

**Investigating the Motives, Barriers and Enablers Associated with the
Implementation of a Sustainable Supply Chain Management in the Saudi
Manufacturing Industry**

A thesis submitted in partial fulfilment of the requirements for the degree of

Doctor of Philosophy

University of the West of England

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July 2021

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Abstract

Sustainable supply chain management (SSCM) can play a significant role in improving a company's sustainability performance by addressing the social, environmental and economic issues affecting the supply chain; including suppliers, in-house operations, distributors and customers. Achieving sustainability through SSCM is a challenge that requires clarification of the complexities that arise when developing efficient and effective SSCM. Limited empirical research has investigated that complexity in detail, especially in developing countries. The aim of this study is to identify and investigate the relevance of key motives, barriers and enabling factors, and their influence on the adoption of SSCM practices in the context of the manufacturing sector in a developing country Saudi Arabia (S.A.)

To accomplish this aim, a range of literature has been explored to identify and to understand the motives, barriers, and enablers of SSCM in the context of developing nations. This review has identified eight important categories of motives, thirteen categories of barriers, and ten categories of enablers; thereby revealing the research gaps that this thesis addresses. The review also has led to the development of a conceptual framework to examine the relevance and influence of the three main components of SSCM empirically: motives, barriers, and enabler in S.A. Each component is attached to four sub-components that aim to enhance understanding of the principal components. The framework has been further enhanced by differentiating the barrier and enabler sub-component effects into economic, environmental, and social categories.

The thesis follows multiple case-study design, supporting a detailed analysis of six large companies working in different Saudi manufacturing sectors; namely, Oil and Gas, Minerals and Mining, Chemicals and Plastics and Energy, combined with evidence from an expert focus group. The manufacturing industry in S.A. is considered relevant to this research because of its supply chain intricacies, and the scale and extent of its ecological and social effects. This thesis further acknowledges the academic research trend towards exploring large firms because their supply chains are mostly concerned with the issues and practices associated with SSCM.

The data-collection methods include in-depth interviews with top-level managers, and documents obtained from company websites. In total, primary data was collected from ten managers and nine experts, and data from 224 secondary sources were analyzed. A thematic-analysis approach was adopted to examine the data, and a template was developed to show the differences and similarities of telling the answer among the cases regarding key motives, enablers, and barriers.

The study results reveal that large manufacturing companies in S.A. acknowledge the importance of adopting SSCM to improve performance. Two related motivators were found to drive adoption; these were to achieve benefits, and to respond to stakeholder pressures such as regulation, competition and corporate social responsibility (i.e. assuming responsibility toward others, such as the local community and employees). This study found that external stakeholder barriers are greater inhibitors of the development of SSCM than internal barriers. Moreover, the study particularly noted the government barriers that can cause negative economic, environmental, and social impacts on the development of SSCM

practices. Perhaps the most significant finding to emerge from the analysis is that stakeholder engagement plays a critical role in mitigating barriers and advancing the adoption of SSCM. The study found that corporate understanding of engaging, developing and managing the positive contributions of external stakeholders, and, more importantly, of internal stakeholders, specifically, the top management is an essential enabler in the development of SSCM. Other significant enablers include the availability of technology, performance measurement, the existence of a sustainability culture and sustainability strategy.

This thesis contributes both theoretically and practically to the field of SSCM. It is the first study of its type to investigate the motives, barriers and enablers of SSCM in the context of S.A. This study's results reveal that the three components are interconnected, inferring that some SSCM categories appear as motives and/or barriers and/or enablers. Therefore, a company needs to identify how these can be presented as motives, enablers, barriers, or both. This research also enhances SSCM knowledge by conducting a comprehensive review of the literature that led to identifying the potential factors in terms of the key motives, barriers and enablers that may affect the adoption of SSCM in developing countries.

Moreover, the study found a lack of theoretical understanding that addressed the motives, barriers, and enablers in adopting SSCM and proposed a conceptual framework to better understood these aspects. Finally, this thesis contributed to bridging the gap between theory and practice by providing a practical roadmap to guide organisations in their effective adoption of SSCM, and the findings also engendered the development of a model that can contribute to a better understanding of the motives, barriers, and enablers of SSCM in the SA.

The thesis also presents limitations and outlines future research, addressing different dimensions. For instance, the findings of this research are based on an investigation of six cases, meaning generalization to Saudi manufacturing industries as a whole is not possible. Thus, it will be interesting to assess the SSCM enablers and barriers and motivators developed in this study through large-scale online, on-site e-mail/ mail surveys across one or multiple sectors.

Acknowledgements

Alhamdulillah (praise be to Allah) first and foremost for helping me to make this thesis a reality. I hope that I will be rewarded by Allah in this life and the life after this by finishing this work.

This thesis would not have achieved fruition without many people's contributions, from my supervisory team, the school's administrators, family and friends, the case study participants, my classmates, colleagues, government Ministries, and my sponsor King Faisal University. So, thank you all.

Special thanks go to those who were directly involved with me during this research. I first offer my immense gratitude to my supervisory team. My gratitude goes first to my study director, Prof. Mohammed Saad, who gave me this opportunity to complete my study under his supervision. He always challenged me to do better, and his insightful comments helped improve this thesis' outcomes. Further gratitude goes to my second supervisor, Prof. Vikas Kumar, who makes me a confident researcher, and for his comments to improve this thesis's outcome. Both supervisors contributed positively to developing my research skills and personality, making me who I am today.

This journey would not have been possible without my family's support. Their faith in me pushed me to keep going and complete this thesis. I cannot thank them enough for this. Many thanks go to my Father, Ahmed, my stepmother Afaf, my brothers Mohammed, Bader, Hesham & Faris, my sisters Duea & Alaa, my grandparents Abdullatif, -Jawahra & Aisha, my aunties and uncles, and my nephews and niece. I also wish that Allah will bless my mother in her grave as a reward for raising a good child.

Further, I cannot express my sincere appreciation to my wife, Abrar, for her support and patience in the last four years. She created an environment that allowed me to focus on finishing my research. Even while she was herself completing her master's degree, she did not forget about me. I am proud of her achievement, and I am lucky to have her on my side. Also, I would like to thank my wife's family for their support as well.

Finally, I would like to thank my friends who asked about me during those years. Special thanks go to Ahmed and Mohammed, whom I have known since I was a child, and I wish them all the best in their personal and career life.

This PhD is now submitted, but the joy and experience obtained during the years spent researching it are unforgettable. This experience has shaped me, and encouraged me to become a better person and researcher.

Publications

Aljoghaiman, A., Saad, M. and Kumar, V. (2019) Investigating the Motives, Barriers and Enablers Associated with the Implementation of Sustainable Supply Chain in Saudi Manufacturing Industry. In: *The International Conference on Industrial Engineering and Operations Management Pilsen, Czech Republic, July 23-26, 2019*.

Chapter 1 : Introduction

This chapter presents an overview of the thesis, including a description of the research background, research questions and objectives, and the subject's importance. This is followed by an exploration of the Saudi context, a discussion of the research design, and finally an overview of the thesis structure.

1.1 Introduction to the study

Businesses must recognise that their future survival depends on satisfying all their stakeholders' needs (Chatterji, Levine and Toffel, 2009). While profits are vital, it should also be recognised that a firm's survival does not depend exclusively on maximising profits (Shevchenko, Levesque and Pagell, 2016). The extant literature concerning ethics and stakeholder theory indicates that unsustainable businesses will fail to survive in the market, as they do more harm than good to society (Hendry, 2006). Stakeholders can force firms to become more accountable for their activities, particularly if these are identified as resulting in negative environmental and social impacts (Oberhofer and Dieplinger, 2014).

By embracing sustainable supply chain management (SSCM), businesses can better respond to most stakeholder demands (Pagell and Wu, 2009), since SSCM is an approach to the management of the supply chain (SC), in which all three aspects of sustainability, namely economic, environmental, and social, are taken into account (Ciliberti *et al.*, 2008). This entails addressing issues such as financial profitability, climate change, air pollution, conservation of water, and working conditions among all the SC members. According to Seuring (2008) and Beske and Seuring (2014), this can be difficult to achieve, as the elements involved can, in practice, prove to be contradictory, resulting in the need for decision-makers to address the issue of trade-offs (Jamali, 2006).

The concept of SSCM is relatively new, in terms of its inclusion of sustainability in supply chain management (SCM), and represents the recent interest in this area of the academic community, policymakers, and practitioners (Ageron, Gunasekaran and Spalanzanie, 2012). It is a matter that is rarely investigated in developing countries, particularly in the Middle East, in countries such as the Kingdom of Saudi Arabia (KSA). The conclusions drawn by previous studies may not always be relevant to the Saudi environment's unique circumstances, and it is therefore beneficial to establish both recognition and understanding of certain factors that might motivate, enable, and inhibit large manufacturing companies in the KSA intending to adopt SSCM. This study's findings have the potential to assist managers, academic researchers, and policymakers of both developing nations and the Saudi

manufacturing industry to facilitate the development of the environmental, social, and economic aspects of SCM.

1.2 Research background

The concept of SSCM is relatively new, and has not yet been fully implemented by many companies in both developed and developing nations, because of a failure to identify and understand the critical factors involved, in terms of motives, barriers, and enablers. For example, around 35% of organisations fail to adopt sustainability aspects into their SCs, due to the failure to identify critical SSCM barriers (Ageron, Gunasekaran and Spalanzani, 2012).

Modern companies choose to adopt SSCM because of the presence of several factors relating to the normative, namely the ethical and moral values of a company (Morais and Silvestre, 2018), as well as the fact that it can be instrumental in increasing the profits and enhancing the reputation of a company (Paulraj, Chen and Blome, 2017), and for reasons of external pressure exerted by stakeholders, such as that of government regulations and environmental groups (Biswal *et al.*, 2018). However, managers, and indeed an industry itself, are likely to experience difficulties in responding simultaneously to all such motivating factors (Mathiyazhagan *et al.*, 2015). The successful implementation of SSCM therefore demands that managers and industries prioritise the identification and understanding of the relevant motives (Sajjad, Eweje and Tappin, 2019), each of which is dependent upon an industry's environment and individual perspective. Thus, the present study identifies and explores the main motives for adopting SSCM, particularly in the Saudi manufacturing sector.

The process of adopting SSCM practices can involve several inhibitors for a company (Tay *et al.*, 2015), and various factors have been identified as major contributing elements for hindering a company's efforts to adopt such practices (Sajjad, Eweje and Tappin, 2015). Most previous studies categorised these as internal barriers, such as management and employees, and external barriers, such as customers and regulations (Walker and Jones 2012; Sajjad, Eweje and Tappin 2015). However, previous studies also demonstrated that each of these barriers do not have the same impact, their influence on the SSCM process varies across different industrial contexts, and it is challenging to eradicate all the barriers simultaneously at the beginning of the SSCM adoption process (Zaabi, Dhaheri and Diabat, 2013). Thus, many suggested that industries and companies should analyse each barrier and its impacts, then commence the process of eliminating the most dominant barriers that prevent them from adopting SSCM, according to their context (Govindan *et al.*, 2014; Walker and Jones, 2012). It is therefore crucial to identify and discuss the key barriers of SSCM adoption in different contexts in which SSCM practices are at an initial stage, in order

to gain a more comprehensive understanding of the potential hurdles involved. In the case of this thesis, in the context of the Saudi manufacturing sector.

Along with the barriers identified during the SSCM adoption process, determining the various enablers can improve the execution of SSCM development (Patel and Desai, 2019). These can relate to factors both inside the organisation, such as top management and employees, and outside an organisation, such as government and suppliers. It is essential to understand that the impact of such enablers can vary between countries, industries, and companies (Faisal, 2010). Consequently, it is imperative to investigate the enablers for SSCM adoption from the Saudi perspective, as no previous studies have investigated this context to date. By analysing the enablers concerned, this study assesses the Saudi manufacturing sector's capabilities and readiness level, in order that a conceptual model can be developed to help these firms to adopt SSCM.

Organisation factors of SSCM implementation can be positioned as enablers or/and barriers or/and motives. For instance, an organisation's stakeholders can exert pressure on a company to adopt SSCM, and can concurrently inhibit and enable the SSCM implementation. The positive and negative influences of an organisation's stakeholders should therefore be determined, in order to investigate whether their role is exclusively motivated, or extended to have a role in enabling or inhibiting the SSCM implementation. Since there is currently a lack of exploratory studies that address these links, the current study seeks to develop a more detailed understanding of SSCM motives, barriers, and enablers that will benefit managers, academic researchers, and policymakers. Specifically, this study seeks to obtain a comprehensive understanding that will help manufacturing organisations, and other interested parties, to recognise the motives, barriers, and enablers of SSCM in developing nations, particularly in the context of the KSA. The goal of the study is to provide insights into the requirements of the Saudi manufacturing sector in adopting SSCM, since only limited research has been conducted to date that examines the motives, enablers, and barriers involved that affect manufacturing organisations in Saudi Arabia, as a developing country.

1.3 Research questions

A literature review is essential for establishing an understanding of the development of research questions capable of directing an empirical investigation. This dissertation is posing to answer the main questions and as set out below.

What are the critical motives, barriers, and enablers associated with the development of sustainable supply chain management in the context of Saudi manufacturing industry?

1. What are the critical motives for Saudi manufacturing companies to adopt SSCM?

2. What are the critical barriers inhibiting Saudi manufacturing companies from the adoption of SSCM?
 - What are the strengths of the critical barriers to influence other barriers in Saudi manufacturing companies' adoption of SSCM?
 - What do Saudi manufacturing companies' action to mitigate the critical barriers that inhibit the adoption of SSCM?
3. What are the critical enablers facilitating Saudi manufacturing companies' adoption of SSCM?
 - What are the strengths of the critical enablers to influence other enablers in Saudi manufacturing companies' adoption of SSCM?
 - What do Saudi manufacturing companies' action to maintain and develop the main enablers that facilitate the adoption of SSCM?
4. What is the most appropriate method employed by Saudi manufacturing companies to develop SSCM?

1.4 Research aim and objectives

This study aims to gain an in-depth understanding of the dominant factors relating to the adoption of SSCM of developing nations, particularly in the context of KSA, including the relevant motives, enablers and barriers. This will be achieved through the following objectives:

1. To theoretically review and understand the current literature about the main motives, barriers, and enablers that affect adopting SSCM in developing nations.
2. To identify and understand the critical motives for the Saudi manufacturing industry to adopt SSCM.
3. To identify and understand the critical barriers influencing the adoption of SSCM by the Saudi manufacturing industry.
4. To identify and understand the critical enablers impacting on the adoption of SSCM by the Saudi manufacturing industry.
5. To develop a roadmap capable of assisting companies in the Saudi manufacturing industry to maintain and develop their SSCM.

1.5 The significance of the study

SSCM plays a vital role in implementing sustainability in a company, because it is a dynamic process that includes a range of functional areas within and between the chain members to ensure a constant flow of material and information in a sustainable way (Ashby, Leat and Hudson-Smith, 2012). The adoption of SSCM by companies is one way to balance the environmental, social, and economic benefits in the SC (Luthra, Garg and Haleem, 2014). However, the development and the management of SSCM is not as direct (Tay *et al.*, 2015), since it is a complicated issue that is affected by certain key factors. The first task in the

adoption process is to develop a sound understanding of the motives involved, and the second is to create a proper understanding of the barriers. Meanwhile, the third task is to identify and comprehend the enablers of the process. Although a number of publications exist on each topic, the field is limited in aspects such as scope and context. For instance, most of the research conducted to date on each topic focused on the environmental aspect of the sustainability pillars, namely green or environmental management, rather than the other three aspects of sustainability in the SC (Quarshie, Salmi and Leuschner, 2016; Winter and Knemeyer, 2013). Although the extant research in these three areas identified the critical factors involved, and evaluated the contextual relationships between them, it suffered from a number of significant drawbacks that caused a lack of understanding of each aspect. The present study therefore proposes a conceptual framework that shows how the researcher can understand the three aspects of motives, enablers, and barriers to the SSCM adoption process.

As a consequence of this omission in the extant research, many do not fully understand the concept of SSCM, which is why its adoption faces challenges in many organisations. Empirical investigation of this matter is therefore required to improve awareness, in order that those involved in SSCM adoption possess an effective understanding of the matter. Many scholars advised that the motives, barriers, and enablers of the implementation of SSCM should be investigated in the context of developing nations, such as Saudi Arabia, observing the influence of the associated factors in the adoption process in each country, industry, and organisation (Silvestre, 2015a).

In summary, this research is important for many reasons. Firstly, it highlights the need to understand the key factors affecting the adoption of SSCM. Secondly, it fills the current gap in practical studies in the Saudi manufacturing sector. Thirdly, it provides a useful roadmap to guide manufacturing organisations in their adoption of SSCM. Fourthly, it contributes to the existing knowledge in the field, especially in the context of developing countries, such as Saudi Arabia, which has a very distinctive culture. Fifthly, this study is important as it obtained access to select cases in large Saudi organisations, and conducted interviews with top level managers, which is not an easy task, especially in Saudi Arabia. Secondary data is used to develop the cases, and to strengthen the understanding of the SSCM-related motives, enablers, and barriers involved. In addition, the use of a focus group approach, providing an overall understanding of these aspects from different perspectives.

1.6 Saudi context

Kingdom of Saudi Arabia (KSA) is a member of G20. It is currently the world's highest exporter of oil, which provides the majority of government revenue and so shapes the

development of the country. KSA has unique characteristics: the government with environmental, social, and economic challenges and its centralise influence in the country and culture are factors that have created exceptional conditions in Saudi Arabia. Corporate social responsibility (CSR) is still in its infancy in KSA, and the government influences its implementation (Maqbool, 2015; Ali and Al-Aali, 2012). For example, the international focus is currently on human rights, labour rights, the environment and anti-corruption. However, the emphasis in KSA is on human and social capital and the achievement of economic development (Maqbool, 2015).

The Saudi government can inhibit the implementation of SSCM through, For example, lack of environmental strategic planning and environmental management of industrial sectors (Al-Saqri and Sulaiman, 2014). The lack of a clear carbon management policy (Hashmi and Al-Habib, 2013). The lack of funding to subsidy solar industry and technology (Alyami, Rezgui and Kwan, 2015). This has a negative impact on the adoption of renewable energy by the manufactures and other sectors in KSA (Kahia, Omri and Jarraya, 2021).

However, Vision 2030 adopted by the government has led to considerable changes in the environment of KSA, in response to economic, environmental and social challenges. The new Saudi government's 2030 vision and its related programmes stress the importance of diversifying the economy to ensure that the private sector will eventually replace the current oil revenue (KSA vision, 2019). Most of the goals of Vision 2030 are in line with the objectives of sustainable development. As mentioned above, the Saudi government is the central administrative body in-country. Therefore, its Vision 2030 has altered its attitude towards sustainability and its approaches to its implementation. These changes can motivate companies to adopt SSCM by changing regulations, improving infrastructure, tax reduction, and investing.

The current researcher, therefore, considers that, under these circumstances, the conclusions drawn by previous studies may not always be relevant to the unique circumstances of the Saudi environment. It was thus viewed beneficial to establish the factors motivating, enabling and inhibiting large manufacturing companies in KSA in the development of sustainability for their supply chain practices within this unique environment. The researcher felt that the findings of this study have the potential to assist policymakers and companies in creating a sustainable economy for KSA.

The current researcher is well placed to conduct this study, due to being a Saudi citizen, which gives him several advantages, such as understanding the culture and the processes in the Kingdom. Moreover, the completion of this thesis will have an impact on the researcher's

career, as he is currently employed as a lecturer in the Business Management Department of King Faisal University.

1.7 Research design

The design strategy for this research consisted of two approaches. Firstly, from the literature review, the number of themes focussing on motives, enablers, barriers and the conceptual framework were developed as a guide to the empirical investigation. Secondly, a qualitative approach was used to facilitate a comprehensive answer to each of the research questions.

This study adopted as its main method multiple case studies of six Saudi manufacturing companies, using both primary and secondary sources. Semi-structured interviews with specific managers were used to gather primary data, while secondary data was collected from corporate websites. In addition, this study employed focus groups. These approaches enabled the use of triangulation to improve the trustworthiness of the research findings.

The cases were analysed using the thematic template approach, which demonstrates the process of analysis throughout the study. The findings of each case were first reported, followed by cross-cases, in order to improve the trustworthiness of the research findings. These processes were all undertaken through the use of NVivo- software.

The organisations used in the case studies operate in the oil, petrochemical, energy and mining sectors. They consist of large firms considered to be some of the most involved in the issues of sustainable development in KSA. This selection of companies from different industries provided a measure of diversity, so enhancing the validity and reliability of the research findings, i.e. by presenting the topic from several different points of view.

1.8 The structure of the thesis

This section outlines the seven chapters making up this thesis.

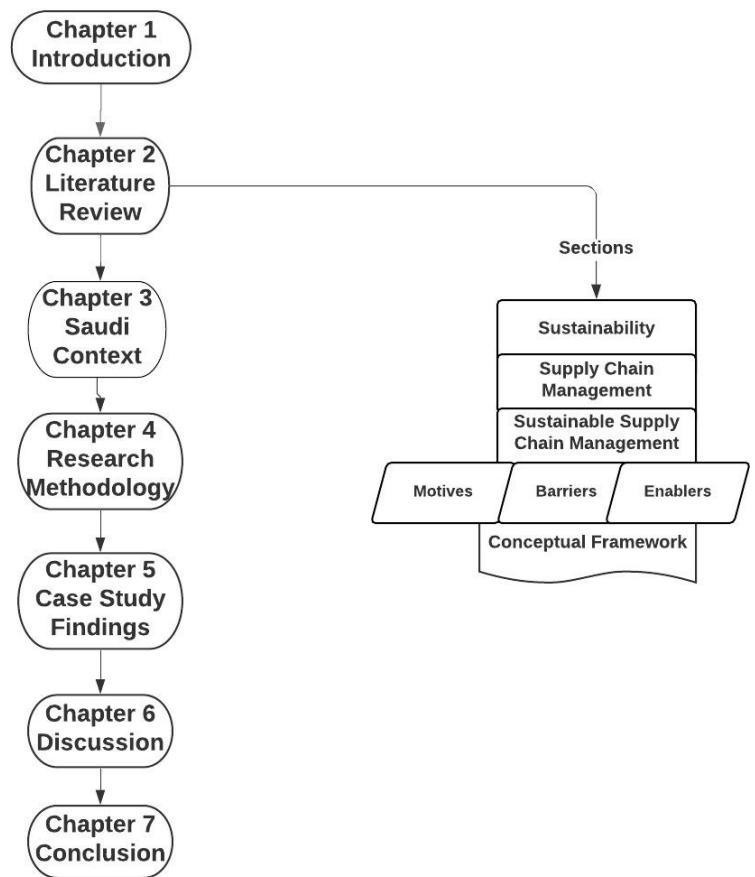


Figure 1.1: Thesis structure

Chapter One offers an overview of the research topic, along with outlining the rationale of the research, the research questions and objectives, as well as a description of the research design. The chapter's objective is to provide the necessary insight to clarify the discussions found in the subsequent chapters, as outline below.

Chapter Two consists of the literature review and addresses three themes: (1) sustainability; (2) Supply chain management; (3) and sustainable supply chain management. The chapter has four objectives; (1) to develop current knowledge regarding the concepts of sustainably and supply chain management; (2) to indicate how supply chain and sustainability interact when developing the concept of SSCM; (3) to explore the SSCM concept forming the main focus of this study, in which factors related to the motives, barriers and enablers of SSCM are identified and discussed, and research gaps are explored; (4) to present the conceptual framework guiding the empirical investigation.

Chapter Three explores the Saudi context from a number of unique dimensions, including political, environmental, social and economic concerns in the Kingdom, and the Saudi Vision 2030. These dimensions can both, directly and indirectly, influence the implementation of SSCM.

Chapter Four presents the research methodology. It commences with a philosophical discussion, followed by a description of the research design and methods, along with ethical considerations.

Chapter Five reports the findings of each case and cross-cases.

Chapter Six discusses the research results and compares them to those of previous studies. It also includes an outline of the degree to which the research objectives are achieved, and the research questions answered.

Chapter Seven forms the conclusion. It includes a discussion of the contribution to knowledge gained by conducting the study and outlines the limitations of the current research, while also making recommendations for future studies.

Chapter 2 : Literature review

2.1 Introduction

The literature review plays a key role in this study, particularly in developing the conceptual framework for the empirical investigation. This current chapter therefore consists firstly of a brief review of sustainable supply chain management origin and concept. Secondly, there is an in-depth investigation of the factors related to the adoption of SSCM, including motives, barriers and enablers, along with the identification of any existing research gaps. Finally, the conceptual framework of this study is outlined.

2.2 The origin and definition of sustainable supply chain management

There is currently an ongoing debate concerning the meaning of sustainability as implied in the context of SCM (Morali and Searcy, 2013). Early SCM literature focused on relating the environmental aspect to functions of the supply chain, including “production planning, scheduling and control, inventory management and reverse logistics issues” (Taticchi, Tonelli and Pasqualino, 2013, p.784). These works have enhanced the integration of environmental practices within the operation, including the supply chain, the provision of technical solutions and the enhancement of understanding (Brandenburg *et al.*, 2014; Taticchi, Tonelli and Pasqualino, 2013). These implementations have resulted in improvements to company performance (Sarkis, Zhu and Lai, 2011; Linton, Klassen and Jayaraman, 2007).

New research has emerged to address many of the shortcomings of previous studies, in response to a recognition of the vital importance of the relationship between sustainability and the supply chain (Brandenburg *et al.*, 2014). These new studies have also help to extend the focus of supply chain functions to include a number of new concepts, such as “product life extension, product-service systems and product end-of-life related issues” (Taticchi, Tonelli and Pasqualino, 2013, p.785).

Moreover, Ahi and Searcy (2015a) indicated that a variety of new terms have been developed to clarify the complex intersection between the concepts of sustainability and SCM, including: (1) Green SCM (GSCM) (Srivastava, 2007); (2) Sustainable SCM (SSCM) (Carter and Rogers, 2008; Seuring and Müller, 2008b); (3) closed-loop supply chains (Neto *et al.*, 2010); and (4) the circular economy (Genovese *et al.*, 2017). It should be noted that the two most widely used terms associated with sustainability and SCM are GSCM and SSCM (Ashby, Leat and Hudson-Smith, 2012).

The literature contains various interpretations of the concepts of GSCM and SSCM (Ahi and Searcy, 2013), with a proportion viewing both concepts as being largely similar (Gurtu,

Searcy and Jaber, 2015). Ahi and Searcy (2013) compared twenty-two definitions of GSCM and eleven of SSCM, based on the characteristics of business sustainability and SCM, as shown in Table 2.1 (below).

Table 2.1: Differences and similarity between SSCM and GSCM (Ahi and Searcy, 2013)

| Category | Definition | Business sustainability and supply chain characteristics |
|----------|---|---|
| GSCM | Handfield et al. (1997); Zhu et al. (2005); Hervani et al. (2005); Sheu et al. (2005); Srivastava (2007); H'Mida and Lakhal (2007); Lakhal et al. (2007); Srivastava (2008); Lee and Klassen (2008); Albino et al. (2009); Wee et al. (2011); Gavronski et al. (2011); Lau (2011); El Saadany et al. (2011); Wu and Pagell (2011); Gnoni et al. (2011); Yeh and Chuang (2011); Sarkis et al. (2011); Kim et al. (2011); Parmigiani et al. (2011); Buyukozkan and Cideci (2012); Andic et al. (2012) | <ul style="list-style-type: none"> • Economic focus • Environmental focus • Stakeholder focus • Long term focus • Flow focus • Coordination focus • Relationship focus • Value focus • Efficacy focus • Performance focus |
| SSCM | Jorgensen and Knudsen (2006); Carter and Rogers (2008); Seuring and Muller (2008); Seuring (2008); Ciliberti et al. (2008); Font et al. (2008); Pagell and Wu (2009); Badurdeen et al. (2009); Haake and Seuring (2009) Wolf (2011); Closs et al. (2011); Wittstruck and Teuteberg (2011) | <ul style="list-style-type: none"> • Economic focus • Environmental focus • Social focus • Stakeholder focus • Long term focus • Resilience focus • Flow focus • Coordination focus • Relationship focus • Value focus • Efficacy focus • Performance focus |

Ahi and Searcy (2013) stated that both concepts differ, with GSCM having a narrow focus on the environmental dimension, while SSCM covers all environmental, social, and economic dimensions. This led them to conclude that the concept of SSCM can be considered an extension of GSCM, as all characteristics of GSCM are included in SSCM. Furthermore, they stated that SSCM has proved a more effective concept for establishing the characteristics of business sustainability and SCM. In addition, Brandenburg *et al.* (2014) pointed out that the concept of SSCM has emerged as a result of the intersection between the concept of Triple Bottom Line (TBL) and aspects of SCM.

This current study therefore adopts the view of SSCM as an expansion of GSCM. The means that the study not only concentrates on environmental dimensions (i.e. GSCM), but also includes the environmental, social and economic dimensions.

Sustainable Supply Chain Management (SSCM) plays a vital role in assisting companies to achieve sustainability, in particular as a result of its dynamic processes, which include a variety of functional areas both within and between chain members (Ashby, Leat, and Hudson-Smith, 2012). Sajjad, Eweje and Tappin (2015) highlighted the emphasis placed by two CEOs on the contribution of SSCM to: (1) increased company growth; (2) improved efficiency; (3) reduced costs; (4) the ability to attract competent employees; and (5) improved sustainability. In addition, data from 1621 companies operating in thirty-two countries led Wolf (2014) to conclude that implementation of SSCM has the potential to

improve company sustainability. Ni and Sun (2019) noted that, in order to improve its environmental, social and economic performance, a company needs to focus on the actions of its supply chain. This is due to the supply chain generally encompassing the complete lifecycle process of a product, including: (1) inbound activities; (2) internal (operations) activities; and (3) outbound activities.

As previously discussed, there are many definitions of SSCM in the literature (see Table 2.1). Touboullic and Walker (2015) reviewed a number of such definitions, concluding that these tend to be made in reference to differing constructs and angles. However, they considered this as only to be expected of a subject still in its infancy. Thus, it appears rational to claim that there is no indisputable definition capable of capturing the scope and context of sustainability in SCM (Ahi and Secrey, 2013; Krause, Vachon and Klassen, 2009). However, more recent definitions have defined SSCM from the perspective of TBL developed by Elkington (1997) (Taticchi, Tonelli and Pasqualino, 2013). This infers that businesses are able to understand sustainability in the supply chain from environmental, social and economic perspectives.

Environmental sustainability refers to the successful management of a company's resources, while continuing to resolve problems regarding the utilisation of natural resources during production (Bonn and Fisher, 2011). Furthermore, this dimension can be measured in terms of: (1) energy consumption; (2) water quality and usage; (3) the production of solid and toxic waste; and (4) land use (Bremser, 2014, p.1). Social sustainability refers to a company's long-term responsibility for its societal commitments to its stakeholders (Deng, 2015). These can be measured in terms of: (1) health and safety; (2) gender equality; (3) access to education; (3) issues surrounding poverty; and (4) the generation of employment (Bonn and Fisher, 2011). Economic sustainability refers to the long-term performance of a company, including its impact on the overall economic framework within which it operates (Bonn and Fisher, 2011). This can be measured in terms of: (1) maximizing shareholder returns; (2) philanthropy; (3) support for local business; (4) contribution to domestic GDP; and (5) investments.

This current study adopts the following definition of Ahi and Secrey (2013), as it meets all the sustainability and supply chain characteristics noted in Table 2.1:

The creation of coordinated supply chains through the voluntary integration of economic, environmental, and social considerations with key inter-organizational business systems designed to efficiently and effectively manage the material, information, and capital flows associated with the procurement, production, and distribution of products or services in order to meet stakeholder requirements and improve the profitability, competitiveness, and resilience of the organization over the short- and long-term (Ahi and Secrey, 2013, p.399).

Due to SSCM being a relatively new and complex concept, it is vital to employ a multidisciplinary approach to fully understand the key motives, barriers, and enabling factors associated with the adoption of sustainable SCM. The following sections discuss the main motives for employing SSCM, along with factors both facilitating and inhibiting its development, focussing primarily on developing nations. The outcome of this investigation will therefore play a significant role in developing the conceptual framework for the empirical study.

2.3 Motives for the adoption of SSCM

A large (and growing) body of studies has investigated the companies motives to embrace sustainability initiatives as an aspect of their supply chain. These studies firstly, examines the main internal and external factors leading to the adoption of SSCM and secondly, discusses the differences, and the relationship, between these factors.

Internal factors: these can prompt companies to adopt SSCM (Ageron, Gunasekaran, and Spalanzani, 2012) and can be divided into two groups: (1) the normative group and (2) the instrumental group (Sajjad, Eweje, and Tappin, 2015). The normative group is associated with factors concerning the ethical and moral values of a company (Morais and Silvestre, 2018; Sajjad, Eweje, and Tappin, 2015), while the instrumental group is associated with factors relating to benefits such as increased profits and enhanced reputation (Paulraj, Chen and Blome, 2017).

External factors: these can also lead to the adoption of SSCM, being generally associated with issues relating to pressures originating from a company's external environment (Sajjad, Eweje and Tappin, 2019).

Researchers investigating the adoption of SSCM have identified various motives for the adoption of SSCM. A number of studies have found external factors to play a significant role in motivating a company to adopt SSCM. Ageron, Gunasekaran, and Spalanzani (2012) stated that, while the reasons for a specific French firm to adopt SSCM generally related to both internal and external factors, it was the external factors (i.e. pressures) that tended to exert a greater impact. The Interpretive Structural Modelling (ISM) study undertaken by Biswal *et al.* (2018) identified external pressures (i.e. government regulation and environmental groups) as critical motivating factors for the adoption of SSCM by senior management in the Indian thermal power industry. Saeed and Kersten's (2019) review of 217 articles concerning the drivers of SSCM concluded that external factors place greater pressures on firms than internal factors.

A number of further researchers have concluded that internal (i.e. normative and instrumental) factors can prove effective in motivating a company to adopt SSCM. Paulraj, Chen and Blome (2017) analysed data from 259 supply chain managers in Germany, concluding that both internal (i.e. normative and instrumental) and external pressures can prove motivating factors, but that internal ethics and values have a greater influence on the adoption of SSCM. In addition, Morais and Silvestre (2018) examined thirty-four social initiatives in the supply chain of six large Brazilian companies, concluding that half of the implemented initiatives arose from each company's moral and ethical values, with the remainder focussing on instrumental factors, i.e. profitability. This indicates that internal factors (i.e. normative and instrumental) tend to be the primary motive for Brazilian companies' adoption of SSCM. Furthermore, in their review of forty-five articles focused on the textile and clothing sector, Köksal *et al.* (2017) concluded that this industry responds to internal rather than external factors when it comes to the adoption of social practices in the supply chain.

A number of further researchers have also demonstrated that internal factors (i.e. normative and instrumental) and external factors (i.e. pressures) are of equal importance for motivating the adoption of SSCM. Sajjad, Eweje and Tappin's (2019) interviews with twenty-eight senior managers from twenty-three companies based in New Zealand led them to conclude that the factors relating to the normative and instrumental internal and external group had an equal impact on a company's adoption of SSCM. Meixell and Luoma (2015) found that some stakeholders demonstrated a greater impact on social practices, while others had more influence on environmental issues. For example, they found that both employees and NGOs tended to be more focused on the adoption of social practices in the supply chain, while government and end customers concentrated on the adoption of environmental practices.

Similarly, Sajjad, Eweje, and Tappin (2015) investigated four multiple case studies of firms in New Zealand, revealing an identical impact of internal and external factors on the adoption of SSCM. Seuring and Müller (2008b) review of 191 papers concluded that a firm acts firstly, in response to pressure from stakeholders and secondly, to benefit from the incorporation of sustainability into the supply chain.

The above discussion indicates the presence of several factors relating to normative-instrumental and external pressure groups motivating business to embrace sustainability initiatives within their supply chain. This also reveals that managers (and industry itself) are likely to experience difficulties in simultaneously responding to all such motives (Mathiyazhagan *et al.*, 2015). The successful implementation of SSCM therefore demands

that managers and industries prioritise the identification and understanding of the relevant factors (Sajjad, Eweje and Tappin, 2019).

The below section explored and identified the main motives for the adoption of SSCM, particularly in the context of developing nations. This investigation will enable managers and industries to identify specific practices related to sustainability, resulting in the following eight categories capable of motivating companies to adopt SSCM.

2.3.1 Motives related to regulation

Government regulations have traditionally been regarded as the most influential external pressure on firms to integrate sustainability into their supply chain (Saeed and Kersten, 2019). Rigorous schemes introduced by various governments have subjected firms to inspections of their operations, so as to check the consistency of their compliance with official regulations (Darnall, Henriques and Sadorsky, 2008). Failure to pass such inspections may result in punishments, fines and claims against a company, as well as the loss of various licenses (Kassinis and Vafeas, 2006).

Several studies have identified pressure from regulations as being influential in firms choosing to establish sustainability within their supply chains. For example, surveys such as that conducted by Zhu, Sarkis, and Geng (2005) have demonstrated regulation pressure as a primary factor in the establishment of a green supply chain by Chinese manufacturers. This conclusion was supported by the work of Zhu, Sarkis, and Lai (2007), who found that the Chinese automobile industry commenced the implementation of environmental practices in their supply chain in response to the existence of a high degree of regulatory pressure.

Xu *et al.* (2013) employed a survey to test two independent hypotheses assessing the impact of thirty-two pressures on various industries in India. They concluded that pressure from policymakers was the most common factor pressuring Indian firms to integrate environmental practices into their supply chain, regardless of the size of the company and the type of industry. Similarly, Mathiyazhagan and Haq (2013) found that government environmental regulation exerted greater pressure than twenty-five further factors in the establishment of a green supply chain in sixteen auto component manufacturing firms in India. An Analytical Hierarchy Process (AHP) study of fifteen pressures undertaken by Mathiyazhagan *et al.* (2015) also found that Indian mining and mineral industries integrated environmental practices into their supply chain in order to avoid government charges and avoid the risk of their operations being shut down for failing to follow government regulations.

Furthermore, Mani, Gunasekaran and Delgado's (2018b) analysis of data from fifty-five Portuguese firms concluded that such organisations tended to adopt social practices into their supply chain with the aim of avoiding penalties arising from a failure to follow local, regional and international regulations. The authors also pointed out that their study contradicted existing evidence in the literature concerning companies operating in developed nations, which failed to cite factors such as regulation as the main motive for the adoption of social practices into the supply chain. Likewise, Paulraj, Chen and Blome (2017) found that German regulations related to sustainability policies were among the most frequently highlighted external factors motivating German supply chain managers to adopt SSCM.

This section has revealed that firms tend to respond to regulatory pressures to integrate sustainability (in particular in relation to the environment) into their supply chains.

2.3.2 Motives related to the globalized market

Globalisation has led to multinational firms operating in countries subject to divergent laws and market conditions. At the same time, the pressures of globalization have led both multinational and domestic firms to adopt sustainability practices into their supply chain. Mathiyazhagan *et al.* (2013) observed that many multinational companies consider India as a potential growth market and thus place considerable pressure on Indian firms to implement a green supply chain. Ageron, Gunasekaran, and Spalanzani (2012) found that French firms adopted SSCM in response to pressure from their local and international competitors. In addition, a survey of managers from four major Indian industrial sectors noted that their implementation of a green supply chain originated from a desire to obtain a competitive advantage in the global market (Xu *et al.*, 2013).

These studies have indicated that a company needs to be competitive in order to meet both local and global pressures and that this can be secured through the adoption of SSCM. Previous studies have reported both market pressure and competitiveness as factors motivating Chinese firms to incorporate green practices into their supply chains (Zhu, Sarkis, and Geng, 2005). In addition, Zhu and Sarkis (2004) found that investment in GSCM initiatives allowed Chinese companies to obtain competitive advantages over rivals, as well as improving company performance.

Furthermore, an in-depth investigation has also been undertaken into the relationship between competitive advantage and the integration of environmental and social factors into the supply chain. Vargas, Mantilla and Jabbour (2018) analysed data collected by means of a questionnaire sent to 244 Colombian firms, concluding that the adoption of social initiatives in the supply chain has a greater ability to increase a company's competitive advantage than the adoption of environmental initiatives. The researchers suggested that

firms working in developing nations should therefore focus on the implementation of social practices.

The above studies have provided evidence indicating the influence of both global and local market pressure, as well as the potential for competitive advantage, in motivating firms to adopt SSCM.

2.3.3 Motives related to reducing risks to business, the environment and health and safety

Firms adopting sustainability can be associated with the reduction of risk throughout the supply chain network. Hofmann *et al.* (2014) pointed out that firms tend to adopt SSCM strategy in order to reduce the risk of losses associated with unethical behaviours or practices among members of their supply chain. In their multiple case study, Sajjad, Eweje, and Tappin (2015) concluded risk management throughout the supply chain to be a strong motive for New Zealand firms adopting SSCM. In addition, Köksal *et al.* (2017) evaluation of forty-seven articles found that large companies within the textile sector tend to adopt the relevant social aspects in the supply chain with the aim of managing and mitigating external risks, so enhancing their reputation and giving a sense of legitimacy to the business.

This section has highlighted that, alongside the main company, the supply chain involves other members located in the upstream of the chain-like suppliers and downstream of the chain-like customers. Thus, a company's motive for adopting SSCM practices can focus on the reduction of risks, as well as potential benefits and responding to pressures from stakeholders. In addition, such firms may embrace SSCM in order to develop long-term strategic relationships with members of their supply chain (Ageron, Gunasekaran, and Spalanzani, 2012).

2.3.4 The motive of suppliers

The current rapid growth in emerging economies around the world has resulted in many firms outsourcing many aspects of their production. However, this economic benefit can also lead to various social and environmental violations (Petrini and Pozzebon, 2009). The operational, financial, and reputational risks associated with outsourcing and purchasing materials from a supplier can therefore be viewed as a further motive for firms to adopt SSCM, as this permits them to assess their suppliers from economic, social, and environmental perspectives.

Securing a sustainable supplier leads to a number of benefits for the buyer, i.e. a reduction in costs, the mitigation of risk and the ability to enhance a firm's public image (Busse, 2016). Busse (2016) also suggested that firms tend to benefit from collaborating with sustainable

suppliers, as this can encourage buyers to embrace sustainability practices throughout the supply chain. Mani, Gunasekaran and Delgado (2018a) found that companies in the Indian manufacturing sector adopted social responsibility practices in the supply chain as a method of improving the social performance of their suppliers in areas including: (1) human rights; (2) the prevention of child exploitation; (3) health and safety; (4) labour rights; and (5) product responsibility. In addition, they concluded that enhancing their suppliers' social performance also led to improvements in their supply chain, i.e. shorter lead times and the greater quality and reliability of the company's products.

These studies therefore provide evidence indicating that the potential for suppliers to motivate a company to adopt sustainability practices as part of their supply chain.

