Elsevier Editorial System(tm) for Resources, Conservation & Recycling or its open access mirror
Manuscript Draft

Manuscript Number: RECYCL-D-19-01141R3

Title: Behavioural factors on the adoption of sustainable supply chain practices

Article Type: VSI: Operation

Corresponding Author: Dr. Anil Kumar, Ph.D

Corresponding Author's Institution: University of Derby

First Author: Anil Kumar, Ph.D

Order of Authors: Anil Kumar, Ph.D; Md. Abdul Moktadir; Syed Abdul R Khan, Ph.D; Jose Arturo Garza-Reyes, Ph.D; Mrinal Tyagi; Yiğit Kazançoğlu, Ph.D

Abstract: Sustainable supply chain management (SSCM) has become a popular research topic among scholars as evidence suggests it has significantly contributed to achieve more environmentally conscious and socially responsible supply chains. Operational excellence (OE), on the other hand, can be achieved by incorporating SSCM practices within existing supply chain operations. However, due to human expertise, involvement and commitment towards excelling at sustainable and operational performance, the effective deployment of SSCM practices now depends on various human-based behavioural factors (BFs). Human behaviour is dynamic in nature and hence has an effect on the implementation of SSCM practices. Nevertheless, research on BFs in view of SSCM practices is limited. To fill this knowledge gap, this study examines the nature of BFs for SSCM practices towards OE in supply chains, particularly within the context of the footwear industry of Bangladesh. In the first phase, the BFs were identified and determined through a literature review and empirical investigation. In the second phase, the Hesitant Fuzzy DEMATEL method was used to establish the cause-effect relationships among the factors. The influence of group validation by experts and a literature survey, along with managerial implications, was discussed and explained in the third phase of the study. The results suggest that the factor, 'organisation culture' is the most influencing behavioural factor, followed by 'commitment from higher authority'. Both theoretical and practical contributions of the study are drawn from its findings, helping footwear industry managers to more effectively adopt SSCM practices in the supply chain operations of their organisations to achieve OE.

Behavioural factors on the adoption of sustainable supply chain practices

Anil Kumar*
Centre for Supply Chain Improvement
The University of Derby, Kedleston Road Campus, Derby, UK, DE22 1GB
A.Kumar@derby.ac.uk

Md. Abdul Moktadir
Institute of Leather Engineering and Technology,
University of Dhaka, Dhaka 1209, Bangladesh
abdulmoktadir2010@gmail.com

Syed Abdul Rehman Khan
School of Economics and Management, Tsinghua University, Beijing, China
Sarehman_cscp@yahoo.com

Jose Arturo Garza-Reyes
Centre for Supply Chain Improvement
The University of Derby, Kedleston Road Campus, Derby, UK, DE22 1GB
J.Reyes@derby.ac.uk

Mrinal Tyagi
School of Management,
BML Munjal University, Gurgaon, India
mrinal.tyagi.16mb@bml.edu.in

Yiğit Kazançoğlu
Department of Logistics Management, Yasar University
Izmir, Turkey
yigit.kazancoglu@yasar.edu.tr

---

*Corresponding Author

*Highlights (for review)

Research Highlights

- The study identifies behavioural factors that play important role in putting sustainable supply chain into practice.
- The ‘organisation culture’ is the most influencing element, followed by ‘commitment from higher authority’.
- Findings will help the industry managers to more effectively adopt SSC practices to achieve operational excellence.

*Manuscript
Click here to download Manuscript: Updated-13.docx Click here to view linked References

Behavioural factors on the adoption of sustainable supply chain practices

Abstract

Sustainable supply chain management (SSCM) has become a popular research topic among scholars as evidence suggests it has significantly contributed to achieve more environmentally conscious and socially responsible supply chains. Operational excellence (OE), on the other hand, can be achieved by incorporating SSCM practices within existing supply chain operations. However, due to human expertise, involvement and commitment towards excelling at sustainable and operational performance, the effective deployment of SSCM practices now depends on various human-based behavioural factors (BFs). Human behaviour is dynamic in nature and hence has an effect on the implementation of SSCM practices. Nevertheless, research on BFs in view of SSCM practices is limited. To fill this knowledge gap, this study examines the nature of BFs for SSCM practices towards OE in supply chains, particularly within the context of the footwear industry of Bangladesh. In the first phase, the BFs were identified and determined through a literature review and empirical investigation. In the second phase, the Hesitant Fuzzy DEMATEL method was used to establish the cause-effect relationships among the factors. The influence of group validation by experts and a literature survey, along with managerial implications, was discussed and explained in the third phase of the study. The results suggest that the factor, 'organisation culture' is the most influencing behavioural factor, followed by 'commitment from higher authority'. Both theoretical and practical contributions of the study are drawn from its findings, helping footwear industry managers to more effectively adopt SSCM practices in the supply chain operations of their organisations to achieve OE.

Keywords: Operational excellence; behavioural factor; sustainable supply chain; footwear industry; hesitant DEMATEL

1. Introduction

The rapid expansion of the number of firms involved in production, along with a subsequent expansion of manufacturing activities, has increased those supply chain activities which directly lead to environmental degradation (Vachon and Klassen, 2008; Bozarth et al., 2009; Gold et al.,

2010; Hofmann et al., 2018; Gardner et al., 2019; Shaharudin et al., 2019). A sustainable approach, integrating environmental, social and economic factors, can help to achieve sustainability in the supply chains of firms (Wu and Pagell, 2011; Mangla et al., 2019). Global business pressure has been increasing significantly in recent years to achieve a number of sustainable development goals (SDGs) by the year 2030. Therefore, sustainable supply chain management (SSCM) practices in manufacturing firms, is attracting more attention in both developed and developing countries. In a developing country like Bangladesh, manufacturing firms are facing many hurdles in the implementation of SSCM practices in their efforts to survive in the global market. At the same time, manufacturing firms are trying to integrate pollution prevention strategies to minimize environmental pollution (Zhu et al., 2008; Diabat and Govindan, 2011; Wang et al., 2013). Unlike traditional manufacturing practices, sustainable manufacturing practices include all phases of a product's life cycle by incorporating social, environmental and economic issues into the supply chain (Pagell and Shevchenko, 2014). SSCM practices enable manufacturing firms and practitioners to consider any potential adverse impact of supply chain activities on the environment, society and the wider economy (Zeng et al., 2017; Bastas and Liyanage, 2018).

According to our literature survey, over the past decades, many industrial firms have started to place greater importance on various environmental, economic and social issues such as "sustainable development" (Sustainable Solutions Development Network, 2013), "social sustainability" (Nica and Potcovaru, 2015), "environmental certifications" (Marimon et al., 2010; Geerts, 2014), "green marketing" (Polonsky, 2011; Chan et al., 2012), "green human resource management" (Renwick et al., 2013; Jabbour et al., 2016), "green purchasing" (Large and Gimenez Thomsen, 2011; Joshi and Rahman, 2015), "sustainable supplier selections" (Famiyeh and Kwarteng, 2018) and "industry 4.0" (Moktadir et al., 2018a).

Many industries in the developed world have already introduced SSCM practices to achieve sustainability in their supply chains, noting that behavioural factors (BFs) play an important role in this aim (Carter and Rogers, 2008; Kramar, 2014; Zaid et al., 2018). Thus, it is important to understand the influence of BFs in the implementation of SSCM practices as well as the goal of operational excellence i.e. it is necessary to create sustainable improvement within an

organization which further helps the organization to create value to the customer. Hence, identifying the BFs involved in SSCM practices is a vital task in the global research agenda.

In the footwear supply chain, to achieve operational excellence, it is important to incorporate SSCM practices considering human BFs; thus, operational excellence can be achieved by human expertise. A number of operations such as sourcing of materials, cutting, splitting, skiving, assembling, lasting, de-lasting, conditioning, edge colouring, finishing etc. are involved in the manufacturing process and have direct or indirect involvement by humans (Crabtree et al., 2009; Muthu, 2013). Therefore, it is evident that operational excellence in footwear manufacturing firms largely depends on human activities. Human BFs, such as dynamic leadership, mutual respect, good working environment, rewards system for skilled workers etc. are important for implementation of SSCM practices as well as to achieve operational excellence in the supply chain networks (Seuring and Müller, 2008; Taticchi et al., 2013). By implementing SSCM practices, sustainability i.e. environment, societal and economic, can be achieved in the footwear supply chain which is labour intensive; therefore, behavioural factors can influence the implementation process of SSCM practices and also contribute to achieving operational excellence in the long term.

SSCM in the footwear supply chain is at an embryonic stage of adaptation. If implemented, SSCM practices may help to reduce both the negative social and environmental impacts of the industry significantly, while achieving economic benefits in the footwear supply chains. To achieve operational excellence in these footwear supply chains during the implementation of SSCM practices, it is necessary to study the involvement of human activities. Therefore, human BFs need to be examined to develop an efficient managerial strategy towards achieving operational excellence. However, after carrying out an extensive literature review on SSCM, limited studies are available in academic databases where researchers talk about behavioural factors needed to achieve operational excellence in the context of SSCM. In order to implement such practices, it is imperative to assess those human BFs which directly or indirectly help to achieve operational sustainability. Since the most recent literature reviews confirm that no study until now investigate the impact of human BFs on SSCM practices, this study tries to address the following research questions:

RQ1: What are the BFs in the context of SSCM practices towards achieving operational excellence in the footwear supply chain?

