manufacturing of cotton yarn dyed with natural Indigo dye

Result and Analysis

This section provides detailed assessment result of LCIA contributing from life cycle stages collected form the different sources. In the following sections, the impacts from the cradle to gate perspective have been discussed. Table given below shows the results of LCIA for 1 kg of Natural Indigo Dyes with Synthetic Indigo Dye.

Table 2: Cradle to gate results of 1kg of dye manufactured

Impact Categories	Bio Indigo® Dye	Synthetic Indigo dye	% difference
Acidification Potential (AP) [kg SO_2 eq.]	0.12	0.25	51.88%
Eutrophication Potential (EP) [kg Phosphate eq.]	0.02	0.05	61.30%
Global Warming Potential (GWP 100 years) [kg CO_2 eq.]	-0.69	10.38	>100%
Photochem. Ozone Creation Potential (POCP) [kg Ethene eq.]	-3.79E-03	2.90E-03	>100%
Primary energy demand (net cal. value) [MJ]	78.61	200.25	60.74%
Ecotoxicity Potential [CTUe]	4.00E-03	1.78E-02	77.53%
Human Toxicity Potential [CTUh]	1.69E-11	1.88E-11	10.26%

The maximum impact was observed in the rope dyeing process and the impact categories were in the range of 92-99% of the total. The Global warming potential and Photochem. Ozone Creation Potential had a credit coming from cultivation of indigo leaves. Whereas acidification potential had a 4% each contribution from Manufacturing of dye and cultivation phase, respectively.

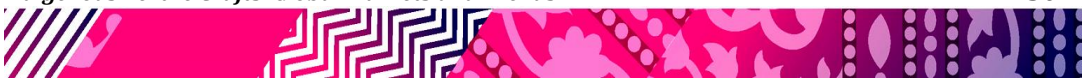
Overall LCIA results of 1 kg of cotton yarn dyed with Synthetic Indigo dye Table given below shows the results of LCIA for 1 kg of cotton yarn dyed with Synthetic Indigo dye.

Table 3: Comparison of LCIA results of dyeing with Natural Indigo dye vs. Synthetic dye

Impact Categories	Bio Indigo® dye	Synthetic Indigo dye	% difference
Acidification Potential (AP) [kg SO_2 eq.]	3.56E-02	4.21E-02	15.55%
Eutrophication Potential (EP) [kg Phosphate eq.]	3.35E-02	3.41E-02	1.93%
Global Warming Potential (GWP 100 years) [kg CO_2 eq.]	8.19	9.03	9.28%
Photochem. Ozone Creation Potential (POCP) [kg ethene eq.]	1.80E-03	2.26E-03	20.08%
Primary energy demand (net cal. value) [MJ]	209.39	227.69	8.04%
Ecotoxicity potential [CTUe]	0.73	0.95	22.62%
Human toxicity potential [CTUh]	3.08E-11	3.60E-11	14.39%

The maximum impact was observed in the rope dyeing process and it was in the range of 92-99% in of the total impact. The Acidification potential had a significant contribution from Synthetic Indigo dye production of 8.74% followed by eutrophication potential which had a 2.16% contribution. Rest of the impacts were seen having 0-2% contribution from Synthetic Indigo dye production.

Conclusions



A comparative LCA study was conducted for 1 kg of cotton yarn dyed with natural indigo and 1 kg of cotton yarn dyed with Synthetic Indigo dye. The main highlight of this study was to understand how a Natural Indigo dye performs in terms of its environmental footprint when applied in the industry. Here the details collected from AMA and other users mainly they have used own agricultural model to incorporate requisite data for analyzing the various environmental impacts associated with cultivation activities. Primary data was also collected from the indigo dye manufacturing plant at AMA Herbals, Lucknow plant and accordingly LCA model for entire value chain was prepared in GaBi software. For the Synthetic Indigo dye stoichiometry was used to develop the production model. When a comparison was made in the application of Dyes in rope dyeing process, Natural Indigo dye consumption was nearly 2 times the amount of Synthetic Indigo dye consumption. This also was a reason why the difference in some impact categories was not much. Thus, improving the technology to better utilize Natural Indigo dye will have more savings potential. When a comparison was made between Cradle to gate of 1 kg of Natural Indigo dye and 1 kg of Synthetic it was observed that Natural Indigo had more than 50% lesser impact. This reinforces the statement that better utilization of Natural Indigo in the textile sector will have more savings potential. Indigo being a legume plant has a lot of N retention capacity. Thus, the GWP and POCP along with other impacts except water consumption was less compared to Synthetic Indigo dye. Maximum impact in the Cradle to gate boundary was due to electricity. Thus, improving energy consumption in manufacturing processes will help further reduce the cradle to gate impact of Natural Indigo dye production.