2.3.5 The motive of customers

Customers are among the most influential stakeholder groups, as a decision to buy or boycott products can have a considerable impact on a company's financial performance (Collins, Steg and Koning, 2007). Thus, companies tend to respond when faced with customer pressure to adopt sustainability, in order to avoid losing sales (Walker and Laplume, 2014). Furthermore, customers can also determine the sustainability of a company (Sandhu *et al.*, 2010).

In addition, customers tend to demand that companies' supply chains are equally sustainable. Sajjad, Eweje, and Tappin (2015) found such demands to be a major factor in motivating firms in New Zealand to establish sustainability within their supply chain. One of the managers in the study made the following comments on customers' expectations regarding sustainability: "[we] are doing it more because we are adapting to what customers want and how they want to interact sort of thing." (p.651).

Similarly, Saeed and Kersten's (2019) review of 217 articles found customer pressure to be critical in motivating firms to adopt SSCM practices, being more influential than: (1) market pressure; (2) competitive advantage; (3) supplier pressure; (4) investor pressure; and (5) pressure from non-government organisations.

Customer pressure forms a central factor in firms adopting SSCM, with companies, responding in order to ensure customer satisfaction. Ageron, Gunasekaran, and Spalanzani, (2012) revealed that a key motive in the adoption of SSCM by French companies is to improve customer satisfaction, which is regarded as having a greater significance than the benefits of improving the lead time, cost, and inventory optimisation.

2.3.6 Reputational motives

Issues related to reputation can also motivate firms to adopt SSCM. Maloni and Brown (2006) stated that various well-known brands are currently engaging in sustainable SCM practices in response to issues in the supply chain having been identified as increasing the threat of public campaigns or protests, which can pose a substantial risk to a company's reputation. Wolf (2014) substantiated this argument, stating that organisations desire to create a reputation for being a 'good citizen', which is enhanced by the adoption of sustainable practices throughout the supply chain, thus enabling a business to increase its legitimacy and access to essential resources (p.325).

Furthermore, Zhu, Sarkis, and Lai (2007) found that the Chinese automobile industry is now focussing on green practices in its supply chain over regulatory requirements, in order to maintain and enhance its public reputation. In addition, one of the study's interviewees indicated that Chinese companies tend to establish green practices to firstly, enhance the company image in the community and secondly, demonstrate the importance of green practices to other members of the supply chain. Moreover, Mani, Gunasekaran and Delgado (2018a) found that the reputation of Indian firms working in the manufacturing sector has been improved by means of economic and social integration in the supply chain.

The desire to maintain a good reputation influences company decision concerning the members included in their supply chain. A manager in the study undertaken by Sajjad, Eweje, and Tappin, (2015) stated that: "[we] are quite an iconic New Zealand brand. Our reputation and image are very important to us... Well, no one wants to be a Nike or a Foxconn in their relationship with suppliers" (Sajjad, Eweje, and Tappin, 2015, p.650).

These examples have demonstrated that reputation is considered a key motivating factor when it comes to the adoption of SSCM (Saeed and Kersten, 2019).

2.3.7 Financial motives

Firms may also adopt sustainability practices in order to improve their economic and financial performance. Gomis *et al.* (2011) noted that the justification for management integration of sustainability could be based on economic and management decisions, i.e. profits and strategic advantages. Sajjad, Eweje, and Tappin (2015) credited economic optimisation as a motive for the adoption of SSCM by companies in New Zealand. Walker, Di Sisto, and McBain (2008) found that a U.K company included in their study stated that its main motive for adopting green initiatives in SCM related to a reduction in costs.

Furthermore, the comparative study of Xu *et al.* (2013) found that large Indian companies adopted green practices in the supply chain as part of their overall green strategies to enhance

long-term profits. They confirmed that the adoption of such strategies increased profits by satisfying customer expectations, as well as enabling them to target a new segment of the market.

Similarly, Mathiyazhagan *et al.* (2018) found that the construction industry's adoption of green SCM was motivated by the desire of Indian companies to increase their profits as a result of improving the market value of their property. Gardas, Raut and Narkhede (2019) analysed data from 490 responses from the oil and gas industries, concluding that such companies primarily tended to adopt SSCM in order to maximise profits and enhance their environmental performance.

These studies indicate the ability of SSCM to improve the financial performance of the company by: (1) reducing costs; (2) opening up new markets; (3) satisfying customers; and (4) resulting in greater profits.

2.3.8 Community motives

The term 'community' encompasses a variety of meanings. Kassinis and Vafeas (2006) stated that a community could be either: (1) a large community, potentially consisting of all those working in an individual plant and (2) specific groups, possibly incorporating individuals having political and social interests, and who may decide to scrutinize the organisation's operations. A number of further researchers have characterized the community as consisting of individuals living near the organisation, and who may be concerned over the environmental and social impact of its operations (Sharma and Henriques, 2005). In addition, Hofmann *et al.* (2014) defined the elements of a community as including the media, neighbourhoods, environmentalists and labour unions.

Many studies in the supply chain literature have highlighted the role of civil society organisations and the media in triggering strategies and practices aimed at improving sustainability in the supply chain (Chkanikova and Mont, 2015). Beamon (2008) stated that NGOs have increased pressure on organisations to review the practices of their supply chain. Walker, Di Sisto and Mc Bain (2008) found that firms engaged in ensuring environmental practices were in place in their supply chain in order to avoid the risk of protests by environmental groups. Furthermore, Biswal *et al.* (2018) found that one of the main reasons for the implementation of SSCM by the Indian coal industry is to avoid negative media attention on issues of industrial waste and energy consumption.

NGOs can be seen as playing a role in the increase of social, rather than environmentally, sustainable supply chains (Mont and Leire, 2009). This view was supported by Köksal *et al.* (2017), who concluded that NGOs and the media focus on identifying social issues within

the textile industry, thereby pressuring large firms to adopt more social practices within their supply chain.

A number of further studies have highlighted community expectation as a motive for the adoption of SSCM. Sajjad, Eweje, and Tappin (2015) found community expectations in New Zealand concerning the role of the country's firms to be external factors for the implementation of SSCM. Mariadoss *et al.* (2016) concluded that the primary motive of US firms (particularly the larger ones) when it came to the adoption of SSCM derived from their responsibility to support the community in which they operate.

Scholars have generally viewed the community as having an immediate impact on the business strategy of firms (Sharma and Henriques, 2005). This highlights that each company needs to take the views of their surrounding community into consideration during the decision process (Searcy, 2012), in order to prevent a failure to meet community needs, with the potential to result in open public dissent (Hofmann *et al.*, 2014).

2.3.9 Conclusion to motives section

This section has revealed the importance of organisations identifying and understanding the main motives of SSCM, in order to address environmental and social concerns within the supply chain. This study has identified a number of factors. Firstly, the internal factors emerging from a firm's responsibility towards the conservation of the earth's resources and the protection and development of human capital. This also includes a belief that the adoption of SSCM initiatives can lead to both short and long-term benefits for the enterprise. Secondly, the external factors emerging from the rising expectations of the community, as well as pressure from government and consumers.

Managers are required to identify and understand the critical factors resulting in their company's adoption of SSCM, while at the same time recognizing that such factors tend to vary between countries, industries and companies. This has resulted in one of the aims of this current study being to answer what are the critical motives for Saudi manufacturing companies to adopt sustainable supply chain management?

2.4 Barriers toward the adoption of SSCM

Sustainable supply chain management (SSCM) is one way to balance environmental, social and economic benefits in a supply chain (Luthra, Garg and Haleem, 2015b). However, the development and the management of SSCM can be challenging (Tay *et al.*, 2015). According to Ageron, Gunasekaran, and Spalanzani (2012), around 35% of organisations fail to adopt sustainability aspects into their supply chains due to failure identifying critical SSCM barriers.

This section contributes to the literature by exploring and discussing a range of barriers faced by businesses that impeded the adoption of SSCM from a theoretical perspective. These barriers can arise from either inside or outside the organisation and impact on each other. They are also context specific and cannot necessarily be eradicated simultaneously (Patel and Desai, 2019). Managers therefore need to determine and understand critical barriers and enablers that can support the development of SSCM. This study will discuss enablers in the next section.

The following sub-sections investigate the relevant literature regarding the barriers that inhibit the SSCM development, especially in developing nations.

2.4.1 Barriers related to regulation

The issue of regulation has received considerable critical attention in the SSCM literature as a common external factor inhibiting or enabling firms to adopt SSCM (Ansari and Kant, 2017; Jia *et al.*, 2018; Alexander, Walker and Naim, 2014). Regulation can serve as a barrier when,

...the regulatory bodies that formulate regulations to meet societal and ecological concerns to facilitate the growth of business and economy suffer from inadequacy policy to support or enforce the development of sustainability in the supply chain. (Srivastava, 2007, p.53)

For example, in their review of GSCM (green sustainable supply chain) barriers, Singh, Rastogi and Aggarwal (2016) reported inadequate regulation and monitoring by government inhibit the implementation of environmental practices in the supply chain. For Zaabi, Dhaheri and Diabat (2013), low self-regulation acts as a significant barrier in the Indian fastener manufacturing industry. Similar results were revealed by Jayant and Azhar (2014), who identified twenty barriers to GSCM in the Indian auto component industry. They modelled these twenty barriers and their contextual relationships using interpretive structural modelling (ISM) and a MICMAC analysis. Their results demonstrated that lack of government support is the chief barrier, informing other barriers. Similarly, Porter and Linde (1995) pointed out that inadequate environmental regulations inhibit firms' ability to innovate. They observed that regulatory bodies might determine the best technology to use but also allocate irrational deadlines for implementation (Porter and Linde, 1995).

Regulatory barriers also appear to have a negative impact on sustainability performance in supply chains. For example, Shaw, Grant and Mangan (2010) mentioned that firms encounter difficulties identifying appropriate criteria to assess the sustainability performance of supply chains, due to a lack of government regulation and support. A survey study in Thailand, conducted by Pakdeechoho and Sukhotu (2018), concluded that firms in emerging

economies struggle to enhance their sustainability performance in the supply chain because the government does not provide the necessary incentives to encourage partners to collaborate to achieve sustainability. Luthra and Haleem (2015) determined that low demand for sustainable products in the Indian automobile sector is a consequence of the absence of a legislative framework and targeted government policies.

Other studies have revealed that buyers face barriers to integrating sustainability when they engage with suppliers in an environment that lacks regulations. Hasle and Jensen (2012) pointed out that international and local regulations rarely address the issues one organisation faces because of another organisation's decision. Liability is indeterminate when environmental and social violations occur within the supply chain. Additionally, Hassini, Surti and Searcy (2012) argued that imposing compliance with economic and social aspects throughout the supply chain is challenging when governments do not provide regulations establishing social and economic measures to employ.

Several other studies have found that lack of regulation reduces firms' and top managements' willingness to adopt SSCM. Muduli *et al.* (2013) mentioned that for developing countries, deficiencies in sustainability regulations and lack of supportive policies are a significant problem. Without regulation, many firms fail to recognise the value of implementing SSCM. An empirical study in the Indian rubber industry discovered that lack of government initiatives promoting SSCM practices led to a lack of commitment from firms' managers (Narayanan, Sridharan and Ram Kumar, 2019).

The lack of a regulatory framework in developing nations has many causes; for example, political instability is a known barrier to the adoption of SSCM (Luthra and Haleem, 2015; Govindan *et al.*, 2014). The effectiveness of its regulatory frameworks is dependent on the political stability of a given country. When a country is unstable, the government can neither support nor enforce industries to adopt SSCM. According to Govindan *et al.* (2016), lack of decision making, and the presence of corruption were key barriers resulting in low regulatory involvement in the development of mining sustainability practices in India. Similarly, Köksal *et al.* (2017) attributed corruption to lack of commitment from governments, observing that this affects SSCM implementation in the textile industry in developing countries. Another study suggested that the leadership approach within government inhibits the establishment of sustainability regulations to motivate manufacturing firms to adopt SSCM (Morali and Searcy 2013).

Undoubtedly, however, other contributory factors exist, as demonstrated by studies undertaken in developed countries. Sajjad, Eweje and Tappin (2015) found that government regulation was not mentioned as a barrier to SSCM by the four New Zealand companies they

surveyed. However, they insist that the government plays a significant role in encouraging top management to promote sustainability. In the UK, Walker and Jones (2012) conducted seven case studies, and only one firm mentioned government regulation as a critical barrier toward the adoption of SSCM. This might indicate that regulation as a critical barrier toward SSCM adoption might vary between developed and developing nations (Mathivathanan, Kannan and Haq, 2018).

Overall, there seems to be some evidence that the lack of regulations and policy support in developing nations might inhibit firms integrating sustainability into their supply chains.

2.4.2 Barriers related to supply chain design

Every decision taken at the product design stage has a significant consequence for SSCM (Bernon *et al.*, 2017). For example, 80–90% of the expenses and advantages of recycling are determined at the product design stage, with just 10–20% driven by the recycling process itself (i.e. separation and cleaning systems) (Bernon *et al.*, 2017).

A clear relationship exists between the design of a product and its sustainability at the manufacturing and assembly stage (Bernon *et al.*, 2017). According to Bernon *et al.* (2017), it is essential that key sustainability requirements be incorporated early in the product design phase, such as how a product will be physically produced, assembled and disposed of. The aim should be to use fewer materials and minimise operational processes involving energy consumption due to the related emissions (Bernon *et al.*, 2017). Thus, Bernon *et al.* (2017) highlighted the crucial nature of the design of resources and planning to deliver a sustainable product.

However, many firms fail at the planning stage, often due to the complexities involved (Bernon *et al.*, 2017). Evidence from Zaabi, Dhaheri and Diabat (2013) suggests the complexity of designing a product that utilises fewer resources limits Indian manufacturing firms capacity to adopt SSCM. Moreover, in their studies, Govindan *et al.* (2014) and Kaur *et al.* (2018) identified the challenges when designing reusable/recyclable products is among the most significant barriers to the adoption of environmentally friendly practices.

Overall, the complexity of introducing green process and system design is a critical barrier to the implementation of green procurement, transportation, design, and operations. Reviewing an ISM based model detailing twelve barriers to SSCM adoption, Majumdar and Sinha (2019) discovered the complexity of the green process and system design is a critical barrier, falling at the bottom level of the ISM hierarchy. This critical barrier then drives other barriers; for example, in the textile industry in Southeast Asian countries, it results in higher implementation and maintenance costs.

2.4.3 Barriers related to financial resources

SSCM typically requires a significant amount of investment from firms (Ansari and Kant, 2017; Govindan *et al.*, 2014; Walker and Jones, 2012). Relatively higher investment in products arises from the need for employees training in environmental management, supplier development, changes in existing infrastructure, machinery and equipment and other environmental management measures (Grimm, Hofstetter and Sarkis, 2014; Meade, Sarkis and Presley, 2007). Indeed, Meade, Sarkis and Presley (2007) estimated that firms might need to spend around 20% of their aggregate income on SSCM activities. As Tay *et al.* (2015) noted, introducing a sustainability programme is costly, and this higher cost conflicts with the objective of having a supply chain, i.e. to minimise costs not maximise them.

Firms need to find additional funding to implement costly programmes to embrace SSCM (Luthra and Haleem, 2015). However, many constraints affect financing throughout a supply chain. In the context of Canada, Morali and Searcy (2013) reported that all the experts they interviewed mentioned financial constraints as a primary barrier to SSCM adoption in their manufacturing industries. In reference to higher costs, Zaabi, Dhaheer and Diabat (2013) identified 13 barriers to SSCM in the Indian fastener manufacturing industry using an ISM model; these included the higher cost of disposal of hazardous waste, the cost of environmentally friendly packaging, and the cost of sustainability. The results of the model found the higher cost related to environmental packaging is a dominant barrier with a high driving power of 13, and at the bottom of the model.

Another constraint is the attitude of banks; who are reluctant to support programmes relating to green initiatives, especially in developing nations (Govindan *et al.*, 2014). This is echoed by Jayant and Azhar (2014), who found that the Indian auto components industry could not adopt GSCM because of the lack of availability of bank loans. Similar results were highlighted by Panigrahi and Rao (2018), who stated that lack of bank loans discouraged the Indian textile industry from establishing green product practices and implementing SSCM. Similarly, in Iran, Narimissa, Kangarani-Farahani and Molla-Alizadeh-Zavardehi (2020) revealed higher costs, banking problems, and lack of availability of financial resources inhibited the implementation of SSCM within the Iranian Oil industry.

2.4.4 Barriers related to return on investment (ROI)

In addition to the barriers above, a significant number of studies also highlighted that sustainability does not guarantee a high return on investment (ROI) (Nguyen and Slater, 2010). Low economic returns cause some firms to reconsider their sustainability practices. Indeed, competitive pressures in the market can prevent firms from adopting SSCM (Zhu, Sarkis and Lai, 2007).

Frequently firms that adopt sustainability practices incur increased costs, placing them at a disadvantage relative to competitors who have not committed to sustainability (Min and Galle, 2001). For example, Yu and Zhao (2015) found that US firms that apply a sustainable strategy receive positive returns from investors. However, a study of the Taiwanese electronics industry, by Luan, Tien and Wu (2013), warned the first firm to adopt green initiatives might not see high economic performance.

In their research, Esfahbodi *et al.* (2017) confirmed that implementation of SSCM had benefited UK manufacturers' environmental performance, but they could not confirm improved economic performance. For example, in their analysis of 100 Canadian corporate sustainable reports, Morali and Searcy (2013) found one company was forced to re-adopt less ecologically-friendly packaging due to declining sales. In the context of developing nations, Zhu, Sarkis and Lai (2007) found the implementation of GSCM had not brought any significant economic improvement for Chinese automobile firms. In addition, Tumpa *et al.* (2019) concluded that the Bangladesh textile industry had achieved little financial benefit in adopting environmental practices.

When economic return from adopting sustainability practices is uncertain, this impacts negatively on the SSCM implementation. For example, Giunipero, Hooker and Denslow (2012) concluded that US buyers and suppliers are hesitant to advance SSCM because it might adversely affect investment. Further, Zaabi, Dhaheri and Diabat (2013) explained that firms in the Indian fastener industry are not adopting sustainability initiatives due to the low financial return.

The ROI firms obtain from the implementation of sustainability differ from firm to firm, and so generalisation is impossible (Kraus and Britzelmaier, 2012). Nonetheless, it can be concluded that engaging in SSCM brings higher risk, because the end product is more expensive and the economic return is uncertain (Sajjad, Eweje and Tappin, 2015; Hsu and Hu, 2008). This higher cost conflicts with the objective of having a supply chain, i.e. to minimise costs not maximise them (Tay *et al.*, 2015). It thus makes firms hesitated to commit themselves toward the SSCM adoption.

2.4.5 Barriers related to customers

The advantages a company receives from SSCM implementation require customers and the market to agree to pay a higher price for a sustainable product. To date, many companies are not adequately compensated by higher prices at the market (Doonan, Lanoie and Laplante, 2005). The lack of customer support for sustainable products is reportedly a major barrier to implementation of SSCM practices (Tumpa *et al.*, 2019; Winter and Knemeyer, 2013; Luthra and Haleem, 2015).

In their study, Köksal *et al.* (2017) explained that customers in developing nations prefer to purchase the lowest priced goods, especially in the case of clothing, and as SSCM raises costs, it is not profitable for companies to introduce it. Lower pricing is only one of the reasons why customers do not buy sustainable products (Tay *et al.*, 2015; Walker and Jones, 2012). Others include the time taken to locate them, and inadequate information about sustainable products (Young, Fonseca and Dias, 2010).

Furthermore, there is insufficient advertising by companies concerning the benefits of buying sustainable products (Wang *et al.*, 2015). Customers' lack of awareness about sustainable products was also revealed by Moktadir *et al.* (2018) as a critical barrier influencing other barriers, such as lack of funding for SSCM in the Bangladesh leather industry. They suggested the removal of this barrier could result in the erosion of other barriers to SSCM implementation. This could be more challenging in developing countries, where there is low customer purchasing power, and limited awareness about sustainability is the norm.

2.4.6 Barriers related to suppliers

Suppliers involvement in company activities means they play a key role in SSCM adoption (Bernon *et al.*, 2017; Beske, Land and Seuring, 2014). Many suppliers “will allocate the required resources (time, effort and money) to improve their [sustainable] supply chain performance” (Lees and Nuthall, 2015, p.4). A detailed discussion of their roles and how buyers can develop a good relationship with them will be highlighted in the enabler section.

Suppliers can hinder buyer's implementation of SSCM, due to lack of green suppliers (Balasubramanian, 2012), poor supplier commitment (Ansari and Kant, 2017; Zaabi, Dhaheri and Diabat, 2013; Walker and Jones, 2012), supplier resistance to the implementation of clean technology (Drohomeretski, Costa and Lima, 2014), and lack of suppliers engaging in socially responsible practices (Mont and Leire, 2009).

For example, companies in the fastener manufacturing industry mentioned that most of the suppliers in India are small- and medium-sized enterprises with no capacity to implement environmental practices (Zaabi, Dhaheri and Diabat, 2013). Experts in Canada mentioned that Canadian firms need to overcome multiple supplier barriers if they are to implement SSCM successfully. Barriers such as supplier audit, transparency concerning suppliers, and quality data received from suppliers relate to sustainable performance measurements, and a reluctance to comply (Morali and Searcy, 2013).

Managers from Swedish companies encountered the same barriers as mentioned above. They added other barriers such as difficulties ensuring all suppliers fulfil codes of conduct,

differences in culture and management styles between buyers and suppliers and dealing with suppliers in corrupt countries (Mont and Leire, 2009). Certainly, monitoring suppliers' sustainability performance produces additional costs (Mont and Leire, 2009).

Additional barriers include buyers' challenge in developing relationships with suppliers based on trust, communication and collaboration. This relationship is essential to improve supplier performance and sustainability in the supply chain (Ageron, Gunasekaran and Spalanzani, 2012; Seuring, 2011; Luthra and Haleem, 2015). Lack of communication can inhibit buyers from developing a good relationship with suppliers. This can be related to the supply chain itself, which includes different components including firms with diverse cultures and languages. In addition, local standards might not meet international SSCM standards. All those factors make communication over sustainability requirements across borders challenging (Walker and Jones, 2012).

Another barrier for buyers is the need to accept the suppliers pricing of sustainable products (Walker and Brammer, 2009), which is a new way of doing business. This is contrary to the traditional purchasing system, as noted by Jayant and Azhar (2014) and Sajjad, Eweje and Tappin (2015). Traditionally, buyers focus on short term goals, buying cheaper products rather than sustainable procurement practices to foster the development of SSCM. Similar results reported in an empirical study by Delmonico *et al.* (2018), found that leading companies in Brazil encounter barriers to the adoption of sustainable procurement practices because they believe involvement in sustainable procurement means higher costs/prices for companies, and this is not supported by a long-term vision.

Finally, it is worth mentioning that supplier barriers are greater when suppliers are based in developing countries (Morali and Searcy, 2013).

2.4.7 Barriers related to performance measurement

One of the reasons for not accepting higher prices for sustainable products and not investing in costly SSCM initiatives is that businesses measure efficiency and effectiveness in economic terms (Tay *et al.*, 2015). That is, firms' decisions regarding supply chain are always informed by economic criteria (Ansari and Kant, 2017). This is incongruent with the notion of integrating three dimensions; i.e. achieving economic growth, and improving social and environmental conditions (Tay *et al.*, 2015). Many scholars concur that sustainable development requires managers to balance trade-offs between all three aspects of sustainability (Pagell and Wu, 2009).

Companies need to incorporate financial and non-financial approaches to measurement to ensure progress towards environmental, social and economic goals (Beske and Seuring,

2014; Boyd *et al.*, 2007). Moreover, specific measures are required for each industry (Taticchi *et al.*, 2015). The decisive role of the performance measurement and its development will be highlighted in the enabler section.

Several studies have identified considerable barriers to developing adequate sustainability performance measurement strategies across the supply chain (Ahi and Searcy, 2015a; Seuring and Müller, 2008b). In particular, social and environmental dimensions are complicated to understand and measure (Winter and Knemeyer, 2013). It is this lack of efficient, sustainable measurement tools that prevent companies from engaging in the successful implementation of SSCM (Sajjad, Eweje and Tappin, 2015; Zaabi, Dhaheri and Diabat, 2013).

A study by Hassini, Surti and Searcy (2012) identified six major factors that inhibit firms from developing sustainable measurements in the supply chain: (1) lack of faith in the customer/supplier relationship; (2) compromising information privacy; (3) difficulty consolidating strategies in the supply chain since each member has different and possibly contradictory strategies; (4) difficulty coordinating competencies, since each member has their own capability, and so, redundancy might occur resulting in loss of benefits; (5) lack of regulatory bodies to monitor the entire supply chain; and (6) performance measures need to be changed over time, due to the dynamic nature of the supply chain.

Another study by Grosvold, Hoejmoose, and Roehrich (2014) demonstrated that the challenge with measuring sustainability in the supply chain arises because the buyer is not only responsible for measuring the internal practices. The buyer also needs to consider all external practices associated with suppliers and customers. Typically, companies only address internal practice measures and fail to assess external practices due to the necessity for inter-organisational collaboration (Lehtinen and Ahola, 2010).

The number of metrics pertaining to sustainability also inhibit firms development of sustainable measurement in the supply chain. For example, Ahi and Searcy (2015a) identified 2,555 different metrics and most of them focusing mainly on the environmental aspect. They also concluded there is no agreement between chain actors with regard to identifying the proper metrics to measure SSCM. Another study mentioned that even with the existence of metrics, firms face difficulties determining which sustainable metric to use within the supply chain (Hassini, Surti and Searcy, 2012).

Assessment of social measures in particular is not well represented in SSCM (Ahi and Searcy, 2015b). This is because indicators and areas of protection vary between countries (Hasle and Jensen, 2012). For example, in some cultures, children working is vital to the

survival of the family. However, the United Nations has repeatedly said that this is against international law.

Other studies have concluded that the metrics available are insufficient to measure sustainability in the supply chain (Ahi and Searcy, 2015a; Jamali, 2006). This is because many of those currently available emphasise short-term performance, and sustainability requires metrics with a long-term focus (Walker and Jones, 2012). Moreover, many metrics contradict the objective of reporting based on the triple bottom line (Tay *et al.*, 2015).

2.4.8 Barriers related to business strategy

Companies need to adopt entirely new business strategies to integrate sustainability initiatives into SCM activities (Nidumolu, Prahalad and Rangaswami, 2009; Pagell and Wu, 2009). Adopting a Corporate Social Responsibility (CSR) strategy can help to achieve this (Tschopp, 2005; Garriga and Melé, 2004). CSR strategies allow companies to perceive sustainability as a long-term objective integrating social and environmental aspects with stakeholders' needs (Dahlsrud, 2008). In addition, it encourages businesses to model the long-term economic benefits of improving social and environmental performance (Jeffers, 2010), ensuring adequate resources are directed towards SSCM implementation (Govindan *et al.*, 2014).

Company's adoption of CSR can be a challenge; Searcy (2009) described it as a problematic issue generating 'pluralistic goals and immense uncertainty' for the company. A key barrier is the lack of a coherent explanation of how CSR strategy can improve company performance (Carroll and Shabana, 2010). Another problem is that the benefits obtained vary between firms (Kraus and Britzelmaier, 2012). Thus, it is a challenge to convince companies of the CSR importance to improve sustainability performance (Kraus and Britzelmaier, 2012).

Choosing not to adopt CSR causes business to lose sight of sustainability issues at both the company and supply chain level (Tay *et al.*, 2015; Walker and Jones, 2012), thereby inhibiting SSCM implementation. An empirical study by Govindan *et al.* (2014) revealed that firms in the Indian manufacturing industry that lack CSR strategies face barriers implementing SSCM. Similar results were revealed by Zaabi, Dhaheri and Diabat (2013) who explained that when firms fail to link short-term goals with long-term goals, this is often due to lack of a CSR strategy. Elsewhere, Kaur *et al.* (2018) observed that lack of a CSR strategy in the Canadian manufacturing sector causes weak commitment to GSCM.

Ultimately, developing an entirely new business strategy is critical to achieving sustainable development (Murthy, 2012).

2.4.9 Barriers related to top management

Developing a new business strategy that facilitates the implementation of SSCM requires commitment from the top management (Moktadir *et al.* , 2018), defined as “Direct participation by the highest-level executives in a specific and critically important aspect or program of an organisation” (Business Dictionary, 2020). In the case of sustainability management, this includes establishing and participating in a sustainability committee, defining and building up sustainability policies and targets, allocating resources and providing training, monitoring the implementation at all company levels and revising policies according to results (Saeed and Kersten, 2019; Luthra, Garg and Haleem, 2015a). More details of top management’s roles in the implementation of SSCM will be highlighted in the enabler section.

Undoubtedly, without top management commitment, the implementation of SSCM is difficult (Wittstruck and Teuteberg, 2012). Much of the current SSCM literature identifies lack of top management commitment as a critical barrier to SSCM adoption (Ansari and Kant, 2017; Zaabi, Dhaheri and Diabat, 2013). For example, Luthra and Haleem (2015) analysed 10 barriers to SSCM using ISM methodology to identify the dominate barriers and their contextual relationship and found lack of top management commitment has a high driving power of 8 and a low dependence power of 3. The authors stated that barriers with a high driving power and low dependence power are critical.

Several empirical studies have also revealed lack of top management commitment creates additional barriers; i.e. insufficient reverse logistics practices (Moktadir *et al.* , 2018), lack of SSCM training for employees, low employee involvement in SSCM practices, lack of investment in infrastructure facilities, poor attention to sustainability metrics (Narayanan, Sridharan and Ram Kumar, 2019), inadequate collaboration with partners to develop measures on sustainability in the supply chain (Singh, Rastogi and Aggarwa, 2016), unsuitable sustainable procurement practices (Islam *et al.*, 2017), and failure to attribute proper value to the benefits derived from sustainability implementation (Govindan *et al.*, 2014). All the barriers mentioned further inhibit the implementation of SSCM.

Thus, Moktadir *et al.* (2018) suggested that mitigating and eradicating poor top management commitment might serve to erode other significant barriers. They also found that one of the causes of lack of top management commitment might relate to managers’ lack of knowledge about the importance of SSCM to the company and society. A similar empirical study by Zhu and Sarkis (2004) explained that Chinese manufacturing companies recognise the significance of GSCM. Nevertheless, the majority of top management employees have no skills or experience in sustainable management, and so struggle to execute SSCM practices

successfully. Chu *et al.* (2017) also highlighted this concern, observing that the development of SSCM is hindered by the lack of the people with the essential talent and knowledge to introduce it at low, middle and senior levels.

Another factor might relate to top management's lack of willingness to engage in proper training about sustainability and its applications. In an analysis of 36 barriers using DEMATEL approach, Kaur *et al.* (2018) concluded that lack of proper training about sustainability and its applications among top management is a key barrier that inhibits environmental adoption in the supply chain in the Canadian electronics industry. The authors mentioned the study outcomes differ from those commonly reported in the literature, i.e. there is a lack of government regulations and lack of financial resources concerning the main barriers to GSCM. This indicates how lack of training of top management is a critical barrier demanding companies' attention.

Overall, lack of top management commitment, limited understanding of sustainability at management level, and lack of proper training are the main barriers associated with management. This is exaggerated in developing countries where management competencies and experience of sustainability is typically lower.

2.4.10 Barriers related to the competencies and the involvement of employees

Employees also have a role to play in the implementation of SSCM, because they are responsible for innovating the firm's proactive sustainability activities. Beckmann and Pies (2008) argued that achieving sustainability strategy components, such as sustainability reporting, and total quality management, depend on a positive contribution from the top management and employees. Consequently, corporations are not able to successfully integrate sustainability into SCM if managers and their employees are not involved.

Despite employees' roles in achieving sustainability in the supply chain, they are sometimes perceived as a barrier. Morali and Searcy (2013) interviewed 18 supply chain experts, all of whom mentioned lack of resources; i.e. people, time, and cost as primary barriers hindering the adoption of SSCM. Lack of appropriate people can arise from a lack of qualified staff and training programmes, lack of career planning, lack of commitment, and resistance to change in supply chain practise (Bohdanowicz, Zientara and Novotna, 2011). Muduli *et al.* (2013) defined employee resistance to change as occurring when individuals are not ready for a new way of working or resist modifications to previous methods.

Several studies have reported that lack of employee training and experience is a common barrier inhibiting firms from adopting SSCM (Ansari and Kant, 2017). Untrained and less well-educated employees opine that environmental concerns are not important, and thus do

not pressure their employers to adopt GSCM (Govindan *et al.*, 2016). Another study mentioned that low involvement from employees, for example in the development of environmental practices in the Indian mining industry, could be explained by lack of training, lack of higher education, and lack of investment in developing employee capability and a suitable working environment (Barve and Muduli, 2013). In their research, Carter and Rogers (2008) pointed to lack of employee motive as a barrier inhibiting the development of SSCM.

In an analysis of 18 barriers using the Decision-Making Trial and Evaluation Laboratory (DEMATEL) approach, in the context of the Indian packaging industry, Wang *et al.* (2015) found that lack of environmental management training is one of the most influential factors preventing the adoption of GSCM. Also, in India, Mani, Agrawal and Sharma (2016) found that lack of commitment from employees' unions hindered the implementation of social practices in the manufacturing supply chain.

Furthermore, Balasubramanian (2012) reported that lack of sustainability and professional skills are a leading barrier to the United Arab Emirates (UAE) construction industry's adoption of GSCM. They suggested that the government could play a critical role in eradicating these critical barriers by adopting a policy to attract sustainable skilled professionals to the region.

2.4.11 Barriers related to organisational culture

Guiding managers and employees to consider the environmental and social aspects of their decisions requires a company culture with strong values and ethics (Bonn and Fisher, 2011). When such a culture exists, firms can then exert a positive impact on other members of the chain (Amaeshi, Osuji and Nnodim, 2008).

Furthermore, several studies have revealed that the strong cultures of firms in the supply chain can ensure the successful implementation of SSCM. An empirical study by Fantazy and Tipu (2019) concluded that when firms have a culture characterised by encouraging learning, focusing on innovation and performing actions directed towards customer satisfaction, this positively influences the implementation of SSCM. Another empirical study mentioned that when firms have a culture that values "open communication, team collaboration, proactive, innovative and risk-taking behaviour" they are more likely to commit to better SSCM strategies throughout the supply chain (Ahmad *et al.*, 2016b). Similarly, Mani, Gunasekaran and Delgado (2018b) found that a strong culture was highly connected to the adoption of SSCM practices in a Portuguese context.

Successful implementation of SSCM requires a cultural shift throughout the entire supply chain. However, there are numerous barriers to this; for example, different political and geographical cultures, fear of the new, poor communication, and queries over the benefits of sustainability (Govinaden *et al.*, 2014). Undoubtedly, cultural differences among supply chain members can be a significant obstacle to change throughout the chain (Zaabi, Dhaheri and Diabat, 2013). Poor cultural awareness among the members of a supply chain can therefore negatively influence the implementation of SSCM (Luthra and Haleem, 2015; Jayant and Azhar 2014; Govinaden *et al.*, 2014; Zaabi, Dhaheri and Diabat, 2013; Walker and Jones, 2012).

2.4.12 Barriers related to reverse logistics (RL) practices

An essential tool to consider in the adoption of SSCM is reverse logistics (RL), which is defined as:

[A] process whereby companies can become more environmentally efficient through recycling, reusing, and reducing the amount of materials used. Viewed narrowly, it can be thought of as the reverse distribution of materials among channel members. A more holistic view of RL includes the reduction of materials in the forward system in such a way that fewer materials flow back, reuse of materials is possible, and recycling is facilitated. (Carter and Ellarm, 1998, p.85)

RL may be one of the prerequisite principals for implementing SSCM. Sarkis, Gonzalez-Torre and Adenso-Diaz (2010) stated that RL ensures the recovery and collection of end-of-life products, recycling, remanufacturing and refurbishing, while diminishing waste. It can therefore enhance the adoption of CSR throughout the supply chain. An empirical study by Gardas, Raut and Narkhede (2019) concluded that adopting RL is vital to the adoption of SSCM, as its positive impact can help oil and gas firms in India improve their sustainability performance by minimising waste and reducing costs.

Several studies have linked lack of RL practices as a barrier to SSCM (Ansari and Kant, 2017). However, some studies have revealed that this factor has little influence, being very dependent on other significant barriers during SSCM implementation (Kaur *et al.*, 2018; Govindan *et al.*, 2014; Zaabi, Dhaheri and Diabat, 2013). A study by Kaur *et al.* (2018) found that lack of technical expertise resulted in a lack of RL. A similar result was reported by Zaabi, Dhaheri and Diabat (2013), who associated lack of inefficient technology and inefficient employees with poor RL practices in India manufacturing industries. Govindan *et al.* (2014) also identified lack of awareness of the benefits of RL in the implementation of green practices as another reason. Without RL, it is difficult to reduce costs and minimise waste in any supply chain.

2.4.13 Barriers related to technology

Solving sustainability issues requires organisations to have the capability to innovate (Bonn and Fisher, 2011). This requirement is more likely to pose a significant challenge for companies that operate in developing nations, more so than the developed nations (Shrivastava, 1995). Indeed, several empirical studies in developing nations have revealed a failure to introduced new technologies as a significant barrier to adopting GSCM (Mathiyazhagan *et al.*, 2013; Govindan *et al.*, 2014). Lack of technology means “unavailability of appropriate technology or process within an organisation” to support SSCM adoption (Mathiyazhagan *et al.*, 2013, p.286).

One of the technologies mentioned most often in the literature as the most critical barrier to SSCM implementation is the lack of the implementation of information technology (IT) (Ansari and Kant, 2017). For example, Zaabi, Dhaheri and Diabat (2013) analysed 13 barriers using an ISM approach and concluded that lack of information technology (IT) imposes a considerable negative impact on the adoption of SSCM. Similar results were reported by Agyemang *et al.* (2018), who used the DEMATEL technique to isolate 12 barriers, and concluded that lack of integrated management system is a critical barrier resulting in uncertainty about economic (financial and operational) benefits, inhibiting the adoption of the green supply chain in West Africa’s cashew industry.

The lack of integrated management system is associated with poor internal infrastructure facilities, such as outdated equipment related to the “collection, transfer or processing of the data” (Narayanan, Sridharan and Ram Kumar, 2019). This was noted by Narayanan, Sridharan and Ram Kumar (2019), as a critical barrier preventing rubber firms in India from monitoring the sustainable performance of the supply chain partners, thereby inhibiting SSCM implementation.

2.4.14 Summary of SSCM barriers

Several barriers have been identified as major factors hindering companies’ efforts to adopt SSCM practices. Appendix 1 summarises the existing barriers identified above, reporting on the negative impact that each factor contributes to preventing firms from adopting SSCM.

Other researchers made an effort to categorise SSCM barriers. For example, Walker and Jones (2012) and Sajjad, Eweje and Tappin (2015), Sajjad, Eweje and Tappin (2019), Narayanan, Sridharan and Ram Kumar, (2019) and Narimissa, Kangarani-Farahani and Molla-Alizadeh-Zavardehi (2020) have brought our attention to both internal barriers (e.g. management, employees) and external barriers (e.g. customer, regulation) to SSCM implementation.

The results of these studies vary. For example, Walker and Jones (2012) identified that UK firms face more internal barriers to SSCM implementation (19) than external barriers (10). Sajjad, Eweje and Tappin (2015) classified a smaller number of barriers as obstacles; identifying 6 internal barriers and 4 external barriers affecting New Zealand companies from adopting SSCM strategies. In a more recent study (2019), they identified that companies in New Zealand have to deal with 4 external barriers and 3 internal barriers. Narayanan, Sridharan and Ram Kumar (2019) concluded that both external barriers and internal barriers exert the same negative impact on SSCM implementation. Their results indicate that firms have to be well equipped to mitigate the effects of internal or external barriers on the implementation of SSCM.

Another categorisation of SSCM barriers was conducted by Morali and Searcy (2013), who related SSCM barriers to three factors, resources, lack of sustainability understanding and risk management and monitoring. They found that people, financial and cost, are the main barriers to implementation.

Other researchers have attempted to distinguish between barriers by investigating their critical importance and their relationship (driving and dependence power). The reasoning behind these studies is that not all barriers carry the same impact, and it is very challenging for companies to eradicate all barriers simultaneously at the beginning of adoption (Zaabi, Dhaheri and Diabat, 2013). Thus, companies need to start to eliminate the most dominant barriers that are preventing them from adopting SSCM (Govindan *et al.*, 2014).

The researchers used various quantitative methods to achieve this objective, such as interpretive structural modelling, combined with “Matriced Impacts crosses-multiplication applique and classmate” (MICMAC) (Panigrahi and Rao, 2018; Luthra and Haleem, 2015; Zaabi, Dhaheri and Diabat, 2013), or the fuzzy-analytic hierarchy process (F-AHP) (Narayanan, Sridharan and Ram Kumar, 2019) and grey-based DEMATEL Approach (Moktadir *et al.*, 2018).

Combined studies, using for example ISM with MICMAC, group barriers into four clusters: autonomous, dependent, linkage, and independent. Autonomous barriers are those with weak driving power and weak dependence power. Dependent barriers are those with weak driving power and weak dependence power. Linkage barriers are those with strong driving power and strong dependence power. Any effect on any of these barriers will influence the other barriers, and the feedback will be reflective. Independent barriers are those with strong driving power and weak dependence powers. Those barriers are dominant and need to be mitigated first (Zaabi, Dhaheri and Diabat, 2013).

This study attempted to identify the relationships between categories to determine the critical barriers in the context of developing nations. However, note that critical barriers are variable from country to country, industry to industry, and firm to firm. Based on the theoretical background and appendix 1, and Lucid chart software, Figure 2.2 was created. The figure reveals that government barriers may be critical inhibitors of the adoption of SSCM by developing nations. The regulations thus far have negatively influenced management, suppliers and customers, as well as performance measurements and technology.

The next critical barrier relates to management; lack of top management commitment negatively affects employee, performance measurement, and financial resources, technology, supplier and customer integration, reverse logistics practices and business strategy. Thus, these barriers must be mitigated first to ensure the successful implementation of SSCM in the context of developing countries. Commitment and involvement from the top (government- management) are essential pre-cursors to successful SSCM, as sustainability implementation in the supply chain requires a top-down approach.