RQ2: What are the cause and effect inter-relationships among the identified BFs in the SSCM practices?

RQ3: How can the identification of inter-relationships help managers to formulate strategies towards achieving operational excellence in the footwear supply chain?

To answer these questions, the following objectives are set:

I. Investigate the BFs that have an impact on SSCM implementation.
II. Propose a methodological framework to aid an investigation of cause-effect inter-relationships existing among the identified human BFs.
III. Formulate the practical and managerial utility of a proposed framework for practitioners and decision makers towards achieving operational excellence in the context of the study.

To deal with the above-mentioned questions, this research attempts to answer the questions by a systematic approach. In the first stage of the study, a systematic literature review has been conducted to identify the BFs for SSCM practices. In the second stage, a recent proposed multi-criteria decision making (MCDM) method is utilized to find the interactions among validated human BFs.

Section 2 presents identification of the BFs. Section 3 describes the proposed methodology while section 4 depicts the applications process. Section 5 covers the results, discussions of the study and findings. The practical implications of the study findings are explained in section 6. The concluding remarks with limitations of the study are provided in section 7.

2. Literature review

In this section, the theoretical background of SSCM and identification of human BFs are discussed.

2.1 Sustainable supply chain management and operational excellence

The term ‘firms’ sustainability’ can be defined using a triple bottom line (TBL) concept that deals with environmental issues, social concerns and economic factors (Colbert and Kurucz,

2007; Slaper and Hall, 2011; Moktadir et al., 2017, 2018b). The TBL concept, if incorporated into manufacturing activities, may help achieve firms' sustainability (Linton et al., 2007). Over the years, research in SSCM practices in the context of various industrial fields has increased dramatically. Previous studies have focused on the economic issues of supply chains integrating environmental/green issues with the resulting green SCM (Walker et al., 2008; Ahi and Searcy, 2013). Several researchers have looked at how green SCM can protect the environment focusing on green product design, green materials sourcing, green manufacturing, green marketing, green human resource management etc. (Seuring, 2013; Govindan et al., 2014). The demands of society are increasing day by day, attracting attention to the importance of SSCM practices in supply chains. SSCM focuses on all three pillars (economic, social and environmental) of sustainability equally (Seuring and Müller, 2008).

To achieve environmental, social and economic sustainability, published literature on SSCM practices is increasing very fast (Schaltegger and Burritt, 2014; Silvestre, 2015). Literature shows that many firms are adopting cleaner production practices and environmental management systems to improve the supply chain performance (Geissdoerfer et al., 2017); Singh et al. (2019) demonstrated the applications of information and communications technology on food supply chains for SSCM; Simon (2019) showed how to implement circular economy practices in the plastic industry; Ponstein et al. (2019) investigated sustainability in Finnish wine supply chains; Reimann et al. (2019) developed closed loop supply chains with process innovation for SSCM practices; Xu et al. (2019) assessed risks to manage supply chains for sustainability; Raut et al. (2019) tried to link big data analytics and operational sustainability for sustainable business development; Sharma et al. (2019) investigated the impact of circular economy for food supply chains towards sustainability; Gardas et al. (2019) demonstrated the critical success factors for reusable plastic packaging towards sustainable supply chains; Kaur and Singh (2019) developed a flexible dynamic model for SSCM practices; Saeed and Kersten (2019) tried to classify and identify drivers to SSCM practices; Principato et al. (2019) investigated the impact of circular economy practices in the Italian pasta industry for sustainable development; Jabbour et al. (2019) showed the effect of the human side of dimensions for circular economy practices for SSCM practices; Gong et al. (2019) conducted a study on the role of customer awareness in promoting firms' SSCM and sustainability; Jia et al. (2018) examined the role of leadership in the context

of multi-tier SSCM; Zeng et al. (2017) demonstrated the inter-relations among circular economy, institutional pressure and SSCM in the context of Chinese eco-industrial park firms; Papetti et al. (2019) developed a web-based platform for eco-sustainable SCM; Huo et al. (2019) investigated how green processes influence sustainability in social, environmental and economic performance; Cole and Aitken (2019) showed the role of intermediaries in achieving sustainability in supply chains; Bastas and Liyanage (2019) investigated sustainability of integrating SSCM practices and quality management.

Operational excellence may be achieved by implementing SSCM practices in the supply chains; it can also help to improve the effectiveness and efficiency of a firm's manufacturing systems (Cherrafi et al., 2017; Caiado et al., 2018). Operational excellence can have a marked impact on the three pillars of sustainability; it is imperative for decision makers and practitioners to know how operational excellence can be achieved by integrating three pillars sustainability into the manufacturing activities (Bai and Sarkis, 2017; Sehnem et al., 2019). In general, operational excellence can be achieved via technological and practical industrial activities such as lean manufacturing concept, reverse supply chains, Industry 4.0, circular economy, information communications and technologies, business process re-engineering, flexible manufacturing system, robotics manufacturing system, automotive manufacturing system etc. (Bou-Llusar et al., 2009; Asif et al., 2010; Resta et al., 2015). In the era of Industry 4.0, many organizations are trying to modify their production processes to focus on economic issues (Luthra and Mangla, 2018; Sellitto et al., 2019). Therefore, integrating TBL approach with Industry 4.0 practices to achieve SDGs is an important and crucial issue. Social and environmental issues, along with economic factors, should be considered for operational excellence in the supply chains. It is also important to acknowledge how operational excellence activities will affect sustainable supply chain performance, dynamism, collaborations, transparency, innovations and relational capabilities (Bai and Sarkis, 2017). Operational excellence can improve the sustainable supply chain's structure and capabilities by modifying the three pillars of sustainability (Schroeder et al., 2018).

2.3 Behavioural factors (BFs)

BFs are those factors which have the potential to affect the behaviour of a person to successfully complete the desired tasks (Grover et al., 2006; Ding et al., 2018). The willingness of a person to

do a certain job is as equally important as his/her ability to actually perform an assigned job. It is imperative that without personal interest and zeal, no one can perform to a better level. Many researchers have pointed out that BFs are important for the management control system (Campbell, 2012). These factors are dynamic in nature and need special attention during the management control system. Previous research has tried to interlink either GSCM practices to human BFs or environmental management systems. In the first stage, to identify the human BFs, an extensive systematic literature review was conducted by utilizing some specific keywords such as human factors, human success factors, motivator, sustainable supply chain management, green supply chain, human resource management, behavioural factors, circular economy, remanufacturing, human side of sustainability etc. considering peer reviewed scientific journals in the various databases. During this process, the following scholarly databases - Google Scholar, Science Direct, Scopus, Taylor and Francis, Emerald and Springer were used. All considered scientific peer reviewed articles were refined as per the set criteria: articles should be written in English, peer-reviewed and align with the current research topic. Accordingly, from the considered and collected articles, the human BFs were identified via brain storming sessions with the assistance of industrial experts from the case industry. In the second phase, these BFs were validated in their applicability in the set industry by experts' inputs as described in the Applications section. Table 1 shows the fourteen BFs with a brief explanation of SSCM practices towards operational excellence together with the author(s) list.

Table 1 shows the fourteen BFs with a brief explanation to SSCM practices towards operational excellence with the author(s) list.

Table 1. Behavioural factors in SSCM practices leading to operational excellence

Factors	A brief explanation	Authors
Dynamic leadership	Dynamic leadership means a transformational facility of leadership that helps to adopt SSCM practices in supply chains. It is considered an important factor to achieve operational excellent in supply chains. Sustainable manufacturing practice needs dynamic leadership activities which help to improve the overall performance of supply chains.	Walker et al. (2008); Chan et al., (2012); Muduli et al. (2013); Schoemaker et al. (2018)
Performance evaluation system and reward facility	A performance evaluation system may encourage a firm's employees to do better work. Rewards for good ideas and work may enhance the effectiveness and efficiency of the organization. Firms committed towards achieving operational	Guest (2002); Gruman and Saks, (2011); Kumar et al.