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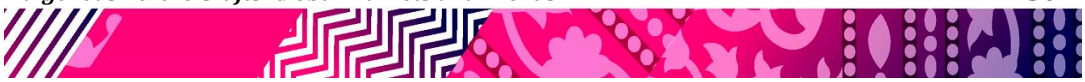

TP-07

HERBAL TEXTILES: GREEN BUSINESS, GREEN EARTH

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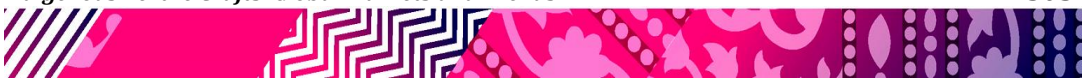
Abstract

Globally, many countries have been enforcing a ban on textiles that have been colored using chemical dyes, which has been a major blow to the hand loom industry. Color has played an important role in human life since Stone Age to the present Silicon Age. Color application not only improves surface appearance of the substrate but also expresses emotion and ideas of the wearer. Herbal Textile is dyed entirely with herbal extractions, without using any sort of chemicals. The herbs used are different from vegetable dyes as they are not only natural but also have medicinal value. These herbs are applied directly to the fabric with the help of natural ingredients, so that the medicinal value of the herbs can be kept intact. No chemical process is adopted while dyeing. Even bleaching of cloth is done naturally by exposing it to sunlight. The herbs also do not pollute the environment through contamination of water resources in areas close to processing units. All kinds of shades of red, yellow, brown, orange and green etc. can be prepared with the help of these herbs. At the same time, textiles dyed using natural vegetable dyes, especially medicinal plants, have been commanding a huge market due to their obvious advantages. Nowadays much of the stress in textile industry is given on Herbal dyes that use only natural plants and minerals for all steps of the production process. The advantages of the dyes extracted from the medicinal plants origin from renewable resources, limited chemical reactions involved in their preparation, Biodegradable properties, health curing properties, and harmony with nature. Environmental friendly fibers such as organic cotton and recycled polyester have become popular among the fabric and apparel manufacturers. Thus, with much research on individual and industrial levels, the concept of herbal textile came into being. Herbal textiles are mostly used in making such garments that stay close to human skin so that its benefits could be absorbed through the skin. The following pioneering suppliers that are using natural and AZO-free dyes: Ayuvastra, Aura herbal textiles, Mantis world, Organic textile company etc.

Key words: herbal, textile dye, green fashion, sustainable, organic



TP-8

E-MARKETING: A TRENDING STRATEGY FOR PROMOTING A PRODUCT

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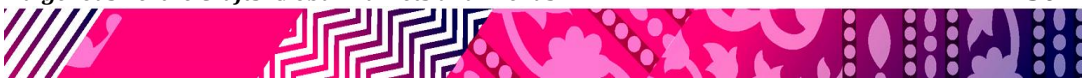
Abstract

E-marketing is the process of marketing a product or service using the Internet. It uses a range of technologies to help connect businesses to their customers. E- marketing is the procedure of promoting a brand utilizing the digital networks. E-marketing incorporates pulling in new business, holding current business & adding toits picture character. Online marketing is the practice of leveraging web-basedchannels to spread a message about a company's brand, products, or services to itspotential customers. The methods and techniques used for online marketing includeemail, social media, display advertising, search engine optimization, etc. This plan ofactions gives the businesses a direct channel of communication with prospects andcustomers for brand promotion. The most important marketing strategies can beContent Marketing, Email Marketing, Search Engine Optimization (SEO), ConversionRate Optimization, Social Media, Paid Advertising and Influencer Marketing. Theutilization of online marketing has expanded now a days and businesses who havenot yet included online marketing in their procedure should utilize this for gettingextraordinary opportunities. The fundamental purpose of starting e-marketing for allthe new ventures is to promote business through internet by using digital informationto achieve the marketing objectives. Information is a basic requirement for customersto make informed decisions before buying any product either on internet or inconventional. Therefore the use of e marketing has many advantages like extremelylow risk, reduction in costs through automation and use of electronic media, fasterresponse to both marketers and the end use, increased ability to measure and collect data. The present paper will discuss the strategies of e- marketing in detail.



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Accredited Grade "A" by NAAC

Department of Clothing and Textiles

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