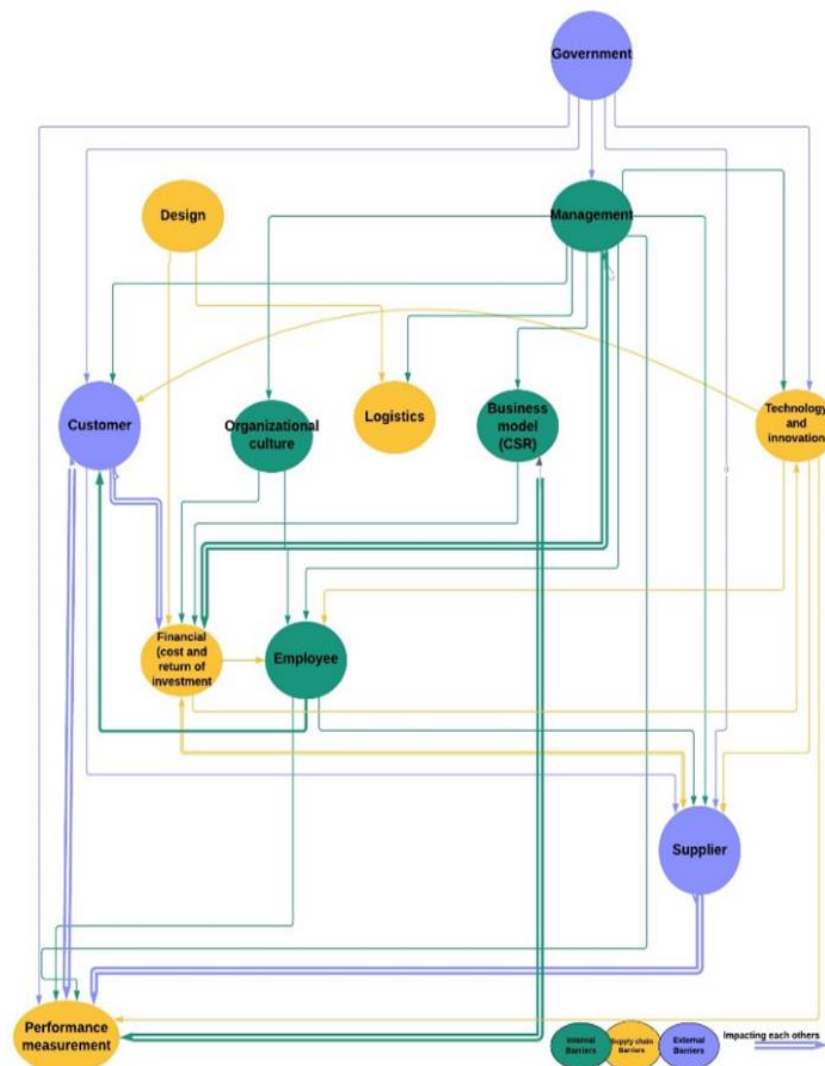


Figure 2.1: Categories for barriers relationships to the adoption of SSCM

2.4.15 Research gaps in SSCM barrier literature and their significance

A database search of various academic journals using different keywords revealed gaps in the existing literature. Table 2.2 explores the empirical barrier studies focusing on the environmental, social and economic sustainability adoptions in SSCM. These theoretical studies have been evaluated according to four criteria: sustainability focus, context, method and number of factors. The table provides evidence to address current research gaps. This analysis, however, does not include studies of barriers from supplier, logistics or customer perspectives. The gaps mentioned in this section are those this study anticipates fulfilling.

Table 2.2: Theoretical studies on SSCM barriers

| Author | SCM focus | Theme | Sustainability focus | | | Context and method | No. of factors |
|---|-----------|--|----------------------|--------|----------|---|----------------|
| | | | Environmental | Social | Economic | | |
| Sajjad, Eweje and Tappin (2015) | SCM | Motivators, Barriers | ✓ | ✓ | ✓ | New Zealand: Case study of four large leading organisations from different sectors: Postal and communication Insurances, Food, Retail and Banking | 9 |
| Walker and Jones (2012) | SCM | Barriers, Drivers | ✓ | ✓ | ✓ | UK: Case study of seven companies from different sectors, such as aerospace, retail, pharmaceuticals, and food and drink. | 29 |
| Zaabi, Dhaheri and Diabat (2013) | SCM | Barriers | ✓ | ✓ | ✓ | India: Two companies interviewed from fastener manufacturing developing an interpretive structural modelling approach | 13 |
| Luthra and Haleem (2015) | SCM | Hurdles | ✓ | ✓ | ✓ | India: Four automobile firms interviewed to develop interpretive structural modelling. | 10 |
| Ageron, Gunasekaran and Spalanzani (2012) | SCM | Barriers part of the review of SSCM development | ✓ | ✓ | ✓ | France: Survey targeted more than one sector. | 17 |
| Morali and Searcy (2013) | SCM | Barriers part of the review of the development of SSCM | ✓ | ✓ | ✓ | Canada: Multi-method approach consisting of content analysis reports and interviewing experts, targeting more than one sector. | 10 |

| | | | | | | | |
|--------------------------------------|-----|-------------------|---|---|---|--|----|
| Giunipero, Hooker and Denslow (2012) | SCM | Barriers, Drivers | ✓ | ✓ | ✓ | US: Multi-method approach consisting of Delphi analysis and interviews with managers targeting more than one sector | 4 |
| Jayant and Azhar (2014) | SCM | Barriers | ✓ | | | India: Interviews with various department managers from Indian auto component manufacturing developing interpretive structural modelling | 20 |
| Govindan et al. (2014) | SCM | Barriers | ✓ | | | India: Discussion with industrial experts through a questionnaire-based survey from various industrial sectors, using analytic hierarchy process | 47 |
| Mani, Agrawal and Sharma (2016) | SCM | Impediments | | ✓ | | India: Questionnaire survey and interviews with experts describing an interpretive structural modelling approach for various manufacturing sectors | 10 |
| Balasubramanian (2012) | SCM | Barriers | ✓ | | | UAE: Expert interviews with academics and industry professionals in the construction sector to develop Interpretive Structural Modelling (ISM) | 32 |
| Wang et al. (2015) | SCM | Barriers | ✓ | | | India: Questionnaire survey of 15 companies experienced in the food packaging industry, to develop A decision making trial and evaluation laboratory | 18 |
| Barve and Muduli (2013) | SCM | Challenges | ✓ | | | India: Interviews with experts from academia and industry targeting Indian mining industries | 11 |
| Drohomeretski and Lima (2014) | SCM | Barriers, Drivers | ✓ | | | Brazil: 13 interviews and analyses of some documents from the companies automotive industry | |
| Panigrahi and Rao (2018) | SCM | Barriers | ✓ | ✓ | ✓ | India: Survey of 103 from 12 companies' textile industry. Including 12 experts for developing the ISM model | 14 |
| Agyemang et al. (2018) | SCM | Barriers | ✓ | | | West Africa: Four experts used in developing grey Decision-Making Trial and Evaluation Laboratory model for Cashew industry | 12 |
| Majumdar and Sinha (2019) | SCM | Barriers | ✓ | | | Southeast Asia: Survey of 22 managers in the textile industry and focus groups involving six experts used in developing ISM modelling | 12 |

| | | | | | | | |
|---|-----|--|---|---|---|---|----|
| Tumpa et al. (2019) | SCM | Barriers | ✓ | | | Bangladesh: Survey of 30 managers in the textile industry, verifying results verify through experts' opinions. Hierarchical cluster analysis is used for analysing the barriers | 15 |
| Sajjad, Eweje and Tappin (2019) | SCM | Barriers, Drivers | ✓ | ✓ | ✓ | New Zealand: Interviews with 29 managers from 23 firms | 7 |
| Moktadir et al. (2018) | SCM | Barriers | ✓ | ✓ | ✓ | Bangladesh: Four experts from the leather industry used in developing the model based on grey- DEMATEL approach | 35 |
| Kaur et al. (2019) | SCM | Barriers | ✓ | | | Canada: Seven experts, for manufacturing industry were used to develop a model based on Paretop analysis | 54 |
| Narayanan, Sridharan and Ram Kumar (2018) | SCM | Barriers | ✓ | ✓ | ✓ | India: questionnaire-based survey and focus group of five managers and two academics used to develop ISM and F-AHP models for the rubber manufacture industry. | 11 |
| Narimissa, Kangarani-Farahani and Molla-Alizadeh-Zavardehi (2020) | SCM | Barriers, Enablers | ✓ | ✓ | ✓ | Iran: Delphi approach consisting of 30 experts from oil companies. | 10 |
| Singh, Rastogi and Aggarwa (2016) | SCM | Barriers | ✓ | | | Literature review | |
| Ansari and Kant (2017) | SCM | Barriers part of review of SSCM development | ✓ | ✓ | ✓ | Literature review | |
| Tay et al. (2015) | SCM | Barriers, Driver | ✓ | ✓ | ✓ | Literature review | |
| Jia et al. (2018) | SCM | Barriers part of review of SSCM development in developing nation | ✓ | ✓ | ✓ | Literature review | |
| Patel and Desai (2019) | SCM | Barriers part of review of SSCM development | ✓ | ✓ | ✓ | Literature review | |

Research Gap 1: Lack of empirical and theoretical studies to examine the barriers from environmental, social and economic perspectives and the integration of the three perspectives of SSCM.

Table 2.2 reveals researchers in developed and developing countries have not previously investigated barriers from the TBL perspective in depth. Only half the studies evaluated attempted to investigate the barriers toward the adoption of GSCM. The remainder assessed the barriers from the TBL integration perspective. There is also limited focus on barriers to the social adoption in the supply chain.

This study confirms research that has consistently shown a dearth of research focusing on the social and three aspects informing the integration of sustainability in the supply chain. In 2013, Seuring reviewed 300 green and sustainable supply chain papers and found the social side and integration of sustainability aspects are not considered by the majority of studies. In a systematic literature review of 456 SSCM articles, Winter and Knemeyer (2013) agreed with Seuring (2013) that the social and three TBL aspects are under-examined. In an analysis of 191 articles, Quarshie, Salmi and Leuschner (2016) highlighted an unreasonable dearth of studies addressing the three aspects of sustainability in the supply chain.

The scholars further mentioned that research trends and organisational practices have been toward applying the three aspects of sustainability in long- and short-term SCM decisions (Ahi and Searcy, 2015a). There has been no reliable evidence identified here to confirm if there are trends towards studying barriers from the perspective of TBL integration. It is apparent, however, that Walker and Jones (2012) were the first to investigate barriers from the viewpoint of TBL integration, and to determine any trend, additional studies are needed.

Although research has investigated the effect on internal/external drivers and barriers in SSCM literature (Quarshie, Salmi and Leuschner 2016), few empirical studies have studied the barriers to adopting SSCM. Indeed, Sajjad, Eweje and Tappin (2015) pointed out that research regarding the practical and theoretical barriers to SSCM is limited compared with motive studies regarding SSCM. The result is supported by this study, which identified only 12 studies as having investigated barriers toward SSCM adoption, compared with 19 studies focused on the motives/enablers of SSCM adoption. This gap had been filled by identifying and discussing barriers to the integration of environmental, social and economic aspects of SSCM to assist managers and employees to understand the role of each in the development of SSCM.

Research gap 2: Lack of empirical and theoretical studies to examine the many barriers that conceptualise each barrier's role in adoption from different industry perspectives.

The barrier factors found to inhibit the adoption of SSCM have been explored in the number of studies. For example, Ageron, Gunasekaran and Spalanzani (2012) studied 17 barriers through their survey method. In their research involving case studies, Walker and Jones (2012) investigated 15 barriers. However, Govindan *et al.* (2014) pointed out that most

studies in the field of sustainable supply chain focus on a limited number of barriers. There are undoubtedly more barriers that could capture the full complexity of SSCM adoption. Thus, this study filled this gap by investigating as many factors as possible.

In addition, far too little attention has been directed towards providing a clear understanding of each barrier. Many studies focus on identifying critical barriers and investigating the relationships between these barriers and related variables. For example, Zaabi, Dhaheri and Diabat (2013) and Luthra and Haleem (2015) used an interpretive structural modelling approach to examine critical barriers and perceive the relationships between variables. The advantage of this method is that it supports the ranking of barriers and identification of complex relationships between them (Zaabi, Dhaheri and Diabat, 2013). A study by Ageron, Gunasekaran and Spalanzani (2012) used a survey method to identify critical barriers, but did not explore the barriers in depth.

Even with case studies, authors have failed to provide a depth exploration of barriers role in the SSCM implementation. For example, Walker and Jones (2012) and Sajjad, Eweje and Tappin (2015) did not provide a deep understanding of barriers because their findings were discussed based on internal and external effects that inhibit the adoption of SSCM and used just one method for collecting data. Thus, these investigations have limited focus for exploring each critical barrier factor in much detail. Thus, Govindan *et al.* (2014) observed that most barrier studies are fragmented, and so cannot provide a clear understanding of each barrier role in inhibiting the implementation of sustainability in the supply chain.

Thus, this study filled this gap by categorising barrier factors based on their importance to SSCM adoption. Each barrier was investigated in-depth by defining the barrier, highlighting sub-barriers describing negative impacts and how these can be eradicated, and identifying the relationships between barrier variables. In addition, it is necessary to evaluate which barriers are critical to SSCM adoption. Detailed information can enhance the understanding of each barrier to SSCM implementation.

Another gap is the lack of a case study investigating barriers from different industry perspectives. For example, Sajjad, Eweje and Tappin (2015) selected four case studies from large firms including postal and communication, insurance, food, retail and banking. Walker and Jones (2012) investigated seven case studies from aerospace, retail, pharmaceuticals, food and drink. Other manufacturing sectors such as oil and gas, chemical, mining, and energy have not been investigated in SSCM barrier studies. Govindan *et al.* (2014) pointed out that barriers should be explored from different industry perspectives. This study analysed barriers in sectors that had not been investigated before to establish if those firms may

perceive the barriers differently, by conducting six case studies in the oil and gas, chemical, mining and energy manufacturing sectors.

This study filled in the gaps mentioned above by developing multiple case studies comprising multiple data sets, to investigate as many barriers as possible and new industrial perspectives concerning the implementation of SSCM.

Research gap 3: Lack of empirical studies to examine the barrier in middle eastern countries.

Table 2.2 illustrates the gap in the research on SSCM in the context of Middle Eastern countries, and specifically, Saudi Arabia. There are just two studies, one in the UAE and another in Iran. The researcher contacted the King Fahad National Library and asked if the topic had been investigated in Saudi Arabia. They responded that it had none (see the letter Appendix 2). This guarantees the originality of the topic.

The lack of empirical and theoretical studies of SSCM in developing nations is a problem that demands critical attention from researchers (Seuring and Müller, 2008b). It is especially important because the supply chain in developing nations has an impact on the sustainability of the global supply chain (Rubio, Chamorro and Miranda, 2007).

A further concern is that the generalisability of much of the published research on this issue is problematic. As noted by Silvestre (2015a), each specific context determines unique challenges from the adoption and management of sustainable supply chains, and, therefore, it is problematic to apply a theoretical, managerial and policy concept to all contexts and companies. Consequently, it is vital to examine barriers from each country, industry and firm perspective (Silvestre, 2015a).

Saudi manufacturing firms are under pressure to improve their sustainability performance. Implementing SSCM will enable Saudi firms to respond to the pressures upon them, satisfy their stakeholders and maintain competitive advantage. However, attempts to embrace SSCM in the Saudi industry are not straight forward due to many obstructions. Luthra and Haleem (2015) pointed out that SSCM practices are at an initial phase in developing countries like Saudi Arabia, and subject to numerous hurdles.

Based upon the above highlighted gaps, the following questions need to be answered.

What are the critical barriers that inhibit Saudi manufacturing companies from the adoption of SSCM?

- What are the strengths of the critical barriers to influence other barriers in Saudi manufacturing companies' adoption of SSCM?
- What do Saudi manufacturing companies' action to mitigate the main barriers that inhibit the adoption of supply chain sustainability?

This study addresses the research questions by developing empirical case studies about six manufacturing firms in the context of Saudi Arabia. Hopefully, the findings of the study will afford a significant opportunity for managers, academic researchers, and regulators to identify and understand chief barrier factors to assist with the development of SSCM from a Saudi perspective.

2.5 Enablers of the adoption of SSCM

The previous section focused on barriers inhibiting firms from adopting Sustainable Supply Chain Management (SSCM). This current section examines the importance of identifying an enabler (Patel and Desai, 2019), defined as “one that enables another to achieve an end where the word enables means to make able; to give power, means, competence, or ability” (Grzybowska, 2012, p.27).

This section focuses on firstly, outlining a broad range of enablers capable of assisting the development of SSCM and secondly, developing a theoretical understanding of their individual roles. This improved understanding promotes SSCM development, using enablers to eradicate the barriers discussed in the previous section.

The enablers of SSCM, particularly in developing nations, can be placed into the following ten categories.

2.5.1 Enablers related to stakeholder engagement

Collaboration is required when there is a “multi-organisational problem that may exist at any sociological level, from local to international, or may span more than one level” (Wood and Gray, 1991, p.13). Sustainability is a complex issue at many sociological levels, both locally and internationally, requiring collaboration and the sharing of knowledge between all disciplines and actors (Ratiu and Anderson, 2015; Rotheroe, Keenlyside and Coates, 2003).

This study focuses on the adoption of sustainability in the supply chain, which demands action from more than a single firm. Sustainability can be established in the supply chain through multi-stakeholder initiatives and actions (Gopal and Thakkar, 2016), which should be arranged collectively according to the capacity of stakeholders to collaborate (Van Hoof and Thiell, 2014).

Collaboration plays a crucial role in enhancing such inter-organisational capabilities by: (1) establishing the capacity for absorption (Van Hoof and Thiell, 2014), i.e. a firm’s ability to identify, absorb, convert and apply valuable external knowledge to enhance its innovative capabilities (Cohen and Levinthal, 1990, p.128); and (2) constructing and encouraging practices relating to common issues and objectives (Van Hoof and Thiell, 2014), i.e. SSCM.

Collaboration is considered fundamental to the implementation of supply chain sustainability (Taticchi, Tonelli and Pasqualino, 2013). Managers are required to collaborate across functions both inside and outside the firm to achieve its short- and long-term financial, ecological and social goals (Ahi and Searcy, 2015a; Grosvold, Hoejmose and Roehrich, 2014). Oelze's (2017) empirical study suggested that, in order to eliminate barriers to sustainability, the textile industry needs to develop a mechanism of formal and informal collaboration with their internal and external stakeholders.

SSCM collaboration is distinguished from a conventional supply chain by its transparency, the adoption of a shared IT infrastructure, and improved sustainability performance (Beske and Seuring, 2014). Beske and Seuring (2014) also noted four vital aspects of successful inter-organisational SSCM cooperation, arguing that these require sufficient technological infrastructure. Furthermore, their positive impact has been explored as an enabler in several SSCM studies, as follows.

Firstly, the integration of information technology by companies. Tseng, Wu and Thoa's (2011) empirical study identified the positive impact of information technology on environmental performance in the supply chain, i.e. supporting business to optimise resources, enhancing the communication and coordination of environmental activities (Tseng, Lim and Wong, 2015).

Secondly, information sharing. Squire *et al.* (2009) highlighted the need to promote sustainability between supply chain partners. Additionally, an empirical study concluded the potential to adopt green practices in a textile supply chain when environmental information is shared between stakeholders (Kuo *et al.*, 2013). This can make a positive contribution to SSCM implementation by coordinating innovative ideas, enhancing communication inside and outside a firm, and creating a sustainable culture (Luthra, Garg and Haleem, 2015a). Furthermore, Khan, Hussain and Saber (2016) found that sharing environmental and social information between buyers and suppliers resulted in improved annual profits for the supply chain.

Thirdly, information follows the flow of goods in both a forward and return direction (Delfmann and Albers, 2000). Thus, logistical integration is vital to ensuring a link between supply chain members, facilitating the sharing of information concerning sustainability (Beske and Seuring, 2014). Thus, each member of the chain (i.e. manufacturing, warehousing and distribution) must be informed on any network development. Delfmann and Albers (2000) stated that supply chain performance is enhanced when members have robust logistical integration between them.

Fourthly, Walker and Jones (2012) highlighted the need for joint development across industries (even between competitors) to ensure the adoption of sustainability in the supply chain. For example, the joint development on an eco-design project between Chinese automobile companies and research institutes, universities and competitors resulted in the creation of substitute materials and innovative technology that enhanced the adoption of environmental practices (Zhu, Sarkis and Lai, 2007).

A further study revealed that a joint development between Indian manufacturing firms, suppliers and product designers to eliminate any environmental impact resulted in the emergence of other driving factors, i.e. suppliers obtaining a certification in the environmental management system (Diabat and Govindan, 2011). This was supported by Oelze (2017), who identified advantages to the textile industry from collaborating with competitors, i.e. improved use of resources, joint audits of suppliers, and motivating firms to engage in SSCM practices.

A number of further significant aspects to ensure successful collaboration include trust between partners and the commitment of the buyer towards environmental and social initiatives (Touboulic and Walker, 2015). Faisal (2010b) pointed out that efficient and sustainable collaboration requires buyer acknowledgement of trust and transparency in their relationship with their supply chain partners. Similarly, Agi and Nishant (2017) highlighted the role of ‘dependence’, ‘trust’, and ‘durability’ in facilitating the implementation of a green supply chain. Furthermore, strategic collaboration is required between supply chain partners, with Mehdikhani and Valmohammadi (2019) concluding that this encourages the sharing of internal and external knowledge, with a positive impact on SSCM implementation.

The above highlights that collaboration between stakeholders enables the implementation of SSCM (Ansari and Kant, 2017). Nevertheless, it remains challenging to attain collaboration for true sustainability (Silvestre *et al.*, 2018), i.e. ensuring the economic, environmental, and social performance of a product’s complete lifecycle (Gold, Seuring and Beske, 2010). Touboulic and Walker (2015) pointed out that sustainability collaboration is challenging due to the complexity of managing external and internal activities. In addition, Alvarez, Pilbeam and Wilding (2010) noted that collaboration between stakeholders to develop SSCM requires extensive resources unavailable to most firms.

2.5.2 Enablers related to stakeholders

The previous section highlighted stakeholder collaboration as a significant factor in the adoption of SSCM. However, this can vary. Meixell and Luoma (2015) identified three stages of a stakeholder’s influence on SSCM development: (1) creating awareness of

sustainability; (2) encouraging the adoption of sustainability goals; and (3) engaging in the implementation of SSCM practices.

The above study indicates the importance of identifying internal and external stakeholders open to collaboration within the supply chain. This is, however, a complex issue, with Gao and Zhang (2006) noting the difficulties arising from differing stakeholder interests, which can be driven by separate (and conflicting) interests. An individual (or group) may have ties to more than one group, or to a future stakeholder. This led the researchers to conclude that stakeholders are neither constant nor identical.

The review of the literature revealed substantial evidence for the existence of four critical stakeholders, i.e. those playing the most influential role in the development of SSCM. Internal stakeholders include management and employees, while external stakeholders include suppliers, customers and government- and non-government organizations. This study recognizes customers and suppliers as external stakeholders presenting particular challenges to firms, since a buyer lacks control over their organization's resources and any development of sustainability (Sharma and Henriques, 2005). In addition, they can marshal public feelings for or against a company's practices (Freeman, 2010). This perspective has been adopted by sustainable-supply-chain researchers, i.e. Zhu and Sarkis (2004) and Walker and Jones (2012). The following section explores the role of external and internal stakeholders in the development of SSCM.

External stakeholders

2.5.2.1 Enablers related to suppliers

For the supply chain to be sustainable, its members need to improve their economic, social, and environmental performance (Ahi and Searcy, 2013; Carter and Easton, 2011). Several studies have found high levels of sustainability practices by suppliers resulting in an improvement of environmental and social practices in the supply chain (Saeed and Kersten, 2019; Mani, Gunasekaran and Delgado, 2018a; Govindan *et al.*, 2016; Testa and Iraldo, 2010).

Buyers therefore adopt approaches to ensure sustainability is extended to their suppliers (Roberts, 2003; Chen and Chen, 2019), including pressure to ensure their existing practices become more sustainable (Faisal, 2010a). However, suppliers may not respond, due to: (1) a lack of capacity; (2) being insufficiently convinced of the need; (3) being uncertain of the benefits; and (4) difficulties in selling sustainable products (Faisal, 2010a). Jorgensen and Knudsen (2006) also stated that most Tier II and III suppliers in the supply chain are Small

and Medium-sized Enterprises (SMEs), which are likely to lack resources to implement sustainability standards.

There are, therefore, a number of other approaches for buyers: (1) finding resources to improve the supplier's performance, or/and (2) exploring the market to select a supplier that has already adopted sustainability practices (Krause, Scannell and Calantone, 2000). Both approaches have been identified in several studies as enablers of SSCM. For example, collaborating with green suppliers proved vital for the successful implementation of SSCM in the Brazilian electronics industry (Kannan, De Sousa Jabbour and Jabbour, 2014) and the Chinese automobile industry (Zhu, Sarkis and Lai, 2007). Similarly, Droghameretski, Costa and Lima (2014) demonstrated that selection of a green supplier by its automobile manufacturing industry contributed to Brazil's implementation of environmental practices in the supply chain, i.e. recyclable materials, reducing waste and management of environmental risks. Furthermore, Chen and Chen's (2019) analysis of 281 Chinese suppliers suggested that if buyers wish to meet their social and environmental obligations, they need to include moral criteria in the selection process.

To choose a sustainable supplier, a buyer should implement sustainable purchasing practices, defined as:

The consideration of environmental, social, ethical and economic issues in the management of the organisation's external resources in such a way that the supply of all goods, services, capabilities and knowledge that are necessary for running, maintaining and managing the organisation's primary and support activities provide value not only to the organisation but also to society and the economy. (Miemczyk, Johnsen and Macquet, 2012, p.491)

Sustainable purchasing is considered an essential factor in creating a sustainable supply chain, ensuring goods and services are environmentally responsible (Handfield *et al.*, 2002). In particular, a buyer should provide design specifications to a supplier, including the environmental requirements, following by collaborating with a supplier to provide materials, equipment, parts and services supporting the firm's environmental goals (Lamming and Hampson, 1996). These are known as green purchasing and exert a positive impact on the operational and economic performance of the Chinese automobile industry (Zhu, Sarkis and Lai, 2007). Another form includes "environmental purchasing, sourcing from minority-owned suppliers, and human rights, safety, and philanthropy issues relating to supply management" (Carter, 2005, p.178). These activities are known as purchasing social responsibility, and it has substantial impact on supplier performance while reducing cost to the buyer (Carter, 2005).

The second approach is for the buyer to use its resources to improve the sustainability of the supplier, with a reward to adopt stricter environmental regulations and employ cleaner production methods (Muduli *et al.*, 2013). Technology transfer to the supplier can help buyers to achieve their sustainability goals (Simpson, Power and Samson, 2007). In addition, the establishment of a training programme can enhance the supplier's ability to adopt sustainable practices (Dou, Zhu and Sarkis, 2014; Grosvold, Hoejmosse and Roehrich, 2014). Moreover, purchasing commitments can reduce supplier uncertainty and tie increased value to sustainable practices (Faisal, 2010b).

This approach demands that the buyer is given assessment tools allowing the allocation resources to support improved sustainable performance of supplier, i.e. a questionnaire, meeting and auditing the supplier, along with providing codes of conduct and formal sourcing processes (Grosvold, Hoejmosse and Roehrich, 2014; Lippmann, 1999). Such tools can improve the adoption of sustainability in the supply chain and fulfil the buyer's promise to stakeholders (Seuring and Müller, 2008b; Hervani, Helms and Sarkis, 2005).

However, in enforcing those assessments, the buyer may not improve supplier sustainability so demanding collaboration with supply chain members, as supplier evaluation alone has not been found to impact on the Triple Bottom Line (TBL) (Gimenez, Sierra and Rodon, 2012). Sancha, Gimenez and Sierra (2016) noted that manufacturing firms in Spain enforcing sustainable compliance without collaborating with their suppliers increased their reputation but failed to make any significant improvement to the suppliers' social performance. They therefore concluded that assessment of, and cooperation with, suppliers are vital to the adoption of a social supply chain. The assessment tools can identify potential issues with suppliers, which can be addressed in a cooperative manner of cooperation. This approach has been followed by several large organisations which have introduced a code of conduct, followed by securing investment for the training of suppliers to enable them to fulfil the code of conduct (Jia *et al.*, 2018).

Cooperation with suppliers has been identified as a significant component of establishing supply chain sustainability (Tay *et al.*, 2015; Mani, Gunasekaran and Delgado, 2018a; Hu and Hsu, 2010; Pagell and Wu, 2009). Some researchers have stressed the quality of the relationship between buyer and supplier as determining a successful transformation to SSCM (Touboulic and Walker, 2015). Collaboration is needed because most suppliers of SMEs have not sufficient knowledge of environmental regulations and the design and management of a green product (Winkler, 2010). They therefore require assistance from the buyer (Jia *et al.*, 2018). Also, collaboration with the supplier helps the buyer to link its sustainability goals

with its supplier practices, which improved for example the environmental performance within the supply chain of Indian manufacturing firms (Dubey *et al.*, 2015).

This highlights that a sustainable supply chain demands that buyers select a sustainable supplier and improve its performance, through collaboration and the appropriate assessment tools.

2.5.2.2 Enablers related to customers

Customers have recently become more aware of sustainability. Beamon (2008) stated that a growing number of customers consider environmental issues and Corporate Social Responsibility (CSR) as of equal importance to price and quality. Studies have identified that customers play a role in the adoption of SSCM practices. For example, Luthra, Garg and Haleem (2016) identified customer management, support and awareness as critical success factors facilitating the adoption of GSCM by Indian automobile firms.

Customers can enable sustainable development by purchasing substantial quantities of sustainable products and materials (Hall 2000; Walton, Handfield and Melnyk, 1998) and demanding sustainable products (Walker and Jones, 2012; Faisal, 2010b). Such demands have led Indian manufacturing to invest in skilful entrepreneurs to enhance the implementation of social initiatives in the supply chain (Mani, Agrawal and Sharma, 2015).

Furthermore, a firm's integration of customer requirements and preferences ensures the long term adoption of sustainability in the supply chain (Mani, Agrawal and Sharma, 2015). Tajbakhsh and Hassini (2015) also suggested that many dimensions of sustainability incorporated into the supply chain must be based on customer preferences. An empirical study by Jayaram and Avittathur (2015) found that the efficient implementation of GSCM among Indian manufacturers required them to relate their customers' requirements for green design, product recovery and reverse logistics.

Thus, firms which collaborate with their customers understand their demands and preferences, potentially leading to the implementation of SSCM. Abdullah, Mohamad and Thurasamy (2017) pointed out that improving sustainability and maintaining a competitive advantage in the supply chain depends on the firm's ability to engage with customers. In the textile industry, this has been found to add valuable insights into the benefits of GSCM implementation (Seuring, 2004b). It has also resulted in a Brazilian automobile firm enhancing the implementation of environmental practices downstream of the supply chain by adopting eco-friendly vehicles (Drohomeretski, Costa and Lima, 2014). This finding was supported by Ni and Sun (2019), who determined that a link between internal and external

sustainability practices downstream of the supply chain is enhanced when a firm values customer relations.

Therefore, managing and understanding the sustainability demands and preferences of customers in the supply chain can assist firms to produce an attractive sustainable product (Ni and Sun, 2019). This then ensures the long term adoption of sustainable practices in the supply chain.

2.5.2.3 Enablers related to government

Many government- and non-government institutions have recently agreed that organisations need to transcend current trajectories to address issues of sustainability (Busse, Meinlschmidt and Förstl, 2017; Beske and Seuring, 2014). Both can facilitate the implementation of sustainability in the supply chain (Luthra, Garg and Haleem, 2015b). In addition, government is essential to SSCM development as it is responsible for setting up the policies, creating jobs, and ensuring security (Dubey *et al.*, 2017).

Governments can employ a number of approaches (i.e. remuneration, tax reductions, or direct regulations and policies) to motivate or pressurise firms to adopt sustainability in the supply chain (Esfahbodi *et al.*, 2017; Sajjad, Eweje and Tappin, 2015). However, the most effective is regulation, with managers in the UK manufacturing sector confirming that this is particularly significant during the initial stage (Esfahbodi *et al.*, 2017).

Several studies have shown regulation to be vital to the implementation of SSCM. A survey of 314 Chinese firms by Zhu, Sarkis and Geng (2005) found that the establishment of regulatory policies by the Chinese government encouraged Chinese firms to adopt environmental certification standards, resulting in improvements in the supply chain. Similar findings were revealed in a study of ninety-four oil and gas industry firms by Ahmad *et al.* (2016a), who concluded that this adoption of SSCM was fostered primarily by governments, i.e. by enforcing pro-sustainability legislation.

A further study showed that firms in Qatar engaged in expensive SSCM practices if set down in law (Faisal, 2010b). Similar results were revealed in India, with Luthra *et al.* (2018) concluding government regulation to be the most influential of thirteen critical factors for the adoption of SSCM. It was also the most important enabler facilitating SSCM in an Indian thermal power plant (Biswal *et al.*, 2018). In a study of ISM models of seven enablers of SSCM in the Indian oil and gas industry, Gardas, Raut and Narkhede (2019) demonstrated that regulatory pressure exerts a high driving power of 7 and low dependence power of 1, so indicating its importance to SSCM implementation.

Several studies identified government regulation as influencing the implementation of other SSCM enablers. Diabat and Govindan (2011) stated that regulations prompted management of Indian manufacturing firms to collaborate with their suppliers to design a green supply chain, including selecting suppliers holding environmental management certification. This was supported by Dubey *et al.* (2015), who detected that pressure from regulations exerts a positive influence on the commitment of senior management and buyer-supplier relationships when it comes to the adoption of GSCM in Indian manufacturing firms. Furthermore, Wu, Ding and Chen (2012) found the regulations also prompted collaboration in designing an environmentally friendly supply chain, resulting in the creation of green products.

Moreover, regulation has been found to influence the engagement of both management and employees, i.e. a number of private and public organisations in the UK have integrated environmental practices into the supply chain (Walker, Di Sisto and McBain, 2008). Regulation has also exerted an impact on the adoption of green purchasing in the Taiwan textile industry (Wu, Ding and Chen, 2012). Moreover, Dubey *et al.* (2017) identified a relationship between institutional pressure and increased organisational commitment toward sustainability in the supply chain of the Indian manufacturing industry. Similarly, Wu, Zhang and Lu's (2018) analysis of data from 167 manufacturing companies in China identified a link between government participation in the SSCM implementation and the commitment of industry.

A further government role in enabling SSCM implementation concerns the establishment of industrial parks, as this concentration facilitates the adoption of SSCM, i.e. firms can exchange waste, share resources and reuse materials to reduce any negative environmental impact and lower costs. Thus, Faisal (2010b) pointed out that the establishment of industrial parks in Qatar facilitated many sustainable business practices in the supply chain. Sarkis (2003) demonstrated that being located near to other manufacturing firms has a positive impact on environmental issues, enabling the transport of waste, the recycling of materials and an additional collaboration with suppliers and customers. Such a location may enable firms to collaborate and exchange resources for integrating sustainability practices into their supply chain.

Ansari and Kant (2017) stated that, due to the importance of government regulations concerning sustainability within supply chains, it is vital that firms collaborate with regulatory agencies. Furthermore, Sekerka and Stimel (2012) emphasised the need for governments and businesses to collaborate to ensure sustainable development.

2.5.2.4 Enablers related to Non-government organisations

Non-governmental organisations can use public pressure on companies to be offering more sustainable products (Hassini, Surti and Searcy, 2012). Faisal (2010b) noted that national legislation and international conventions provide guidelines for companies' implementation of various sustainability practices for the supply chain. Furthermore, an empirical study found that non-government organisations' guidance towards compliance with environmental standards (ISO) and safety standards (OHSAS) played a critical role in enabling SSCM practices in the Indian steel industry (Prasad *et al.*, 2018). Jia *et al.*'s (2018) review of articles, made between 2000 and 2016, concluded that, when engaging with suppliers to deliver sustainability initiatives, organisations are more likely to use government and non-government organisations (i.e. industry associations and private auditors).

Internal stakeholders

The internal organizational factors are the most significant in the implementation of SSCM (Prasad *et al.*, 2018). The recognition and support of management and employees for sustainability is critical for the implementation of SSCM. For instance, Hu and Hsu (2010) found that the support of top management, alongside involvement of the workforce, proved critical factors in allowing Taiwanese electrical and electronic industries to deliver environmental practices in the supply chain. Additionally, this support can be related to the skills necessary to execute SSCM practices. Dubey and Gunasekaran (2015) stated that improved implementation of SSCM depends on the relevant skills of management and employees, and their need to collaborate to ensure sustainability (Mirvis, Googins and Kinnicutt, 2010).

2.5.2.5 Enablers related to management

The role of management in the adoption of a sustainable supply chain focuses on the allocation of resources needed for SSCM, including: (1) adequate technology; (2) funding; (3) human capital; (4) ideas; and (5) sustainable strategies and policies (Saeed and Kersten, 2019; Luthra, Garg and Haleem, 2015b). Ageron, Gunasekaran and Spalanzani (2012) highlighted that SSCM is not possible without the support of top management, including: (1) allocating resources; (2) developing sustainable policies; (3) collaborating with partners; and (4) supporting innovative practices. Waite (2013) pointed to the consensus among researchers publishing in various management journals that senior management drives the innovation capable of solving the issue of sustainability.

Researchers view such commitment as critical factors in the implementation of GSCM and SSCM (Ansari and Kant, 2017; Dubey *et al.*, 2015; Giunipero, Hooker and Denslow, 2012; Seuring and Müller, 2008b). For example, Prasad *et al.* (2018) found that the support of

senior leadership was the most significant internal aspect facilitating the adoption of environmental practices in the supply chain in the Indian Steel industry. This was supported by Agi and Nishant (2017), who identified enablers for GSCM in the context of Gulf countries. A further study also stated that the commitment of top management influenced the adoption of SSCM in the Iranian oil and gas industry (Narimissa, Kangarani-Farahani and Molla-Alizadeh-Zavardehi, 2020).

A number of studies have additionally highlighted the importance of commitment from middle management (Luthra, Garg and Haleem, 2016; Walker and Jones, 2012). For example, Vargas, Mantilla and Jabbour's (2018) analysis of data from 126 Colombian firms concluded that the involvement of top and middle management was a critical enabler of SSCM practices.

Additional studies have identified the influence of the vision, commitment and cognition of top management on the implementation of further enablers of SSCM practices. For example, a survey of 167 enterprises in China by Wu, Zhang and Lu (2018) found that top management's cognition of sustainability had a positive impact on the environmental, social and economic performance in the supply chain. They concluded that implementation of SSCM depends entirely on the wishes of top management. A further study noted that environmental leadership among senior management (i.e. rewarding and empowerment of, employees) positively influenced employees to champion environmental implementation in the supply chain (Graves, Sarkis and Gold, 2019).

Furthermore, the support of top management in the Indian manufacturing sector resulted in an improved understanding of sustainability, so facilitating its introduction into the supply chain (Luthra and Mangla, 2018). Commitment from top management also resulted in the introduction of green measurements in the supply chain, with a positive influence on the implementation of SSCM (Singh, Rastogi and Aggarwa, 2016; Ageron, Gunasekaran and Spalanzani, 2012).

In order to implement SSCM network, a manager needs to obtain new skills and competency (Dubey and Gunasekaran, 2015). A case study of four New Zealand companies by Sajjad, Eweje and Tappin (2015) concluded that the ethical values, sustainability knowledge, and leadership demonstrated by top management directly influenced the adoption of SSCM practices. Dubey and Gunasekaran (2015) pointed out that management needs to combine two kinds of skills:

'Hard' skills. These form the technical knowledge managers require to perform their jobs efficiently and effectively, i.e. green logistics, green packaging, and TBL frameworks.

‘Soft’ skills. These form a manager’s ability to communicate with others, i.e. leadership, teamwork, positive attitude, ability to learn, and innovative thinking.

Overall, the literature views leadership and the commitment of the top management as an essential internal factor in the implementation of sustainability in the supply chain (Saeed and Kersten, 2019; Mirvis, Googins and Kinnicutt, 2010). Management support for SSCM practices is available if managers have ethical values, commitment and skills in sustainability.

2.5.2.6 Enablers related to employees

The role of employees in the adoption of a sustainable supply chain arises from their active engagement in SSCM implementation. An empirical study by Diabat, Kannan and Mathiazhagan (2014) concluded that SSCM could not be achieved in the Indian textile industry without participation from employees. The positive impact of employees has also been highlighted as critical to the development of SSCM, i.e. their cognitive and practical skills involved in the procurement of staff and other personnel in the supply network (Roberts, 2003). Additionally, their commitment and teamwork enhance the development of innovative technology to assist in the implementation of GSCM (Muduli *et al.*, 2013).

Furthermore, in Sweden, the social responsibility of employees is vital for enhancing the adoption of social aspects in the supply chain (Mont and Leire, 2009). Their engagement leads to efficient information sharing and process improvement between departments and staff, both inside and outside the supply chain, so enhancing the adoption of SSCM (Gattiker *et al.*, 2014). Thus, high levels of employee commitment are vital due to their role as carrying out of sustainable programmes (Govindan *et al.*, 2016).

A firm needs to adopt new approaches to ensure workers engage in sustainability initiatives, including (despite the additional cost) hiring skilled and committed employees (Luthra, Garg and Haleem, 2015a). Another approach is to use the firm’s resources to encourage employees to engage in SSCM practices, i.e. green training has exerted an improvement of the implementation of GSCM among Brazilian firms (Teixeira *et al.*, 2016). Another example is when management empowers employees during their daily work to ensure commitment to the implementation of SSCM (Dubey and Gunasekaran, 2015). The right workplace environment can also improve employee morale concerning sustainability practices (Barve and Muduli, 2013). For instance, Munny *et al.* (2019) found that, for footwear supply chains in Bangladesh, health and safety in the workplace and levels of pay were critical enablers for improving social adoption.

Similar results were revealed in India, where a reward and incentive programme encouraged employees to engage in sustainable practices (Luthra, Garg and Haleem, 2013). However, Graves, Sarkis and Gold (2019) argued that employee involvement would be more effective if it originated from employees taking pride in doing the right thing.

Human Resource Management (HRM) plays a critical role in the adoption of SSCM, being responsible for recruiting moral workers, detecting areas of concern and establishing training programs to enhance the skills and the relevant skills to sustainability (Dubey and Gunasekaran, 2015).

2.5.2.7 Summary of the stakeholder role in the adoption of SSCM

This section demonstrated that the adoption of SSCM requires commitment from all supply chain members to meet social and the environmental criteria (Ni and Sun, 2019; Taticchi, Tonelli and Pasqualino, 2013). Each member needs to identify emerging issues regarding sustainability in order to respond to (or anticipate) changes as early as possible, to prevent the chain becoming too fragile to implement sustainability (Hall, Daneke and Lenox, 2010). As noted above, collaboration is vital for capturing the contributions of all supply chain partners and other stakeholders.

In addition, a focal firm needs to be responsible for organising and connecting the supply chain and other stakeholder initiatives, i.e. “companies that govern the supply chain, contact and design the products and services provided to the customers” (Seuring and Müller, 2008b, p.1699). Silvester (2015b) noted that focal firms play an essential role in developing sustainability practices, due to acting as central agents facilitating the direction and communication between supply chain members, i.e. it is easier for these firms to spread the sustainability agenda and develop the capability of members in the supply network. Moreover, focal firms can use their procurement functions to enhance sustainable supplier performance, as well as using marketing, logistics and stakeholder communication to change behaviour (Silvester, 2015b). The integration between the two functions allows focal firms to manage external activities upstream and downstream of the supply chain, so facilitating their commitment to sustainability (Foerstl *et al.*, 2015).