	excellence by implementing SSCM practices should confirm that an incentive and reward system reflect the firm's commitment to the importance of sustainable supply chains performance by promoting desirable employee behaviour.	(2018)
Effective communications structure	An effective communications structure is important for sharing knowledge, strategies and objectives of firms among team members. It helps to achieve firms' performance while building strong relationships with firms' partners. An effective communication framework in the SC network may assist employees to achieve operational excellence in the SC.	Boström et al. (2015); Gosling et al. (2017); Sauer and Seuring (2017)
Employee treated as team member	Successful operational performance via implementing SSCM practices in the supply chain largely depends on employee behavioural activities. If organizational culture treats every employee as a team member, it will be easy to achieve the desired goals.	Kramar (2014); Jabbour andJabbour (2016)
Trust among employees	Trust between employees and management can increase responsiveness. It can help to achieve inter-organizational effectiveness between employees and the management team. During the implementation process of SSCM practices, it is important to create an environment of mutual understanding among managers and employees.	Rungtusanatham et al. (2003); Chardine-Baumann and Botta-Genoulaz (2014); Verburg et al. (2018)
Sustainable strategy	Sustainable planning towards implementing SSCM practices is imperative since planning helps to handle critical situations in supply chain activities. It is mandatory for organizations to develop long term strategic planning towards SSCM implementation; this will help to achieve a sustainable business environment.	Gimenez et al. (2012); Schrettle et al. (2014); Sáez-Martínez et al. (2016)
Sustainable innovation	To achieve a sustainable business framework, it is necessary to introduce new technology to reuse waste, minimize waste, process materials, collect waste products for further processing etc. Sustainable and innovative change management is necessary for any firm's performance improvement. For operational excellence, an innovative human development program may help to achieve SSCM practices.	Dearing (2000); Todeschini et al. (2017); Fellnhofer (2018); Schoemaker et al. (2018)
Facility of training program	Training should be seen as a dynamic process that leads employee behaviour towards achieving operational excellence in supply chains. During the implementation process of SSCM practices in supply chains, training may act as a vital component. Carrying out tasks related to SSCM practices will require knowledge and experience; employees can achieve the necessary skills through a continuous training program.	Hassini et al. (2012); Seuring (2013); Wu and Pagell (2011)
Organizational culture	A set of basic assumptions dealing with internal problems and external issues may be referred to as organizational culture. It has a potential impact on employees to hinder or motivate SSCM practices in the implementation process. It may therefore act as a strong human BF to achieve operational excellence in the SC.	Seuring and Müller (2008); Gold et al. (2010); Carter and Easton (2011); Kumar et al. (2019)

Social legitimacy, accountability and trust	To achieve a sustainable business framework, it is imperative for an organization to consider social legitimacy, accountability and trust. Business organizations are constantly trying to develop strategic plans to align with this factor.	Daily and Huang (2001); Gruman and Saks (2010); Demir et al. (2017)
Freedom of choice of job responsibility	Freedom of choice of job responsibility is an important BF to achieve a firm's desired goals. Freedom of choice of job responsibility may enrich organizational performance and productivity. It is crucial to assign appropriate jobs for employees to achieve best performance.	Venkatesh et al. (2010); Piercy and Rich (2015)
Motivation towards green practices	Motivation towards green practices among employees is crucial for success because the workforce is directly involved in the implementation process. Therefore, the management team should search for effective methods to motivate employees to adopt SSCM practices.	Walker et al. (2008); Sarkis et al. (2011); Kumar et al. (2019); Hu et al. (2019)
Commitment from high authority	Commitment from high authority indicates the overall efforts carried out by a management team towards SSCM practices implementation. It may act as a vital element of organizational change management process and facility. It may help to drive the firm's performance to achieve operational excellence.	Zhu and Sarkis (2004); Abdul-Rashid et al. (2017); Moktadir et al. (2018c)
Profit sharing among employees	A profit-sharing culture in a firm may significantly enhance the productivity of employees. During the implementation process of SSCM practices, there needs to be extra involvement from staff; it is necessary for the firm's management to encourage a culture that motivates employees for the successful implementation of SSCM practices.	Darnall et al. (2008); Lee et al. (2012); Tseng et al. (2013); Laari et al. (2017)

3. Research methodology

3.1. Methodology framework

A three-phase study framework is presented in Figure 1. In the first phase, behavioural factors were identified through a literature review and expert opinions, finalized by footwear industry experts. In the second phase study, a questionnaire was prepared and data was collected from experts on the influence assessment of behavioural factors; a cause-effect digraph was thus developed. In the last phase, based on the study outcomes, practical implications were suggested along with concluding remarks.

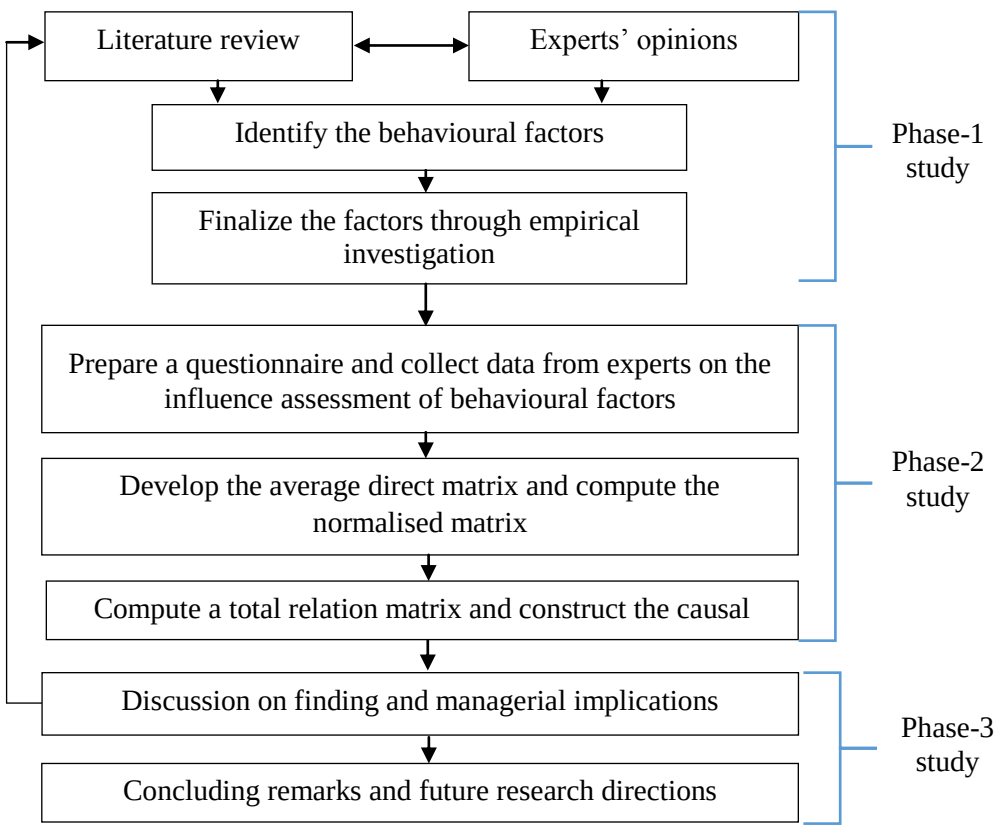

Figure 1. Proposed research methodology framework

3.1. Hesitant Fuzzy DEMATEL (HF-DEMATEL)

The freedom to organise the hesitancy more than the matter under consideration is offered by the Hesitant Fuzzy sets (HFs) (Torra, 2010; Xia and Xu, 2011). Below are the most crucial fundamentals pertaining to the (HFs). Here we have a set $Y = \{y_1, y_2, \dots, y_n\}$, this is a HF which happens to be a subset i.e. [0, 1]. This has been shown mathematically in a more concrete expression below (Torra, 2010):

$$M = \{\langle y, h(y) \rangle \mid y \in Y\}, (1)$$

The expression $h(y)$ relates to the set which holds the values in [0, 1], $y \in Y$ to the set M. M is therefore defined as the set of total HFs in Y. Hence, we can define M as:

$$M = \left\{ \left\langle y, \bigcup_{\gamma \in h(x)} \{\gamma\} \right\rangle \mid y \in Y \right\},$$

The standard theory of DEMATEL was first introduced in the year 1971 by the Battelle Memorial Institute in Geneva. Ever since then the method has been used by many researchers in different fields to establish relationships amongst the variables (Lin et al., 2018). But there are certain domains where this method fails to identify the unevenness in the data. As a result, the sets in the hesitant fuzzy DEMATEL method provide the freedom to organise the hesitancy more than the matter (Wu et al., 2017). The step wise process of this is mathematically shown below:

Step 1. Collect experts' opinions to construct a hesitant fuzzy direct-influence matrix.

Step 2. Obtain the crisp direct-influence matrix

Step 3. Compute the normalized direct-influence matrix

Where, $B = k \times \bar{A}$

Step 4. Derive the total-influence matrix by
$T = B(I - B)^{-1}$

Total sum of rows and columns of the T matrix, are obtained from Eqs. (5-6) as below:

$$r = [r_i]_{n\times 1} = \left[\sum_{j=1}^{n} t_{ij} \right]_{n\times 1} \quad (4) \quad c = [c_i]_{1\times n} = \left[\sum_{i=1}^{n} t_{ij} \right]_{1\times n}$$

Where t_{ij} is total relation matrix, for $i, j = 1, 2, \ldots, n$.

Step 5. In order to avoid minor impact Eq. (6) is used.

$$\alpha = \frac{\sum_{i=1}^{n} \sum_{j=1}^{n} [t_{ij}]}{N} \quad (6)$$

where N signifies all elements. Those values greater than (α) are taken into account to construct the causal model.

4. Applications in real life of proposed method

The proposed method is applied in the largest manufacturing industry in Bangladesh - the named footwear firm. The contribution of the footwear industry to the country's economy growth is

remarkable, as confirmed from the report by the Export Promotion Bureau (EPB) (EPB, 2018). EPB confirm that in the FY2018, Bangladesh earned $1.08 billion from footwear exports; in FY2017 the figure was $1.23 billion. Beside the negative growth of export performance, statistics of OTEXA (Office of Textiles and Apparel) confirmed that the Bangladeshi footwear industry captures significantly more of the US footwear market compared to China's footwear industry. The report of OTEXA showed that in the FY2018 Bangladesh earned $133.25 million from exporting footwear; the figure was $113.33 million in the FY2017. As the footwear industry is labour intensive, it needs to consider human BFs for sustainable manufacturing practices if operational excellence is to be achieved in the footwear supply chains. Currently, the footwear industry in Bangladesh is in a transformational stage towards a more innovative and technological driven sector, with an increasing number of big, medium and small footwear manufacturers. The manufacturers are now focusing on strategies to introduce newer technologies to cope with market developments throughout the world. It is imperative to consider the human side of BFs to tackle this situation. To acknowledge the current status of the industry and to show the nature of human BFs in footwear supply chains, this research focuses on the human side of BFs in SSCM practices towards achieving operational excellence. To identify the importance and interactions among BFs, in this research, eight experts (as mentioned in Table 2) from randomly selected footwear companies are questioned as they know full well the importance of human BFs in SSCM practices.

Table 2. Experts' profiles

Experts	Scale of Industry	Years of experience	Role and responsibilities	Firms' details in FY-2018
1.	Large	20	He is a supply chain manager and responsible for managing the overall supply chain, logistics strategy and operations.	Size: 3.42 acres Employees: 5800 Annual sales turnover: USD $0.6 billion
2.	Medium	19	His designation is senior production manager. He is responsible for production of high-quality footwear and maximizing productivity.	Size: 2.34 acres Employees: 3400 Annual sales turnover: USD $0.41 billion
3.	Medium	23	His designation is quality manager, working in the operations department. He is	Size: 1.98 acres Employees: 2920 Annual sales turnover: USD

			responsible for quality control and quality audits.	$0.34 billion
4.	Small	13	He is supplier relationship manager. He is responsible for creation of strong links with the company suppliers.	Size: 0.92 acres Employees: 1600 Annual sales turnover: USD $20 million
5.	Large	15	He is logistics manager with responsibility to ensure the timely shipment of end products, communication with transportation service providers, strategy development focusing on logistics facility to maximize the company's profit.	Size: 4.42 acres Employees: 7500 Annual sales turnover: USD $0.99 billion
6.	Large	17	He is a senior supply chain and innovation manager; a key member for preparation of the materials consumption sheet for materials sourcing; he maintains good relationships with buyers and customers.	Size: 3.12 acres Employees: 5700 Annual sales turnover: USD $0.8 billion
7.	Medium	19	Holds a senior position in supply chain and designing department He is responsible for development of interactive design based on buyer demand, pattern development and sample development.	Size: 2.49 acres Employees: 3100 Annual sales turnover: USD $30 million
8.	Small scale	14	He is a core member in planning and SC department, responsible for overall manufacturing activities; sets targets for each month via strategic planning.	Size: 0.93 acres Employees: 1704 Annual sales turnover: USD $ 15 million

5. Results and discussion

5.1 Finalization of the factors

One of the most high-profile topics in the area of supply chains is sustainability. Therefore, understanding human BFs is very important for organizations to ensure proper implementation of sustainable practices in their supply chain process. Similarly, for sustainable practices to work, a long-term vision for the company needs to be taken. Thus, after identification of BFs from

literature, with the help of the questionnaire, as attached in Appendix A.2, the opinion of the experts, as mentioned in Table 2, were recorded. The relevance of the stated factors was validated; received mean scores for all the factors were individually recorded as more than the expected/threshold value of 3.5 as suggested by previous literature (Kapse et al., 2018). The analysis shows strong agreement of the identified factors with those from the literature review.

4.2. Evaluation of factors using Hesitant Fuzzy DEMATEL (HF-D)

The following sections describe the followed step by step process for HF-D analysis.

Step 1: Appendix A.3 covers a questionnaire based on the evaluation of the factors using the HF-D. As shown in Table 2, all the experts who participated in the survey come with a strong professional background in the footwear industry and its related areas/domains. All participants are well aware and knowledgeable about the sustainable practices in the contemporary context. Many of the experts are currently engaged in such work in their professional capacities and also contribute towards maintaining sustainability for the environment at large. The selection of experts involved a snowballing sampling, a non-probability sampling method. Soon after the first expert was contacted and his input recorded, the team referred to the next expert operating in a similar field. The results of the survey depend significantly on the overall size of the sample. A sample with too few respondents or one which is too large is not desirable; an ideal sample size is one which has around 5-50 respondents/experts (Kusi-Sarpong et al., 2019, Kumar et al., 2019). Following this pattern, we collected samples from a total of eight experts as mentioned in Table 2. Table 3 (as mentioned in Appendix A.1) shows the evaluation of all the selected experts on the first success factors (F1); likewise, the same process was followed for all the other factors.

Step 2: The matrix for the factors displaying the crisp direct-relationship is established.

Step 3: Using Equation (2), the normalization matrix is calculated.

Step 4: Calculating the total relation matrix. Using Equation (3), the total relation matrix was calculated as shown in Table 4. The summation of the overall rows and columns is (r_i+c_j) and (r_i-c_j); Equation (4) and Equation (5) was used in the MS excel software as shown in Table 5. For a factor to qualify in the cause group, the value of (r_i-c_j) should be a positive value; if not, it is included in the effect group.

Table 4. Total direct relation matrix

0.999	1.124	1.043	1.064	1.060	1.052	1.051	1.020	1.052	1.069	1.037	1.046	1.004	1.047
1.047	1.029	1.016	1.053	1.039	1.046	1.049	1.010	1.018	1.037	1.009	1.036	0.976	1.037
1.033	1.086	0.931	1.032	1.018	1.036	1.022	0.992	1.004	1.008	0.988	1.001	0.964	1.009
1.031	1.076	0.998	0.963	1.039	1.028	1.033	0.975	1.020	1.010	0.987	1.020	0.960	1.013
1.005	1.050	0.974	1.011	0.932	1.008	0.998	0.959	0.974	0.995	0.974	0.987	0.943	0.974
0.987	1.042	0.948	0.985	0.989	0.919	0.981	0.942	0.958	0.970	0.949	0.963	0.925	0.962
0.993	1.027	0.957	0.995	0.978	0.996	0.914	0.948	0.957	0.962	0.952	0.967	0.921	0.965
1.002	1.066	0.984	1.008	0.996	1.002	0.996	0.904	0.987	0.998	0.982	0.983	0.947	1.001
1.050	1.098	1.027	1.046	1.031	1.056	1.039	1.017	0.958	1.046	0.999	1.018	0.982	1.047
0.991	1.053	0.960	0.984	0.986	0.997	0.991	0.957	0.974	0.917	0.955	0.987	0.923	0.988
0.987	1.031	0.959	0.994	0.982	0.985	0.977	0.939	0.970	0.961	0.886	0.963	0.926	0.962
1.067	1.107	1.005	1.047	1.040	1.060	1.037	1.004	1.027	1.040	1.011	0.959	0.972	1.009
1.014	1.049	0.971	0.999	1.004	0.996	1.001	0.972	0.980	0.989	0.962	0.974	0.876	0.981
1.045	1.104	1.014	1.047	1.043	1.038	1.037	1.007	1.027	1.030	1.013	1.032	0.986	0.959

Table 5. Cause/effect parameters for factors

r_i	c_j	r_i+c_j	$r_i- c_j$	Group	r_i	c_j	r_i+c_j	$r_i- c_j$	Group
14.668	14.251	28.918	**0.417**	**Cause**	13.856	13.644	27.501	**0.212**	**Cause**
14.403	14.942	29.345	-0.539	Effect	14.414	13.906	28.320	**0.509**	**Cause**
14.125	13.788	27.912	**0.337**	**Cause**	13.662	14.032	27.694	-0.370	Effect
14.153	14.227	28.380	-0.074	Effect	13.522	13.705	27.226	-0.183	Effect
13.782	14.138	27.920	-0.355	Effect	14.385	13.936	28.320	**0.449**	**Cause**
13.520	14.218	27.738	-0.698	Effect	13.769	13.306	27.075	**0.463**	**Cause**
13.530	14.125	27.655	-0.595	Effect	14.382	13.954	28.337	**0.428**	**Cause**

5. Discussion of findings

5.1 Cause group factors

As per Table 5, the factor 'organisation culture' is the most critical factor in the entire pool of the cause group factors with a value of 0.509, the highest value of (r - c). The factor stands out for being crucial not only for itself, but also its influence on the other factors. Thus, it becomes imperative for organisations to maintain a robust working culture in its premises and for its employees alike. Having regular and periodic interaction with employees, appreciating their points of view while creating a healthy hard and soft level infrastructure all make for delivery of a positive culture for an organisation (Daily and Huang, 2001; Gopalakrishnan et al., 2012; Jabbour et al., 2018). The factors 'commitment from higher authority' with a composite (r - c) value of 0.463 is the second most influencing cause group factor with its cause group validation confirmed by all the experts. As per previous studies (Latan et al., 2018; Dubey et al., 2019), a proactive and supportive top-level management encourages an established system of employee engagement leading to delivery of required objectives on a day to day basis. Commitment from higher authority ranks as the second most critical factor in the cause group. Similarly, the factor 'motivation towards green practices' with a composite (r - c) value of 0.449 ranks as third most influential in the cause group. Previous studies show that green motivation plays an important role for an organisation to achieve sustainable goals (Jabbour et al., 2016; Kumar et al., 2019; Zhang et al., 2019). 'Profit sharing amongst the employees' qualifies as the fourth most influencing cause group factor with a composite (r - c) value of 0.428. This factor confirms that the principal agent theory holds relevance even in the modern corporate setting, as demonstrated by motivation of employees through financial incentives in the organisation (Hong et al., 2018). Time and again it is observed that whenever monetary gains are extended to employees other than their income, it has resulted in better performance of the workforce, eventually increasing the development of the organisation in the long term. The factor 'dynamic leadership' is the fifth most important factor in the cause group with a composite (r - c) value score of 0.417. A strong and vibrant leadership displayed by leaders at all levels translates into a better flow and execution of policies, delivering more promising results at a later level (Hong et al., 2018; Silvestre et al., 2018). With a composite (r - c) value score of 0.337, the factor 'effective communication structures' is the sixth most important cause group factor. In an organisation,

smooth flow of information makes for a more efficient delivery of services and a more effective mode of execution of orders in the chain of command. With a composite (r - c) value score of 0.212, the factor ‘facility for training programme’ is the least important cause group factor, validated by the experts’ opinions.