Integration is effective when the focal firm embraces collaboration and its activities are internally sustained (Blome, Paulraj and Schuetz, 2014), so enhancing SSCM implementation. For example, Droghda, Costa and Lima (2014) found that the adoption of GSCM practices in Brazilian automotive sectors was achieved by transferring the organisation’s internal green activities to the supply chain. Köksal *et al.*’s (2017) review of forty-five journal articles concluded that companies’ internal sustainability practices ensure effective implementation of social practices in the supply chain in the textile industry.

This indicates that firms need to ensure the robust implementation of internal sustainability practices before expanding this to external stakeholders. Some studies consider this fundamental to the implementation of SSCM. Blome, Paulraj and Schuetz (2014) noted that if a firm has already identified how to apply sustainability internally, it will increase its ability to access and absorb the richness of information obtained through supply chain collaboration. Similar results were revealed by Abdullah, Mohamad and Thurasamy (2017), who concluded that Malaysian firms focused on transforming their internal practices to becoming green before expanding this to their external practices. They concluded that committed internal stakeholders would work internally and externally to reduce the environmental impact throughout the supply chain.

This indicates that firms need to first focus on becoming internally sustainable and to introduce Sustainable Supply Chain Collaboration (SSCC), i.e. “firm’s willingness to devote specific resources to joint activities with suppliers and customers to address sustainability goals” (Pakdeechoho and Sukhotu, 2018, p. 276). Collaboration between customer and supplier is critical for enhancing the implementation of SSCM. Firstly, it benefits the development of buyer capabilities, enabling them to focus on implementing GSCM (Abdullah, Mohamad and Thurasamy, 2017) and secondly, it enhances the buyer’s sustainability performance (Blome, Paulraj and Schuetz, 2014).

Incentives have been found to encourage SSCC. Pakdeechoho and Sukhotu’s (2018) analysis of 215 manufacturing firms in Thailand concluded that such incentives enhanced SSCC, enhancing the economic and social performance of the supply chain. A further study suggested that external collaboration can be facilitated through the development of mutual benefits between a firm, its suppliers and customers (Blome, Paulraj and Schuetz, 2014). SSCM can thus be seen from a holistic point of view, one that includes the buyer and its supply chain partners, as well as other stakeholders (Ni and Sun, 2019; Blome, Paulraj and Schuetz, 2014). Managers are required to understand both internal and external activities, including those related to suppliers and customers (Porter and Derry, 2012), to ensure the firm becomes more ‘cognitive’ and ‘moral’ and progresses toward sustainable practices (Waddock, 2001).

This section has identified the need to address the issue of sustainability from the supply chain perspective to ensure implementation of SSCM (Faisal, 2010b). This highlights the need to develop a sustainable strategy (Walker and Jones, 2012), as discussed in detail below.

2.5.3 Enablers related to sustainability strategy

A sustainable strategy can enhance the implementation of SSCM, allowing firms to manage

sustainable initiatives relating to the supply chain (Kleindorfer, Singhal and Wassenhove, 2005). In addition, it can also ensure that firms obtain a vision for creating value over both the short- and long-term, resulting in reliable SSCM (Tay *et al.*, 2015). Dubey *et al.* (2015) indicated that, from a strategic point of view, sustainability results in a superior environmental and economic performance in the supply chain. Furthermore, Giunipero, Hooker and Denslow (2012) suggested organisations adopt green policies as a long-term strategy because, while the initial cost is high, it is cost-effective in the long run. This long-term approach allows an organisation to be better prepared to deal with rapid changes in technology and changing the behaviour of stakeholders (Sarkis, 2003).

A sustainable strategy also allows firms to manage the necessary resources and progress towards sustainability (Gopal and Thakkar, 2016). This assists in developing a platform to support partners in the supply chain (Faisal, 2010b). Droghda, Costa and Lima (2014) found that sustainability strategies incorporated by three firms in the Brazilian automotive industry supported the adoption of environmental practices both within their firms and across the supply chain. Furthermore, Leppelt *et al.* (2013) found that a sustainability strategy helps firms to demonstrate to partners in the chain (and other stakeholders) that they are committed to the implementation of SSCM. Chen (2014) noted that when a firm emphasises sustainability as core value, it is more likely to recruit candidates with a proactive commitment toward sustainability.

For a sustainable strategy to be effective, it should involve every functional level in an organisation, thus impacting on the decision making of managers (Bremser, 2014; Bonn and Fisher, 2011). Firms also need to establish an innovative strategy to ensure sustainability in the supply chain (Malviya and Kant, 2017), which additionally depends on the participation of the stakeholders (Tay *et al.*, 2015).

Furthermore, a sustainable strategy for the supply chain should be linked with existing corporate strategies, i.e. CSR or corporate sustainability (CS) (Walker and Jones, 2012). CSR ensures that business attitudes, behaviours and practices focus on integrating the economic, environmental, and social aspects of sustainability (Ciliberti, Pontrandolfo and Scozzi, 2008), which is vital for the implementation of SSCM (Luthra, Garg and Haleem, 2016; Luthra, Garg and Haleem, 2015b). Govindan *et al.* (2016) suggested that management in Indian mining sectors should concentrate on CSR because it empowers other factors (i.e. managerial realisation and profitable business opportunities) with an influence on the adoption of the GSCM. Furthermore, Biswal *et al.* (2018) found that corporate social responsibility plays an essential role in increasing the awareness of SSCM practices in the energy sector in India, including the benefits and the risks of non-adoption. In addition,

Saeed and Kersten (2019) concluded the organisational strategy to be one of the most effective enablers for motivating a company and its partners to implement sustainability initiatives in the supply chain.

2.5.4 Enablers related to performance measurement

A sustainable strategy must also be linked to indicators measuring SSCM performance. The sustainable indicator is defined as a “piece of information that summarises or highlights what is happening in a dynamic system” (Tajbakhsh and Hassini, 2015, p.74). For SSCM, a firm offers information concerning a new measurement standard (i.e. the reduction of green emissions and the frequency of employee injury), combined with traditional indicators, i.e. increases in productivity as well as market share and profit (Grosvold, Hoejmosé and Roehrich, 2014; Li *et al.*, 2006).

Further research has outlined the benefits of sustainability indicators for improving decision-making, defining strategic orientation, and identifying possibilities for improvements in the supply chain (Gunasekaran, Patel and McGaughey, 2004). A further positive impact of sustainable indicators concerns the ability of a firm to control its internal and external activities and ensure continuous improvement (Hervani, Helms and Sarkis, 2005). This can be achieved by highlighting weaknesses and indicating directional changes in the supply chain (Faisal, 2010b). Sustainability indicators are thus considered an essential factor for the adoption of SSCM, due to permitting the evaluation of the entire supply chain by means of sustainability criteria (Tay *et al.*, 2015).

A firm’s success in measuring its sustainability initiatives within the supply chain depends on the following criteria:

Table 2.3: Proposal for developing sustainability measurement in the supply chain

| |
|---|
| <ol style="list-style-type: none"> 1. Comparing the audit results of the company’s own facilities against previously set company goals. 2. Number of supplier audits conducted by the company. 3. New contracts including responsible product specifications. 4. Market success or financial outcomes achieved as a result of such initiatives. 5. Local procurement policies and practices, results of supplier assessment questionnaires, updating and implementing a code of conduct, and waste reduction as performance measures. 6. The development of a carbon calculator tool to help customers calculate their total carbon footprint from transportation emissions. 7. The increase in the number of green products offered by the company. 8. The presence of health and safety indicators. 9. Recognition of the need to measure the success of sustainability initiatives, generally addressed through green procurement policies, market success, and brand recognition. <p>(Morali and Searcy, 2013, p. 647)</p> |
|---|

A further study noted that sustainability indicators can be addressed through social, economic, and environmental recognition, fulfilling goals while ensuring stakeholder participation (Beske-Janssen, Johnson and Schaltegger, 2015). They should also be addressed as strategic, tactical, and operational plans, including tangible/quantitative and intangible/qualitative factors (Morali and Searcy, 2013; Hervani, Helms and Sarkis, 2005).

Tajbakhsh and Hassini (2015, p.74) defined Composite Indicators (CI) as the “systematic integration of a set of such indicators, for which there is no obvious way of weighting them”. These can prove beneficial when seeking to satisfy a broad range of stakeholders (Bardy and Massaro, 2013). Hassini, Surti and Searcy (2012) suggested CI as beneficial due to the complexity of SSCM and its need to be measured by multi-dimensional indicators. Companies can thus expand their responsibilities to include financial indicators and those relating to climate change, human rights and water pollution (Bardy and Massaro, 2013; Kraus and Britzelmaier, 2012).

A firm’s CI can be developed through: (1) the Global Reporting Initiative (GRI, 2013); (2) the Carbon Disclosure Project (CDP, 2013); (3) the International Federation of Accountants (IFAC, 2013); (4) the Dow Jones Sustainability Index; and (5) the FTSE4Good Index. Of these, GRI is one of the most frequently employed, with Morali and Searcy (2013) considering a guideline for developing the indicators. Beske-Janssen, Johnson and Schaltegger (2015) highlighted that GRI could develop performance indicators covering a substantial part of the supply chain. In addition, Shaw, Grant and Mangan (2010) stated that GRI allows a firm to report TBL in the supply chain, as it used by many firms and forms the primary focus of most stakeholders.

Hassini, Surti and Searcy (2012) identified a need for different indicators to correspond with the objectives of individual companies, with each supply chain partner collecting indicators on each of the three dimensions. Decisions regarding measurement are subject to the goal of each strategic partner, with sub-indicators shaping the sustainability dimensions. These indicators can become more sophisticated over time.

SSCM literature has generally indicated the need for an agreement between all supply chain members when it comes to data collection (Hervani, Helms and Sarkis, 2005). King, Lenox and Terlaak (2005) noted the need for supply chain members to agree on how and when to measure and check improvement against sustainable targets and goals. Additionally, Lehtinen and Ahola (2010) asserted that all supply chain members must equally consent to share the data of the sustainability metrics.

It is, therefore, vital to ensure collaboration when sharing information regarding sustainability indicators. Hassini, Surti and Searcy (2012) stated that transparency in reporting and measuring SSCM is based on collaboration between supply chain partners and governments and non-governmental organisations. Moreover, Squire *et al.* (2009) stressed that it is essential to share information, due to difficulties in evaluating some related sustainability practices. Firms therefore need to agree on procedures and indicators for developing metrics to evaluate sustainability implementation in the supply chain (Seuring and Gold, 2013, p.3).

2.5.5 Enablers related to technology and innovation

Innovative technologies play a vital role in the implementation of sustainability (Hall, Daneke and Lenox, 2010) and SSCM (Bag *et al.*, 2020). Innovation is fundamental to facilitate sustainable practices (Shevchenko, Lévesque and Pagell, 2016), i.e. green technology (Dubey *et al.*, 2015; Hu and Hsu, 2010).

Industry 4.0 is also critical for the implementation of SSCM, including: (1) adoption of advanced machine learning algorithms; (2) integration of digital and physical systems; (3) Adoption of the six R's (i.e. reinvent/rethink, refuse, reduce, reuse/repair, recycle, replace/rebuy within the organisation); (4) effective IT interdepartmental linkage system; and (5) digitisation of supply chain activities (Yadav *et al.*, 2020). A survey of 520 South Africa companies concluded that SSCM was improved by effective management of Big Data Analytics (BDA), while also facilitating green product development (Bag *et al.*, 2020).

Industry 4.0 solutions are enhanced by adopting the Internet of Things (IoT), by leveraging the cloud and Internet to “interconnect the machines, components, devices and users” with multiple sites, resulting in a digital supply chain encouraging the implementation of future SSCM practices (Manavalan and Jayakrishna, 2019, p.945).

Such innovation emerges from the collective leverage of knowledge relating to the supply network (Van Hoof and Thiell, 2014; Blomqvist and Levy, 2006). This demands firstly, knowledge and innovation to implement the complex changes required to transform a traditional supply chain into one that is sustainable (Silvestre, 2015b), i.e. new business strategy and technology (Bag *et al.*, 2020; Silvestre, 2015b). Droghomerecki, Costa and Lima (2014) concluded that continued improvement in innovative practices and highly-advanced equipment had a significant impact on the adoption of GSCM by Brazilian automotive manufacturers. This was supported by Fantazy and Tipu's (2019) analysis of data from 242 supply chain and logistics' managers in Pakistan, which concluded that knowledge development has a positive influence on SSCM.

Secondly, collaborative capacity plays a key role when supply chain members pursue innovation (Blomqvist and Levy, 2006). Silvestre (2015b) pointed out that the objective of a supply chain is the competence to develop innovations benefiting the environment, society, and the economy. This has prompted many organisations to adopt new business structures, information technology, and reward systems, enhancing collaborative practices (Blomqvist and Levy, 2006).

In addition, this encourages informal collaboration, essential for the development of innovation, through the voluntary sharing of knowledge (Blomqvist and Levy, 2006). A firm therefore needs to empower both internal and external stakeholders to voice their opinions (Blomqvist and Levy, 2006).

2.5.6 Summary of SSCM enablers

Several factors contribute to a company's efforts to adopt SSCM (see Appendix 3) including in developing nations, i.e. (1) government; (2) management; (3) employees; (4) customers; (5) suppliers; (6) sustainable strategies; (7) measurement of performance; (8) innovation and technology; (9) non-government organisations; and (10) stakeholder engagement.

This current study highlights critical enablers for developing nations, which vary between countries, industries and companies (see Figure 2.3, below). In addition, appendix 3 and Lucid chart software employ to indicate that internal organisational factors (i.e. the commitment and skills of top management) are crucial to the adoption of SSCM in developing nations. The positive impact of top management was found to exert the most significant influence on enablers, including: (1) employees; (2) strategies; (3) suppliers and customers; (4) non-government organisations; (5) technology; (6) performance measurement; and (7) organisational culture. Thus, it is vital to secure the commitment of top management for successful SSCM implementation in the context of developing nations.

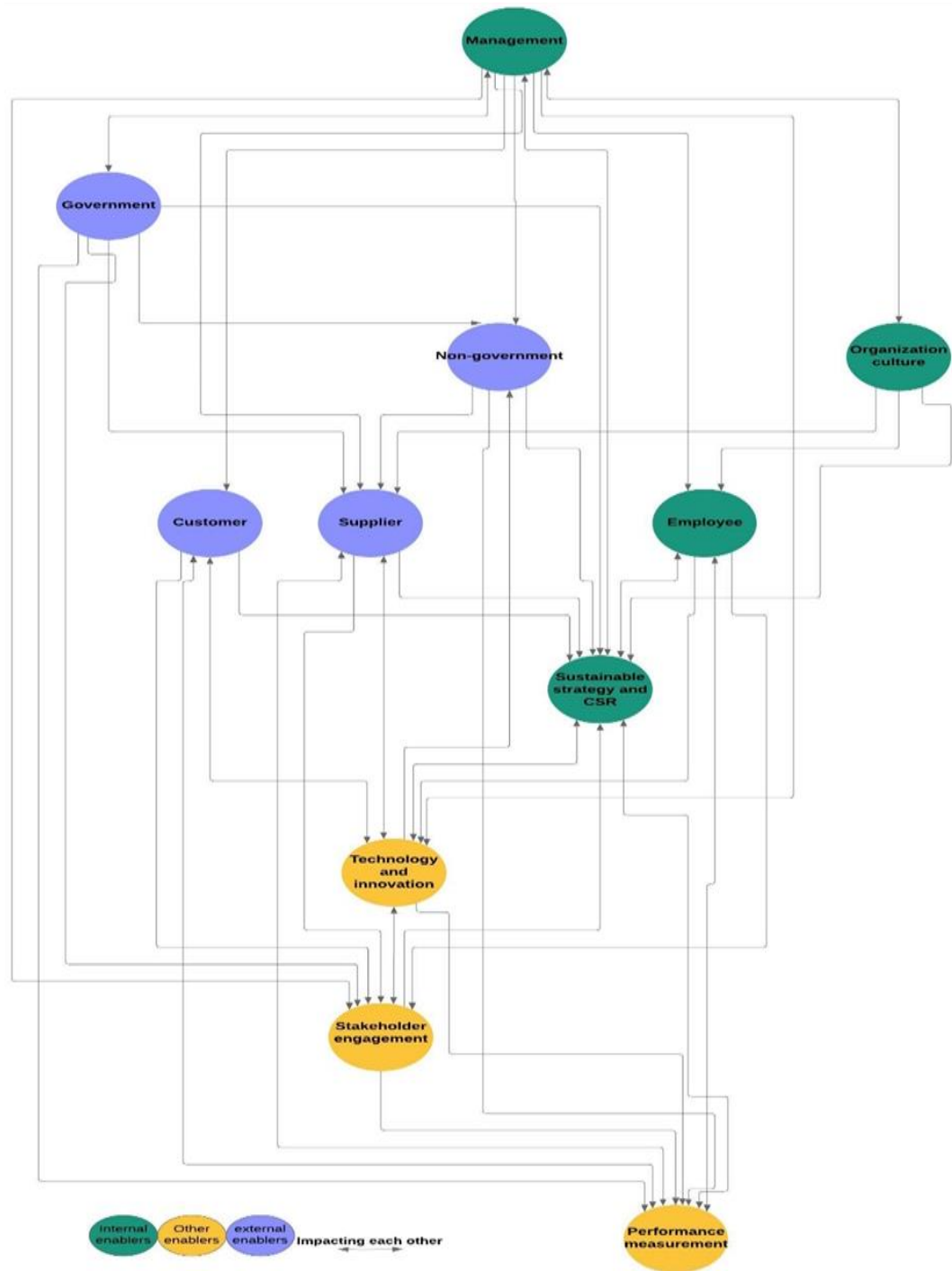


Figure 2.2: Categories for enablers relationships to the adoption of SSCM

2.5.7 Research gaps in SSCM enabler literature and their significance

A database search using different keywords related to SSCM enablers in various academic journals confirmed the field to be limited in scope and context. Table 2.4 outlines empirical studies of enablers focusing on the adoption of environmental, social and economic sustainability in the supply chain. To address the research gaps, these empirical aspects were evaluated by means of: (1) sustainability focus; (2) context; (3) method; and (4) the number of factors. This analysis does not include enablers related to suppliers, logistics and customers, but focuses exclusively on the gaps this study aims to address.

Table 2.4: Theoretical studies on SSCM enablers

| Author | SCM focus | Theme | Sustainability focus | | | Context and method | N.O of factors |
|---|-----------|---|----------------------|--------|----------|---|----------------|
| | | | Environmental | social | economic | | |
| Gopal and Thakkar (2016) | SCM | Critical success factors | ✓ | ✓ | ✓ | India: Interviews with experts in one case study concerning organisations contributing to the development of the ISM automobile industry. | 25 |
| Walker and Jones (2012) | SCM | Drivers, Barriers | ✓ | ✓ | ✓ | UK: Semi-structured interviews in seven case studies with companies in different sectors, i.e. aerospace, retail, pharmaceuticals, and food and drink. | 19 |
| Diabat, Kannan and Mathiyazhagan (2014) | SCM | Enablers | ✓ | ✓ | ✓ | India: Five textile firms employing twenty-five experts for developing Interpretive Structural Modelling (ISM). | 13 |
| Ahmed et al. (201) | SCM | External influence on the achievement of sustainability goals in the supply chain | ✓ | ✓ | ✓ | Multiple countries: Surveys targeting the oil and gas industries. | 8 |
| Faisal (2010) | SCM | Enablers | ✓ | ✓ | ✓ | Qatar: Interviews with multiple manufacturing segments developing ISM, i.e. retail, dairy products and mineral water. | 10 |

| | | | | | | | |
|--------------------------------------|-----|--------------------------|---|---|---|---|----|
| Wittstruck and Teuteberg (2012) | SCM | Critical success factors | ✓ | ✓ | ✓ | German: Recycling networks of the electric and electronic industry, using an online questionnaire. | 14 |
| Oelze (2017) | SCM | Enablers and Barriers | ✓ | ✓ | ✓ | Textile sector:- Twenty-three interviews with managers of ten companies. | 9 |
| Drohomeretski, Costa and Lima (2014) | SCM | Drivers, Barriers | ✓ | | | Brazil: Thirteen interviews and a document analysis of automotive companies. | |
| Malviya and Kant (2017) | SCM | Enablers | ✓ | | | India: A nationwide questionnaire-based survey of automobile organisations, with outcomes and ISM methodology fuzzy MICMAC This model was also based on a literature review and input from experts. | 35 |
| Dubey et al. (2015) | SCM | Enablers | ✓ | | | India: The Indian manufacturing sector using a mixed method (ISM) survey | 9 |
| Hu and Hsu (2010) | SCM | Critical factors | ✓ | | | Taiwan: Survey questionnaires with eighty-two electrical and electronics institutes. | 20 |
| Singh, Rastogi and Aggarwa (2016) | SCM | Barriers/enabler | ✓ | | | India: ISM)/ expert opinions. | 12 |
| Luthra, Garg and Haleem (2015) | SCM | Critical success factors | ✓ | | | India: ISM used to propose a structural model through the case study. | 26 |

| | | | | | | | |
|----------------------------------|-----|--|---|---|---|--|----|
| Luthra, Garg and Haleem (2014) | SCM | Critical success factors linked to performance outcomes of GSCM implementation | ✓ | | | India: Indian automobile industry questionnaire using an Interpretive Ranking Process (IRP) modelling approach. | 26 |
| Diabat and Govindan (2011) | SCM | Drivers | ✓ | | | India: ISM of one manufacturing firm. | 11 |
| Govindan et al. (2016) | SCM | Influential strength factor | ✓ | | | India: Mining: a second questionnaire collecting opinions of responses obtained from experts, then analysed employing DEMATEL methodology. | 20 |
| (Dubey et al. 2017) | SCM | Drivers | ✓ | ✓ | ✓ | India: Total interpretive structural modeling, based on the views of twenty-eight experts from different manufacturing sectors. | 12 |
| Gardas, Raut and Narkhede (2019) | SCM | Determiners | ✓ | ✓ | ✓ | Oil and Gas industry: Two approaches, ISM, experts, then Structural Equation Modeling (SEM). Based on a survey of 490 companies in oil and gas industry. | 41 |
| Luthra and Mangla (2018) | SCM | Strategies | ✓ | ✓ | ✓ | India: Automotive manufacturing ISM with fuzzy MICMAC analysis, based on expert opinion. | 9 |

| | | | | | | | |
|---|-----|---|---|---|---|--|----|
| Luthra et al. (2018) | SCM | Critical success factors | ✓ | ✓ | ✓ | India: Automotive manufacturing Grey-DEMATEL, based on seventeen experts from three cases studies. | 13 |
| Vargas, Mantilla and Jabbour (2018) | SCM | Two SSCM enablers and links to competitive advantages | ✓ | ✓ | ✓ | Colombia: Survey of 126 compaines from different industries in the city of Bogota. | 2 |
| (Prasad et al., 2018) | SCM | Critical success factors | ✓ | ✓ | ✓ | India: Steel sector survey with selected firms, i.e. Tata, SAIL, Essar and Jindal. | 22 |
| Mani, Agrawal and Sharma (2015) | SCM | Enablers | | ✓ | | India: Survey and interviews with thirty-one experts to rank the enablers, including middle and high-level managers in supply chain functions; operations from different manufacturing industries; and social experts and research associates. The objective was to develop ISM and MICMAC analysis. | 14 |
| Biswal et al. (2019) | SCM | Enablers | ✓ | ✓ | ✓ | India: Experts from a coal fired thermal power plant were used to develop total interpretative structural modelling. | 14 |
| Narimissa, Kangarani-Farahani and Molla-Alizadeh-Zavardehi (2019) | SCM | Enablers, Barriers | ✓ | ✓ | ✓ | Iran: Delpih study, of three rounds, with thirty experts. | 10 |

| | | | | | | | |
|--------------------------|-----|---|---|---|---|---|----|
| Agi and Nishant (2017) | SCM | Influencers | ✓ | | | Gulf countries: Interviews with thirteen Supply Chain (SC) executives from different manufacturing industries; ISM and MICMAC analysis. | 19 |
| Wu, Zhang and Lu (2018) | Scm | Influencers | ✓ | ✓ | ✓ | China: Survey of 167 manufacturing enterprises, using a Structural Equation Model. | 4 |
| Munny et al. (2019) | SCM | Enablers | | ✓ | | Bangladesh: Twelve footwear industry experts used in a best-worst method. | 10 |
| Tay et al. (2015) | SCM | Drivers, Barriers | ✓ | ✓ | ✓ | Literature review. | |
| Ansari and Kant (2017) | SCM | Enabler aspect of review of SSCM development | ✓ | ✓ | ✓ | Literature review. | |
| Dhull and Narwal (2016) | SCM | Driver, Barriers | ✓ | | | Literature review. | |
| Saeed and Kersten (2019) | SCM | Enablers, drivers, pressures | ✓ | ✓ | ✓ | Literature review. | |
| Patel and Desai (2019) | SCM | Barriers and enabler aspect of review of SSCM development | ✓ | ✓ | ✓ | Literature review. | |

The First Research Gap: The lack of empirical and theoretical studies examining SSCM enablers from environmental, social and economic perspectives.

The initial review identified only a small number of studies focussing on sustainable-supply-chain enablers from an environmental, a social, and/or an economic point of view, in either developing or developed countries. Twenty studies analysed the enablers of SSCM adoption, with eleven focusing on GSCM enablers and two on enablers of social supply chain management. This current study confirms the lack of research into the three pillars of sustainability in the supply chain (Patel and Desai, 2019; Quarshie, Salmi and Leuschner, 2016).

The lack of studies into SSCM enablers may arise from challenges faced by academic researchers and industrial experts (Diabat, Kannan, and Mathiyazhagan, 2014), resulting in

low adoption of SSCM (Patel and Desai, 2019). This current study therefore offers an in-depth analysis for managers and academic researchers by examining the enablers assisting the development of the social, environmental and economic aspects of the supply chain in developing nations.

The Second Research Gap: The lack of empirical and theoretical studies capable of conceptualising enabler roles in SSCM.

The analysis demonstrated that fourteen of the sixteen studies listed in Table 2.4 focused on identifying critical enablers of SSCM using quantitative methods (i.e. a survey), or those used in the development of ISM, along with fuzzy MICMAC analysis and Structural Equation Model (ESM). This assisted in developing the SSCM model and determined the driving and dependence relationship between enabling factors. Gopal and Thakkar (2016) illustrated that enablers having a high driving force and low reliance control are crucial for implementation, while enablers with high reliance control and a low driving force tend to focus on a firm's performance. These aspects need to be identified in order to ensure the correct distribution of resources. Gopal and Thakkar (2016) also concluded that a firm needs to continually focus on enhancing independent or driver enablers.

Although this approach is appropriate for evaluating contextual relationships between sustainability enablers (Diabat, Kannan and Mathiyazhagan, 2014), it suffers from several significant drawbacks, so lacks reliability and validity (Gopal and Thakkar, 2016; Ansari and Kant, 2017; Faisal, 2010b; Diabat, Kannan and Mathiyazhagan, 2014). This may be due to the model being based on the potentially biased judgment of experts (Gopal and Thakkar, 2016; Diabat, Kannan and Mathiyazhagan, 2014; Faisal, 2010b). This is in accord with Ansari and Kant (2017), who concluded that most existing studies fail to build their SSCM model on rigorous quantitative methods, with only two employing a survey of 167 Chinese firms (Wu, Zhang and Lu, 2018) and 490 oil and gas firms (Gardas, Raut and Narkhede, 2019). Thus, the method failed to provide statistical detail for each enabler influencing SSCM adoption (Gopal and Thakkar, 2016; Faisal, 2010b).

Furthermore, since the model's objective is to identify relationships between enabling factors, it may not provide a deep understanding of their role in SSCM adoption (Saeed and Kersten, 2019). Ahmad *et al.* (2016a) found that each enabler factor plays a different role in the long- and short-term goals of sustainability, suggesting that managers should understand external factors influential in developing appropriate SSCM strategies, so accomplishing sustainability goals.

The qualitative approach permits an in-depth understanding of SSCM enablers, particularly the use of a case study. However, there remains a lack of multiple case studies offering a basis for future research (Ansari and Kant, 2017). This study found that, of twenty studies surveyed, only Walker and Jones (2012) used multiple case studies to examine SSCM enablers. However, the data was collected using a single method, with Ansari and Kant (2017) pointing out the lack of data triangulation in most SSCM studies, as well as the use of a mixed-method approach in dealing with the research question developed for the study.

This current study filled this gap by identifying the role of each enabler in the adoption of SSCM by conducting rigorous case studies and collecting data from multiple sources.

The Third Research Gap: The lack of empirical studies examining enablers in Middle Eastern countries and from different industries.

Several studies have investigated SSCM enablers in industry from the perspective of their own country. For example, Diabat, Kannan and Mathiyazhagan's (2014) analysis of thirteen Indian enablers found that these enhanced the efficiency of the Indian textile industry, while Gopal and Thakkar (2016) analysed twenty-five critical success factors for SSCM in the Indian automobile industry. Furthermore, Faisal's (2010b) examination of ten enablers for SSCM implementation in Qatar concluded that management focus on dominating enablers impelled others towards SSCM practices. Moreover, Walker and Jones (2012) exploration of nineteen enablers for the development of SSCM in the United Kingdom categorised them according to their relationship to internal and external factors.

A number of further enablers are capable of improving SSCM in industry (Faisal, 2010b; Saeed and Kersten, 2019). However, most studies in Table 2.4 failed to identify how these can assist in SSCM implementation. Saeed and Kersten (2019) noted that, despite the literature review identifying many external and internal enablers of SSCM, there remained issues concerning their ability to provide reliable information. Many researchers have also suggested that the list of enabling factors should be modified to include additional important enablers (Diabat, Kannan and Mathiyazhagan, 2014; Gopal and Thakkar, 2016; Walker and Jones, 2012; Faisal, 2010b).

This current study filled this gap by identifying relevant enablers categorised in relation to their importance to the adoption of SSCM. In addition, it set out their categorisation roles in depth, by identifying their specific enablers, including their positive impacts, their influence on other enablers, and how this category can be developed (see Appendix 3). This has been considered in an empirical manner.

There remains a lack of empirical studies investigating enablers in various countries and industries, including Saudi Arabia. The analyses also showed a lack of empirical studies identifying the enablers within certain industries, i.e. automobile, energy, mining and logistics (Ansari and Kant, 2017). Wittstruck and Teuteberg (2012), Diabat, Kannan and Mathiyazhagan (2014) and Saeed and Kersten (2019) all highlighted the need to investigate enablers across the globe and for each industry, since regulations vary according to industry and cultural differences. Walker and Jones (2012) concurred, noting difficulties in generalising findings to other firms and industries, due to specific conditions influencing each firm's sustainability approach in the supply chain. Faisal (2010b) pointed out that the impact of enablers on the adoption of SSCM differs across industries. For Mathivathanan *et al.* (2019) examined twenty-five enablers across three different manufacturing sectors in India, concluding that it was not possible to apply a framework for successful SSCM implementation across sectors. This confirms that enablers should be investigated from the perspective of each industry and individual firm.

Based upon the above highlighted gaps, the following questions need to be answered.

What are the critical enablers that facilitate Saudi manufacturing companies from the adoption of SSCM?

- What are the strengths of the critical enablers to influence other enablers in Saudi manufacturing companies' adoption of SSCM?
- What do Saudi manufacturing companies' action to maintain and develop the main enablers that facilitate the adoption of SSCM?

What is the most appropriate method employed by Saudi manufacturing companies to develop SSCM?

This research answered these questions by examining multiple case studies from different sectors not previously explored (i.e. mining, electricity, oil and gas and petrochemicals), particularly in the context of Saudi Arabia.

2.6 Conceptual framework for SSCM development

The literature includes a number of factors potentially motivating organisations toward the adoption of SSCM, along with relevant constraints and barriers. It also highlights facilitators enabling the adoption of SSCM. The three elements described above assisted in developing the conceptual framework (see Figure 2.4) guiding the current investigation into SSCM motives, enablers, and barriers in the Saudi manufacturing context.

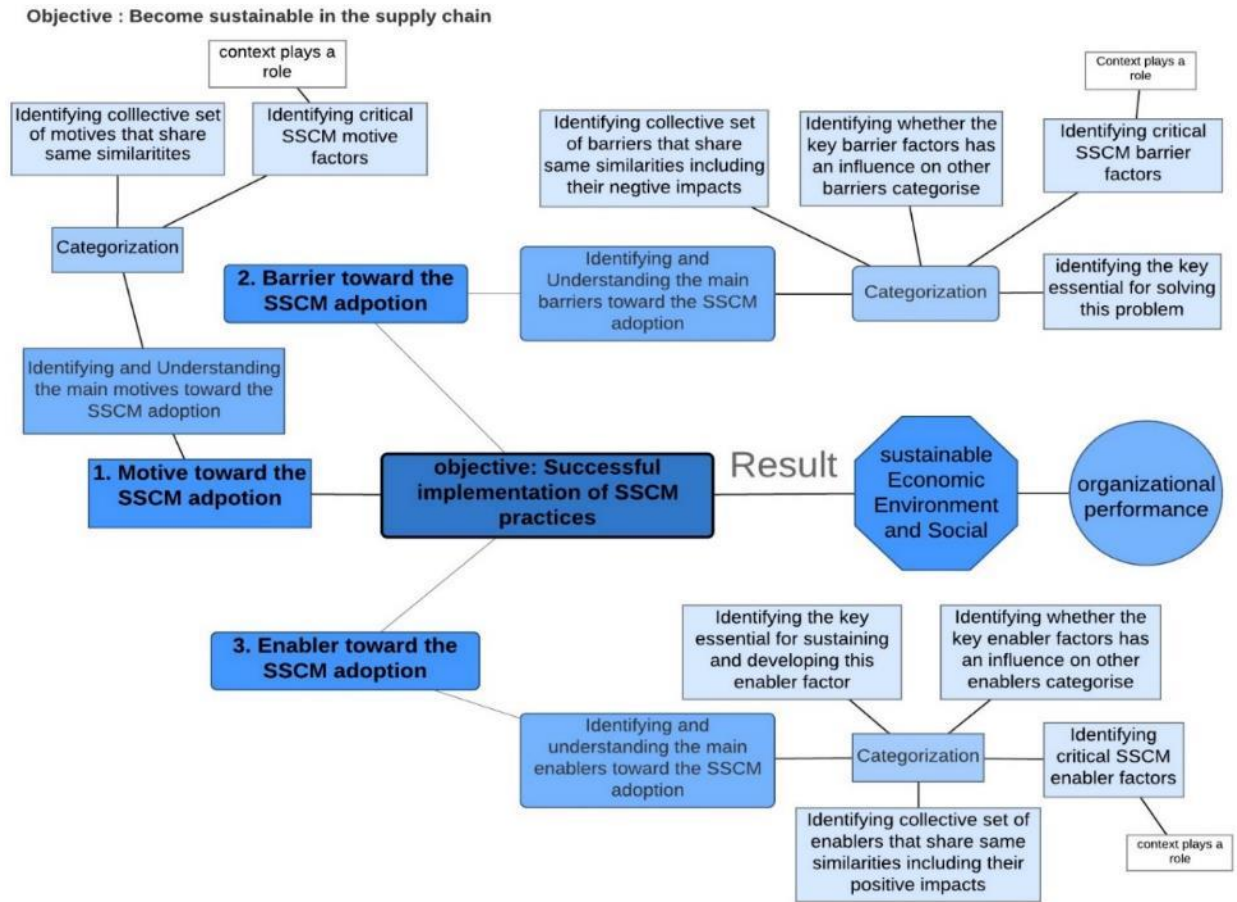


Figure 2.3: Conceptual framework for SSCM development

This conceptual framework consists of three components.

The first is composed of motives influencing the adoption of sustainability in the supply chain. The review above shows key factors helping a company determine appropriate sustainability practices for adoption by the supply chain. The proposition statement for this component is:

The development of SSCM is more likely when a manufacturing firm identifies key motivating factors favouring such a development.

The second relates to barriers to the development of SSCM. Identifying and understanding of key barriers allow a firm to develop strategies to overcome such barriers. The proposition statement for this component is:

The development of SSCM practices is more likely when the manufacturing firm identifies and understands key barriers to the development of SSCM.

The third relates to the availability of ‘enablers’ or ‘enabling’ factors. A company needs enablers to enhance and support the adoption of sustainability in the supply chain, establishing an understanding of key enablers thus increases the efficiency of SSCM implementation. The proposition statement for this component is:

The development of SSCM practices is more likely when a manufacturing firm identifies the key enablers of the development of SSCM.

These three components are interconnected, inferring that SSCM factors can appear as motives and/or barriers and/or enablers (see Figure 2.5).

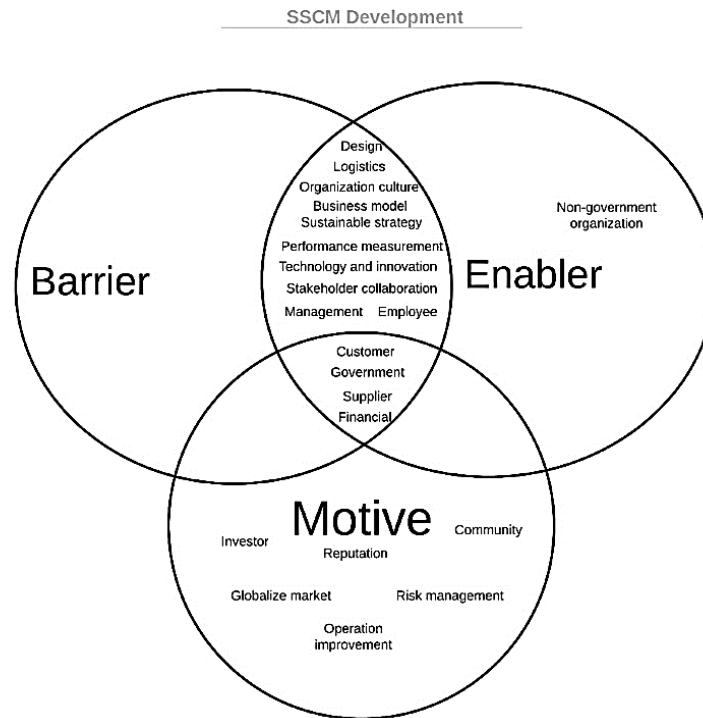


Figure 2.4: Categories for motives, barriers, enablers relationships to the adoption of SSCM

Figure 2.5 identifies the twelve main categories appearing as both enablers and barriers: (1) government; (2) product design; (3) management; (4) employees; (5) customers; (6) suppliers; (7) organisational culture; (8) business strategy; (9) performance measurement; (10) cost of sustainability and return on investment; (11) logistics and (12) technology. It is notable that non-government organizations appeared only on the enabler side. The figure also shows that customers, government, suppliers, and finances can all work as enablers, barriers and motives. This indicates that the above categorisations are significant for SSCM development.

It is therefore vital for a company to identify: (1) how these can be presented as an enabler, barrier or as both aspects; (2) whether they can be understood in depth by exploring their exact factors and roles; and (3) whether they are influential on the success of other factors. (see Appendix 1 and 3) shows each categorisation in the enabler, barrier side including their negative and positive impact and how they can be developed.

2.7 Summary of the main theoretical findings and research gaps

The literature review of this study suggested a tendency for integrating sustainable practices into the SC through the introduction of a number of concepts, including GSCM, SSCM, and reverse logistics. The present thesis adopted the concept of SSCM, in order to examine the intersection between the SC and sustainability, primarily due to this having proved to be more effective for encompassing both sustainability and SCM matters.

Since the theoretical findings concluded that the concept of SSCM is currently in the process of emerging, this study examined a large number of previous studies, in order to identify the key motives, barriers, and enablers of SSCM, focussing primarily on developing nations. The examination of these theoretical studies engendered the creation of various categories of SSCM motives, such as regulation, reducing risk to business, reputation, financial, and community.

The examination also engendered the classification of SSCM barriers (Appendix 1) into 12 main categories: government, design, management, employee, customer, supplier, organisation culture, business strategy, performance measurement, financial, reverse logistics, and technology. The theoretical findings of the literature review suggested that governmental barriers could prove to be critical inhibitors of the adoption of SSCM in developing nations. For example, a lack of regulation and support was demonstrated to have a negative influence on (1) management commitment, (2) the awareness of suppliers and customers, (3) the choice of sustainability indicators, and (4) the use of green technology. However, it should be noted that SSCM practices, along with the identification of critical barriers to their use, may differ across countries, industries, and firms.

The examination of these matters in the extant literature engendered the identification of the enablers for the development of SSCM, related to aspects both within and outside an organisation; these were classified under government, management, employees, customers, suppliers, sustainability strategies, performance measurement, innovation and technology, and non-governmental organisations (see Appendix 3). The theoretical findings implied that internal organisational factors, including the commitment and skills of top level management, are crucial to the adoption of SSCM in developing nations. The findings also showed that the commitment of top management improved the commitment of employees to the process, and enhanced the adoption of sustainability practices within the SC. This was achieved by (1) directing resources, including financial resources; (2) encouraging and supporting research and development; (3) the use of green technology; (4) encouraging and supporting the adoption of reverse logistics; (5) encouraging and supporting the use of

sustainability indicators. It was also noted that the same critical enablers may not prove to be appropriate for use across all countries, industries, and firms.

The literature review of this study also discussed the current gaps in the research and their significance, along with how they were addressed by the current study. These gaps were identified by evaluating the existing theoretical studies, according to their focus on sustainability, context, method, and a number of factors. Table 2.5 provides a summary of these gaps, including how they were addressed by the current study.