5.2 Effect group factors

As per Table 5, with -0.698 the highest value of (r - c), the factor ‘sustainable strategy’ is the most critical factor in the entire pool of the effect group factors. The way forward to make the continuum greater for the organisation is through the medium of bringing sustainability on board. Higher sustainability brings with it new and novel approaches for enhancing the operations of the business and creating greater value for the organisation and its business in the long term. With a value of -0.595, the factor ‘sustainable innovation’ is the second most important effect group factor. The lifecycle for any product depends heavily on how much the developers are committed to innovation and development. Similarly, with a (r - c) value of -0.539, ‘performance evaluation system and reward facility’ is the third most important effect group factor. Monitoring, evaluating and rewarding the work carried out by employees and the members of the team gives a strong boost to the enthusiasm of the entire work culture of an organisation. The factors ‘social legitimacy, accountability and trust’ is the fourth most important effect group factor, embracing the views of both the shareholders and the stakeholders of an organisation. With a (r - c) value of -0.355, the factor ‘trust among employees’ qualifies as the fifth most influencing effect factor in the effect group. This soft factor has a widespread impact on the overall delivery of a more conducive and positive organisational culture and workforce environment. ‘freedom of choice of job responsibility’ is the sixth most contributing factor in the effect group. Likewise, the factor ‘employee treated as team member’ is the least important effect group factor.

5.3 Research implications

5.3.1 Practical implications

The analysis on cause and effect amongst human BFs provides the decision makers with valuable knowledge by identifying the factors that are influenced and the factors that are influencing. Moreover, the professionals who are managing the industry can introduce strategies for improvement based on the implications mentioned below:

1) Footwear supply chains (SCs) are very complex in nature and should strive to achieve operational excellence. Operational excellence may be achieved by implementing SSCM practices with consideration of BFs. This study therefore, may act as a benchmark study in the context of Bangladesh's industries achieving operational excellence in SCs.
2) The findings of this study will help footwear industry managers in proper implementation of SSCM practices in their organizations.
3) The results may help footwear industry managers by identifying causal group human BFs to formulate motivational programs; a greater emphasis on causal group BFs can help to achieve operational excellence throughout the supply chains.
4) This study may help footwear companies improve their operational performance by setting this study as a benchmark. Additionally, the nature of the causal and influencing factors can help industry experts set a benchmark for sustainable development of the entire sector.

5.3.2 Theoretical implications

The major theoretical contributions of the study in the present context are as given below:

1) This study highlights the importance of human BFs for SSCM practices towards achieving operational excellence; this is a major theoretical contribution to the analysis of the role of human BFs in adopting SSCM practices (Grover et al., 2006; Muduli et al. 2013; Kumar et al., 2019; Bag et al., 2020).
2) A cause and effect relationship among BFs has been identified through this study by the HF-DEMATEL method; a contribution has been added to HF-DEMATEL theory in processing how this method can help to understand the relationships among BFs.
3) A major contribution of this study is the development of a well-defined new framework for BFs assessments to achieve operational excellence by focusing on SSCM practices in manufacturing companies; a gap in existing literature has been filled (Zhu and Sarkis 2004; Abdul-Rashid et al., 2017; Moktadir et al., 2018c).

6. Concluding remarks

The demand for a holistic examination of behaviours in an industry such as footwear, or any other major industry, is rising at an unprecedented rate. Various elements, such as the commitment from the management team and the participation of the workforce, can contribute

significantly to the growth of an organisation in the contemporary economic landscape. All industrial sectors are in transition to find new and sustainable ways of taking the business forward with a number of factors now becoming more relevant and in need of examination.

Henceforth, in the wake of recent studies, factors such as “sustainable strategy and energy” from the effect group and ‘organisational culture and commitment from top management” from the cause group have surfaced as being the most contributing factors in the footwear industry; this is confirmed by expert opinion in the study.

With the help of the hesitant based fuzzy DEMATEL technique, we have established the relationship between the cause and effect factor for the behavioural factors. From the fourteen factors that we have identified in the study, seven of the factors were confirmed as cause group factors. In the cause group factors, the most important factor is ‘organisation culture’ followed by ‘commitment from higher authority’. The factor ‘motivation towards green practices’ is in third spot, followed by ‘profit sharing amongst the employees’, ‘dynamic leadership’ and ‘effective communication structures’, ‘facility for training program’ is the least important.

Similarly, the remaining seven factors were shown to be effect group factors. As the name suggests, the factors in the cause group bear influence on the effect group factors. Because of this, decision making becomes crucial; it is vital to use the cause group factors wisely as this has an impact on the effect group factors. In the effect group, the factor, ‘sustainable strategy’ is the most important critical success factor followed by ‘sustainable innovation’, ‘performance evaluation system and reward facility’, ‘social legitimacy, accountability and trust’, ‘trust among employees’ and ‘freedom of choice of job responsibility’, ‘employee treated as team member’, is the least important.

6.1 Unique contributions

- ✓ In this study, human behavioural factors which play an important role in implementation of SSCM practices have been identified through the literature review and input from experts.
- ✓ All identified factors are validated through a designed questionnaire.

- ✓ With the help of the hesitant based fuzzy DEMATEL technique, we have established the relationship between the cause and effect factors for the behavioural factors.
- ✓ The proposed method is applied in the largest manufacturing industry in Bangladesh with a named footwear company.
- ✓ The supply chain of footwear industry is complex; this study provides several managerial and practical implications to enable industry managers to overcome potential problems and to adopt sustainable supply chain practices.

This paper has some key limitations. The study is conducted in the context of a footwear company; in future, similar work can be conducted related to other industries. Any future work in this domain in the form of a research study can contribute to existing knowledge, however small the study may be. Any research at any level will be considerable in taking up the challenges i.e. implementation of 4.0, circular supply chain etc. that are faced by the footwear industry and the organisations working in it. To establish the relationship between the cause and effect factors, a future study can be taken up to measure the empirical evidence.

References

Abbasi, M., & Nilsson, F. (2012). Themes and challenges in making supply chains environmentally sustainable. *Supply Chain Management: An International Journal*, 17(5), 517-530.

Abdul-Rashid, S. H., Sakundarini, N., Raja Ghazilla, R. A., & Thurasamy, R. (2017). The impact of sustainable manufacturing practices on sustainability performance: empirical evidence from Malaysia. *International Journal of Operations & Production Management*, 37(2), 182-204.

Ahi, P., & Searcy, C. (2013). A comparative literature analysis of definitions for green and sustainable supply chain management. *Journal of Cleaner Production*, 52, 329-341.

Asif, M., Fisscher, O. A., de Bruijn, E. J., & Pagell, M. (2010). Integration of management systems: A methodology for operational excellence and strategic flexibility. *Operations Management Research*, 3(3-4), 146-160.

Asrar-ul-Haq, M., Kuchinke, K. P., & Iqbal, A. (2017). The relationship between corporate social responsibility, job satisfaction, and organizational commitment: Case of Pakistani higher education. *Journal of Cleaner Production*, 142, 2352-2363.

Bai, C., & Sarkis, J. (2017). Improving green flexibility through advanced manufacturing technology investment: Modeling the decision process. *International Journal of Production Economics*, 188, 86-104.

Bag, S., Wood, L. C., Mangla, S. K., & Luthra, S. (2020). Procurement 4.0 and its implications on business process performance in a circular economy. Resources, Conservation & Recycling, 152, 104502

Bastas, A., & Liyanage, K. (2018). Sustainable supply chain quality management: A systematic review. *Journal of Cleaner Production*, 181, 726-744.

Bastas, A., & Liyanage, K. (2019). Integrated quality and supply chain management business diagnostics for organizational sustainability improvement. *Sustainable Production and Consumption*, 17, 11-30.

Boström, M., Jönsson, A. M., Lockie, S., Mol, A. P., & Oosterveer, P. (2015). Sustainable and

responsible supply chain governance: challenges and opportunities. Journal of Cleaner Production, 107, 1-7.

Bou-Llusar, J. C., Escrig-Tena, A. B., Roca-Puig, V., & Beltrán-Martín, I. (2009). An empirical assessment of the EFQM Excellence Model: Evaluation as a TQM framework relative to the MBNQA Model. *Journal of Operations Management*, 27(1), 1-22.