Table 2.5: Summary of the research gaps

| Gaps identified from the theoretical discussion | How this study responded to those gaps | Research questions |
|--|--|--|
| Lack of empirical and theoretical studies examining the barriers from an environmental, social and economic perspective, as well as the integration of the three perspectives of SSCM. | This gap was filled by identifying and discussing barriers to the integration of the environmental, social and economic aspects of SSCM, in order to assist managers and employees in understanding the role of inhibitors in the development of SSCM. | What are the critical barriers that inhibit Saudi manufacturing companies from the adoption of SSCM? <ul style="list-style-type: none"> • What are the strengths of the main barriers to influence other barriers in Saudi manufacturing companies' adoption of SSCM? |
| Lack of empirical and theoretical studies examining the many barriers, as well as conceptualising the role of each barrier from different industry perspectives. | <p>This study filled this gap by categorising barriers based on their importance to the adoption of SSCM. An in-depth investigation was undertaken into each categorisation, in particular by defining the barrier itself, while firstly, highlighting various sub-barriers, secondly, describing their negative impact and how this could be eradicated, and thirdly, identifying the relationships between barrier variables. In addition, a number of critical barriers to SSCM adoption were identified.</p> <p>This study benefits industry by addressing a number of barriers. This was achieved by developing multiple case studies, comprised of multiple data sets, to investigate: (1) as many barriers as possible and (2) new industrial perspectives concerning the</p> | <ul style="list-style-type: none"> • What do Saudi manufacturing companies' action to mitigate the main barriers that inhibit the adoption of SSCM? |

| | | |
|---|--|---|
| | implementation of SSCM in the manufacturing industry of Saudi Arabia. | |
| Lack of empirical studies examining the barriers currently in place in Middle Eastern countries. | This gap was addressed by developing a number of empirical case studies focussing on six manufacturing firms in the context of Saudi Arabia. It is hoped that the findings of this study will provide a significant opportunity for managers, academic researchers, and regulators to identify and understand the main barriers and thus assist with the development of SSCM from a Saudi perspective. | |
| The lack of empirical and theoretical studies examining SSCM enablers from environmental, social and economic perspectives. | This current study offered an in-depth analysis for managers and academic researchers by examining the enablers assisting with the development of the social, environmental and economic aspects of the supply chain in the Saudi manufacturing sector. | <p>What are the critical enablers that facilitate Saudi manufacturing companies from the adoption of SSCM?</p> <ul style="list-style-type: none"> • What are the strengths of the main enablers to influence other enablers in Saudi manufacturing companies' adoption of SSCM? • What do Saudi manufacturing companies' action to maintain and develop the main enablers that facilitate the adoption of SSCM? <p>What is the most appropriate method employed by Saudi manufacturing companies to develop SSCM?</p> |
| The lack of empirical and theoretical studies capable of conceptualising the enabler roles in SSCM. | This gap was fulfilled by identifying the role of each enabler during the adoption of SSCM by conducting rigorous case studies and collecting data from multiple sources. It also set out their categorisation roles in depth, by identifying their specific enablers, including: (1) their positive impact; (2) their influence on other enablers; and (3) how this category can be developed. | |
| The lack of empirical studies examining enablers in Middle Eastern countries, as well as from different industries. | This research filled this gap by examining multiple case studies from different sectors not previously explored (i.e. mining, electricity, oil and gas and petrochemicals), particularly in the context of Saudi Arabia. | |

The discussion of the motives, enablers, and barriers also helped to construct a conceptual framework, presented in the final section of this thesis. The framework was constructed

according to three components, with each attached to further elements to enhance the understanding of each component. Each of these reflected the research question and its sub-questions that were designed in response to the current gaps in the literature. The research framework informed the empirical investigation examining SSCM adoption in the industrial segment in the KSA. This study's findings can facilitate a more detailed understanding of SSCM from a new perspective, which will benefit both managers and academic researchers. The next chapter highlights the Saudi context, which can both directly and indirectly impact the implementation of SSCM in the Saudi manufacturing industry.

Chapter 3 : Saudi Context

3.1 Introduction

The aim of this study is to identify the motives, barriers and enablers affecting the implementation of SSCM in Saudi manufacturing industries. As a developing country in the Gulf region, the Kingdom has a different character from other countries. Its unique political, cultural, social, economic, and environmental characteristics and Saudi Vision 2030 influence the implementation of SSCM directly and indirectly. Silvestre (2015a) asserts that the context of the country, such as politics can play a crucial role in developing and managing a sustainable supply chain for an organization.

The objective of this chapter, therefore, is to highlight some aspects from the Saudi context that, in some part, make it unique from other nations, especially Western ones, to explain their impact on SSCM implementation. But at first, an overview of Saudi Arabia and the current status of the Saudi manufacturing industry and the challenges it faces are presented.

3.2 The Kingdom of Saudi Arabia: An overview

Saudi Arabia (SA) (capital city, Riyadh) is the home to the holy cities (Makkah and Madinah) which serve as Qibla, where the Muslims pray. The size of the Kingdom is approximately 2.2 million squares kilometres, which ranks it as the largest in the Middle East and the twelfth largest in the world (Sohail and Al-Abdali, 2005). According to the 2018 census, the Kingdom has an estimated population of some 33 million people, including 12 million foreign residents (Saudi General Authority for Statistics, 2019). The population lives in 13 provinces, with a governor and deputy governor in each one. The official language is Arabic and the religion Muslim.

3.3 Manufacturing development in Saudi Arabia

This study focuses on six companies as case studies forming the units of analysis. Each of these originates from a differing manufacturing sector of Saudi Arabia and conforms to the following criteria:

- The company operates within the Saudi manufacturing industry.
- The company is of a considerable size, i.e. having a large number of employees; purchasing a considerable amount of raw materials; ensuring separation between owners and management; and demonstrating high levels of total assets and profitability.
- The company demonstrates an interest in sustainability, in particular, by adopting a strategy of Corporate Social Responsibility (CSR) and publishing a sustainability report.

The manufacturing industry in SA is considered relevant to this research because of its supply chain intricacies, and the scale and extent of its ecological, social, and economic effects. The following sections examine the Saudi manufacturing industry, including its historical development and challenges potentially impeding its future development.

The Saudi Arabian manufacturing industry has improved over many years, with the Saudi government has recently placed greater importance on industrial development. Figure 3.1 (below) shows the improvement in the manufacturing industries between 1974 and 2018 in term of the number of manufacturing facilities, size of investments and number of employees.

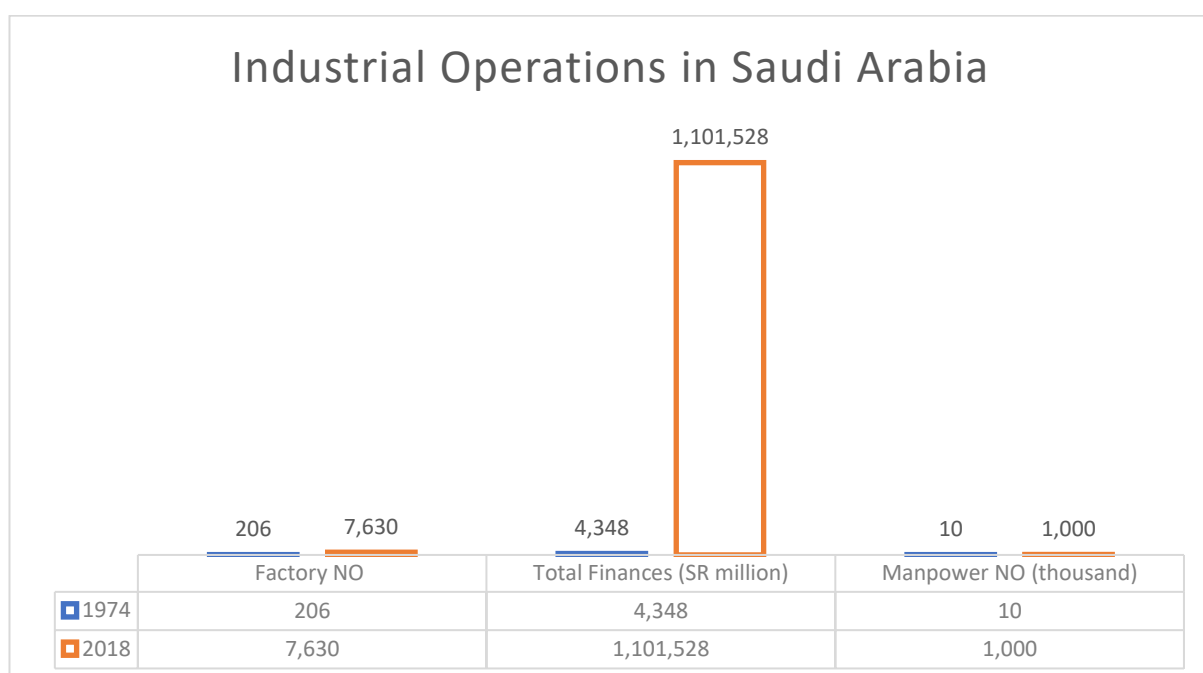


Figure 3.1: An overview of industrial operations in Saudi Arabia (Saudi Industrial Development Fund, 2019a)

As indicated Figure 3.1 (above), the pace of manufacture in the Kingdom has recently increased, with the number of manufacturing facilities operating in the Kingdom being raised from 206 in 1974 to 7,630 at the end of the first quarter of 2018. It also reveals that investment capital has increased from approximately SR. 4.3 billion in 1974 to around SR 1.1 trillion in 2018. Furthermore, the number of employees working in the manufacturing industry has developed rapidly, from ten thousand in 1974 to over one million in 2018. Furthermore, the contribution of the manufacturing industries to the Gross Domestic Product (GDP) has increased from SR 32 billion in 1974 to approximately SR 319.5 billion in 2018 (Saudi Industrial Development Fund, 2019a).

The oil industry has been dominant in Saudi Arabia over a long time, with the Kingdom being viewed as the largest global exporter of oil. The oil sector has, therefore, been

considered the most productive segment of the Saudi economy, generating 44.60% of its GDP in 2010 (Saudi Ministry of Labour and Social Development, 2016). However, the Kingdom has recently attempted to diversify the portfolio of its economy by supporting the growth of the private sector outside the oil business (Sohail and Al-Abdali, 2005). In 2015, these private sectors accounted for 39.5% of real GDP, an increase of approximately 2% in comparison to 2010 (see Figure 3.2, below) (Saudi Ministry of Labour and Social Development, 2016).

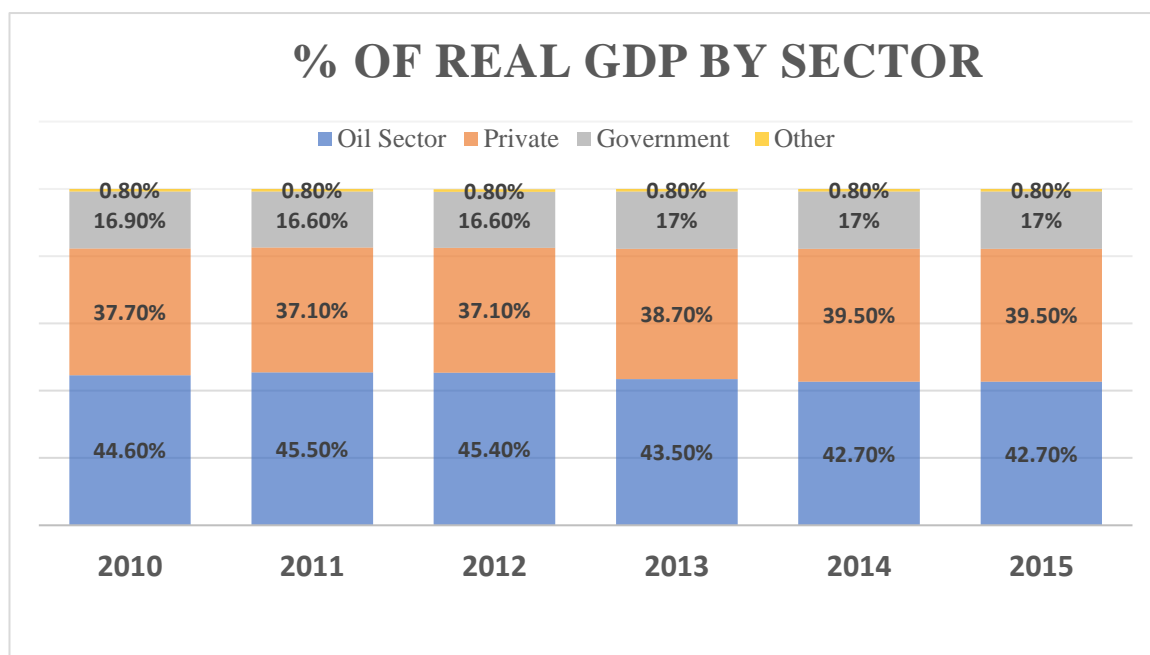


Figure 3.2: An overview of oil, private, government, and other sectors contribution to the GDP of Saudi Arabia (Saudi Ministry of Labour and Social Development, 2016).

There has been a rapid increase in the development of non-oil business following the 2016 announcement of the Kingdom's Vision 2030. This has led to the local economy experiencing a fundamental level of change in all fields, in response to the move towards a 'sustainable structure' (Saudi Industrial Development Fund, 2019b). The contribution of the non-oil sector to the GDP of the country increased from 39% in 2015 to 56.23% in 2017 (Saudi Industrial Development Fund, 2019b). This was due to the improvement of some sectors, including (1) non-oil manufacturing; (2) mining industries; (3) finance; and (4) insurance (Saudi Industrial Development Fund, 2019b).

Figure 3.3 (below) illustrates the productivity of the Saudi non-oil manufacturing sector, reporting its performance in 2017 against three indicators, based on (1) added value per worker; (2) value of exports; and (3) the level of employment. The average of the added value per worker for all non-oil sectors was approximately SR 278,000. The highest of these was the Chemicals and Plastics industry, with the average added value per worker being SR 798,000 (Saudi Industrial Development Fund, 2019b).

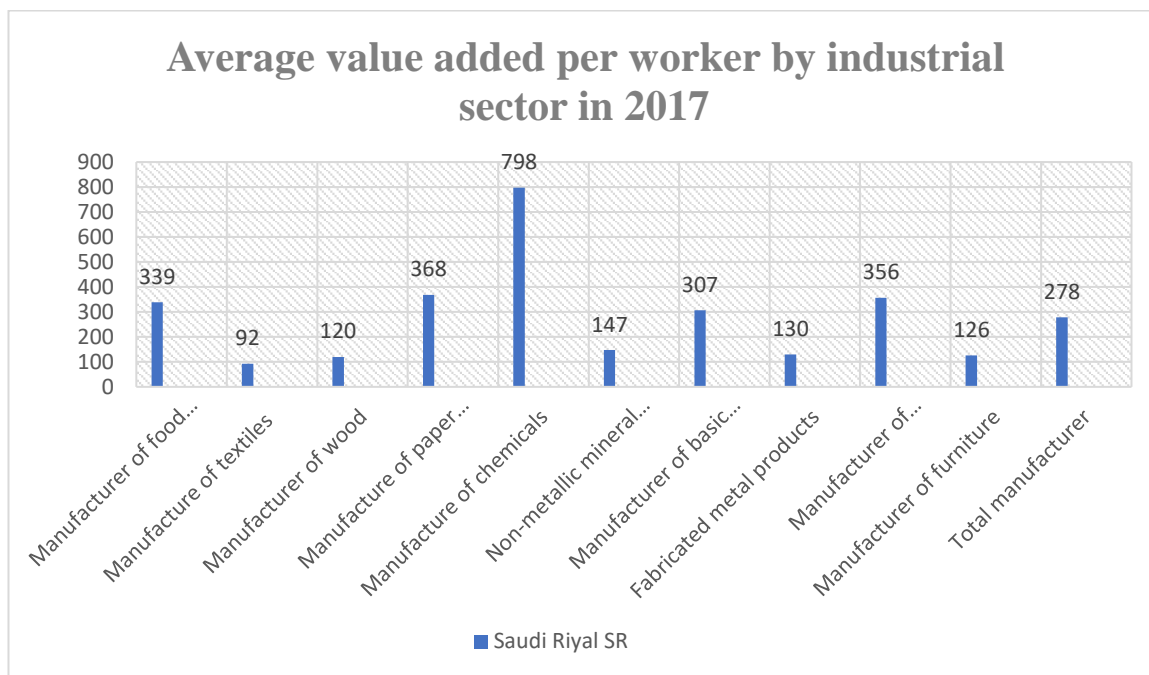


Figure 3.3: An overview of each manufacturing sector contribution on average value added per worker (Saudi Industrial Development Fund, 2019b)

Figure 3.4 (below) demonstrates that, in comparison to other industries, Chemicals and Plastics industry represented the highest exports of its products, accounting for 59% of the companies' total sales, followed by basic metals (35%). The total export sales of all non-oil manufacturing sectors (i.e. 'excluding re-exports') improved by 9% to approximately SR 159 billion (Saudi Industrial Development Fund, 2019b).

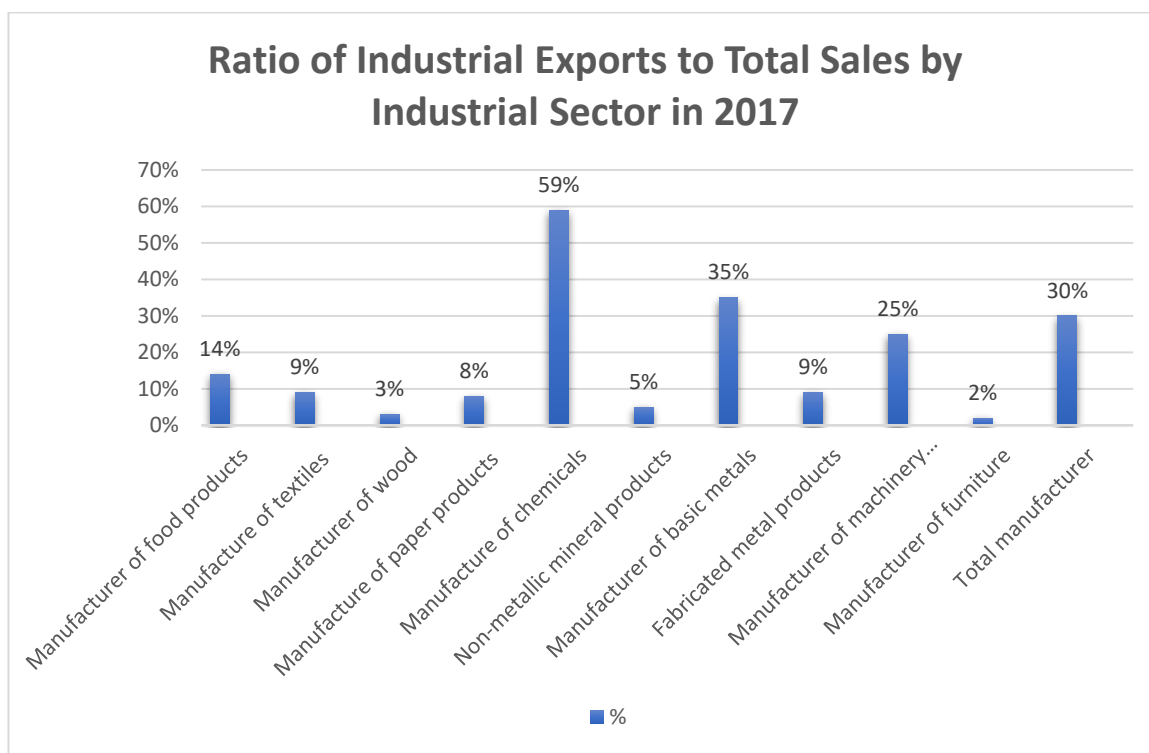


Figure 3.4: An overview of each manufacturing sector contribution in ratio industrials exports to total sales (Saudi Industrial Development Fund, 2019b)

The majority of Saudi workers are now employed in the non-oil manufacturing sector, with 44% working in the chemical and plastics sector and 36% in the basic metals sector (see Figure 3.5). Figure 3.5 (below) also shows that the non-oil manufacturing industries accounted for 24% of total Saudi employment.

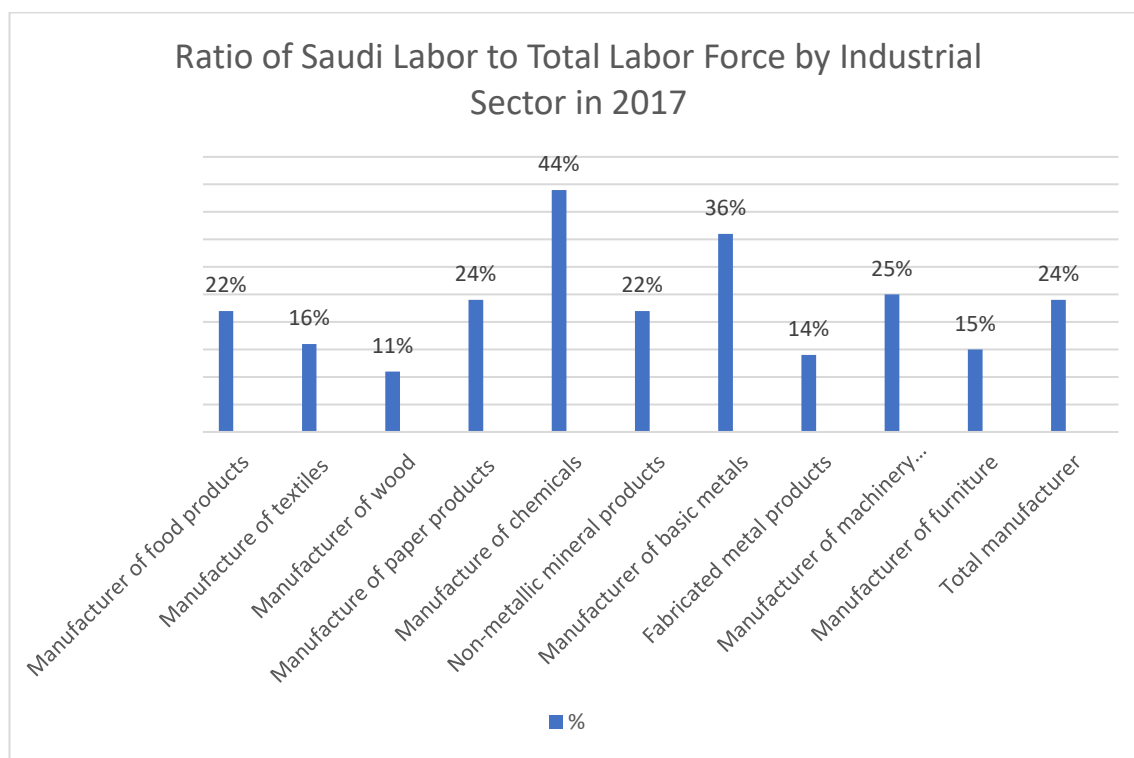


Figure 3.5: An overview of each manufacturing sector contribution in the ratio of Saudi labour to the total labour force (Saudi Industrial Development Fund, 2019b)

The above results demonstrate that, over recent years, the Kingdom has made substantial progress regarding the development of its manufacturing industries. However, its industrial sectors face challenges that may potentially impede its future development including: ‘(1) improving the competitiveness of national products; (2) keeping pace with developments in international markets; (3) expediting transfer and adoption of technology; (4) dealing with World Trade Organization regulations and developments; (5) the industrial environment and sustainable development framework; (6) development of Saudi manpower capabilities; and (7) improving industrial management’ (Saudi Industrial Development Fund, 2020, p.1).

Most of the above challenges are related to the issue of sustainable development, which is the primary focus of this current study. Thus, the results of this research will add value to the subject, through its exploration of the phenomenon of supply chain sustainability (including its motives, enablers and barriers). While also proposing a roadmap of the adoption of supply chain sustainability by companies, to enable them to develop and manage their SSCM efficiently and effectively.

3.4 Political characteristics

Saudi Arabia is a monarchy, in which the King is the head in the government and the commander in chief of the armed forces. The King plays a vital role in directing the country's development. He governs with the help of a Council of Ministers. The Ministers, who comprise a cabinet lead by the King, must advise him and manage their Ministries effectively to guide and ensure the country's development. The King also relies on another body called the Consultative Assembly (known in Arabic as Majlis Al-Shura). The Majlis has 150 members, all of whom are chosen by the King to serve for a four-year term. The Majlis has no power of enforcement, and its job is to recommend new laws and regulations and advise amendments to existing ones to the King and his cabinet.

The political regime is in control of everything over the country direction, even in the domain of economic activities (Giunipero and Flint, 2001). The decision-making process concerning the country's development is discussed at the top level, others take on the responsibility of executing the decisions reached. This type of centralization in government reflects dependency and driving force of devotion to and respect for authority (Sidani and Showail, 2013).

This centralization process can also facilitate good governance and sustainable development (Roy and Tisdell, 1998). However, the choice of centralized, decentralized, or both approaches to govern sustainability varies based on the situation, the current level of the problem and its scope (Mann and Gennaio, 2010).

In this context, the organization's decision to implement SSCM results in a high obligation to include and meet government demands as a top priority. The Saudi government currently faces environmental, social and economic challenges. Those challenges can play a role in motivating, inhibiting, or enabling the implementation of SSCM and are presented in greater detail below.

3.5 Economic concerns

Saudi Arabia is known as the biggest exporter of oil with massive reserves, accounting for 25 % of global oil reserves (Al-Torkistani, Salisu and Maimany, 2016). Since the discovery of oil in 1938, the Kingdom has relied heavily on oil to support its economy. Undoubtedly this has helped to improve the standard of living in the Kingdom. In 2002, oil and oil-based commodities represented 70% of government revenues (Nurunnabi, 2017).

One major issue here is the government's reliance on oil revenues to fund the national budget. This disproportionate reliance on oil is increasingly unsustainable, given the

fluctuation in oil prices, which can put the Kingdom at risk of being unable to meet its obligations to its citizens (Nurunnabi, 2017).

Another issue is that the oil subsidies have encouraged high rates of domestic oil consumption. In 2013, the country was ranked among the twelve nations consuming the most energy worldwide (Ouda *et al.*, 2016). High consumption of oil harms the Kingdom in two ways. First, according to Al-Torkistani, Salisu and Maimany (2016), increasing oil consumption reduces the quantity of oil available for export. This will, therefore, lead to a reduction in government revenue, which will profoundly impact the execution of government programmes. The Saudi government, therefore, has sought to diversify the portfolio of the economy by encouraging and supporting the growth of the private sector (Sohail and Al-Abdali, 2005). The new 2030 vision was introduced to achieve key government objectives. More details about this vision and what it entails in terms of sustainable development are discussed in section 3.9.

3.6 Environmental concerns

Second, since oil is not renewable, and there is not an efficient energy mix policy to meet high domestic demand. This situation raises questions about the Kingdom's obligations concerning the environment, both locally and globally, given the increasing pressure from the global community (Al-Torkistani, Salisu and Maimany, 2016). According to Hashmi, Abdulghaffar and Edinat (2015), in 2009, the country was responsible for 1.1 per cent of greenhouse gas emissions despite its small population (which is approximately 0.4 percent of the global population).

Furthermore, the Kingdom has scored poorly in terms of its global environmental rankings. A Report was published in 2013 relating to Global Energy Sustainability. The report is evaluating the countries energy sectors according to three criteria: "effective management of primary energy source to meet the current and future demand, accessibility of the energy throughout the population and the energy efficacies and development of renewable/low-carbon sources". The Kingdom was ranked 45, 12 and 124, respectively, with an overall ranking of 51 (World Energy Council, 2013). It appears from the report the Kingdom scored well in two of the criteria, but it failed to achieve a high ranking for environmental sustainability. Another report was conducted by the Climate Action Tracker (2019), which ranked the Kingdom as inadequate in terms of its efforts contributing to the worldwide community's objective of reducing global temperature below 2°C level.

Thus, critics on the international level have accused the Kingdom of not doing enough to reduce its greenhouse gas emissions and encouraging such other countries to follow the same path (Depledge, 2008). These critics claimed that Saudi Arabia had not taken many efforts

to be more sustainable because a reduction in oil consumption worldwide means less government revenue which hurts the development of the country (Barnett, 2008).

The criticism at the international level imposes pressure on the government to line up with the global community's objectives with regard to protecting the environment. Saudi Arabia is a signatory to the 1997 Kyoto Protocol and the Climate Change Summit in Paris in 2015, which include agreements to reduce greenhouse gas emissions (Hashmi, Abdulghaffar and Edinat, 2015). The Kingdom ratified this international agreement in its new policies and initiatives, which in turn impact on organizations (primarily those in the manufacturing sector), who need to integrate environmental aspects.

One of this new policy introduced is that government removal of the subsidies for the fossil fuel and impose new rules to push industrial manufacturers to use more renewable energy (Al-Arabiya English, 2016). The Saudi government in 2015 issued a plan which objective was to better manage energy consumption. It increases the price of fuel, water and electricity. However, the price is still low compared with the average price worldwide (Atalla, Gasim and Hunt, 2018). This change in energy policy is likely to alter Saudi organizations' behaviour toward the integration of additional environmental practices that can help them to manage energy consumption better throughout products' life cycles.

Furthermore, government efforts in this regard, as represented by the Ministry of Environment, Water, and Agriculture are promising. Recently, the Ministry has collaborated with the UN Environment programme to strengthen its commitment to environmental protection (UN environment programme, 2019). This demonstrates that there is a desire to reinforce mandatory environmental regulations. The Ministry used UN technical experts in the environmental field to improve the Kingdom's environmental law, regulations and standards. Those experts support the Kingdom efforts in the area of managing air quality climate change and waste disposal (UN environment programme, 2019). The adoption of these regulations is likely to push Saudi manufacturers to comply by implementing environmental practices in the supply chain.

3.7 Social concerns

The social issues facing the country are very challenging and need to be addressed by the government's issuance of new legislation. Social issues such as human rights, women rights, unemployment rate, and foreign worker right, fall within the interest of the national and local community.

Human Rights groups have criticized the Kingdom for many social issues, for example, its policies and rules in terms of foreign worker rights (Human Rights Watch, 2019). The kafala

(visa sponsorship) system has been criticized; such that foreign workers who wish to work in the Kingdom need to be sponsored by their employer. A worker cannot move to another job or travel without receiving consent from his/her employer (Human Rights Watch, 2019).

The Kingdom has also been accused of not doing enough to protect the safety and health of those in low skilled jobs, the majority of which are occupied by foreigners (Human Rights Watch, 2019). The government has, however, been working to resolve some of these issues by implementing new legislation, such as forcing employers to provide health insurance to workers and their families (Council of Cooperative Health Insurance, 2019). These kinds of regulations, for example, can signal to Saudi firms the importance of taking care of the health and safety of their employees, which then enhances the social practices of Saudi firms and their supply chain.

A further essential social issue that has raised government concern is the high unemployment rate among Saudis. According to the General Authority for Statistics, in the second quarter of 2019, the unemployment rate among Saudi citizens stood at 12.3%. Overall, the women comprised a more significant proportion than men accounting for 31.1% of the total number of unemployed (Saudi General Authority for Statistics, 2019). A Saudisation quota policy, designed to regulate the proportion of expatriate staffs in the Saudi marketplace has been adopted to address this issue. Recently, the government has also introduced a monthly tax on foreign workers (Human Rights Watch, 2019). This policy may be useful for the organizations, as it can serve to improve the social performance by hiring more local employees. Still, it might be something of a drawback for them in term of associated costs and experiences.

3.8 Cultural characteristics

The culture in Saudi Arabia derives from two main aspects, the Islamic religion and Bedouin traditions (Sidani and Showail, 2013). Thus, Saudi cultural norms include an emphasis on Islamic values such as honour, helping others, hospitality, and kindness to one's parents and relatives. Islam also emphasizes the responsibility of a person to care about her or his society and the environment (Khan, Al-Maimani, and Yafi, 2013).

Islamic values urge firms to engage in CSR in order to respond to and balance the needs and wants of organizations' stakeholders (Murphy *et al.*, 2019). Islam encourages firms to maximize their value to all humankind, instead of just a narrow focus on simply providing profits to their shareholders (Khan, Al-Maimani, and Yafi, 2013). Adhering to the values of Islam can help fortify the moral disposition of a firm and embrace its responsibility towards the general public, nature and humanity (Khan, Al-Maimani, and Yafi, 2013).

Saudi Arabia is an Islamic nation, and Islam has significantly affected CSR practices (Khan, Al-Maimani, and Yafi, 2013). Aldosari and Atkins (2015) pointed out that Saudi firms value CSR because social responsibility is prioritized in Islam as it emphasizes philanthropy (Zakat and Sadaga). It can, therefore, be asserted that Islamic values can influence managers in Saudi Arabia to undertake further responsibility to serve society at large by adopting SSCM.

Islam, with its moral imperative to encourage the use of money and time to help others, opens the door for the non-profit sector to flourish. An estimated 2598 non-profit associations exist in the Kingdom. They work in the areas of Advocacy and Religious Guidance (601), Development and Housing (666), Professional and Scientific Societies (301), Education and Research (18), the Environment (17), Culture and Entertainment (35) Social Services (674), Health (83), Charitable and Volunteer Support Organizations (169) (King Khalid Foundation, 2018). These non-profit organizations have contributed significantly to the economy, as well as social and environmental improvements in Saudi Arabia (King Khalid Foundation, 2018).

Recently, the Kingdom witnessed the emergence of the King Khalid Foundation that focuses on improving sustainable development across Saudi organizations. This association establishes standards for sustainable business practices and prioritizes providing technical support to companies of all sizes, in all sectors, to achieve objectives (King Khalid Foundation, 2019). It can therefore help to accelerate discussions about sustainability in Saudi Arabia, and can help Saudi businesses to build roadmaps to sustainability, that can guide them in the adoption of SSCM.

Bedouin traditions, such as obligations to family members and one's tribe, are crucial in Saudi culture. This tradition helped unite the Kingdom in the past and will ensure the stability of the country in the future (Sidani and Showail, 2013). Due to this tradition, people are more likely to emphasize social responsibility around local people and aspects of community (Munro, 2013). The obligations to family members and tribe allow new conceptualizations of Arabic Wasta to emerge. Wasta can be likened to nepotism; i.e. through this Wasta system, it is possible to access employment or attain a promotion through favouritism rather than based on concrete credentials (Sidani and Showail, 2013).

In this context, therefore, organizational decision-makers can accommodate two sets of commitments, a commitment to family and tribe, and another clashing commitment to general notions of equity and decency, which permeate Islamic values (Sidani and Showail, 2013). This conflict is relevant to this study as businesses need to manage and include all

stakeholders to achieve sustainability in the supply chain and not manage businesses from a narrow tribal perspective.

3.9 Saudi Vision 2030

On April 25, 2016, the Saudi cabinet issued a new vision to transform the Kingdom for a new era to be implemented by 2030 (KSA Vision 2030, 2019). This vision prioritizes for a reliable, flourishing, and stable economy that extends opportunities to all, empowering the private sector through improved partnerships, driving more beneficial work for residents and guaranteeing long term success for all (Alshuwaikhat and Mohammed, 2017). The strategy is formed around three pillars: “a vibrant society”, “a thriving economy” and “an ambitious nation”. Table 3.1 below clarifies The Saudi Vision, its themes and its objectives. It is worth mentioning that the achievement of these goals may be affected by the changing in environmental aspects such as oil revenue and coronavirus crisis.

Table 3.1: Saudi Arabia 2030 vision, goals and objectives (Alshuwaikhat and Mohammed, 2017, p.5).

| Theme | Theme Objectives/Targets |
|---------------------|---|
| A vibrant Society | <ul style="list-style-type: none"> To increase KSA's capacity to welcome Umrah visitors (pilgrims) from 8 million to 30 million every year; To more than double the number of Saudi heritage sites registered with UNESCO; To have three Saudi cities be recognized in the top-ranked 100 cities in the world; To increase household spending on cultural and entertainment activities inside the Kingdom from the current level of 2.9% to 6%; To increase the ratio of individuals exercising at least once a week from 13% of population to 40%; To raise our position from 26 to 10 in the Social Capital Index; To increase the average life expectancy from 74 years to 80 years. To Optimize the use of renewable water resources for agricultural purposes |
| A thriving Economy | <ul style="list-style-type: none"> To lower the rate of unemployment from 11.6% to 7%; To increase SME contribution to GDP from 20% to 35%; To increase women's participation in the workforce from 22% to 30%; To move from our current position as the 19th largest economy in the world into the top 15; To increase the localization of oil and gas sectors from 40% to 75%; To increase the Public Investment Fund's assets, from SAR 600 billion to over 7 trillion; To rise from our current position of 25 to the top 10 countries on the Global Competitiveness Index; To increase foreign direct investment from 3.8% to the international level of 5.7% of GDP; To increase the private sector's contribution from 40% to 65% of GDP; To raise our global ranking in the Logistics Performance Index from 49 to 25 and ensure the Kingdom is a regional leader; To raise the share of non-oil exports in non-oil GDP from 16% to 50%. |
| An ambitious Nation | <ul style="list-style-type: none"> To increase non-oil government revenue from SAR 163 billion to SAR 1 Trillion; To raise our ranking in the Government Effectiveness Index, from 80 to 20; To raise our ranking on the E-Government Survey Index from our current position of 36 to be among the top five nations; To increase household savings from 6% to 10% of total household income; To raise the non-profit sector's contribution to GDP from less than 1% to 5%; To rally one million volunteers per year (compared to 11,000 now). |

The objectives mentioned in the table 3.1 are to be achieved through the implementation of thirteen targeted programmes (KSA Vision 2030, 2019). Each programme has a directly related goal and un-direct one. There are also indicators related to macroeconomic metrics

and program-specific metrics that are used to measure the progress towards the achievement of each program. Most of the indicators focus on the programmes' ability to enhance job creation in the private sector, increase gross domestic products and non-oil revenues, and improve the share in local content (KSA Vision 2030, 2019)

The objectives and goals of this vision are to some extent consistent with sustainability goals and objectives (Alshuwaikhat and Mohammed, 2017). Regarding environmental sustainability, for instance, the government plans to invest in water treatment, recycling, and reducing consumption, in part by establishing firms that specialize in collecting and recycling waste (Al-Arabiya English, 2016). The Saudi cabinet has already approved new reforms associated with the management waste by giving the Ministry of Municipal and Rural Affairs full responsibility for bringing new capital from the private sector and monitoring the new waste management sectors (Arab News, 2013).

Regarding renewable energy, the government sets a new plan to use solar and wind power up to 9.5 GW to meet the demands of its citizens in a more environmentally responsible way. For example, the government recently signed a deal with SunEdison Inc. of California to establish a new solar power complex in the Kingdom, which cost \$6.4 billion (Harrington, 2014). The government has established the King Salman Renewable Energy Initiative to set the framework for and the regulation of the energy market (Al-Arabiya English, 2016).

Socially, the government is expecting to achieve high standards for all aspects of its citizen's and non- citizens life, such as health, entertainment, education, safety, training, and empowerment of women (Al-Arabiya English, 2016). Towards improving the employment of women, their participation in the workforce is expecting to increase from 22% to 30 % by 2030 (Al-Arabiya English, 2016).

Regarding economic development, the government is expecting to focus on enabling the Small Medium Enterprise (SME), entrepreneurship, privatizing some government services, and opening new areas of investment. For instance, currently, SMEs comprises 20 % of the Kingdom's GDP, which is low compared to that of other countries (Al-Arabiya English, 2016). Therefore, the government has a plan to help those firms by allowing them to bid on a government contract and giving them funding and training. The government has established new authority to focus more on SMEs because they are so crucial for developing the economy (Al-Arabiya English, 2016).

Furthermore, the three programmes expected to influence the effective implementation of SSCM are the National Industrial Development and Logistics Program, the National

Transformation Program, and the Public Investment Fund. Table 3.2 below details the main objective of each programme, describing how it can contribute to SSCM implementation.

Table 3.2: Saudi Arabia 2030 vision, programmes (KSA Vision 2030, 2019)

| Saudi vision programmes | The program objectives | How this program can contribute to the SSCM implementation directly or indirectly. |
|--|---|--|
| National industrial development and logistics program | Develops industries and promotes local production (e.g. renewable energy and military industries), exports, mining, energy, technology and the robotic workforce. This will comprise infrastructural improvement, export support, and logistics service development to render the KSA an ideal logistical platform given its location at the intersection of three continents. This program will also create promising job opportunities for young people. | <ul style="list-style-type: none"> • Grow contribution of renewables to national energy mix. • Enhance competitiveness of the energy market. • Localize promising manufacturing industries. • Increase localization of non-oil sectors. • Create and improve performance of logistic hubs. • Improve local, regional and int 'l connectivity of trade & transport networks. |
| Public Investment Fund | The program strengthens the Public Investment Fund, which is the engine behind economic diversity in the KSA. It also develops high focus strategic sectors by growing and maximizing the impact of the fund's investments, making it the largest sovereign wealth fund in the world. Moreover, the program establishes strong economic partnerships that help deepen the KSA's impact and role both regionally and globally. | <ul style="list-style-type: none"> • Unlock new sectors through the Public Investment Fund • Localize edge technology & knowledge through the Public Investment Fund • Build strategic economic partnerships through the Public Investment Fund |
| National Transformation program | The program aims to develop government effectiveness, establish the necessary infrastructure to realize Vision 2030 and support its objectives by driving flexibility in government and increasing coordination, joint work and planning. The program will identify shared objectives for public entities, based on national priorities, transferring expertise between public agencies, and involving the private and non-profit sector in the process of identifying challenges and innovating solutions. It will also look at funding and implementation methods, and contribute to follow-up and performance assessment for involved entities | <ul style="list-style-type: none"> • Improve quality of services provided in Saudi cities (utilities, public transports, etc.). • Enhance traffic safety. • Reduce all types of pollution (e.g., air, sound, water, soil). • safeguard the environment from natural threats. • Enhance ease of doing business. • Create special zones & rehabilitate economic cities. • Develop the digital economy. • Increase women participation in the labour market. • Enable integration of people with disabilities in the labour market. • Grow SME contribution to the economy. • Improve working conditions for expats. • Source relevant foreign talent effectively • improve productivity of government employees. • Develop the e-Government. • Strengthen communication channels with citizens & business community. • Ensure the responsiveness of government entities to stakeholders' feedback. • Ensure sustainable use of water resources. • Promote & enable financial planning. |

| | | |
|--|--|--|
| | | <ul style="list-style-type: none"> • Enhance businesses' focus on social responsibility. • Enhance businesses' focus on the sustainability of the national economy |
|--|--|--|

In such a new context, businesses and other relevant stakeholders have to take full responsibility because the government has triggered the accountability roles toward them (Alshuwaikhat and Mohammed, 2017). As a matter of the fact that the 2030 vision is in line somewhat with sustainability goals and objectives (Alshuwaikhat and Mohammed, 2017). Thus, we can assume that management in the manufacturing sector has incorporated the government visions and priorities in its CSR, which can motivate and guide them indirectly toward the SSCM adoption as a way to respond to this new reality.

3.10 Chapter summary

The mentioned above confirms that when discussing corporations in Saudi Arabia, an understanding of the values of the region becomes highly relevant as they inform the potential effectiveness of future changes. Saudi leaders find that in the implementation of SSCM, they have to reconcile not only issues of tribal and religious understanding, but also need to account for, and respond positively to, changes in initiatives that come from the government without ignoring their other stakeholders' demands.

Ultimately, it is interesting to establish empirically if any of the factors mentioned above have a role to play in motivating, enabling or inhibiting SSCM implementation in the Saudi manufacturing industry.

The next chapter explains how empirical research is designed and conducted to address the above research questions in a Saudi manufacturing context.

Chapter 4 : Research methodology

4.1 Introduction

The literature analysis in chapter two had provided the theoretical basis of what motivates, inhibits, and facilitates the implementation of SSCM, especially in developing nations. This chapter also needs to explain and justify the choice of the research methodology. The goal of this chapter is to clarify why certain information for exploring this phenomenon will be gathered, what information will be gathered, where it will be collected from, when and how it will be gathered, and how it will be investigated. Therefore, exploring the research methodology is imperative to achieve these goals, which can help to answer the research questions of this study. Figure 4.1 provides, in graphic format, the outline of the research methodology discussed in detail throughout this chapter.