Bozarth, C. C., Warsing, D. P., Flynn, B. B., & Flynn, E. J. (2009). The impact of supply chain complexity on manufacturing plant performance. Journal of Operations Management, 27(1), 78-93.

Bozarth, C. C., Warsing, D. P., Flynn, B. B., & Flynn, E. J. (2009). The impact of supply chain complexity on manufacturing plant performance. *Journal of Operations Management*, 27(1), 78-93.

Caiado, R., Nascimento, D., Quelhas, O., Tortorella, G., & Rangel, L. (2018). Towards sustainability through Green, Lean and Six Sigma integration at service industry: review and framework. *Technological and Economic Development of Economy*, 24(4), 1659-1678.

Campbell, D. (2012). Employee selection as a control system. *Journal of Accounting Research*, 50(4), 931-966.

Carter, C. R., & Liane Easton, P. (2011). Sustainable supply chain management: evolution and future directions. *International Journal of Physical Distribution & Logistics Management*, 41(1), 46-62.

Carter, C. R., & Rogers, D. S. (2008). A framework of sustainable supply chain management: moving toward new theory. *International journal of physical distribution & logistics management*, 38(5), 360-387.

Chan, H. K., He, H., & Wang, W. Y. (2012). Green marketing and its impact on supply chain management in industrial markets. *Industrial Marketing Management*, 41(4), 557-562.

Chardine-Baumann, E., & Botta-Genoulaz, V. (2014). A framework for sustainable performance assessment of supply chain management practices. *Computers & Industrial Engineering*, 76, 138-147.

Cherrafi, A., Elfezazi, S., Govindan, K., Garza-Reyes, J. A., Benhida, K., & Mokhlis, A. (2017). A framework for the integration of Green and Lean Six Sigma for superior sustainability performance. *International Journal of Production Research*, 55(15), 4481-4515.

Colbert, B. A., & Kurucz, E. C. (2007). Three conceptions of triple bottom line business sustainability and the role for HRM. *People and Strategy*, 30(1), 21-29.

Cole, R., & Aitken, J. (2019). The role of intermediaries in establishing a sustainable supply chain. *Journal of Purchasing and Supply Management*. (in press)

Crabtree, P., Dhokia, V. G., Newman, S. T., & Ansell, M. P. (2009). Manufacturing methodology for personalised symptom-specific sports insoles. *Robotics and Computer-Integrated Manufacturing*, 25(6), 972-979.

Daily, B. F., & Huang, S. C. (2001). Achieving sustainability through attention to human resource factors in environmental management. *International Journal of Operations & Production Management*, 21(12), 1539-1552.

Darnall, N., Jolley, G. J., & Handfield, R. (2008). Environmental management systems and green supply chain management: complements for sustainability?. *Business Strategy and the Environment*, 17(1), 30-45.

de Sousa Jabbour, A. B. L., Jabbour, C. J. C., Foropon, C., & Godinho Filho, M. (2018). When titans meet–Can industry 4.0 revolutionise the environmentally-sustainable manufacturing wave? The role of critical success factors. *Technological Forecasting and Social Change*, *132*, 18-25.

Dearing, A. (2000). Sustainable innovation: Drivers and barriers. Innovation and the Environment. *OECD: Paris*, 103-125.

Demir, R., Wennberg, K., & McKelvie, A. (2017). The strategic management of high-growth firms: A review and theoretical conceptualization. *Long Range Planning*, 50(4), 431-456.

Diabat, A., & Govindan, K. (2011). An analysis of the drivers affecting the implementation of green supply chain management. Resources, Conservation & Recycling, 55(6), 659-667.

Ding, Z., Jiang, X., Liu, Z., Long, R., Xu, Z., & Cao, Q. (2018). Factors affecting low-carbon consumption behavior of urban residents: A comprehensive review. *Resources, Conservation &*

Recycling, *132*, 3-15.
Dubey, R., Gunasekaran, A., Childe, S. J., Papadopoulos, T., & Helo, P. (2019). Supplier relationship management for circular economy: influence of external pressures and top management commitment. *Management Decision*, *57*(4), 767-790.
Famiyeh, S., & Kwarteng, A. (2018). Supplier selection and firm performance: Empirical evidence from a developing country's environment. *International Journal of Quality & Reliability Management*, 35(3), 690-710.
Fellnhofer, K. (2017). Drivers of innovation success in sustainable businesses. *Journal of Cleaner Production*, 167, 1534-1545.
Gardas, B. B., Raut, R. D., & Narkhede, B. (2019). Identifying critical success factors to facilitate reusable plastic packaging towards sustainable supply chain management. *Journal of environmental management*, 236, 81-92.
Gardner, T. A., Benzie, M., Börner, J., Dawkins, E., Fick, S., Garrett, R., ... & Mardas, N. (2019). Transparency and sustainability in global commodity supply chains. *World Development*, *121*, 163-177.
Geerts, W. (2014). Environmental certification schemes: Hotel managers' views and perceptions. *International Journal of Hospitality Management*, 39, 87-96.
Geissdoerfer, M., Savaget, P., Bocken, N. M., & Hultink, E. J. (2017). The Circular Economy–A new sustainability paradigm?. *Journal of Cleaner Production*, 143, 757-768.
Gimenez, C., Sierra, V., & Rodon, J. (2012). Sustainable operations: Their impact on the triple bottom line. *International Journal of Production Economics*, 140(1), 149-159.
Gold, S., Seuring, S., & Beske, P. (2010). Sustainable supply chain management and inter- organizational resources: a literature review. *Corporate Social Responsibility and Environmental Management*, 17(4), 230-245.
Gong, M., Gao, Y., Koh, L., Sutcliffe, C., & Cullen, J. (2019). The role of customer awareness in promoting firm sustainability and sustainable supply chain management. *International Journal of Production Economics*. (in press)
Gopalakrishnan, K., Yusuf, Y. Y., Musa, A., Abubakar, T., & Ambursa, H. M. (2012). Sustainable supply chain management: A case study of British Aerospace (BAe) Systems. *International Journal of Production Economics*, *140*(1), 193-203.
Gosling, J., Jia, F., Gong, Y., & Brown, S. (2016). The role of supply chain leadership in the learning of sustainable practice: toward an integrated framework. *Journal of Cleaner Production*, 137, 1458-1469.
Grover, S., Agrawal, V. P., & Khan, I. A. (2006). Role of human factors in TQM: a graph theoretic approach. *Benchmarking: An International Journal*, 13(4), 447-468.
Gruman, J. A., & Saks, A. M. (2011). Performance management and employee engagement. *Human Resource Management Review*, 21(2), 123-136.
Guest, D. E. (1997). Human resource management and performance: a review and research agenda. *International Journal of Human Resource Management*, 8(3), 263-276.
Hassini, E., Surti, C., & Searcy, C. (2012). A literature review and a case study of sustainable supply chains with a focus on metrics. *International Journal of Production Economics*, 140(1), 69-82.
Hofmann, H., Schleper, M. C., & Blome, C. (2018). Conflict minerals and supply chain due diligence: an exploratory study of multi-tier supply chains. *Journal of Business Ethics*, *147*(1), 115-141.
Hong, J., Zhang, Y., & Ding, M. (2018). Sustainable supply chain management practices, supply chain dynamic capabilities, and enterprise performance. *Journal of Cleaner Production*, *172*, 3508-3519.
Hu, J., Liu, Y. L., Yuen, T. W. W., Lim, M. K., & Hu, J. (2019). Do green practices really attract customers? The sharing economy from the sustainable supply chain management perspective. *Resources, Conservation & Recycling*, 149, 177-187.
Huo, B., Gu, M., & Wang, Z. (2019). Green or lean? A supply chain approach to sustainable performance. *Journal of Cleaner Production*, 216, 152-166.
Jabbour, C. J. C., & de Sousa Jabbour, A. B. L. (2016). Green human resource management and green

supply chain management: Linking two emerging agendas. *Journal of Cleaner Production*, 112, 1824-1833.

Jabbour, C. J. C., Sarkis, J., de Sousa Jabbour, A. B. L., Renwick, D. W. S., Singh, S. K., Grebinevych, O., ... & Godinho Filho, M. (2019). Who is in charge? A review and a research agenda on the 'human side'of the circular economy. *Journal of Cleaner Production*, 222, 793-801.

Jia, F., Gong, Y., & Brown, S. (2018). Multi-tier sustainable supply chain management: The role of supply chain leadership. International Journal of Production Economics. (in press)

Joshi, Y., & Rahman, Z. (2015). Factors affecting green purchase behaviour and future research directions. *International Strategic Management Review*, 3(1-2), 128-143.

Kapse, C. P., Kumar, A., Dash, M. K., Zavadskas, E. K., & Luthra, S. (2018). Developing textile entrepreneurial inclination model by integrating experts mining and ISM-MICMAC. *International Journal of Production Research*, *56*(14), 4709-4728.

Kaur, H., & Singh, S. P. (2019). Flexible dynamic sustainable procurement model. *Annals of Operations Research*, 273(1-2), 651-691.

Kramar, R. (2014). Beyond strategic human resource management: is sustainable human resource management the next approach?. *The International Journal of Human Resource Management*, 25(8), 1069-1089.