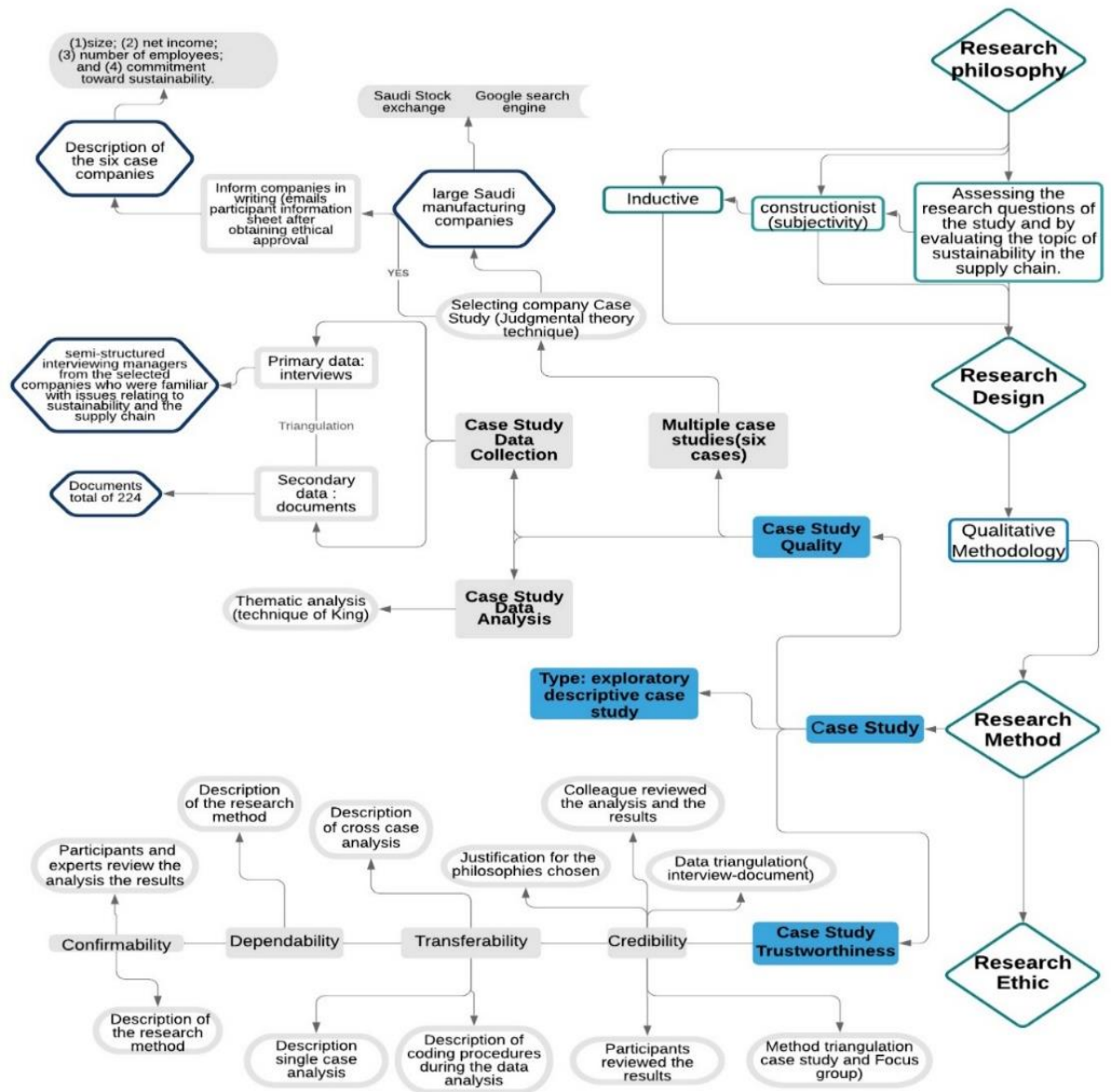


Figure 4.1: An overview of research methodology

This chapter commences with an in-depth discussion of research philosophy in order to choose the right ontology and epistemology for this study. SSCM is presented as a complex, dynamic, and contemporary phenomenon. Thus, the constructivist philosophy and the justification for its choice is provided to explore the different meanings of SSCM in the context of Saudi Arabia. Inductive theory-building is linked with constructivism, as its goal is to achieve an in-depth understanding of new and complex phenomena.

Next, the research design is discussed, and the rationale for justifying the chosen methodology is presented alongside reasons for other methodology not being chosen. This part presents qualitative research as an appropriate methodology that aligns with the constructivism paradigm. By applying this methodology, understanding the issues and challenges, motives and enablers of SSCM in the Saudi context will grow because this methodology is characterised by its ability to provide an in-depth understanding of the phenomena.

The case study, as the research method of this study, is presented in detail, and the reason for choosing this method is discussed. In addition, the advantages and disadvantages of this method are recognised. This section describes how the case study have been selected. This section also mentions multiple data sources and focus group that enable data and method triangulation in order to ensure the rigour of the results. The primary data for the case companies and focus group is collected by semi-structured interview, which has enabled an in-depth understanding of SSCM in the Saudi manufacturing context. A guide for the interview with the participant is discussed. The secondary data is used, which supported the primary source in the understanding of SSCM from a different perspective.

The thematic analysis is chosen as the appropriate method to analyse the unstructured text of qualitative data collection. This section discusses the advantages and factors influencing how the analysis is undertaken and the steps to conduct a thematic network. It also presents a discussion of the software program chosen, NVivo, and the value it adds to the analysis.

This chapter discusses the rigour of qualitative research. The issues of reliability, validity, and trustworthiness are discussed in detail, in order to identify the term that applies best when exploring the rigour of the case study. The criteria for trustworthiness are shown to follow a rigorous structure for this study. The chapter concludes with the research ethics.

4.2 Philosophical background

Research philosophy can be defined as a general term that identifies the development of knowledge and the nature of that knowledge in specific research (Saunders, Lewis and Thornhill, 2009). It incorporates underlying assumptions about how a researcher sees the

world. These assumptions have an influence on the research design and method, which impact the understanding of the research findings (Creswell, 2014, p. 5). Fleetwood (2014) pointed out that the same phenomenon might have different results from one study to another since there are various philosophical assumptions. It is noteworthy that the best philosophy is one that can answer the research questions (Saunders, Lewis and Thornhill, 2009).

By contrast, a ‘paradigm’ is another term used in social science to understand research philosophy. It is defined as ‘a set of interrelated assumptions about the social world which provides a philosophical and conceptual framework for the organised study of that world’ (Collis and Hussey, 2014, p.43). The philosophical view has two interrelated elements, namely ontology and epistemology. Saunders, Lewis and Thornhill (2009) emphasised that ontology and epistemology are considered essential elements in the exploration of research philosophy and are more likely to be utilised in the social science context.

Ontology is about the nature of the social world and what can be known about it (Guba and Lincoln, 1994). The term ‘social’ refers to the unique way people live their life and develop their values and norms (Campbell and Wasco, 2000). The ontological perspective is related to whether the object in the social world should be considered objectively independent from social actors, or a construction developed from social actors’ observations and actions (Bryman and Bell, 2015). Campbell and Wasco (2000) pointed out that the real objective goal is to study the structures and functions of the social world. Meanwhile, how to understand the social world structure is a concern of subjective reality study. Based on the abovementioned discussion, there are two assumptions regarding ontology, namely, objective or subjective reality, and each one applies to a different aspect of the object.

Epistemology, the second element, is concerned with what it is acceptable knowledge in the field (Bryman, 2008), and whether the natural science approach is suitable for examining the social world (Bryman and Bell, 2015). Campbell and Wasco (2000) argued for an alignment of epistemology and ontology in the philosophical discussion. Based on the underlying epistemological research philosophy, four different epistemological theories in social science are presented. Those theories contain different views about resolving the debate on what comprises reality and what is known about it (Campbell and Wasco, 2000).

The first epistemological theory is positivism, which considers reality from a singular and objective view. The social actors have no role to play in the development of this reality. Reality emerges as independent from social actors (Saunders, Lewis and Thornhill, 2012). The second epistemological theory is realism, which has some similarities with the positivist view on the assumption of objective reality. However, the difference between the two is that

it is impossible to capture reality in a purely unbiased, objective way. Therefore, the researcher needs to develop some technique to mitigate bias (Campbell and Wasco, 2000). These positions are imposed on the use of measurable methods and are associated with a quantitative approach (Saunders, Lewis and Thornhill, 2012).

The third epistemological theory is critical realism, according to which there is no objective reality since reality is interpreted through different factors of the social actors –social, political, cultural, economic, ethnic, gender and values (Guba and Lincoln, 1994). Those factors influence the researcher’s decisions in formulating research questions, and in collecting and analysing data that have an impact on the findings (Campbell and Wasco, 2000). Therefore, the researcher has to show how his or her experiences influence the research findings (Campbell and Wasco, 2000).

The last epistemological theory is constructivism, which is considered an extension of critical realism theory. It assumes that social reality is constructed explicitly (Campbell and Wasco, 2000). Traditionally, this position assumes that social actors are not considered only as determinants, but that they have a role in influencing the meaning and accomplishment of phenomena in the social world (Campbell and Wasco, 2000). Humans create the phenomena and alter it in the future as they develop socially (Saunders, Lewis and Thornhill, 2012). This view is associated with a qualitative approach.

This study investigates aspects related to the development of sustainable supply chain management (SSCM) in the Saudi manufacturing sector. The theory underpinning this research is constructionism (subjectivism), by which the researcher sees the nature of reality as socially constructed. The researcher reached this decision based on assessing the research questions of the study and by evaluating the topic in the literature review. The following section explains this choice.

4.2.1 Research questions

The main question posed in this thesis is: “What are the critical motives, barriers, and enablers associated with the development of sustainable supply chain management in the context of Saudi manufacturing industry?”. This main question is divided into four sub questions. The first sub-question is about “What are the critical motives for Saudi manufacturing companies to adopt SSCM?”. This question aims to explore Saudi manufacturing practises, specifically to understand the reasons for the adoption of economic, environmental, and social sustainability in the supply chain. The second and third research sub-questions are: “What are the critical barriers inhibiting Saudi manufacturing companies from the adoption of SSCM?” and “What are the critical enablers facilitating Saudi manufacturing companies’ adoption of SSCM?”. The purpose of these questions is to

identify the critical barriers and enablers, and most importantly, to understand their roles in inhibiting or enabling SSCM implementation in a Saudi manufacturing context. Understanding their roles are achieved through investigating the following sub-sub questions:

What are the strengths of the critical barriers to influence other barriers in Saudi manufacturing companies' adoption of SSCM?

What do Saudi manufacturing companies' action to mitigate the critical barriers that inhibit the adoption of SSCM?

What are the strengths of the critical enablers to influence other enablers in Saudi manufacturing companies' adoption of SSCM?

What do Saudi manufacturing companies' action to maintain and develop the main enablers that facilitate the adoption of SSCM?

The fourth research sub-question is investigated "What is the most appropriate method employed by Saudi manufacturing companies to develop SSCM?". This question aims to highlight how Saudi manufacturing companies maintain and develop their SSCM.

Through the process of the theoretical review and the discussion provided in Chapter Two, this study identified collective sets of motives, barriers, and enablers regarding SSCM development. Nevertheless, there is currently a lack of understanding concerning how Saudi firms enact these in their SSCM implementation. Contextual factors, such as culture, level of education, economy, technology, governance, buying habits, firm size, and strategy have a role in influencing, either positively or negatively, the practitioner's interaction with SSCM development.

Each participant in SSCM development, for example, the government, the firm, and its suppliers and customers, may think and act in a certain way, because of the influence of these contextual factors. Hence, it can be argued that there is no optimal solution that can be applied to all organisations regarding how to make the right decision, or how to organise and lead. Instead, the leader at each organisation applies their own style of leadership, and the action taken is dependent on the restraints of the internal and external context (Morali and Searcy, 2013).

This notion aligns with the contingency theory founded on the ideas proposed by Woodward (1958; 1965) (Kaplan, 2016). The aforementioned argument, with the support of contingency theory, helped the present research to highlight and reveal both the internal and external contexts that can affect the actions taken by organisations (Chen *et al.*, 2017). Thus,

this study sought to attain an understanding of how the contextual factors perform both individually, and in relation to each other, in affecting the actors concerned, such as the organisations involved in the SSCM development, thereby impacting SSCM implementation in a Saudi manufacturing context.

Furthermore, the current literature has demonstrated that sustainability is a broad, complex concept (Faber, Jorna and van Engelen, 2005). According to Alblas, Peters and Wortmann (2014) sustainability has various meanings across different actors. The complexity of sustainability comes from the conflation of the environmental, economic, and social dimensions and the multiple actors involved in solving the sustainability issues.

By contrast, when sustainability is integrated into the supply chain, it results in greater complexity. The complexity emanates from differences in motivation, orientation, understanding, and the desire to develop sustainable supply chains (Walker and Jones, 2012, p.15). Therefore, SSCM might have a different meaning in different societies and different enterprises. As indicated by Ahi and Searcy (2015a), a variety of terms has been developed to clarify the complex composite of the SSCM concept.

After all, the different interpretations lead to each company possibly having a different view and understanding of sustainability in the supply chain rather than one view of it in the world. These differences of views probably influence by social actors' activities and actors' manner of social interaction with others (Saunders, Lewis and Thornhill, 2012). Therefore, participants involvement through interactive discourse are vital to understand this socially constructed reality (Saunders, Lewis and Thornhill, 2012). By interpreting the meaning of the different social actors involved, we can grasp the aspects of SSCM development in a Saudi manufacturing context.

4.3 Research design

Research design can be defined broadly as the overall strategy and logical structure that a researcher adopts to conduct his or her research (Creswell, 2014). There are three kinds of methodological approaches: quantitative, qualitative, and mixed (Johnson and Onwuegbuzie, 2004). Research philosophy influences the implementation of the research design approach (Creswell, 2014). Therefore, understanding and discussing these aspects of the methodological approach assists the researcher to choose an approach that is in line with the constructivism nature of this study research.

Thus, it is conducive to apply qualitative methodology, which broadly used in the business and management research (Saunders, Lewis and Thornhill, 2009, p.151). This study focuses on a new topic and concept for which little research has been undertaken to date (Seuring

and Gold, 2013). Qualitative methodology is a useful approach to understand a concept on which there has been little research in the literature (Creswell, 2014).

The qualitative approach is characterised by the method of using words instead of numbers as data for analysis, which lead to understanding the main reason behind a problem or an issue in social life (Creswell, 2014). It offers an effective way of understanding the culture and personal experiences of individuals or groups who participate in solving the problem related to the phenomena (Bricki and Green, 2007). The subjective reality views of participants about the phenomena can be understood by adopting the qualitative approach (Ryan, Scapens and Theobald, 2002).

The research questions of this study indicate a need to understand the various motive, barrier, and enabler factors of sustainable supply chain implementation. The qualitative approach, therefore, allows the researcher to distinguish and clarify the complexities of SSCM factors without having to predetermine either the variables to be included or the interrelation between them (Syed, 2012).

Moreover, the understanding of the SSCM aspects in this study will be enhanced as this approach provides flexibility to change and modify the research questions, sample size, and data collection during the research process (Creswell, 2014). This flexibility enables better responsiveness to local situations, conditions, stakeholders' needs, and any changes that might occur during the research study (Johnson and Onwuegbuzie, 2004). Such an understanding cannot be acquired from the quantitative methodology.

There are some criticisms of the qualitative approach, such as small sample size, which makes it very difficult to generalise the findings to all population. However, in this study, the purpose is not to generalise the findings to other subjects or settings, but rather, to deeply explore SSCM and its history to build further knowledge and to develop a more focused practice that is responsive to research participants (Thomas and Magilvy, 2011; Saunders, Lewis and Thornhill, 2009). Thus, the research strategy and objective were concerned with identifying and gaining an in-depth understanding of the main and various factors affecting the adoption of SSCM in the context of a developing country, such as the KSA, although the findings may also be useful for other, similar contexts.

Another limitation is that questions have been raised about the degree of involvement of the researcher in the study, which makes the findings less accurate and more biased (Bricki and Green, 2007). This issue can be eradicated by following a rigorous structure, as discussed in full in section 4.4.3.5.

On the other hand, the quantitative methodology is characterised by a method that uses numbers instead of words to test a theory by statistically understanding and analysing the relationships between the variables (Creswell, 2014). The quantitative approach has been assessed by measuring large-scale data and using statistical analysis to test the variables and the differences between them (Ponterotto, 2005). The large scale of the data collected enables this approach to have an advantage over the qualitative approach with respect to generalising the findings or replicating the study by other researchers (Creswell, 2014, p.4).

However, generalising the findings of knowledge to the all population especially in SSCM development might not fit other groups, contexts, and situations that have particular characteristics (Saeed and Kersten, 2019; Diabat, Kannan and Mathiyazhagan, 2014; Wittstruck and Teuteberg, 2012). On this point, Saudi Arabia as shown in chapter 3 has a unique culture and encounter unique challenges: its government, education system, economy, business customs, corruption problems, and segregation of women are factors that have created exceptional conditions in Saudi Arabia. Those factors and conditions might impact on exploring the aspects of SSCM implementation in Saudi Arabian manufacturing firms. Thus, applying current findings in the literature might not be applicable in this context.

Another limitation with this approach is that the researcher might miss understanding the reason for participants' answers regarding the phenomena because the approach tests the theory by adopting a deductive approach instead of generating theory using an inductive approach (Johnson and Onwuegbuzie, 2004). Therefore, it made little sense to select a quantitative approach for this study.

Mixed methodology is an approach using qualitative and quantitative approaches to explore a phenomenon or solve a problem by using a unique design that involves 'philosophical assumptions and theoretical framework' (Creswell, 2014, p.4). It is often used to test existing theories or models, with smaller amounts of data collected with a large number of subjects (Thomas and Magilvy, 2011). In the case of SSCM, there is a shortage of theories (Touboullic and Walker, 2015) and models (Brandenburg *et al.*, 2014) on sustainability and supply chain in the literature.

Therefore, it will be appropriate to develop models and generate theories first by using qualitative methodology. Then, when the SSCM concept has developed with its theories and models, the mixed approach might be the best solution. It also was difficult for the researcher to carry out this approach since it requires the researcher to have both statistical skills and creative writing skills (Creswell, 2014). A researcher without a good background in statistics might produce a lower-quality performance. Besides, mixed methods are expensive and time-consuming (Johnson and Onwuegbuzie, 2004).

4.3.1 Inductive versus deductive

Another methodological issue that emerges from the philosophical positions is whether to use a deductive or inductive approach when searching the literature and collecting and analysing the data (Saunders, Lewis and Thornhill, 2009). The deductive approach is adopted more in positivist research methodology. It is often characterised by an inability to capture an in-depth understanding of a complex phenomenon (Leonard and McAdam, 2001). The inductive approach is adopted in constructivism position. It is used for understanding complex phenomena in the social world. Table 4.1 below summarises some of the significant contrasting aspects of the deduction and induction approaches.

Table 4.1: Contrasting aspects of the deductive and inductive in qualitative approach (Saunders, Lewis and Thornhill, 2009, p.127)

| Deduction emphasises | Induction emphasises |
|--|--|
| <ul style="list-style-type: none">• scientific principles• moving from theory to data• the need to explain causal relationships between variables• the collection of quantitative data• the application of controls to ensure validity of data• the operationalisation of concepts to ensure clarity of definition• a highly structured approach• researcher independence of what is being researched• the necessity to select samples of sufficient size in order to generalise conclusions | <ul style="list-style-type: none">gaining an understanding of the meanings humans attach to events• a close understanding of the research context• the collection of qualitative data• a more flexible structure to permit changes of research emphasis as the research progresses• a realisation that the researcher is part of the research process• less concern with the need to generalise |

According to Saunders, Lewis and Thornhill (2009), while it is beneficial to a signpost these differences between research philosophies, such labelling may be misleading, as the two different approaches can be included in the same research project, at different stages. The present thesis generally followed the inductive approach in its qualitative methodology, commencing by reviewing the extant literature regarding how SSCM can be developed, especially from a developing nation's perspective. After assessing the previous literature on SSCM development, it was possible to frame the concept in terms of an investigation of the motives, enablers, and barriers of SSCM in a context not yet addressed, namely Saudi Arabia. The theoretical stance enabled the formulation of the main questions and objectives, and enabled the identification of the current research gaps, and the categorisation of the factors related to the motives, enablers, and barriers of SSCM implementation in developing nations.

The theoretical position of this study was therefore not guided by the use of a specific theory, but by the inductive review of 347 articles. For example, the categorisations of the motives,

barriers, and enabling factors of SSCM were not known in the outset, rather they evolved as the review process progressed, and with the help of the Nvivo program, the categorisations and understanding of these factors was enhanced.

This categorisation of the key SSCM motives, enablers, and barriers was not intended to represent a theoretical construct that can alternatively discard and direct the views of the participants involved in the study (Saunders, Lewis and Thornhill, 2009), rather the opposite occurred, as during the interviews conducted for this study, the interviewer did not highlight the categorisations to the participants. This safeguarded the discussion from the researcher's influence, and from directing the discussion towards specific categorisations. Instead, the interviewer asked general questions (see the interview questions in Appendix 4). For example, what do you think enabled your firm's implementation of SSCM? If there were enablers, what was their impact, and how did your company acquire them?

The categorisations developed were useful for the data analysis stage, which adopted King's (2012) approach, which recommended the use of categorisations as previously-proposed themes as a starting-point for the data analysis. This study was therefore guided by the previously-developed themes at the outset of the analysis, while simultaneously being mindful that new themes and issues might evolve during the exploration of the data. Further information about how the data was analysed is provided in section 4.4.3.4 of this chapter, and at the beginning of Chapter Five.

In summary, this inductive approach helped to direct the researcher to the most appropriate literature sources, and provided a deep understanding of the findings and a continual ability to interact with the data collection and analysis (Goulding, 1998).

The following section justifies the choice of research method associated with a qualitative approach.

4.4 Research methods

Interviews, observation, grounded theory, ethnography, phenomenological, and case study are methods associated with the qualitative approach (Easterby-Smith, Thrope and Jackson, 2012). This study adopted a case study as an appropriate method for use in this research. The literature review revealed the use of the case study in various disciplines, such as management (Saunders, Lewis and Thornhill, 2009) and SSCM (Hassini, Surti and Searcy, 2012), indicating that the use of this method is up to date. The case study can be used to accomplish various aims, including providing descriptions and testing or generating theory, either explanatory or exploratory (Yin, 2003; Eisenhardt, 1989). This emphasises that a case

study is an increasingly important method for developing and enhancing knowledge in social science (Flyvbjerg, 2006).

The next section discusses the justification for choosing a case study as an appropriate method for use in this research over other qualitative methods.

4.4.1 Case study: A justification

The subject of this study investigates motives, barriers, and enablers of the development of environmental, social, and economic dimensions in the supply chain. These subjects of SSCM are considered an emerging field (Hassini, Surti and Searcy, 2012). Employing a case study; therefore, as a method for investigating emerging fields is highly endorsed by various researchers such as Seuring (2008) and Morali and Searcy (2013).

The case study focuses on understanding and assessing phenomena in the real world without concentrating on the validation construct or extending the theory (Voss, Tsikriktsis and Frohlich, 2002; McCutcheon and Meredith, 1993). This understanding of a complex phenomenon comes from concentrating on a limited number of cases that help to provide in-depth information about each case and to enable cross-case investigation. However, it also limits the expansion of the analysis by focusing on the important factors included in the phenomena under study (Eisenhardt, 1989; Voss, Tsikriktsis and Frohlich, 2002). Thus, the understanding of SSCM in the corporate context will be enhanced.

Sustainable supply chain management includes multiple stages located inside and outside the organisation (Morali and Searcy, 2013). So, the information gathered from different stages of the supply chain requires a method like a case study, which enables customisation of the research process design (Seuring, 2005). Also, the flexibility in the design process of the case study helps with gathering information data from multiple stages in the supply chain, which will enhance the empirical findings of the supply chain study (Seuring, 2008). The present study employed these advantages to enhance its findings by adopting triangulation, which involved collecting both primary and secondary data from each case and using a focus group.

4.4.2 Type of case study: A justification

Another issue arising from case study discourse is case study type. Yin (2003, p.3) pointed out that the case study can be categorised into three types. First, an exploratory case study focuses on exploring research questions, develops hypotheses, or finds an optimal solution for the research procedure. Second, descriptive research aims to describe and provide a full understanding of the phenomena. Third, an explanatory case study seeks to explore the cause-effect relationship, clarifying how events occur.

The exploratory, descriptive case study research method was deemed to be the most suitable approach for this study for a number of reasons. First, it provides a good understanding of phenomena in a real-life context (Voss, Tsikriktsis and Frohlich, 2002). Second, it provides rich detail about a concept and its context, a discussion of what occurred, and how different people recognise what happened (Oates, 2006). Thus, this type of case study lends itself to the in-depth investigation of the main motives, barriers and enablers associated with the development of sustainable supply chains in Saudi manufacturing industry. Third, it provides a good understanding of the emerging phenomena in a real-life context, especially where relationships do not exist between the phenomena and the context, such as political and cultural (Yin, 2003). Therefore, as SSCM was a phenomenon not previously investigated in the context of the Saudi manufacturing industry, this type of case study helped to reveal and explain the context in which the motives, barriers, and enablers of SSCM matter.

4.4.3 Case study: Quality

With the growth in the case study method using SSCM as a subject, there is increasing concern about the absence of a rigorous structure (Ellram, 1996). However, Seuring (2008) argued that there is still a chance for the case study to provide rigorous, in-depth analysis of the phenomena if the research has a well-documented structure in place. The quality of the case study will depend on how well the research represents certain criteria, such as case selection, data collection, data analysis, and validity and reliability (Seuring, 2008). The next sub-section discusses the criteria considered by this research.

4.4.3.1 Case study approach: Single versus multiple case study

Case study research can be conducted in multiple ways. A key aspect to understand the differences between case studies based on the number of cases, population criteria, and sampling is chosen (Voss, Tsikriktsis and Frohlich, 2002). Coherent choice of those elements results in enhanced reliability and validity of the case study (Seuring, 2008). Besides, case study selection has an impact on knowledge generated to understand the phenomena and generalising knowledge to the population (Eisenhardt, 1989). The next section presents each element in more detail.

4.4.3.1.1 Single versus multiple case study

Single or multiple case study types are used to assess decisions about the number of cases. Each type has some advantages and disadvantages, and each type is applied to achieve different aims and goals. For example, if the research aims to understand the problem in greater depth, then a single case study might accomplish this purpose. However, a major problem with this kind of case study is to convince others of the reliability and validity of

the study, the researcher's ability to conduct academic research, and generalisation to the population (Voss, Tsikriktsis and Frohlich, 2002).

Meanwhile, multiple case study can eradicate the drawbacks of the single case study and maintain the level of in-depth understanding of the phenomena (Voss, Tsikriktsis and Frohlich, 2002). Thus, 6 cases were employed to achieve this purpose, as the literature demonstrates that 4 to 10 cases are appropriate numbers to consider in case study research (Eisenhardt, 1989). Stuart *et al.* (2002) are of the view that 1 to 3 cases should be enough in case study research.

The six case studies in this research enable comparison between Saudi manufacturing companies to identify the motives, barriers, and enablers associated with the implementation of the sustainable supply chain in a Saudi manufacturing context. This comparison enhanced the generalisability of the findings that may be relevant to other, similar contexts, and also meant that the study possessed the advantages associated with multiple cases.

4.4.3.2 The method of choosing the sample cases

After defining the population of the sample, as discussed in Chapter Three, the sampling method was selected for use in the study. There are many methods to explore the sampling technique. The qualitative approach is used in non-probability sampling. Eisenhardt (1989, p.537) claims that a 'random sampling technique is neither necessary, nor preferable' in qualitative research'. The study sample had been chosen based on the judgemental/purposive theory technique with a homogeneous focus. It means that the researcher has the knowledge of that sample as having the right elements to represent the population and the purpose of this research (Saunders, Lewis and Thornhill, 2009).

The case studies selected from the manufacturing sector were primarily based on the factors discussed in Chapter Three. The following section discusses the process of selecting an appropriate company, which, as noted previously, needed to be of considerable size, acknowledge sustainability as an aspect of its corporate strategy, and the importance of the company within the national (and/or international) market.

Two approaches were used to construct the database of companies from which the selected cases were chosen. The first was to examine the Saudi Stock Exchange, which offered an indication of the relative size of manufacturing companies. The companies' websites were subsequently visited, to establish the importance given by each company to sustainability, including the existence of a stated corporate social responsibility vision and mission and/or the publishing of a sustainability report. The second approach involved the use of keywords

in the Google search engine, including: ‘large Saudi manufacturing companies publishing a sustainability report’ and ‘sustainability report in Saudi Arabia’.

Both approaches resulted in the identification of thirty-one manufacturing companies having the potential company to participate in this study. It also found that, of these, only eleven had published a sustainability report, including those operating in the following sectors: (1) Oil and Gas; (2) Energy; (3) Chemical; (4) Plastics; (5) Mining and Mineral. The researcher targeted those companies first.

The database of thirty-one companies contained the following information: company email, number, and type of sector. Following obtaining ethical approval from Bristol Business School, the researcher sent an email with the participant information sheet attached to the official email of all listed companies, with a reminder sent two weeks later (see Appendix 5 for the participant information sheets, consent forms and email covering letter). This approach resulted in a low rate of response from the companies, with two declining to join after consulting their legal departments, due to concerns relating to data confidentiality. This indicates the challenges that the researcher faced in recruiting the cases.

The researcher then sought assistance from the Royal Court, which handed his request to the Ministry of Energy, Industry and Mineral Resources, which subsequently assisted in moving two companies to participate. Several other approaches (i.e. using the researcher own social relationships and contacting managers directly through their emails and social media accounts, i.e. LinkedIn) helped the researcher to recruit four more companies.

In total, six companies were recruited for this study. The selected case studies represented four manufacturing sectors: (1) oil and gas; (2) chemical and plastics; (3) mining and mineral; and (4) energy. These sectors, as discussed in Chapter Three, make a considerable contribution to the Saudi economy, and being leaders in the field of sustainable development.

The case studies had been introduced anonymously in this study so that greater freedom of knowledge could be obtained. The diversity in the manufacturing sectors enhances the validity and reliability of the research findings by aiding understanding of the main enablers, barriers, and motives associated with the adoption of the sustainable supply chain from the perspectives of different elements of the manufacturing sectors (Yin, 2009). The following section highlights general information concerning the case companies.

4.4.3.2.1 An overview of the sample cases

The selected case studies represented four manufacturing sectors: (1) oil and gas; (2) chemical and plastics; (3) mining and mineral; and (4) energy. The websites of the companies confirmed that all have been in business between thirteen and fifty years. They,

therefore, well established in their industries. Their company websites identified that, collectively, they employ approximately 117,000 workers and have achieved high levels of net income over the previous last four years. The average of the companies' total net income in 2018 was calculated at approximately SR 36 (£7.38) Billion (Tadawul, 2019). Company A was not included in this average, as it does not belong to the Saudi Stock Exchange and therefore gives no information concerning its statement of income and balance sheet. However, its manager confirmed that it is profitable.

All the companies are independently managed. The owners are not part of the management team, which is governed by the board of directors, who ensure the direction of company business and provide guidance to management in defining overall company strategy.

All these companies have been found to exhibit a high commitment to sustainability, having adopted a variety of initiatives focusing primarily on improving the social and environmental aspects of the Kingdom. For example, all the companies had introduced a local content strategy, which helped to localise the materials produced in the Kingdom, and to promote the development of the sustainability performance of local suppliers.

Their commitment to sustainability was demonstrated in each company's sustainability report and annual report. They have also all obtained accreditation in the environment, safety, health and sustainability from different agencies bodies, i.e. ISO and OHSAS. Further discussion of company sustainability practices can be found in Chapter Seven.

Table 4.2 shows the details the selected companies, in terms of (1) size; (2) net income; (3) number of employees; and (4) commitment toward sustainability.

Table 4.2: Differences and similarities between the companies involved in the study

| |
|---|
| Age of Business |
| Company B, C, F > 25 years in Business |
| Company A, D, E < 25 years in Business |
| Management Structure |
| Company A, B, C, D, E, F- independently managed |
| Financial Performance |
| Company B, C, F > SR Billion in net income |
| Company A, D, E < SR Billion in net income |
| Environmental practices |
| Company B, C, F environmental practices are higher compared with companies A, D and E |
| Social practices |
| Company B, C, F social practices are higher compared with companies A, D and E |
| Accreditation |
| Company A, B, C, D, E, F- ISO 9001, 14001, and OHSAS |
| Number of Employees Employed |
| Company B, C, F > 15 thousand |
| Company A, D, E < 15 thousand |

Based on Table 4.2, this study assumes that companies B, C, F are approximately equal in terms of size, net income, number of employees and commitment toward sustainability. In contrast, companies A, D, E can also be categorised at being at the same level.

4.4.3.3 The data collection method

Two approaches were employed for gathering the data to develop the case studies. The first was to interview managers from each company, while the second consisted of collecting secondary data from each company website. Charmaz (2006) pointed out that other sources of data collection can complement interviews. Yin (2009) strongly promotes the adoption of multiple sources of data collection to enhance the effectiveness of the case study database.

This study had used the second most recognised source of data techniques in SSCM, namely, secondary data, such as documents, websites and publications (Seuring, 2008). Both approaches helped to create in-depth case studies capable of answering the research questions.

Besides, a focus group was also used to enhance the understanding of SSCM phenomena in the Kingdom. This study was, therefore, able to obtain data concerning SSCM in Saudi Arabia by talking directly to: (1) managers; (2) government and non-government organisations; (3) universities; and (4) industrial experts.

These three complementary approaches enabled the use of triangulation, which helped to enhance the validity of the study. This is discussed further in Section 4.4.3.5 The next section outlines each approach.

4.4.3.3.1 The method of interviewing participants

The number of techniques can be used to collect data on a certain case. Interviews, regardless of whether they are unstructured, semi-structured, or structured, are one of the most widely used types of data-gathering techniques for case study research on SCM (Seuring, 2008). Each interview type has a different objective, advantage, and disadvantage (Easterby-Smith, Thrope and Jackson, 2012). For example, compared with a structured interview, the unstructured and semi-structured interview tends to be more flexible in representing the questions to the participants and collecting sensitive answers from them (Easterby-Smith, Thrope and Jackson, 2012). Another example is that the semi-structured interview has the advantage to let participants speak freely about an issue (Oates, 2006).

In this research, the primary source of data gathering had been utilised from semi-structured interviews. This approach helps to seek consistent answers to the research questions of how the participants understand the motives, enablers and barriers of SSCM in a Saudi manufacturing context. It also provides the interviewees with the opportunity to add any important issues not mentioned in the questionnaire. It is defined as those with adequate numbers of open-ended questions prepared in advance, and the sequence of the questions should not be sequential, but rather unplanned (Rocco, 2003).

This type of approach allows the researcher to have a list of themes and questions to be asked but also few open questions (Saunders, Lewis and Thornhill, 2009). In this study, themes and questions asked to have been obtained from the theoretical framework. Furthermore, the modification of questions and the order of asking questions during the interview might be different across the participants, depending on the facts that arise during the interview (Saunders, Lewis and Thornhill, 2009). This, therefore, might increase the chance of exploring emergent themes and patterns about the phenomenon as interviews progress (Easterby-Smith, Thrope and Jackson, 2002). Since this research examines the emerging role of SSCM in the context of Saudi Arabia, using semi-structured interviews could help to explore and add new themes and patterns to the phenomenon.

The sustainable supply chain is a complex topic; the information cannot not be under the control of one person in the organisation and its supply chain. Multiple responses, therefore, from various participants are needed in cases in which knowledge is not in the hands of one person (Easterby-Smith, Thrope and Jackson, 2012; Voss, Tsikriktsis and Frohlich, 2002). Thus, the total number of participants in this empirical study was 19. For qualitative research, it considers as the suitable number as Murry and Hammons (1995) suggested that 10 to 30 participants are enough to conduct a qualitative approach based on interviews approach. In this investigation also, recruiting more participants was stopped when the information gathered seemed enough to answer the research questions (Voss, Tsikriktsis and Frohlich, 2002).

4.4.3.3.2 The method of recruiting the managers

The data for this study was collected via interviews with managers at the companies selected who had at least 10-years' experience and expertise with the issues related to SSCM. The LinkedIn website was used to construct a database of the potential participants, as it provided full details of the business professional concerned, such as their position in the company, their role in the supply chain/sustainability functions, and their years of experience. When an individual met the study's requirements, a message was sent to them via their LinkedIn account.

The interviews took place between August and October 2018. Prior to these meetings, the participant information sheet (see Appendix 5) containing thirteen questions related to this study was forwarded to each manager's email address, which had been obtained from LinkedIn and the company website. Also, the researcher used his social connections to deliver the participant information sheet to the targeted managers.

The participant sheet was sent to the potential interviewees to help them decide whether they would be willing to participate in the study. Following an agreement to participate, an

appointment was made with each manager following his/her existing schedule. The managers were asked to review the interview questions before the meeting. It helped them understand the topic and provide the documentation necessary to help increase the reliability and validity of the study (Saunders, Lewis and Thornhill, 2009).

The interview questions were checked and approved by an SSCM academic who worked at the business school of a public university in Saudi Arabia, and who specialised in supply chain management and total quality management. Besides checking and approving the interview questions, this process helped to add a new question, namely the managers' views concerning the future of SSCM, and also highlighted to the researcher the need not to mention the pre-categorisations to the participants, in order that the direction of the discussion was not influenced.

All the interviews took place in company offices located outside the researcher city and followed the safety protocol set down in the ethical approval (see Appendix 5). Each interview commenced with an overview of the research objectives and highlighted the participant's right to withdraw at any time. The interview followed the semi-structured approach, which allows for the addition and removal of questions, as well as the ability to change the order in which they are put. For example, during the second interview, the manager highlighted that investors (particularly those from abroad) formed a barrier to the adoption of SSCM. This subsequently became a question put to other participants, helping to evaluate the extent to which this issue penetrated across the cases.

In general, each interview covered three sections. The first section focused on the manager's background and his/her views of the company in the field of SSCM, i.e. its definition and the motivation for its adoption. The second and third sections focused primarily on factors constituting barriers and enablers, while the final section focused on the future of SSCM (see Appendix 4). The meeting ended by thanking the person for participating, highlighting some critical points raised during the meeting, and checking whether the individual wanted to add anything about the subject. Besides, the interviewee was asked for permission to follow up with them if any issues were arising from the analysis of the data.

Each interview lasted for approximately 2.5 hours. Each manager had an in-depth understanding of SSCM, because they were targeted according to rigorous criteria. The entire process of questions and answers were recorded by note taking and recording. Voss, Tsikriktsis and Frohlich (2002) recommend using tape recording in subjective research because it enhances understanding of the meaning of the participant's answers. Table 4.3 (below) highlights information about the managers who had been interviewed in this study.

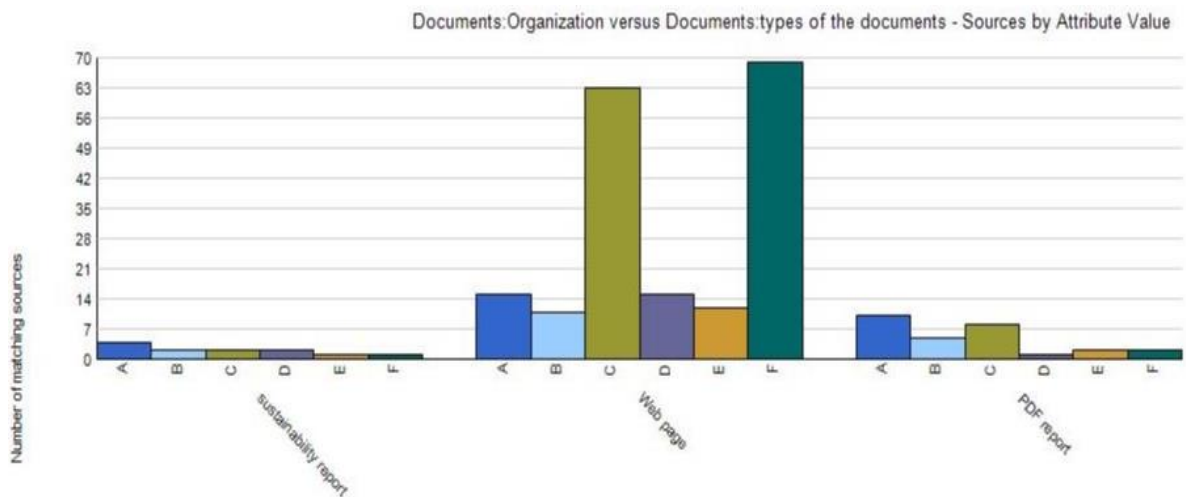
Table 4.3: General information about the managers participating in the study

| Name | Position | Date of the interview | Method of recruiting | Examples of the manager's responsibilities | Company |
|------|---|-----------------------|--|--|---------|
| BA | Sustainability Manager, | 06/08/2018 | Support from the Ministry of Energy Industry and Mineral resources | Developing a sustainability strategy and dealing the related risks and opportunities. Implementing and monitoring this strategy across the business units at the company, and its affiliated companies. Reporting to the top management on sustainability performance, and its risks and opportunities. Developing a sustainability business case that could be sold to multi-stakeholder. | B |
| EA | Marketing and Sales Manager | 8/08/2018 | Social networking | One of the members of the sustainability committee, a committee that developed and promoted the sustainability strategy, and its implementation, throughout the company departments. | E |
| CW | Strategic Procurement and Project Management, Manager | 12/8/2018 | Social networking | Framing and implementing several corporate procurement strategies, in order to improve the localisation of industrial manufacture in the Kingdom. Managing the day-to-day activities of the company supply chain and procurement strategy, including sourcing, standardisation of materials, and supplier relationships, with a focus on the development of local suppliers. | C |
| DM | Logistics and Distribution/Supply Chain, Manager | 15/8/2018 | LinkedIn | Monitoring the implementation of Responsible Care requirements throughout all supply chain activities. Recording and reporting key performance indicators (KPI) performance in the system. Managing all supply chain logistics activities, including warehousing, transportation, sourcing the service providers, monitoring, and enhancing their performance. | D |
| AO | Sales and Logistics, Manager | 1/9/2018 | Social networking | Reviewing and recording the performance of the logistics department. Managing supply chain logistics activities, including ensuring all the company products were delivered safely to the customer, and on time. Negotiating contracts with service logistics providers, | A |

| | | | | | |
|----|--|------------|--|--|---|
| | | | | such as land transport, and developing long-term relationships with them, monitoring their performance, and developing their capabilities. | |
| FA | Senior Vice President, supply chain | 16/09/2018 | Support from the Ministry of energy industry and mineral resources | Framing and implementing the procurement and supply chain strategy, in order to maximise local content, and to promote the local content opportunities to investors. Managing the day-to-day activities of the company supply chain, including contractor issues, and supplier monitoring and development, Ensuring the KPI measures were met. | F |
| FS | Division Manager, business development, supply chain business line | 16/09/2018 | Senior Vice President , supply chain | | F |
| FB | Manager, Supply chain | 16/09/2018 | Senior Vice President , supply chain | | F |
| FC | Manager, Supply chain | 16/09/2018 | Senior Vice President , supply chain | | F |
| FD | Manager, Supply chain | 16/09/2018 | Senior Vice President , supply chain | | F |

4.4.3.3.3 The method of collecting secondary data

A total of 224 documents written in English were collected from each manager and company website. These documents represented a vital element in enhancing the development of each case study, and gave the researcher easy access to information from all levels of employees, as well as an in-depth description of the company's sustainability practices. The written documents also helped to save time as there was no need for recording and transcribing (Saunders, Lewis and Thornhill, 2009). Table 4.4 highlights the types of documents collected for this study.

Table 4.4: Description of the secondary data used in the study

| Type of document | Description |
|-----------------------|--|
| Sustainability report | Report on the performance of company sustainability initiatives, along with strategies and governance, and enablers. |
| Web pages | Presentation of (1) general company information; (2) sustainability vision and mission; (3) latest news regarding the company's sustainability initiatives; (4) collaboration with partners; (5) technology adopted; and (6) participation in conferences. |
| PDF report | Reports of (1) the company's supplier code of conduct; (2) supplier safety guide; (3) material supplier guide; and (4) the annual report. |

Each case study was developed by collecting data from interviewees and documents. Both measures assisted in providing a case study that is rich in data which helps to improve the reliability and validity of the findings (Yin, 2003; Lincoln and Guba, 1990). It also helps to provide a good understanding of the phenomena under study and allows verification of the results (Saunders, Lewis and Thornhill, 2009).

4.4.3.3.4 The method of recruiting focus group members

A focus group was adopted, including experts from government and non-government organisations, as well as academics and industry workers. The participants in this focus group were selected for their expertise and understanding of the concept of SSCM, and each was recruited using the researcher social relationships, social media and, when feasible, visits to the participant's location. In total, nine members were included in the focus group, which was considered to be a suitable number, since Saunders, Lewis and Thornhill (2009) stated that ideally a focus group should have somewhere in the range of four to eight members, up to a total of 12.

Table 4.5 (below) provides information about the focus group participants. Each interview took approximately one and a half hours to complete. The meeting followed the same pattern as the interviews with the managers. Still, the group participants were asked to express their

views on the factors motivating, enabling and inhibiting large Saudi manufacturing companies, such those in the sample, when it comes to the adoption of SSCM.

Table 4.5: General information about the focus group members participating in the study

| Name | Academic | Industry experts | Government | Non-government | Method of recruiting | Expertise |
|------|----------|------------------|------------|----------------|----------------------|---|
| SS | | | ✓ | | Visiting | Saudi quality and standards. |
| AK | ✓ | | | | Visiting | Industrial management, corporate social responsibility. |
| AI | | | ✓ | | Visiting | Responsible for ensuring environmental protection. |
| MO | | ✓ | | | Social networking | Procurement activities, such as acquiring goods, services, or works from an external source. |
| AS | | | ✓ | | Visiting | Project management activities, such as creating quality standards, and defining the objectives of project. |
| FS | | | ✓ | | Visiting | Procurement activities, such acquiring goods, services, or works from an external source. |
| FD | ✓ | | | | Social networking | Corporate social responsibility. |
| MJ | | ✓ | | | LinkedIn | Logistics activities, including organising shipments, waste management, and ensuring health and safety standards are met. |
| DN | | | | ✓ | LinkedIn | Managing all operations in the country and executing the non- organisational objectives. |

The focus group is useful to any research, as it allows new ideas to emerge and be responded to within an interactive discussion amongst the participants. It therefore helps to describe and investigate the concept(s) concerned, but not in as much depth as in a one-to-one interview (Saunders, Lewis and Thornhill, 2009). It should be noted that for this study, due to the difficulty in arranging a focus group meeting, each participant was interviewed separately at a time of their convenience, which helped to capture all the possible individual contributions, and to eliminate the disadvantages of the focus group approach, such as trust issues, the differences in status between the members, and the dominance of a particular individual(s) in the discussion (Saunders, Lewis and Thornhill, 2009).

The views of the participants in the focus group helped to enrich the investigation of SSCM in Saudi Arabia by mitigating any bias in the findings, i.e. a participant's opinion is not, unlike those of the managers, influence by being a member of the selected company. This approach also helped in validating the answers of the managers and in exploring new enablers, barriers, and motivational factors relating to SSCM adoption.

4.4.3.4 The method of data analysis

The analysis of the primary and secondary data had been conducted using the thematic technique proposed by King (2012; 2008; 2004). This technique was considered suitable for this current study for a number of reasons. Firstly, it allows the study to commence with

prior themes to assist in guiding the coding process (King, 2012). Secondly, it aligns with the philosophical assumption of this study, which is based on the constructivist point of view (King, 2012), i.e. an assumption that different interpretations lead to the potential for each company to have a different view of its motives, barriers, and enablers relating to SSCM development. Thirdly, it provides an opportunity to design a flexible template capable of showing the entire process followed to achieve the results (King, 2012).

King developed as shown in Figure 4.2 a step-by-step guide on how to do thematic analysis. His approach comprises six steps: defining themes and codes; initial template; final template and interpreting and presenting the template analysis.

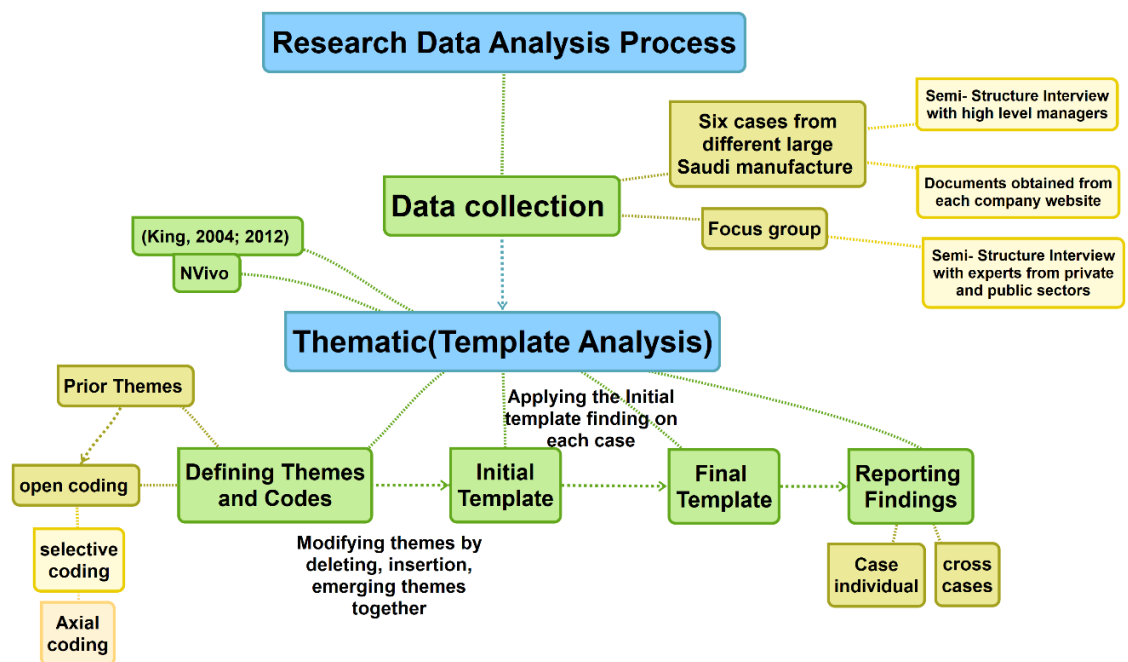


Figure 4.2: an overview of research analysis

Following these steps, this study has achieved the following objectives (a) a systematical analysis of the text; (b) each step of the analytic process is described in detail; (c) good presentation of the data; and (d) identification of rich and sensitive meaning from the text and determining patterns in the text (Attridge-Stirling, 2001). King demonstrated the procedures employed in figure 4.2 as outlined below.

4.4.3.4.1 Defining themes

The analysis of the research data was initially created by the themes emerging from the literature review. The prior themes (see Figure 4.3) formed a starting point for developing a template that then became progressively more focused and detailed.

| |
|---|
| Priori themes |
| 2 : what are the Barriers of SSCM |
| 3 : Business model |
| 4 : Collaboration |
| 5 : Cost of sustainability and return on investment |
| 6 : Customer |
| 7 : Employee |
| 8 : Innovation technology |
| 9 : Logistics |
| 10 : Management |
| 11 : Organisational sustainable Culture |
| 12 : Performance measurement |
| 13 : Product design |
| 14 : Regulation |
| 15 : SSCM strategy |
| 16 : Stakeholder role in the adoption of SSCM |
| 17 : Supplier |
| 18 : temporarily |
| 19 : what are the Enablers of SSCM |
| 20 : Collaboration |
| 21 : continues improvement |
| 22 : Cost of sustainability and return on investment |
| 23 : CSR |
| 24 : Customer |
| 25 : Employee |
| 26 : government regulation and non-government standards |
| 27 : Logistics |
| 28 : management system |
| 29 : Management |
| 30 : Organisational Culture |
| 31 : Performance measurement |
| 32 : planning and procedures |
| 33 : Product design |
| 34 : Stakeholder role in the adoption of SSCM |
| 35 : Strategy |
| 36 : Supplier |
| 37 : temporarily |
| 39 : what are the Motive of SSCM |
| 40 : community |
| 41 : Customer |
| 42 : economy improvement |
| 43 : Globalisation |
| 44 : Investor |
| 45 : Operational improvement |
| 46 : Regulation |
| 47 : Reputational improvement |
| 48 : Risk management |
| 49 : Supplier |

Figure 4.3: Prior theme

Figure 4.3 reveals that ten themes were identified from the literature review to establish the motivation for embracing sustainability initiatives into the supply chain. Some of these reasons originated from government, customers, community and pressure from investors, while others stemmed from businesses acknowledging the importance of SSCM in improving operational and financial performance and enhancing their reputation.

The literature also indicated the existence of barriers inhibiting the integration of sustainability into the supply chain. As shown in Figure 4.3, these barriers were classified under twelve main categories: (1) regulation; (2) product design; (3) management; (4) employees; (5) customers; (6) suppliers; (7) organisational culture; (8) business strategy; (9) performance measurement; (10) cost of sustainability and return on investment; (11) logistics; and (12) technology and innovation. These factors related to aspects both inside and outside an organisation and compromised the adoption of SSCM.

Several factors were identified from the literature as being major contributing elements for the adoption of sustainability in the supply chain. As shown in Figure 4.3, the enablers were

classified under thirteen categories: (1) regulation; (2) product design; (3) management; (4) employees; (5) customers; (6) suppliers; (7) organisational culture; (8) business strategy; (9) strategy; (10) performance measurement; (11) logistics; (12) collaboration; and (13) technology and innovation. Some of these enablers related to internal factors emerging from the firm's acknowledgement and initiatives concerning SSCM, i.e. senior management and employees. Other factors were associated with the external environment that assisted in issues of sustainable implementation, i.e. suppliers, customers and government regulations.

4.4.3.4.2 Initial template

Several procedures were followed once the data was ready for coding and imported into NVivo. NVivo adds value to this study by enhancing the explanation, making the process more transparent, ensuring the codes are connected in a robust way, and making it easier to know the frequency of expression in the text (Bryman and Bell, 2015).

The complete datasets were reviewed and coded, according to the prior themes. This study employed open coding, in which the exploration of the data was undertaken line-by-line. The researcher read all the interview transcripts and documents, in order to create the main categories of SSCM motives, enablers, and barriers. The reading of the data exceeded what was written and stated in the interviews, to include the examination of ideas, assumptions, and conceptualisations. This provided the depth necessary to understand the meaning, reality, experiences, and events that impact the phenomena under study (Braun and Clarke, 2006).

This study employed axial coding, which helped to explain the theme further by breaking it down into multiple levels. For example, in the motives section, business responsibility to internal and external stakeholders was broken down into four sub-themes that elaborated upon the central theme.

Once the main categories emerged, selective coding was employed, with any new coding limited to those within the core categories. For example, after generating the initial template form analysing Case A, the coding from the other cases was limited to the core categories. The motives section, for instance, included two main categories, benefit and stakeholder. The coding obtained from the other cases was located under these two core categories.

Preliminary main themes from the above procedure were constructed (King, 2004). Also, some prior themes being eliminated, and others relocated to demonstrate their most relevant aspects (King, 2004). For instance, four of the a priori themes relating to the barrier section were not included in the initial template: (1) business strategy; (2) performance measurement (3) sustainability culture; (4) innovation and technology as there were no data supporting

these prior themes. Logistics was integrated into other themes, as the data showed logistics issues to be primarily related to government and supplier barriers identified by almost all the case study participants.

In the motive section, globalisation (i.e. the company adopting SSCM in response to pressure from multinational firms) was unable to stand alone as a main theme and was therefore merged with the theme ‘responding to competition among responsible organisations’, under the subcategory of ‘external stakeholder pressure’ and the main category of ‘stakeholders’. In the enabler section, the product design category was removed from the template, due to the lack of any supporting data.

The theme of ‘stakeholder’ appeared in all template sections. This identified how the data collected from cases indicated the motive, enabler and barrier factors of SSCM through the positive and negative impact of stakeholders on SSCM development. At this stage, some themes not previously assigned to the main themes were placed in theme labelled ‘temporary themes’.

Following extensive testing of various structural procedures and the preliminary coding of case A, through NVivo and a Word document, the initial template was created. Appendix 6 presents the initial template involving five higher levels code and sub-divided into many levels explaining the higher level in depth.

The initial template was adjusted by insertions, deletions and changes to its scope, in order to produce the final template (King, 2004) (see Appendix 7). It was initially checked first by means of Case A, to evaluate whether the previous coding had captured every vital aspect of the data relating to the research objectives. The resulting changes to the template included:

- Enhancing the wording of all created themes.
- All changes were placed under the main categories composing five levels, i.e. a new category was created within the five levels.
- Two levels associated with negative impacts from government were added under ‘economic implications’ i.e. ‘decreasing profitability’ and ‘increasing shipment costs’. These helped to explore in depth how government barriers impacted on the economics of the organisation.
- Following a re-reading of the quotation: “when it comes to the digital world and how you use data in the right way, we have companies using basic tools, such as pen and papers. How you are going to change this culture? They have not interested in the implementation of digital technology”, it seemed more appropriate to change the theme from ‘resistance to digital technology adoption’ to ‘Lack of suppliers of digital technology’, followed by moving it to ‘The reasons for the ineffective sustainability performance of suppliers’.

- ‘Sustainability indicators shown in the environment, social, and economic dimensions’ listed under the performance measurement category as ‘enabler’ was expanded to contain all the indicators in the template related to economic, social and environmental factors.

Then, the initial template, with the adjustments, was subsequently applied to the further cases: firstly, for validation of the codes and secondly, to evaluate whether any changes were required to the template. For example, Company A’s template result was applied to Company B, and the template of Company A and B was applied to Company C, etc. This indicated that many revisions have been placed to produce the final template. Appendix 7 illustrates the final template, along with the findings in each case. Examples of the resulting changes to the template include:

- Adding three levels (i.e. supplier risk, customer risk and operational risk) under ‘Managing risks to business, environmental, health and safety factors’, which is associated with the second level of benefits category. These levels were added to highlight the importance of managing risk throughout the supply chain, due to the data revealing it to be one of the main reasons for the adoption of SSCM.
- Adding a new level under ‘business responding to external stakeholder demand’, i.e. ‘Responding to ownership (founder)’. This factor was first raised by Company B, to be subsequently verified by all cases apart from Company A. A closer examination of Company A’s data identified that it was owned by Saudi investors who noted that one of the business’ objectives involved development of the Saudi community.
- After reading the two themes ‘Shows transparency’ and ‘Commitment to the stakeholders’ under the measurement of the positive impact of performance, it was considered more appropriate to merge them under ‘Governing businesses and their supply chains with integrity, responsibility and transparency’.
- Adding a new theme ‘local Supplier benefit’ to the template in the benefits category in the section on motivation. This aspect was first highlighted by the manager of Company C, and subsequently confirmed by both Company F and the focus group.
- Adding two new themes (‘responding to Saudi Vision 2030’ and ‘Responding to pressure from the local community living near the company’s operations’) to the template under ‘Business responding to external stakeholder demand’. This aspect was first raised by Company B. The first theme was validated by all the case studies apart from that of Company A, while the second was only mentioned by Company B, with the manager stating that “the pressure from the communities around the operation gives a push to our agenda. We are near to people’s houses. We are in the middle of villages, okay?”.

- In the barrier section, the theme ‘lack of collaboration with other large Saudi organisations’ was added to the external stakeholder category. This was first raised by Company C and verified by companies E and F, along with the focus groups. A further two themes were also added under the same category: (1) ‘lack of awareness of SSCM in the Kingdom’ and (2) ‘complexity in sustainable design’. These aspects were both raised by the focus group participants
- The main category of ‘Investor’ under the external stakeholder barrier was created by company B and verified by both company E and the focus groups. The main ‘management’ category under the internal stakeholder and other barriers was also created in response to issues raised by Company B.
- In the enabler section, the theme ‘the availability of business customers prepared to buy company waste’ was added to the template under the category of ‘customer’. This was noted by Company D and verified by Company F.
- The theme ‘allowing improvement of sustainability performance’ was added under the technology enabler. This was raised by Company B and validated by all the subsequent case studies. ‘Advanced research centre’ was also added to ‘key essentials for deploying this important factor’ under the technology enabler category. This was first noted by Company C and validated by companies D and F.
- Table 4.6 is from a summary presenting the final template. Press on the ctrl tap and click to view any of the main themes in the final template.

Table 4.6: The results of the final template for Saudi sample cases and focus group

| Main Question | Main theme |
|--|---|
| <u>Key factors that act as a motive</u> | <u>Benefits</u> <u>Stakeholder</u> <ul style="list-style-type: none"> • <u>Responsibilities of business</u> • <u>Pressure on business</u> |
| <u>Key factors that act as Barrier</u> | <u>Stakeholder</u> <ul style="list-style-type: none"> • <u>Customer</u> • <u>Government</u> • <u>Supplier</u> • <u>Investor</u> • <u>Employee</u> • <u>Management</u> |
| <u>Key factors that act as an enabler</u> | <u>Corporate social responsibility</u> <u>Performance measurement</u> <u>Stakeholder</u> <ul style="list-style-type: none"> • <u>Customer</u> • <u>Government</u> • <u>Non-governmental associations</u> • <u>Supplier</u> • <u>Employee</u> • <u>Management</u> <u>Strategy</u> <u>Culture</u> <u>Technology</u> |

4.4.3.4.3 Final template

The decision of when to cease revising the template is unique to each research project (King, 2012). King (2012) also highlighted that it is not possible to create a perfect template, due to the time limitations relating to the external constraints of all research projects. The decision to stop modifying the template of this current project was made after ensuring that the coding of the collected data relating to the research questions (King, 2012).

The final template, as shown in Appendix 7, included five main aspects: (1) an overview of the company's perception of SSCM; (2) the motive behind the implementation of SSCM; (3) barriers to SSCM, including any negative impact and how this should be addressed; (4) factors enabling SSCM, including their positive impact and keys for their deployment; and (5) the future of SSCM in Saudi Arabia. It should be noted that, of these, numbers (2), (3) and (4) answered the research questions. The following section discusses the five main aspects.

4.4.3.4.3.1 Company overview

This category explored the general information about each company, including: (1) its definition of sustainability, and (2) when they had first considered the issue of sustainability. Figure 4.4 illustrates the level of coding.

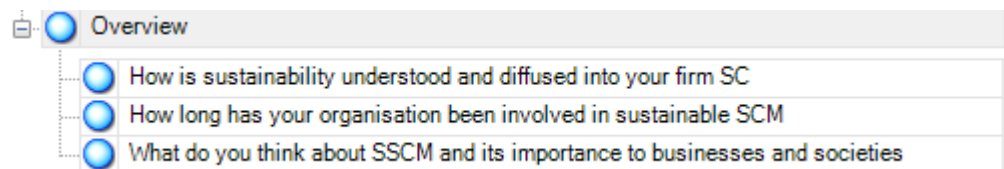


Figure 4.4: level of coding of company overview

4.4.3.4.3.2 Motive for SSCM development

This category outlines the main reason for the application of sustainability to the supply chain of the selected cases. The reasons varied, but can be defined in terms of the following two main categories: (1) 'Benefits' and (2) 'Stakeholders'. Sub-levels beneath these two main categories were inserted. Figure 4.5 illustrates the level of coding.



Figure 4.5: Level of coding in the final template of SSCM motive

4.4.3.4.3.3 Barriers to SSCM development

This category described the barriers inhibiting the selected manufacturing companies from adopting SSCM, highlighting the negative impacts and how these can be mitigated. The main stakeholders were categorised into ‘Internal’ and ‘External’. External stakeholders were subcategorised into (1) customers; (2) suppliers; (3) government; (4) investors; and (5) other barriers. Internal stakeholders were subcategorised into: (1) employees; (2) management; and (3) other barriers. Each subcategory was then divided into barrier factors, negative impact, and key factors for overcoming the barrier. In addition, a number of different levels were added under each categorisation. Figure 4.6 (below) illustrates the level of coding.

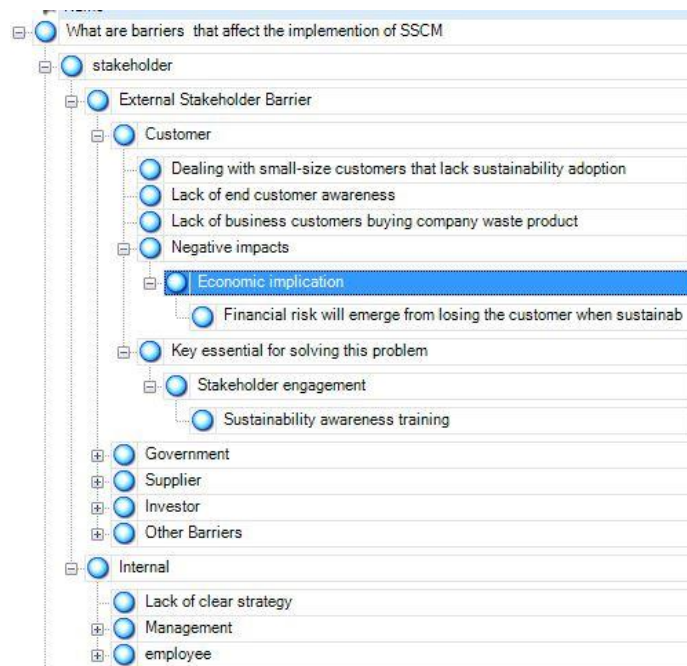


Figure 4.6: Level of coding in the final template of SSCM barrier

4.4.3.4.3.4 Enablers for SSCM development

This category outlined the enabling factors, including their positive impact and key factors for their deployment, as noted by the selected case studies. The factors were allocated into six main categories, including: (1) measurement of performance; (2) corporate social responsibility; (3) stakeholders; (4) strategy; and (5) sustainability culture and (6) technology. The main categories were divided into: (1) enabling factors; (2) positive impacts; and (3) keys for deploying each factor. A number of additional levels were also added under each categorisation. Figure 4.7 illustrates the level of coding.

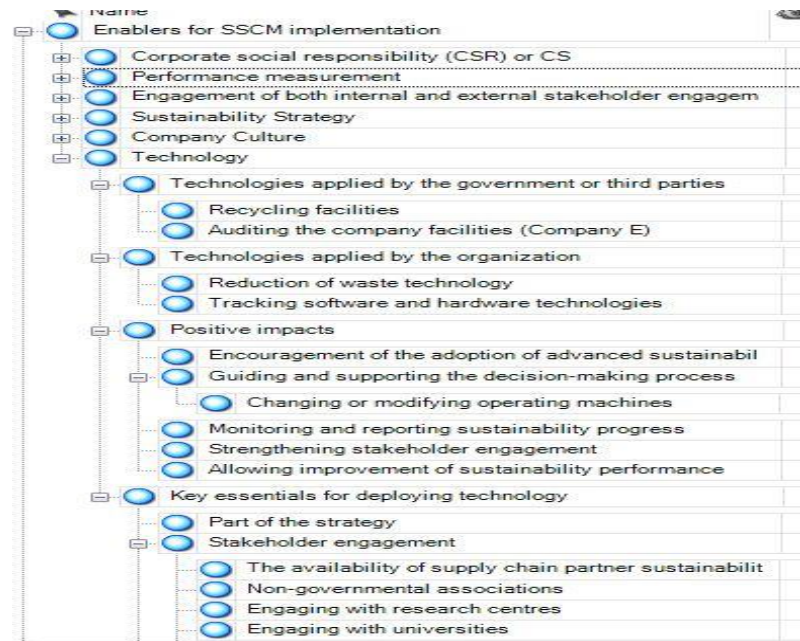


Figure 4.7: Level of coding in the final template of SSCM enabler

The exception to this organisation was the stakeholder category, which was divided into: (1) 'Internal'; (2) 'External'; and (3) 'Stakeholder engagement'. The external stakeholder category included customers, suppliers, and government and non-government associations, while the internal stakeholder category included employees and management. Apart from this aspect, they followed the same format as the other categories. Figure 4.8 illustrates the level of coding.

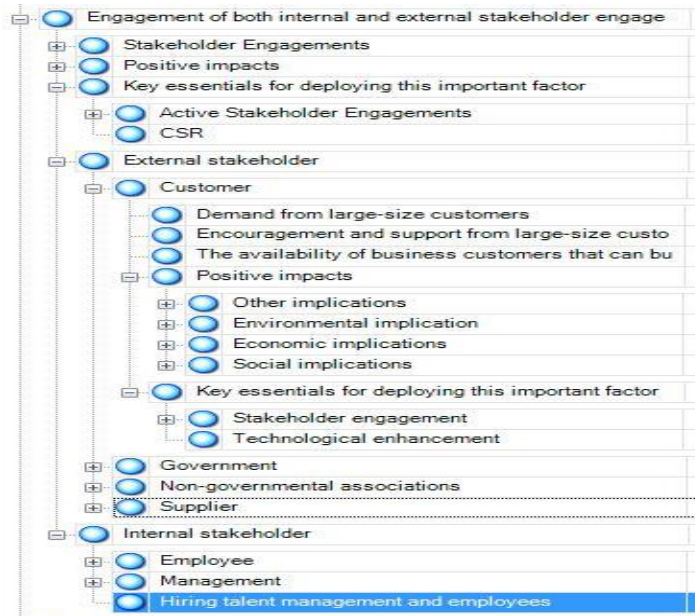


Figure 4.8: Level of coding in the final template of SSCM stakeholder enabler

4.4.3.4.3.5 The future of SSCM in Saudi Arabia

This category explored the future of sustainable supply chains in Saudi Arabia and was divided into four headings. Figure 4.9 illustrates the level of coding.

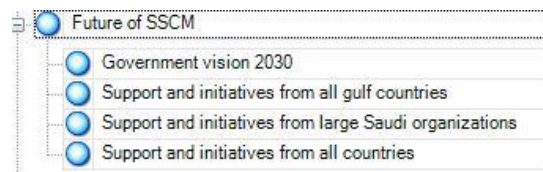


Figure 4.9: Level of coding in the final template of SSCM future

4.4.3.4.4 Interpreting and presenting the template analysis

The coded data used to create the final template required interpretation and presentation. This was considered to be the final task of the template analysis (King, 2004). Illustrating an understanding of the interpretation of coded data relies on both the study objectives and content (King, 2004). This current study focussed on four objectives: (1) identifying the factors related to the primary motivation; (2) determining the factors relating to the main barriers; (3) identifying the main enabler factors; and (4) constructing a road a map showing how SSCM can be developed based on data collected from six cases and the focus group in Saudi Arabia.

In order to achieve these objectives, this study used a thematic presentation of the findings, employing the six individual cases to represent and explain each of the main themes (King, 2012; 2004). Each main theme was interpreted by identifying the relevant factors, including: (1) their positive or negative impact; (2) investigating whether the theme related to any of

the other themes; (3) identifying whether the theme was salient to SSCM development; and (4) demonstrating how the theme could be developed or mitigated.

This study took into consideration the guides created by King (2004), including the issue of selectivity, with some themes needing to be explained in further depth, due to being more closely related to the examination of the topic (King, 2004). NVivo was used to identify the frequency across the data set and thus determine those aspects requiring additional analysis. It should be noted that it was considered more important to identify high frequency themes, even though these did not necessarily represent a particular theme, than the use of other themes, for the development of SSCM (King, 2004). The discussion was also supported by direct quotations from the case studies, which is considered vital when reporting the template analysis (King, 2004).

The thematic presentation of the findings helps to elaborate the differences and similarities between cases, as well as drawing up an illustrative example from cases around the identified main themes (King, 2012; 2004). This is therefore underlined as the most appropriate approach to creating a well-defined thematic discussion (King, 2012; 2004).

4.4.3.5 The trustworthiness of the research

The Oxford College Dictionary (2017) defines rigour as the quality of being extremely detailed, comprehensive, or truthful. Previous studies have reported that there are different criteria terms applied to represent rigour in qualitative or quantitative approach (Morse *et al.*, 2002). The qualitative approach defines rigour as ‘the criteria for the trustworthiness of data collection, analysis, and interpretation’ (Prion and Adamson, 2014, p.107). The term ‘trustworthiness’ was first reported in the model of Lincoln and Guba in 1985 (Morse *et al.*, 2002). Credibility, transferability, dependability, and confirmability criteria are essential components in the trustworthiness model proposed by Lincoln and Guba, (1985). They play a fundamental role in ensuring rigour in the qualitative approach (Houghton *et al.*, 2012). By contrast, internal validity, external validity and constructed validity, and reliability are among the most widely used groups of reliability and validity. They have been used extensively to show the rigour of the quantitative approach (Morse *et al.*, 2002).

The debate continues about whether the criteria of trustworthiness in the qualitative approach is still needed. Prion and Adamson (2014) stated that the criteria model in qualitative research has some similarity with the reliability and validity criteria in their meaning. Therefore, Morse *et al.* (2002) questioned the model developed by Lincoln and Guba (1985). They argued for the adoption of the validity and reliability term in qualitative research. Furthermore, the authors set out different ways to ensure that rigour in the qualitative approach is maintained by the researcher instead of relying on the judgment of the reviewers.

A considerable number of studies have been published on assessing the quality of qualitative research (Thomas and Magilvy, 2011). Some of these studies rely either on the utilisation of the Lincoln and Guba (1985) criteria or on modifying the name of the criteria to achieve the same goal (Morse *et al.*, 2002). Even studies that apply different strategies emphasise the impact of Lincoln and Guba's (1985) work. For example, Mores *et al.* (2002) indicated that the trustworthiness model of Lincoln and Guba (1985) has a positive impact on ensuring rigour in the qualitative approach. Given the abovementioned discussion, it can be claimed that 'trustworthiness' is an appropriate technique for use in evaluating the rigour in this study. The criteria ensure that the research process is well structured, and the case selection and data collection are rationally chosen (Seuring, 2008).

A significant and growing body of literature has investigated the rigour of the case study approach. Riege (2003) provides an in-depth analysis of all the case study rigour techniques developed in the marketing literature. He suggested that those techniques can be adopted in other management disciplines, such as SSCM. He also proposed that a relationship might exist between the trustworthiness criteria and the reliability and validity criteria, indicating rigour in qualitative research (Riege, 2003). As shown in Table 4.7, the confirmability, credibility, transferability, and dependability criteria have an interchange with the construct, internal validity, external validity, and reliability criteria, respectively. As mentioned in the previous paragraph, the focus of this study is on techniques related to the trustworthiness criteria.

Table 4.7: Trustworthiness of the case study

| Qualitative case study (trustworthiness) | Quantitative case study (reliability and validity) |
|--|--|
| Credibility | Internal validity |
| Transferability | External validity |
| Dependability | Reliability |
| Confirmability | Construct validity |

Credibility refers to whether participants and peers accept the study findings (Riege, 2003). It contains two processes; (1) provide proof of evidence, and (2) the research follows rational decisions regarding the research process (Houghton *et al.*, 2012). Some studies have suggested multiple techniques should be used to achieve credibility. Triangulation is one of the techniques; it refers to the implementation of different sources of proof, examiners, and methods throughout the data-gathering and data-interpretation stage of the study (Lincoln and Guba, 1985). According to Denzin (2009, p.310), there are four types of triangulation in management research, including 'theoretical triangulation, data triangulation, investigator triangulation, and methodological triangulation'. Jick (1979) emphasised that triangulation should be regarded as an inspired way to maximise data collection by gathering data from multiple sources.

This research employed methodological and data triangulation. Methodological triangulation is defined as the ‘use of two or more independent sources of data or data-collection methods within one study in order to help ensure that the data are telling you what you think they are telling you’ (Saunders, Lewis and Thornhill, 2009, p.146). The research data in this thesis were drawn from multiple sources, such as multiple interviews, corporate websites, including documents, newspapers, and visual material. Moreover, the focus group was also employed to validate the responses of the managers, and to explore new enablers, barriers, and motivational factors relating to SSCM adoption, which increased the credibility of the study (Creswell, 2014).

In addition, a peer debriefing technique was used to review the results of the data analysis, which were checked at the end of the analysis process (Hirschman, 1986). The individual selected to conduct this provided her overall comments and concerns regarding the first draft, which were used to improve the analysis and findings chapter. One of the peer comments was that the structure of chapter’s argument was not sufficiently clear, and she suggested that before composing it

you need to work it through in your head or in note/bullet point form. Work out what your main argument is, i.e. what conclusion do you want your reader to reach? What is the starting point for your readers (i.e. the current state of knowledge on the subject)? What evidence do you have to get your reader from that starting point to the conclusion you are arguing? What is the best way to structure that evidence so that your reader can follow it easily and be convinced? (peer reviewer, 2019).

The reviewer also recommended the use of headings and subheadings to help the reader follow the structure of the chapter.

The participants also had the opportunity to review the results and any issues or concerns arising from them were included in the written report (Lincoln and Guba, 1985). This technique is crucial for this study because it verifies the accuracy of the data interpretation and helps reduce bias by sharing the results with the participants (Robson, 2002). Therefore, the conclusions obtained from the findings were placed together in a single file, which was emailed to the participants who agreed to follow up with the researcher. In total, two of the six participants responded to the email with positive comments about the findings.

The first three techniques were adopted to provide evidence that the research followed the necessary steps to ensure the credibility of the study. Also, the researcher had considered the effects of the constructed reality of the subject by justifying the philosophies chosen and the researcher’s self-monitoring. The adoption of these two techniques had ensured the

rationality of the decisions related to the research process.

Transferability is concerned with the generalisation of the findings to similar context and situation without losing the meaning of the interpretation of the study's first findings (Houghton *et al.*, 2012). A generalisation is not about a population, but rather, the applicability of theory to be implemented in another similar case study (Riege, 2003). Riege (2003) suggested that comparing the results across case study organisations in a way that shows different or similar results of a phenomenon from each case organisation helps to achieve transferability.

This study had used multiple cases in various manufacturing industries in Saudi Arabia. Each case had been investigated as a signal unit first (Eisenhardt and Graebner, 2007). Then, the combined case study had been used for comparison, as it helps to expand understanding of the theory (Yin, 2009). Symbols, signs, and other coding procedures during the data analysis had been adopted in this study to achieve the goal of transferability (Riege, 2003), and to ensure that the findings of the present study were transferable to other, similar contexts.

Dependability is also known as audibility; it refers to the ability of other researchers to follow decision-taking for the implementation of the research process and to reach a similar conclusion (Prion and Adamson, 2014). Thomas and Magilvy (2011) reported six strategies of audit trails that might enhance the dependability of a study. Those six strategies are associated with the purpose of the study, sampling techniques used, and how credible the data collection and analysis are. It seems that this criterion can be achieved by providing a detailed description of the research method (Prion and Adamson, 2014); this study had adopted such a description.

Confirmability is concerned with whether data collection and analysis are performed in a logical and unbiased way, and most importantly, the data represent the findings in the most reasonable way (Riege, 2003). The technique is similar to one developed for the dependability criteria (Houghton *et al.*, 2012). Also, using the participants and expert to assess the data analysis and interpretation of the results had been used to eradicate the researcher's subjectivity (Prion and Adamson, 2014).

Together, these criteria provide valuable insights into the ensuring trustworthiness of qualitative research. However, the strategies and techniques mentioned should not be performed in a sequential manner, although it is essential to progress along each stage of the research process (Prion and Adamson, 2014). In this study, movements during the research processes are in parallel or iterative to ensure the trustworthiness of the results.

4.5 Research ethics

Research ethics is a very important aspect to consider in qualitative research. Saunders, Lewis and Thornhill (2009) pointed out that research ethics should be applied in every aspect of research; it starts with the responsibility of the researcher to integrate moral aspects in clarifying the research topic, extends to data-related concerns, such as collecting, analysing, and storing the data, and finally, to writing up the research findings.

In this study, as already mentioned, research ethics had been considered as follows. The empirical study started by seeking approval from the research ethics committees of the University of the West of England. This approval had ensured that the research was undertaken ethically. It was necessary to emphasise the rights of participants and their companies during the data collection. Therefore, steps had been taken to protect their rights. For example, participants' and companies' names were confidential; participants had the right to withdraw partially or entirely from the study; consent from the participants and company were obtained, and the companies were notified about the uses of the research findings and offered a guarantee that the results would be used for research purposes only and not affect their businesses in any way. The interviews had been held in venues that were not harmful to the participants or the researcher.

4.6 Chapter summary

There are many ways to introduce phenomena in life by adopting different research methodology approaches. Central to the entire discipline of research methodology is the concept of philosophical assumptions (Creswell, 2014, p.5). Therefore, this chapter started by identifying two of the most recognised philosophical positions and exploring several assumptions related to them. The first section influences the next section which focused on explaining the research design applied in this study: qualitative, quantitative, or a combination of both (mixed method) (Creswell, 2014, p.5).

The following section discussed the background to the case study technique, based on their advantages and drawbacks, to confirm the suitability of the case study as a research method for this study (Creswell, 2014, p.5). Thereafter, data collection strategies and techniques for interpreting the approach in the practice of the case study method were introduced. It clarified procedures for, among others, interview planning, data gathering, and data processing. After that, the chapter discussed issues related to reliability, validity, and research ethics. The next chapter reports the findings of the case study.

Chapter 5 : Case study findings

5.1 Introduction

Chapter 4 focused on examining the research methodology used in this study. This chapter examines the findings in relation to the thematic discussion. Firstly, the results of each case are highlighted, including the definition given of sustainability, beginning with its implementation, and highlighting the main theme as applicable in each case as it is relevant to the study research questions. This improved the validity of the findings, due to the uniqueness of each case's results being independently maintained. Eisenhardt (1989) pointed out that presenting the results of each case enable the researcher to analyse a large amount of data effectively, helping to generate ideas and insights into the problem being investigated.

The discussion then continues by reflecting on the results in a cross cases analysis. This is divided into three main sections. The first section consists of firstly, a thematic discussion of the motivation of sample companies for adopting SSCM. Secondly, there is a discussion of the barriers inhibiting the sample cases from implementing SSCM. Finally, there is a discussion of the enablers identified by the sample cases as being relevant to the development of SSCM.

5.2 Reporting the key findings of each case and focus group

5.2.1 Company A (CA)

The history of company A (CA) can be traced back to 2002. It is owned wholly by Saudi investors (Sustainability report, 2017). The company specializes in supplying materials used in the production of various items that we use in our daily lives. The CA has customers from both inside and outside the Kingdom.

CA recently explored its choices for ensuring sustainability (PDF report). It defined sustainability from the perspective of the triple bottom line, as evidenced throughout the dataset. For example, the sustainability manager defined the company's sustainability as uniting economic planning aimed at fostering growth, while simultaneously promoting environmental and social responsibility (PDF report). The CEO of CA acknowledged the importance of including sustainability in its design, in order to promote continuity of thinking and address concerns relating to economic considerations of the company's environmental and social responsibilities (PDF report).

CA also defined and implemented sustainability in its supply chain, focusing on environmental, social and economic considerations. Thus, CA's sustainability report stated

that sustainability had been integrated into all the company's processes, from the design stage to the final disposal of the product. Similarly, the logistics manager pointed out that the company focused on managing the environmental, social and economic aspects of the supply chain. He illustrated that the company's supply chain has to be cost-effective, eco-efficient in its operations, work on time, be socially responsible, and maintain good relationships throughout the chain's members, and other stakeholders such as government and the community. The following section discusses the factors motivating, inhibiting and enabling the CA to implement SSCM.

5.2.1.1 Company A's motive for adopting SSCM

As represented in the template table 4.6, CA motive for adopting SSCM originated out of the company's responsibility towards stakeholders, and as a way to achieve benefits from the adoption. A strong theme that emerged for this case was CA responsibility towards internal and external stakeholders. More importantly, improving the living standards of the Saudi community by focusing on supporting local suppliers, developing the economy, and protecting the environment appeared to be the main motives leading to SSCM adoption. Table 5.1 presents these themes, illustrated by quotations from company statements in relation to each theme.

Table 5.1: Key factors that act as a motive for company A

| Key factors that act as a motive | CA: Documents coding reference | CA: Interview coding reference | Illustrative quotation |
|--|--------------------------------|--------------------------------|--|
| Responsibilities of business to internal and external stakeholders | 23 | 15 | |
| 1: Responsibilities toward community | 0 | 0 | |
| B Locally Conservation of the local ecosystem Development of the Saudi economy Safety | 16 | 5 | "The second commitment is to make sure that people and the environment remain safe, because, in the end, we are responsible for this aspect and it determines our social values." (Logistics manager) |
| 2 Responsibility toward employees' health and safety | 5 | 1 | "The safety of our workforce is an essential priority." (Sustainability report, 2017) |
| 3 Responsibility toward industry development | 0 | 7 | "First of all, before any financial considerations, we are committed to being an active member in the industry development of sustainability in the region." (Logistics manager) |
| 4 Responsibility toward local suppliers and entrepreneurial development | 2 | 2 | "Now we have reached a different level, we try to ensure all our manufacturing is undertaken internally, so we no longer purchase from outside the country. We localize the sourcing of materials, thus ensuring a responsibility for supporting local suppliers." (Logistics manager) |

5.2.1.2 Company A's barriers to SSCM adoption

Based on the template provided, CA engages with external stakeholders, including government, supplier, and customer barriers that inhibited them from adopting SSCM. As the logistics manager pointed out, "the problem is outside because the supply chain is outside". The strong theme that emerged from this case was the government barrier. Most importantly, inefficient customs policy and lack of port infrastructure hindered the company's efforts towards SSCM implementation. One negative implication of this was that the company had to deal with an increase in shipment costs as there were delays in processing the shipment. Delays to the processing of the shipment effected the satisfaction of the company's customers. Table 5.2 presents those themes, and illustrative quotations of company statement in each theme.