Kumar, A., Mangla, S. K., Luthra, S., & Ishizaka, A. (2019). Evaluating the human resource related soft dimensions in green supply chain management implementation. *Production Planning & Control*, 1-17.

Kumar, A., Zavadskas, E. K., Mangla, S. K., Agrawal, V., Sharma, K., & Gupta, D. (2019). When risks need attention: adoption of green supply chain initiatives in the pharmaceutical industry. *International Journal of Production Research*, *57*(11), 3554-3576.

Kusi-Sarpong, S., Gupta, H., Khan, S. A., Jabbour, C. J. C., Rehman, S. T., & Kusi-Sarpong, H. (2019). Sustainable supplier selection based on industry 4.0 initiatives within the context of circular economy implementation in supply chain operations. *Production Planning and Control*. (in press)

Laari, S., Töyli, J., & Ojala, L. (2017). Supply chain perspective on competitive strategies and green supply chain management strategies. *Journal of Cleaner Production*, 141, 1303-1315.

Large, R. O., & Thomsen, C. G. (2011). Drivers of green supply management performance: Evidence from Germany. *Journal of Purchasing and Supply Management*, 17(3), 176-184.

Latan, H., Jabbour, C. J. C., de Sousa Jabbour, A. B. L., Wamba, S. F., & Shahbaz, M. (2018). Effects of environmental strategy, environmental uncertainty and top management's commitment on corporate environmental performance: The role of environmental management accounting. *Journal of cleaner production*, *180*, 297-306.

Lee, S. M., Tae Kim, S., & Choi, D. (2012). Green supply chain management and organizational performance. *Industrial Management & Data Systems*, 112(8), 1148-1180.

Lin, K. P., Tseng, M. L., & Pai, P. F. (2018). Sustainable supply chain management using approximate fuzzy DEMATEL method. *Resources, Conservation & Recycling*, 128, 134-142.

Linton, J. D., Klassen, R., & Jayaraman, V. (2007). Sustainable supply chains: An introduction. *Journal of Operations Management*, 25(6), 1075-1082.

Luthra, S., & Mangla, S. K. (2018). When strategies matter: Adoption of sustainable supply chain management practices in an emerging economy's context. *Resources, Conservation & Recycling*, 138, 194-206.

Mangla, S. K., Kusi-Sarpong, S., Luthra, S., Bai, C., Jakhar, S. K., & Khan, S. A. (2019). Operational excellence for improving sustainable supply chain performance. *Resources, Conservation & Recycling*, 142, 277-278.

Marimon, F., Casadesus, M., & Heras, I. (2010). Certification intensity level of the leading nations in ISO 9000 and ISO 14000 standards. *International Journal of Quality & Reliability Management*, 27(9), 1002-1020.

Moktadir, M. A., Ali, S. M., Rajesh, R., & Paul, S. K. (2018b). Modeling the interrelationships among barriers to sustainable supply chain management in leather industry. *Journal of Cleaner Production*,

181, 631-651.
Moktadir, M. A., Rahman, T., Rahman, M. H., Ali, S. M., & Paul, S. K. (2018a). Drivers to sustainable manufacturing practices and circular economy: A perspective of leather industries in Bangladesh. . *Journal of Cleaner Production*, 174, 1366-1380.
Muduli, K., Govindan, K., Barve, A., Kannan, D., Geng, Y., 2013. Role of behavioural factors in green supply chain management implementation in Indian mining industries. *Resources, Conservation & Recycling*, 76, 50–60.
Muthu, S. S. (2013). The environmental impact of footwear and footwear materials. In Handbook of Footwear Design and Manufacture (pp. 266-279). Woodhead Publishing.
Nica, E., Potcovaru, A., 2015. The social sustainability of the sharing economy. Econ. Manag. Financ. Mark.
Pagell, M., Shevchenko, A., 2014. Why research in sustainable supply chain management should have no future. J. Supply Chain Manag.
Papetti, A., Marconi, M., Rossi, M., & Germani, M. (2019). Web-based platform for eco-sustainable supply chain management. *Sustainable Production and Consumption*, 17, 215-228.
Piercy, N., & Rich, N. (2015). The relationship between lean operations and sustainable operations. *International Journal of Operations & Production Management*, 35(2), 282-315.
Polonsky, M. J. (2011). Transformative green marketing: Impediments and opportunities. *Journal of Business Research*, 64(12), 1311-1319.
Ponstein, H. J., Ghinoi, S., & Steiner, B. (2019). How to increase sustainability in the Finnish wine supply chain? Insights from a country of origin-based greenhouse gas emissions analysis. *Journal of Cleaner Production*, 226, 768–780.
Principato, L., Ruini, L., Guidi, M., & Secondi, L. (2019). Adopting the circular economy approach on food loss and waste: The case of Italian pasta production. *Resources, Conservation & Recycling*, 144, 82-89.
Raut, R. D., Mangla, S. K., Narwane, V. S., Gardas, B. B., Priyadarshinee, P., & Narkhede, B. E. (2019). Linking big data analytics and operational sustainability practices for sustainable business management. *Journal of Cleaner Production*, 224, 10–24.
Reimann, M., Xiong, Y., & Zhou, Y. (2019). Managing a closed-loop supply chain with process innovation for remanufacturing. *European Journal of Operational Research*, 276(2), 510-518.
Renwick, D. W., Redman, T., & Maguire, S. (2013). Green human resource management: A review and research agenda. *International Journal of Management Reviews*, 15(1), 1-14.
Resta, B., Powell, D., Gaiardelli, P., & Dotti, S. (2015). Towards a framework for lean operations in product-oriented product service systems. *CIRP Journal of Manufacturing Science and Technology*, 9, 12-22.
Rungtusanatham, M., Salvador, F., Forza, C., & Choi, T. Y. (2003). Supply-chain linkages and operational performance: a resource-based-view perspective. *International Journal of Operations & Production Management*, 23(9), 1084-1099.
Saeed, M. A., & Kersten, W. (2019). Drivers of Sustainable Supply Chain Management: Identification and Classification. *Sustainability*, 11(4), 1137.
Sáez-Martínez, F. J., Lefebvre, G., Hernández, J. J., & Clark, J. H. (2016). Drivers of sustainable cleaner production and sustainable energy options. *Journal of Cleaner Production*, 138, 1-7.
Sarkis, J., Zhu, Q., Lai, K.H., 2011. An organizational theoretic review of green supply chain management literature. Int. J. Prod. Econ. 130, 1–15.
Sauer, P. C., & Seuring, S. (2017). Sustainable supply chain management for minerals. *Journal of Cleaner Production*, 151, 235-249.
Schaltegger, S., & Burritt, R. (2014). Measuring and managing sustainability performance of supply chains: Review and sustainability supply chain management framework. *Supply Chain Management: An International Journal*, 19(3), 232-241.
Schoemaker, P. J., Heaton, S., & Teece, D. (2018). Innovation, dynamic capabilities, and leadership. *California Management Review*, *61*(1), 15-42.

Schrettle, S., Hinz, A., Scherrer-Rathje, M., & Friedli, T. (2014). Turning sustainability into action: Explaining firms' sustainability efforts and their impact on firm performance. *International Journal of Production Economics*, 147, 73-84.

Schroeder, P., Dewick, P., Kusi-Sarpong, S., & Hofstetter, J. S. (2018). Circular economy and power relations in global value chains: Tensions and trade-offs for lower income countries. *Resources, Conservation & Recycling*, 136, 77-78.

Sehnem, S., Jabbour, C. J. C., Pereira, S. C. F., & de Sousa Jabbour, A. B. L. (2019). Improving sustainable supply chains performance through operational excellence: circular economy approach. *Resources, Conservation & Recycling*, 149, 236-248.

Sellitto, M. A., Hermann, F. F., Blezs Jr, A. E., & Barbosa-Póvoa, A. P. (2019). Describing and organizing green practices in the context of Green Supply Chain Management: Case studies. *Resources, Conservation & Recycling*, 145, 1-10.

Seuring, S. (2013). A review of modeling approaches for sustainable supply chain management. *Decision support systems*, 54(4), 1513-1520.

Seuring, S., & Müller, M. (2008). From a literature review to a conceptual framework for sustainable supply chain management. *Journal of cleaner production*, 16(15), 1699-1710.

Shaharudin, M. S., Fernando, Y., Jabbour, C. J. C., Sroufe, R., & Jasmi, M. F. A. (2019). Past, present, and future low carbon supply chain management: A content review using social network analysis. *Journal of Cleaner Production*, 218, 629-643.

Sharma, Y.K., Mangla, S.K., Patil, P.P., Liu, S. (2019). When challenges impede the process: For circular economy-driven sustainability practices in food supply chain. Manag. Decis. 57, 995–1017.

Silvestre, B. S., Monteiro, M. S., Viana, F. L. E., & de Sousa-Filho, J. M. (2018). Challenges for sustainable supply chain management: When stakeholder collaboration becomes conducive to corruption. *Journal of Cleaner Production*, 194, 766-776.

Silvestre, B. S., Monteiro, M. S., Viana, F. L. E., & de Sousa-Filho, J. M. (2018). Challenges for sustainable supply chain management: When stakeholder collaboration becomes conducive to corruption. . *Journal of Cleaner Production*, *194*, 766-776.

Silvestre, B.S., 2015. Sustainable supply chain management in emerging economies: Environmental turbulence, institutional voids and sustainability trajectories. Int. J. Prod. Econ. 167, 156–169.

Simon, B. (2019). What are the most significant aspects of supporting the circular economy in the plastic industry?. *Resources, Conservation & Recycling*, 141, 299-300.

Singh, R. K., Luthra, S., Mangla, S. K., & Uniyal, S. (2019). Applications of information and communication technology for sustainable growth of SMEs in India food industry. *Resources, Conservation & Recycling*, 147, 10-18.

Slaper, T. F., & Hall, T. J. (2011). The triple bottom line: What is it and how does it work. *Indiana Business Review*, 86(1), 4-8.

Sustainable Solutions Development Network, 2013. Solutions for Sustainable Agriculture and Food Systems., Solutions for Sustainable Agriculture and Food Systems: Technical Report for the Post-2015 Development Agenda.

Taticchi, P., Tonelli, F., & Pasqualino, R. (2013). Performance measurement of sustainable supply chains: A literature review and a research agenda. *International Journal of Productivity and Performance Management*, 62(8), 782-804.

Todeschini, B. V., Cortimiglia, M. N., Callegaro-de-Menezes, D., & Ghezzi, A. (2017). Innovative and sustainable business models in the fashion industry: Entrepreneurial drivers, opportunities, and challenges. *Business Horizons*, 60(6), 759-770.

Torra, V. (2010). Hesitant fuzzy sets. *International Journal of Intelligent Systems*, *25*(6), 529-539.

Tseng, M.-L., Chiu, (Anthony) Shun Fung, Tan, R.R., Siriban-Manalang, A.B., 2013. Sustainable consumption and production for Asia: sustainability through green design and practice. *Journal of Cleaner Production*, 40, 1–5.

Vachon, S., Klassen, R.D., 2008. Environmental management and manufacturing performance: The role of collaboration in the supply chain. *International Journal of Production Economics*. 111, 299–315.

Venkatesh, V., Bala, H., & Sykes, T. A. (2010). Impacts of information and communication technology implementations on employees' jobs in service organizations in India: a multi- method longitudinal field study. *Production and Operations Management*, 19(5), 591-613.

Verburg, R. M., Nienaber, A. M., Searle, R. H., Weibel, A., Den Hartog, D. N., & Rupp, D. E. (2018). The role of organizational control systems in employees' organizational trust and performance outcomes. *Group & organization management*, *43*(2), 179-206.

Walker, H., Di Sisto, L., & McBain, D. (2008). Drivers and barriers to environmental supply chain management practices: Lessons from the public and private sectors. *Journal of Purchasing and Supply Management*, 14(1), 69-85.

Wang, Y.F., Chen, S.P., Lee, Y.C., Tsai, C.T. (Simon), 2013. Developing green management standards for restaurants: An application of green supply chain management. *International Journal of Hospitality Management*. 34, 263–273.

Wu, S. M., Liu, H. C., & Wang, L. E. (2017). Hesitant fuzzy integrated MCDM approach for quality function deployment: a case study in electric vehicle. *International Journal of Production Research*, *55*(15), 4436-4449.

Wu, Z., & Pagell, M. (2011). Balancing priorities: Decision-making in sustainable supply chain management. *Journal of operations management*, 29(6), 577-590.

Xia, M., & Xu, Z. (2011). Hesitant fuzzy information aggregation in decision making. *International Journal of Approximate Reasoning*, *52*(3), 395-407.

Xu, M., Cui, Y., Hu, M., Xu, X., Zhang, Z., Liang, S., Qu, S., 2019. Supply chain sustainability risk and assessment. *Journal of Cleaner Production*, 225, 857–867.

Zaid, A.A., Jaaron, A.A.M., Bon, A.T., 2018. The impact of green human resource management and green supply chain management practices on sustainable performance: An empirical study. *Journal of Cleaner Production*, 204, 965–979.

Zeng, H., Chen, X., Xiao, X., & Zhou, Z. (2017). Institutional pressures, sustainable supply chain management, and circular economy capability: Empirical evidence from Chinese eco-industrial park firms. *Journal of Cleaner Production*, 155, 54-65.

Zhang, D., Rong, Z., & Ji, Q. (2019). Green innovation and firm performance: evidence from listed companies in China. *Resources, Conservation & Recycling*, 144, 48-55.

Zhu, Q., & Sarkis, J. (2004). Relationships between operational practices and performance among early adopters of green supply chain management practices in Chinese manufacturing enterprises. *Journal of Operations Management*, 22(3), 265-289.

Zhu, Q., Sarkis, J., & Lai, K. H. (2008). Green supply chain management implications for "closing the loop". *Transportation Research Part E: Logistics and Transportation Review*, 44(1), 1-18.

Appendix A.1

Table 3. Influence assessment of all experts on dynamic leadership

	Dynamic leadership								Collective opinions
	Ex1	Ex2	Ex3	Ex4	Ex5	Ex6	Ex7	Ex8	
Performance evaluation system and reward facility	0.4	0.6	0.5	0.7	0.8	0.7	0.3	0.5	{0.4, 0.6, 0.5, 0.7, 0.8, 0.3}
Effective communications structure	0.5	0.4	0.6	0.5	0.7	0.6	0.8	0.7	{0.5, 0.4, 0.6, 0.8, 0.7}
Employee treated as team member	0.7	0.3	0.7	0.6	0.8	0.8	0.4	0.6	{0.7, 0.3, 0.6, 0.8, 0.4}
Trust among employees	0.4	0.7	0.3	0.5	0.8	0.4	0.6	0.7	{0.4, 0.7, 0.3, 0.5, 0.8, 0.6}
Sustainable strategy	0.3	0.6	0.4	0.7	0.5	0.5	0.8	0.5	{0.3, 0.6, 0.4, 0.7, 0.5, 08}
Sustainable innovation	0.6	0.4	0.5	0.8	0.6	0.4	0.9	0.8	{0.6, 0.4, 0.5, 0.8, 0.6, 0.9}
Facility of training program	0.7	0.7	0.4	0.9	0.7	0.3	0.7	0.6	{0.7, 0.4, 0.9, 0.3, 0.6}
Organizational culture	0.2	0.6	0.5	0.4	0.6	0.6	0.6	0.7	{0.2, 0.6, 0.5, 0.4, 0.7}
Social legitimacy, accountability and trust	0.8	0.4	0.6	0.6	0.6	0.5	0.5	0.4	{0.8, 0.4, 0.6, 0.5}
Freedom of choice of job responsibility	0.6	0.7	0.5	0.4	0.5	0.7	0.4	0.3	{0.6, 0.7, 0.5, 0.4, 0.3}
Motivation towards green practices	0.7	0.8	0.6	0.5	0.4	0.8	0.3	0.3	{0.7, 0.8, 0.6, 0.5, 0.4. 0.3}
Commitment from high authority	0.7	0.5	0.5	0.7	0.6	0.8	0.5	0.6	{0.7, 0.5, 0.6, 0.8}
Profit sharing among employees	0.5	0.6	0.4	0.4	0.6	0.6	0.7	0.7	{0.5, 0.6, 0.4, 0.7}

Ex. stands for expert.

Appendix A.2

Phase 1 - Finalization of human behavioural factors

Greetings!!!!

Dear respondent, in this research we are trying to understand the role of human behavioural factors in adoption of sustainable supply chain. We have identified factors from current literature, request you please rate the factors on the scale 5 – very important to 1 – not at all important.

Behavioural factors on adoption of sustainable supply chain	**Response**
Dynamic leadership	
Performance evaluation system and reward facility	
Effective communications structure	
Employee treated as team member	
Trust among employees	
Sustainable strategy	
Sustainable innovation	
Facility of training program	
Organizational culture	
Social legitimacy, accountability and trust	
Freedom of choice of job responsibility	
Motivation towards green practices	
Commitment from high authority	
Profit sharing among employees	
If any others, please add….	

Appendix A.3

Phase 2 - Influencing assessment behavioural factors sustainability in supply chain in footwear industry

Please rate the influencing assessment of one factor to another based on the following scale: 0.0 - Absolutely low influence 0.1 - Low influence 0.2 - Fairly low influence 0.3 - Medium influence 0.4 - Fairly medium low influence 0.5 - High influence 0.6 - Fairly high influence 0.7 - High influence 0.8 - Absolutely high influence 0.9 - Very high influence	**Compare the influence of one critical factor over another as per mentioned scale**													
	Dynamic leadership	Performance evaluation system and reward facility	Effective communications structure	Employee treated as team member	Trust among employees	Sustainable strategy	Sustainable innovation	Facility of training program	Organizational culture	Social legitimacy, accountability and trust	Freedom of choice of job responsibility	Motivation towards green practices	Commitment from high authority	Profit sharing among employees
Dynamic leadership	0													
Performance evaluation system and reward facility		0												
Effective communications structure			0											
Employee treated as team member				0										
Trust among employees					0									
Sustainable strategy						0								
Sustainable innovation							0							
Facility of training program								0						
Organizational culture									0					
Social legitimacy, accountability and trust										0				
Freedom of choice of job responsibility											0			
Motivation towards green practices												0		
Commitment from high authority													0	
Profit sharing among employees														0