Table 5.2: Key factors that act as a barrier for company A

| Key factors that act as a barrier | CA: Documents coding reference | CA: Interview coding reference | Illustrative quotation |
|--|--------------------------------|--------------------------------|---|
| Government | 4 | 33 | |
| 1. lack of Infrastructure A. Poor logistics infrastructure B. Poor waste infrastructure | 1 | 9 | "The world has passed us by when it comes to logistics, particularly in terms of data sharing, documentation, the automation process, speed of processing and hardware. There are things that, until now, have not reached us and we were unaware of them. (Logistics Manager) |
| 2. lack of regulation, support, and guidance from regulatory authorities | 1 | 3 | "Until now, the government has not forced companies to adopt sustainability initiatives, but respected companies, and those that respect themselves and their society, have considered it to be a commitment. Our own company is committed." (Logistics manager) |
| A Customs authority Customs clearance delay lack of transparency lack of good policies lack of safety standards Lack of technical expertise | 0 | 15 | "Customs is a barrier; they do not have sufficient understanding of the concept of sustainability." (Logistics manager) |
| Negative impact | | | |
| 1 Economic implication A. Decreasing profitability B. Increasing shipment cost | 0 | 5 | "Today, the company is supposed to make \$100, but because of the customs delay we may make only \$20. This of course impacts on our profitability, which impacts on our ability to invest in sustainability initiatives." (Logistics manager). |
| 2 Environment implication A. Impact on waste management strategy | 2 | | "CA faced barriers to comprehending a broad waste management approach because of 'inconsistent regulations and enforcement', demanding that the company 'eliminates the generation of harmful effects and supports efforts to promote a more sustainable society'". (Sustainability report, 2017) |
| 3 Social implication A. Hinder safety initiatives innovation | 0 | 1 | "Government procedures and policies are hindering the company's efforts to take control of the development and facilitate some of the industry's safety initiatives. The government's procedures should be at a sufficient level if we want to implement sustainability". (Logistics manager) |

5.2.1.3 Company A's enablers of SSCM adoption

According to the template mentioned above, CA had explored various enablers, which facilitated SSCM implementation. The enablers had been categorised according to performance measurement, CSR, stakeholder engagement, sustainability strategy, sustainability culture, and technology. A strong theme to emerge from this case was the

importance of top management, as they found to have strong commitment, long-term vision and skills pertaining to how SSCM could be implemented at the company. The top management commitment passed to employees who ended up delivering high social and environmental performance throughout the supply chain. Table 5.3 presents these themes, illustrated by quotations from the relevant company in each theme.

Table 5.3: Key factors that act as an enabler for company A

| Key factors that act as an enabler | CA: Documents coding reference | CA: Interview coding reference | Illustrative quotation |
|--|--------------------------------|--------------------------------|---|
| Management | | | |
| Senior management commitment and responsibility | 5 | 5 | "The idea that people in power have a commitment to sustainability, and what they have done, is honestly magnificent." (Logistics manager) |
| Senior management vision and skills | 2 | 1 | "The management has a clear vision, as well as skills allowing them to play an active role in the improvement of sustainability strategies and overall performance." (Logistics manager; Sustainability report, 2013) |
| Positive impact | 20 | 22 | |
| <ul style="list-style-type: none"> • Creating a sustainability culture will be hard to change • Defining roles and responsibilities • Guidance, providing information, mentoring for the employees or leadership • Influential on other CEO partners • Overcoming any internal barriers to the sustainability implementation • Showing the importance of the KPI for monitoring sustainability performance • Structure sustainability plans and policies • Structure sustainability strategy • Support the company when collaborating with non-governmental organizations • Establishing and supporting sustainability teams | | | <p>"Our management is magnificent, it has put everything in place, we are motivated and now embrace this culture. Now, all new employees understand this, so it would be difficult for any of them to remove something good from the procedure." (Logistics manager)</p> <p>"The roles and responsibility of sustainability execution have been defined by the company's top management." (Sustainability report, 2014)</p> |

5.2.2 Company B (CB)

Company B (CB) was established two decades ago to meet the objective of creating an industry that helps the country to diversify its economy from oil. Its operations encompass a number of different subsidiaries that cover most of the industry's value chain. The company is one of the largest in the world in its industry, and its products are being sold all over the world (PDF report).

The sustainability manager pointed out that sustainability considerations at the company had been developed in two phases. Phase one has been integrated, since its inception, as the company objective is to "champion the new sector; creating a new job and protecting the natural resources". This phase had recently been developed to create a sustainable holistic strategy for the business, following the company's audit of their sustainability practices

having identified: firstly, a lack of any sustainability strategy; secondly, that the company engaged in few initiatives aimed at developing local communities; and thirdly, having no measures in place to promote sustainability (Sustainability report).

Sustainability at the company is defined now according to three aspects, environmental, social, and economic, as mentioned across the case data set; these three aspects have been implemented across all the company's activities. For example, the sustainability manager defined sustainability in the supply chain as "create an ecosystem that respects the planet, people and economy at the same time". The company's webpage showed that it endorsed the definition of sustainability as proposed by the World Business Council for Sustainable Development: "the continuing commitment by business to behave ethically and contribute to economic development, while improving the quality of life of the workforce and their families as well as of the local community and society at large". Next is highlighted what motives, inhibits and enables the CB to implement SSCM.

5.2.2.1 Company B's motives for adopting SSCM

As shown in the table 4.6, the company was motivated to adopt SSCM as part of its responsibility towards internal and external stakeholders, as a way to achieve particular benefits. The category concerning responsibility towards internal and external stakeholders was more apparent here than other themes. This theme was also linked with another strong theme and emerged from a case related to the company founder's (government) demands. The founder demanded that the company be responsible for the development of the Saudi community by creating a job, preserving the environment and developing the industry and the local supplier. Table 5.4 presents these themes, illustrated by quotations from company statements in relation to each theme.

Table 5.4: Key factors that act as a motive for Company B

| Key factors that act as a motive | CB: Documents coding reference | CB: Interview coding reference | Illustrative quotation |
|--|--------------------------------|--------------------------------|--|
| Responsibilities of business to internal and external stakeholders | 24 | 4 | |
| 1: Responsibilities toward community | | | |
| B Locally Conservation of the local ecosystem Development of the Saudi economy Safety | 14 | 3 | "CB will undertake and support activities addressing the environmental and social impacts of our operations on the communities in which we operate." (Sustainability manager) |
| 2 Responsibility toward employees' health and safety | 2 | | "CB conducts its business in a safe environment that helps to prevent accidents resulting in any fatality, bodily injury or illness, as well as damage to property and a negative impact on the environment." (Sustainability Report, 2014) |
| 3 Responsibility toward industry development | 5 | 1 | "We are in industry with a bad history. At the same time, we are one of the ancient industries that have contributed to humanity. So, working in this industry puts more pressure on us, in particular, to show that our industry can contribute to sustainable development." (Sustainability manager) |
| 4 Responsibility toward local suppliers and entrepreneurial development | 3 | | "Adopting sustainability standards across all our operations, as well as strategic sourcing and increasing the inclusion of local content in our supply chain." (PhD Report, 2017) |
| Pressure on business from external stakeholders | 0 | 6 | |
| Responding to government public fund pressure (founder) (Company B) | 0 | 6 | "CB is not an exception. CB is a company established by the government to champion a new sector in Saudi Arabia, and to make sure that it provides decent jobs and natural resources are managed in the correct way and in the right market. So, we are not an exception." (Sustainability manager) |

5.2.2.2 Company B's barriers to SSCM implementation

As detailed in the table 4.6 above, some barriers existed inhibiting CB from SSCM implementation. These barriers were categorised in reference to external stakeholders; including the government, investors, and other barriers as well as the internal stakeholder barrier. Lack of sustainability and commitment from high-level people in the Kingdom was another issue that was a strong theme to emerge from this case, such as members of senior management and the boards of Saudi organisations, as well as government leaders. The lack of commitment from them caused Saudi companies to focus on short term results, whereas sustainable investment was needed long term to focus on guaranteeing returns. The company, therefore, faced difficulties transforming the company's sustainability agenda, prompting further action in the supply chain. Table 5.5 presents these themes, illustrated by quotations from company statements in relation to each theme.

Table 5.5: Key factors that act as a barrier for company B

| Key factors that act as a barrier | CB: Documents coding reference | CB: Interview coding reference | Illustrative quotation |
|---|--------------------------------|--------------------------------|---|
| Investor | | 7 | |
| Lack of investor interest except for government public investment funds | | 5 | "The only investor that might have some concerns, other than government, is the Public Investment Fund (PIF). Particularly when it comes to other institutions lacking concern for the environment. They also show little interest in any social aspects, including health and safety, but are only concerned about governance, and even then, it's not...it's the board structure." (Sustainability manager) |
| Negative impact | | | |
| Economic implications •Focusing on short term results | | 2 | "Everyone wants to create short-term profit, to convince the investors that the company is a good investment opportunity. (Sustainability manager) |
| Management | | 12 | "People are the barriers; especially the top people, such as the top management, the board, and government, etc." (Sustainability manager) |
| Lack of sustainability champion on board at the organization | | 1 | "In any company it has to come down from the top to the bottom. For example, in CB, we don't currently have anyone on the board acting as a sustainability champion. But if we had a champion who really believed in sustainability, or even an advisor on sustainability for the board, I think we would be in a much better position than now." (Sustainability manager) |
| Senior management and board at Saudi organizations A Lack of senior management and board level commitment | | 5 | "If they are not educated, if they are used to simply doing lip service about sustainability, they just give you the talk, but they are not walking the walk. You know, they just talk the talk, and this the limit of the engagement of our businesses in Saudi Arabia, and in the Middle East. People are talking the talk. Nobody is walking the walk." (Sustainability manager). |
| Negative impact | | | |
| The difficulty in transforming the company sustainability agenda into action, or less commitment toward sustainability implementation | | 5 | "Sustainability is a macro-concept, it's not a micro-concept. My personal view (and I hope I'm wrong) is that all attempts to do it bottom-up are not successful. It's a macro-concept. You have to do it top-bottom. You don't do it bottom-up. (Sustainability manager) |
| Focusing on short term result | | 1 | "Short-term profit is killing the company. Company needs a macroeconomist, and that is very important. This is one of the barriers." (Sustainability manager) |

5.2.2.3 Company B's enablers of SSCM implementation

As shown in the table 4.6 above, enablers existed for CB, in terms of SSCM implementation. These enablers were categorised according to performance measures, CSR, and stakeholders including external ones like the government, suppliers, non-government associations, and internal ones like top management and employees, as well as sustainability strategies, sustainability culture and technology. A strong theme that emerged from this case was the

significance of the government's Saudi 2030 Vision. This has helped to accelerate SSCM implementation in the company, as the government owns most of the stock of large companies' in the Kingdom.

The sustainability manager pointed out that, since the introduction of Vision 2030, there have been few questions concerning the importance of: (1) developing the presence of, and purchasing from, local suppliers; (2) hiring and empowering women within an organisation; or (3) implementing eco operations to enable resources to be managed efficiently and effectively. He also noted that this vision has helped to construct a discussion concerning sustainability between large companies in the Kingdom, thereby enabling the implementation of SSCM. Table 5.6 presents these themes, illustrated by quotations from company statements in relation to each theme.

Table 5.6: Key factors that act as an enabler for company B

| Key factors that act as an enabler | CB: Documents coding reference | CB: Interview coding reference | Illustrative quotation |
|--|--------------------------------|--------------------------------|--|
| Government | | 20 | |
| Saudi Vision 2030 | | 7 | "So, I see them...strangely enough, I see that our government is an enabler, pushing us to be better companies, especially now with 2030." (Sustainability manager) |
| Positive impact | | | |
| Environmental implications Extra pressure toward environmental implementation | | 1 | "The government, for us...in our case at B, and even in other cases, has played a beautiful role in pushing these companies beyond their limits when it comes to hiring locals; developing the skill markets and general environmental compliance." (Sustainability manager). |
| Social implications Extra pressure toward Saudization hiring Extra pressure/support toward content localization | | 4 | "It's through policy. For example, as I said, through local content development. It was a question of asking 'why', and since the introduction of 2030 a big part of this has resulted in the use of local content. There is also a national committee on local content. They really enforce company targets." (Sustainability manager). |
| Other implications Unifying the sustainability discussion among all actors Acceleration in sustainability adoption from why to how | | 8 | "To be honest with you, because of 2030. During these twenty years...God, things changed so much for us when it comes to sustainability. It has changed from the question of 'why' to the question of 'how'. And now we've already found what 'how' looks like — we have a department for that. The question has now turned from 'why' and 'how' to 'what'. Now, what exactly can we gain from this? What exactly should we do for that? And so on. It's even changing the dialogue between companies." (Sustainability manager) |

5.2.3 Company C (CC)

Company C (CC) was established many years ago, and its operations encompass different subsidiaries, covering the industry value chain, from acquisition of raw materials to delivery to its customers worldwide. In terms of the consideration of the environment, the social and the economic aspect is integrated into all the company's decisions, as it has engaged in a strategy for sustainable development in the Kingdom since its establishment. The procurement manager mentioned that the company's supply chain activities must support such objectives. The following section highlights what motives, inhibits and enables CC to implement SSCM.

5.2.3.1 Company C's motives for adopting SSCM

As shown in the table 4.6 above, CC was motivated to adopt SSCM as a way to achieve benefits and be responsible for internal and external stakeholders. The responsibility taken towards internal and external stakeholders proved to be a salient motive for SSCM adoption. A strong theme to emerge from this case was that adoption resulted from the demands of the founders, specifically a second sub-category of stakeholders. The founder in this case was the government. The government demanded that the company execute sustainability initiatives, because as explained by the procurement manager, his company had obtained a strong capacity and resources that could have been expected to exceed government capabilities. Overall, he pointed out that the government, as founder required support from the company to develop the country, by creating jobs, preserving the environment and developing local suppliers. Table 5.7 presents those themes, and illustrative quotations of company statement in each theme.

Table 5.7: Key factors that act as a motive for company C

| Key factors that act as a motive | CC: Documents coding reference | CC: Interview coding reference | Illustrative quotation |
|---|--------------------------------|--------------------------------|--|
| Pressure on business from external stakeholders | | | |
| Responding to government public fund pressure (founder) | | 2 | <p>“Top management’s views on sustainability aspects, as well as their motives. But I think, as I said before, because the company is owned by the government, maybe the top management support this because they want to improve the image of the company in the eyes of the investors which, in this case is the government.” (Procurement manager)</p> <p>“In terms of capabilities and resources, CC can support the government when it comes to the development of the country and this why the government pushes the company to engage in sustainability.” (Procurement manager)</p> |

5.2.3.2 Company C's barriers to SSCM implementation

As shown in the table 4.6 above, CC faced barriers that inhibited them from SSCM adoption. These barriers related to the external stakeholder category, such as supplier, government and other barriers. The notable theme that emerged in this case was the governments influence on the company's SSCM implementation. Lack of logistics infrastructure, lack of education supporting supply chain concepts and lack of regulation, support and guides, and inefficient customs were factors mentioned by CC as government barriers inhibiting their adoption of SSCM. This was found to have economic and social implications that inhibited the company's implementation of SSCM. Table 5.8 presents those themes, and illustrative quotations of company statement in each theme.

Table 5.8: Key factors that act as a barrier for company C

| Key factors that act as a barrier | CC: Documents coding reference | CC: Interview coding reference | Illustrative quotation |
|---|--------------------------------|--------------------------------|---|
| Government | 2 | 17 | |
| lack of Infrastructure Poor logistics infrastructure | | 3 | "There are poor logistics in the Kingdom, resulting in a lack of potential to develop sustainability in the supply chain." (Procurement manager) |
| poor education system regarding supply chain and sustainability concept | | 1 | "Public universities do not offer anything to support and enhance understanding of supply chain management and sustainability. The issue concerns the existence of a gap between universities and the needs of the private sector." (Procurement manager) |
| lack of regulation, support, and guidance from regulatory authorities Lack of consistency in the regulations between government authorities Lack of commitment from regulatory authorities Lack of data about qualified suppliers Customs authority | | 6 | "The information you want from the government is not there or is not useful. If the company needs anything, including information, it must look within the company." (Procurement manager) "For example, we needed to know how many suppliers were working in the Kingdom, so we contacted a government agency in order to find out the number. The agency did not have accurate information about the real numbers and the kind of business." (Procurement manager) |
| Negative impact | | 7 | |
| Economic implication A. Decreasing profitability | | 2 | "When a shipment enters into the Kingdom, a tax is taken again. It means that, instead of paying 5%, I pay 10%. This is all because there is no trust and transparency between the gulf customs." (Procurement manager) |
| Social implication Hindering the company effort to attract investors for localization content Hindering the company effort to buy from local suppliers Hindering the company effort toward the development of SSCM understanding | | 3 | "The company cannot buy from a local supplier if it doesn't know how the product has been produced. This is very important to us, as it gives our customers confidence in our products and all this is down to the customs system." (Procurement manager) "The global investor with whom we work has no wish to build a plant in the Kingdom, because of a lack of infrastructure and policies." (Procurement manager) |
| Other implications Impact on company resources | | 2 | "If the company needs anything, including information, it must find it within the company. This takes resources of money, people and time, which makes our job of supporting local suppliers and the environment very challenging." (Procurement manager) |

5.2.3.3 Company C's enablers of SSCM implementation

As shown in the table 4.6 above, CC had enablers that facilitated SSM implementation. The company was engaged in CSR, performance measurement, stakeholder engagement, external (government- non-government and supplier) internal (management- employee), sustainability culture, sustainability strategy, and technology. It seemed that the strong theme that appeared from this case was associated with technology. Innovation is in the area of sustainable technology; and company processes were vital for ensuring the implementation of environmental and social aspects of SSCM. The company's homepage noted that CC is currently investing heavily in the development of highly advanced research centres located around the world. These research centres collaborated with renowned universities and other research centres, which helped advance sustainability and innovative technology, as well as to improve the development of sustainability throughout the supply chain. Table 5.9 presents those themes, and illustrative quotations of company statement in each theme.

Table 5.9: Key factors that act as an enabler for company C

| Key factors that act as an enabler | CC: Documents coding reference | CC: Interview coding reference | Illustrative quotation |
|--|--------------------------------|--------------------------------|--|
| Technology | | | |
| Technologies applied by the organization Applying the latest technology Reduction of waste technology Tracking software and hardware technologies | 30 | 4 | <p>“One of the enablers is the use of advanced technology and information systems.” (Procurement manager)</p> <p>“The company has an advanced centre combining operational data and analysis, so as to improve the management of the company’s energy consumption.” (Procurement manager)</p> <p>“This is how CC operates —on the leading edge of science and creativity — helping the sector to become more beneficial and sustainable.” (CEO, Webpage, 2018)</p> |
| Positive impacts Encouragement of the adoption of advanced sustainability Monitoring and reporting sustainability progress Strengthening stakeholder engagement Allowing improvement of sustainability performance | 19 | 3 | <p>“Our adoption of energy technologies has led to a reduction in the consumption of energy in the company’s building and transportation, which has also helped us to benefit the environment. (Procurement manager)</p> <p>“The development of technology has promoted and enhanced the sustainability performance of the company.” (Procurement manager)</p> <p>“The company’s systems allow the company to engage with suppliers, so we can more easily exchange information concerning sustainability issues.” (Procurement manager)</p> |
| Research centre | 17 | | <p>“Sustaining a global research centre is vital for enabling sustainability. We focus our efforts on improving the sustainability of both our upstream and downstream activities. (Webpage, 2018; Sustainability report, 2014)</p> |

5.2.4 Company D (CD)

The company’s history dates to two decades earlier. It is a publicly traded Saudi joint-stock company listed on the Tadawul, the Saudi stock exchange. It produces high specialised materials for use in 20 products, such as in the automotive industry, electronics, textiles, agriculture, footwear, packaging, paints, construction, pharmaceuticals, and solar panels. Sustainability infers that the company is responsible for meeting social, environmental, and economic objectives for both current and future generations (Sustainability report). This definition is integrated into all the company processes, including the supply chain, as highlighted by the logistics and supply chain manager. Next is highlighted what motives, inhibits and enables the CD to implement SSCM.

5.2.4.1 Company D’s motives for adopting SSCM

As shown in the table 4.6, CD motives in terms of SSCM adoption focused on the company’s desire to achieve benefits, and its responsibility towards internal and external stakeholders. The strong theme that emerged from this case was the company’s responsibility towards the internal and external stakeholder. Most importantly, the development of the local community involving saving the environment, by enhancing the Saudi economy and developing the industry in the region. Table 5.10 presents these themes, illustrated by quotations from company statements in relation to each theme.

Table 5.10: Key factors that act as a motive for company D

| Key factors that act as a motive | CD: Documents coding reference | CD: Interview coding reference | Illustrative quotation |
|--|--------------------------------|--------------------------------|---|
| Responsibilities of business to internal and external stakeholders | 10 | 4 | |
| 1: Responsibilities toward community | | | |
| B Locally Conservation of the local ecosystem Development of the Saudi economy Safety | 7 | 2 | <p>“Sustainability is mandatory; it is an opportunity to create jobs and a good life for everyone and this has a positive reflection on the company. Sustainability is a must not a choice.” (Logistics and Distribution/Supply Chain, manager)</p> <p>“CD is committed to the highest quality standards in all its activities, from products to the integrity of the surrounding environment and to the safety of its employees. This is what we consider to be our purpose.” (Sustainability report, 2015)</p> <p>“The socio-economic value we create through our business activities.” (Sustainability report, 2017)</p> |
| 2 Responsibility toward employees' health and safety | 2 | 1 | “The adoption of sustainability shows our responsibility to the safety and health of our employees and community.” (Logistics and Distribution/Supply Chain, manager) |
| 3 Responsibility toward industry development | | 1 | “CD is adopting sustainability in order to improve sustainability standards in the industry.” (Logistics and Distribution/Supply Chain, manager) |
| Responsibility toward local supplier | 1 | | “CD is responsible for supporting local suppliers and contractors.” (Sustainability report, 2015) |

5.2.4.2 Company D's barriers to SSCM implementation

As shown in the table 4.6, CD faced barriers that inhibited their move towards SSCM adoption. These barriers related to external stakeholders, including the government and suppliers. A strong theme that emerged from the case concerned government barriers. Logistics infrastructure and lack of policy, support, and inefficient customs were factors associated with the government barriers inhibiting the implementation of SSCM. Table 5.11 presents those themes, and illustrative quotations of company statement in each theme.

Table 5.11: Key factors that act as a barrier for company D

| Key factors that act as a barrier | CD: Documents coding reference | CD: Interview coding reference | Illustrative quotation |
|--|--------------------------------|--------------------------------|--|
| Government | | 5 | |
| lack of Infrastructure Poor logistics infrastructure | | 1 | “Infrastructure is everything that impacts on others. If you have poor infrastructure, it impacts on the logistics. For example, you will save money if you have a train running between an industrial city and the main city, which is the port. This is better than having a hundred trucks loaded with dangerous materials, passing our street, where any accident would result in a catastrophe for the community. Having a train solves this problem. Also, the employees living in the industrial city can use this train to travel to work instead of using their cars, so reducing accidents in the street. (Logistics and Distribution/Supply Chain, manager) |
| lack of regulation, support, and guidance from regulatory authorities lack of Customs policies Negative impact | | 1 | “Custom regulation is a barrier, which results in slowing up shipment clearance and so losing you money. Customs also have issues related to trust and collaboration.” (Logistics and Distribution/Supply Chain, manager) |
| Economic implication A. Decreasing profitability | | 2 | “You are going to save money if you have a train.” (Logistics and Distribution/Supply Chain, manager) |
| Social implication Hindering the company effort to ensure the safety of the community | | 1 | “Using a train will help you to save peoples' lives”. (Logistics and Distribution/Supply Chain, manager) |

5.2.4.3 Company D's enablers of SSCM implementation

As shown in the table 4.6 CD had obtained enablers that facilitated the process of SSCM implementation. They had CSR, performance measurement, stakeholder engagement with the internal (employees, management) and external (customer, government, non-government, supplier), strategy and sustainability culture and technology. A strong theme to emerge from this case was the importance of the commitment and skills of top management, which had a positive influence on employee commitment and skills, so ensuring social and environmental practices were integrated into the supply chain. Table 5.12 presents those themes, and illustrative quotations of company statement in each theme.

Table 5.12: Key factors that act as an enabler for company D

| Key factors that act as an enabler | CD: Documents coding reference | CD: Interview coding reference | Illustrative quotation |
|--|--------------------------------|--------------------------------|---|
| Management | | | |
| Senior management commitment and responsibility | | 1 | "I can say that management commitment towards sustainability is a strong factor." (Logistics and Distribution/Supply Chain, manager) |
| Senior management vision and skills | | 1 | "Top management and the employees are professional and have technical capabilities." (Logistics and Distribution/Supply Chain, manager) |
| Positive impact | 3 | 5 | |
| <ul style="list-style-type: none"> Defining roles and responsibilities Guidance, providing information, mentoring for the employees or leadership Showing the importance of the KPI for monitoring sustainability performance Structure sustainability plans and policies Structure sustainability strategy Support the company when collaborating with non-governmental organizations Establishing and supporting sustainability teams | | | <p>"With its skilful and innovative management team, CD has achieved an improvement in waste disposal and a community-oriented culture, while also maximizing its return on capital." (Sustainability report, 2017).</p> <p>"Throughout the year, the management team monitored the progress of safety, the environment and the health of production activities on a weekly basis." (Logistics and Distribution/Supply Chain, manager)</p> <p>"The company has engaged with a non-government organization focusing on spreading the concept of sustainability throughout the supply chain. This is because the top management support this collaboration." (Logistics and Distribution/Supply Chain, manager)</p> |

5.2.5 Company E (CE)

The establishment at CE is relatively new compared with other cases. It operates in different locations around the Kingdom, and its products are being sold around the world. Its products are used in end products, such as those that we use every day. It is highly ranked and among the most prominent 100 Saudi companies operating in Saudi Arabia.

The marketing and sales manager stated that sustainability has been considered a primary objective since the company's inception. CE's sustainability report demonstrated that

sustainability at the company is defined in terms of long term economic, social, and environmental development. The same report also showed sustainability as being incorporated into all company activities, including the supply chain. It appears that the company implements a responsible care strategy issued by an industry association committing companies, along with their suppliers and customers, to cooperate in continuously improving the environmental, health, safety and security performance of their products and processes. Next is highlighted what motives, inhibits and enables the CD to implement SSCM.

5.2.5.1 Company E's motives for adopting SSCM

As shown in the table 4.6, CE motives for adoption centred on the achievement of benefit and a sense of responsibility towards the internal and external stakeholders. A strong theme that emerged here was the company's desire to be responsible for internal and external stakeholders by protecting the environment, developing the economy, and ensuring the safety of members of the Saudi community. Table 5.13 presents those themes, and illustrative quotations of company statement in each theme.

Table 5.13: Key factors that act as a motive for company E

| Key factors that act as a motive | CE: Documents coding reference | CE: Interview coding reference | Illustrative quotation |
|--|--------------------------------|--------------------------------|--|
| Responsibilities of business to internal and external stakeholders | | | |
| 1: Responsibilities toward community | | | |
| B Locally Conservation of the local ecosystem Development of the Saudi economy Safety | 5 | | "Sustainability is built on three pillars: People, Planet and Prosperity. These pillars address all of our activities, showing our commitment to the protection of the environment and the welfare of our employees and community." (Webpage, 2018; sustainability report, 2016) |
| 2 Responsibility toward employees' health and safety | 1 | 1 | "We have responsibility to protect the health and safety of our employees, contractors, community, assets and the environment. (Marketing and sales manager) |
| Responsibility toward local suppliers and entrepreneurial development | 1 | | "To support and encourage local suppliers, including: (1) Holding regular meetings with local manufacturers to open channels of communication and reach optimum solutions for any obstacles and problems and (2) the development of new methods of working." (Webpage, 2018) |

5.2.5.2 Company E's barriers to SSCM implementation

As shown in the table 4.6, the company encountered barriers that limited their rate of SSCM adoption. These barriers were categorised in reference to external stakeholders (government

and investors), and internal stakeholders, which included lack of understanding on the part of top management. The study also found that government related barriers were an important theme. Lack of waste and logistics infrastructure, and lack of pressure on the company to adopt sustainability were mentioned by the manager as the chief barrier to SSCM implementation. Table 5.14 presents those themes, and illustrative quotations of company statement in each theme.

Table 5.14: Key factors that act as a barrier for company E

| Key factors that act as a barrier | CE: Documents coding reference | CE: Interview coding reference | Illustrative quotation |
|---|--------------------------------|--------------------------------|---|
| Government | | | |
| lack of Infrastructure Poor logistics infrastructure | | 1 | “Logistics’ infrastructure is weak and under developed in the country and fails to support our sustainability initiatives.” (The marketing and sales manager) |
| lack of regulation, support, and guidance from regulatory authorities lack of Customs policies | | 1 | “There are other reasons. There is a lack of any pressure or support for top management from either government or investors when it comes to adopting and expanding sustainability in the company.” (The marketing and sales manager) |

5.2.5.3 Company E’s enablers of SSCM implementation

As shown in the table 4.6, the company also had enablers categorised according to CSR, performance measurement, stakeholders, including external ones (government, non-government, suppliers), and internal ones (employee and management, technology, sustainability culture, and strategy). It was very challenging in this case to detect a salient theme as no theme emerged as the main enabler for Company E.

5.2.6 Company F (CF)

CF was established many years ago. It is considered one of the biggest companies among the 100 Saudi companies operating in the Kingdom. It is also known for outstanding achievements at the international level (PDF Report). The company operations cover the entire the value chain, from raw material production to the end customer.

As presented on the company webpage, sustainability is defined as the integration of the environment and economy with social issues. This forms an integral part of all the processes and decisions, focussing on achieving the objectives of sustainable development. The company webpage also highlights that chain members should take these dimensions into consideration. The following section highlights the factors motivating, inhibiting and enabling CF to implement SSCM.

5.2.6.1 Company F's motives for adopting SSCM

As shown in the table 4.6, the company was motivated to adopt SSCM to achieve benefits and to demonstrate its responsibility to internal and external stakeholders. The strongest theme to emerge from this case was that the company wished to improve the Saudi community by saving the environment, developing the Saudi economy, and ensure employee health and safety. Table 5.15 presents those themes, and illustrative quotations of company statement in each theme.

Table 5.15: Key factors that act as a motive for company F

| Key factors that act as a motive | CF: Documents coding reference | CF: Interview coding reference | Illustrative quotation |
|--|--------------------------------|--------------------------------|---|
| Responsibilities of business to internal and external stakeholders | | | |
| 1: Responsibilities toward community | | | |
| B Locally Conservation of the local ecosystem Development of the Saudi economy Safety | 3 | | "CF is committed to reduce pollution, as well as protect the environment and public health, while supporting sustainable development." (PDF report, 2018) |
| 2 Responsibility toward employees' health and safety | 1 | 1 | "The company once used a product it subsequently discovered caused damage to the health of its employees. We changed it because we care for our employees' health." (Senior Vice President, supply chain) |

5.2.6.2 Company F's barriers to SSCM implementation

As shown in the table 4.6, the company faced barriers to adoption of SSCM. These barriers were related to factors associated with external stakeholders, that been categories based on the government, the supplier, the customer, and other barriers. A strong theme was associated with the inefficiency of government laws; and poor education system regarding supply chain and sustainability concept were the main barriers. These main barriers had hindered for example the localisation of material strategy of the company in the supply chain. Table 5.16 presents those themes, and illustrative quotations of company statement in each theme.

Table 5.16: Key factors that act as a barrier for company F

| Key factors that act as a barrier | CF: Documents coding reference | CF: Interview coding reference | Illustrative quotation |
|--|--------------------------------|--------------------------------|--|
| Government | | | |
| poor education system regarding supply chain and sustainability concept | | 1 | “There are no skilled workers familiar with supply chains and sustainability.” (Supply chain manager) |
| lack of regulation, support, and guidance from regulatory authorities | | 2 | “Laws and regulations, along with the speed of change when it comes to these laws and regulations. For example, the new laws about labour fees and the charges relating to visas, as well as salary increases, have resulted in higher costs for hiring workers for our suppliers. This has consequently impacted on the financial statements of many suppliers and can expose our company to risk.” (Senior Vice President, supply chain) |
| Negative impact | | | |
| Social implication Hindering the company effort to buy from local suppliers | | 1 | “After undertaking some research, we found that the fees and new laws implemented by the government were one of the reasons for the local supplier being placed in an adverse financial position. This influences our localization of materials in the Kingdom.” (Senior Vice President, supply chain) |

5.2.6.3 Company F’s enablers of SSCM implementation

As shown in the table 4.6, the company had enablers that helped them with SSCM implementation. These enablers were categorised based on CSR, performance measurement, stakeholders, including external ones, customer-supplier government and non-government association, and internal stakeholders, management and employees, sustainability strategy, and the company’s culture and technology. A strong theme that emerged from this case was top management support, vision and skill, as a main enabler of SSCM implementation. Table 5.17 presents those themes, and illustrative quotations of company statement in each theme.

Table 5.17: Key factors that act as an enabler for company F

| Key factors that act as an enabler | CF: Documents coding reference | CF: Interview coding reference | Illustrative quotation |
|---|--------------------------------|--------------------------------|--|
| Management | | | |
| Senior management commitment and responsibility | | 2 | “The company’s executive effort and commitment and action contributed to the realization of the sustainability goals.” (Senior Vice President, supply chain) |
| Senior management vision and skills | | 2 | “Top management’s vision and their orientation, because this supports and designs the sustainability strategy. Therefore, the board of directors and management form one of the enablers.” (Supply chain manager) |
| Positive impact | 1 | 2 | |
| <ul style="list-style-type: none"> Showing the importance of the KPI for monitoring sustainability performance Establishing and supporting sustainability teams | | | <p>“We have achieved significant improvement in the field of health and safety. Now, we have safety policy regarding warehouses, along with drivers and trucks. This all took place as a result of the support of top management. (Senior Vice President, supply chain)</p> <p>“The sustainability performance of the company is reviewed by the board of directors at the end of year. They have just approved the establishment of a localization department, which will enhance our social responsibility toward our suppliers and the creation of jobs inside our supply chain.” (Senior Vice President, supply chain)</p> |

5.2.7 Focus group (FG)

The focus group approach was adopted to enhance the findings by cross-checking the reliability and validity of the data collected from companies. The focus group included members drawn from the government, non-government bodies, the university, and industrial experts. The following section highlights the views of members concerning the aspects motivating, inhibiting and enabling large manufacturing companies to implement SSCM.

5.2.7.1 Company FG's motives for adopting SSCM

The members of the focus group agreed that large manufacturing companies typically adopt SSCM as pressure on business from external stakeholders. Mostly, the government as they invested or the founder of those large companies, which in this case had a role in encouraging large organisations to adopt sustainability as part of their activities. The focus group also stated that large companies engaged in SSCM implementation in order to achieve benefits, primarily those related to economic advantages and an enhanced reputation. Table 5.18 presents these themes, illustrated by quotations from company statements in relation to each theme.

Table 5.18: Key factors that act as a motive for focus group

| Key factors that act as a motive | Academic | Industry experts | Government | Non-government |
|---|---|--|--|---|
| Responsibilities of business to internal and external stakeholders | | | | |
| Pressure on business from external stakeholders | | | | |
| Responding to government public fund pressure (founder) (Company B) | These companies are partially owned by government and therefore may implement social responsibility because of their requirement to follow the government agenda. | These large companies are owned by the government, so the reputation of the company, both domestically and globally, would reflect on the government's own reputation. They therefore tend to adopt sustainability in order to avoid any negative publicity for the government. | | |
| Responding to government Saudi Vision 2030 | | | For example, the companies support the use of local content and buy from the local suppliers, because the government has highlighted this as important in its 2030 vision. | |
| Responding to and anticipating local rules and policies | Pressure from government. | | Government legislation motivates these companies. For example, large companies will not invest in sustainability unless there is government regulation and enforcement in place. | Intensive direct and indirect pressure from the government. |
| Responding to competition among responsible organizations | Following global practices and world standards. | "They adopted sustainability because their competitors. Sustainability is also a way for the company to gain a competitive advantage, not just to reduce costs but to enhance the quality of the process, so the customer knows that the company product has been produced with responsibility standards". | Competitive motives- a company is obliged to keep up with its competitors. | |

| | | | | |
|---|---|---|--|--|
| Benefits | There are a number of indirect returns, including reputation, stakeholder satisfaction, employee loyalty and the ability to sell the product to overseas customers. | | | |
| Economic benefit | Top management need to justify any decision to invest in sustainability practices, linking this with returns from this investment, in particular economic returns. | Companies aim to ensure future profitability, rather than focussing on immediate profits. | The company applying these initiatives must benefit financially from their adoption. | The firm wishes to avoid costs. |
| Local supplier benefit | | There are indirect benefits from supporting local suppliers, including: (1) an economic advantage; (2) shorter lead times; (3) lower levels of cost; (4) a reduction in any need for a large inventory; and (5) environmental benefits, such as reducing the need for transportation. | There is support for local suppliers, in order to eliminate any need to use foreign suppliers, so ensuring materials flow easily, while also supporting the local economy. | |
| Reputation benefit | Enhances the reputation of the companies involved. | Reputation/ brand. | The company's reputation | Management aims to improve the company's reputation, including to board members, government and the community. |
| Market opportunities for business growth globally | | Identification of new customers | Promoting customer confidence in the quality of the product, in order to compete with international companies in terms of product specifications. | Seeking out new customers in new markets. |

5.2.7.2 Company FG's barriers to SSCM implementation

Responders from the focus group highlighted external stakeholder barriers, such as customer, the government, supplier, and investors, and internal stakeholders such as resistance to change from employees as barriers inhibiting large organisations from SSCM implementation. The central theme that appeared here was the government barrier. Mostly, the logistics infrastructure and weakness in the education system and lack of regulatory support were problematic. Guides and monitoring were also reported to inhibit large manufacturing companies from embarking upon SSCM implementation. Table 5.19 presents those themes, and illustrative quotations of FG statement in each theme.

Table 5.19: Key factors that act as a barrier for focus group

| Key factors that act as a barrier | Academic | Industry experts | Government | Non-government |
|--|--|------------------|---|----------------|
| Government | | | | |
| Poor logistics infrastructure | | | A lack of logistics can increase product costs. Currently, there are insufficient supporting logistics in the Kingdom, which tends to have an adverse impact on companies' initiatives. | |
| poor education system regarding supply chain and sustainability concept | | | The Kingdom lacks sufficient educators to ensure a skills' supply chain. There is currently only one university offering a major in supply chains as an undergraduate course. This has proved an issue for companies. | |
| lack of regulation, support, and guidance from regulatory authorities Lack of consistency in the regulations between government authorities | There is a lack of sufficient government monitoring, despite the appropriate laws and policies being in place. | | There is a lack of clarity when it comes to the laws upon which companies can rely, due to differences between government agencies. Each agency has a specialised law with little integration existing between regulations. | |

5.2.7.3 Company FG's enablers of SSCM implementation

Responders also mentioned that large organisations had many enablers that facilitated SSCM implementation. They observed that these companies have CSR, performance measurement, and stakeholder engagement with external (customer- government, non-government associations, supplier) and internal (management and employee) strategies, company culture, and technology. The strong theme also appeared to match many cases that mentioned top management commitment and skills, and employees were the main enablers facilitating SSCM implementation in large manufacturing organisations. Table 5.20 presents those themes, and illustrative quotations of FG statement in each theme.

Table 5.20: Key factors that act as an enabler for focus group

| Key factors that act as an enabler | Academic | Industry experts | Government | Non-government |
|--|--|--|---|--------------------------------|
| Management | | | | |
| Senior management commitment and responsibility Senior management vision and skills | Awareness from the companies' top management, due to most having studied abroad. | Commitment from top management, because they can enforce the adoption of sustainability and drive the ensuing results. | Top management and the leadership of these companies being very strong. | Commitment from top management |

5.2.8 Section conclusion: Main themes

Based on the above, this study found that across all the companies, there was consensus with regard to defining sustainability from the three aspects, environmental, social and economic. With notation that economic sustainability was found to be essential to the case study companies.

In the motive section, all the cases agreed that the real motivation for the adoption of SSCM was to reap benefits rewards and to demonstrate responsibility towards internal and external stakeholders. The most important emphasis was found to be that concerning responsibility towards internal and external stakeholders. However, the results from the focus group highlighted the most significant factor as being pressure from government founders and the need to achieve benefits from the adoption of SSCM.

Furthermore, in the barrier section, all cases and the focus group agreed that the external barriers, and those related to external stakeholders encompassed challenges that inhibited them from completing SSCM implementation. In general, it is interesting to note that all the cases mentioned government barriers as the main salient theme needing to be addressed to ensure successful adoption of SSCM.

In the enabler section, that majority of cases had agreed that internal stakeholders, and top managers were the main enablers for SSCM implementation. In addition, technology and the Saudi 2030 Vision were also key enablers mentioned.

Next section focuses on presentation of study findings across cases.

5.3 Presentation of findings concerning SSCM motives for the sample cases

This section provides an insight to identify and discuss the main motives influencing the investigated sample wishing to adopt SSCM. In total, 25 motivating factors for SSCM adoption were identified from the sample cases and the focus group. These findings are summarised in Figure 5.1.

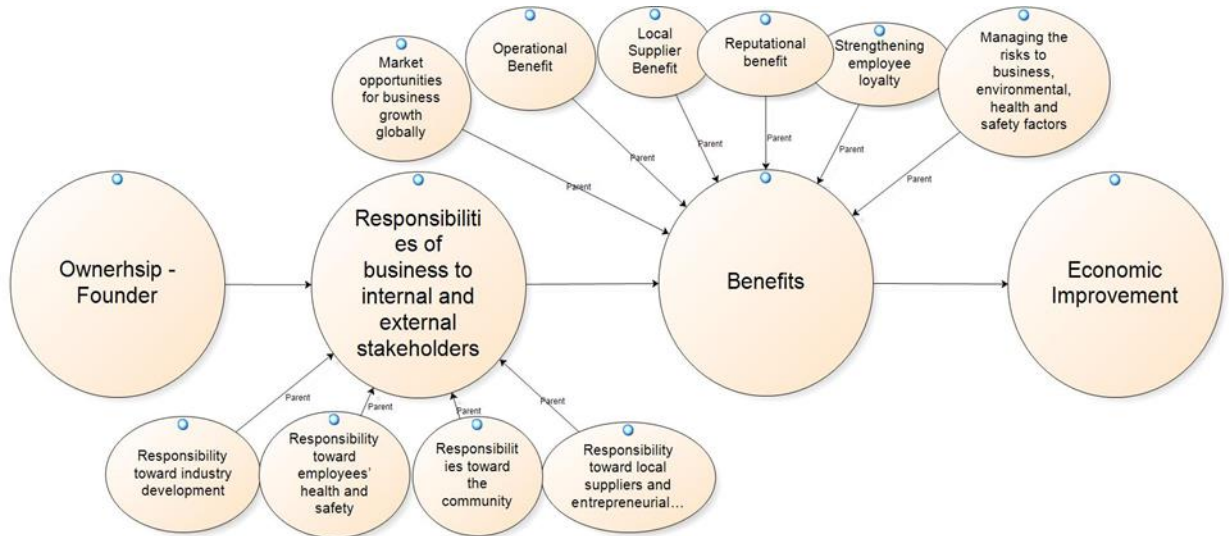


Figure 5.1: key motives to the adoption of SSCM in sample cases

The empirical study reveals that the responsibility toward both the internal and external stakeholders were the chief motivation for the case study companies choosing to embrace SSCM. Figure 5.2 presents a list of the most frequently used words in the stakeholder category nodes to help identify potentially important themes.

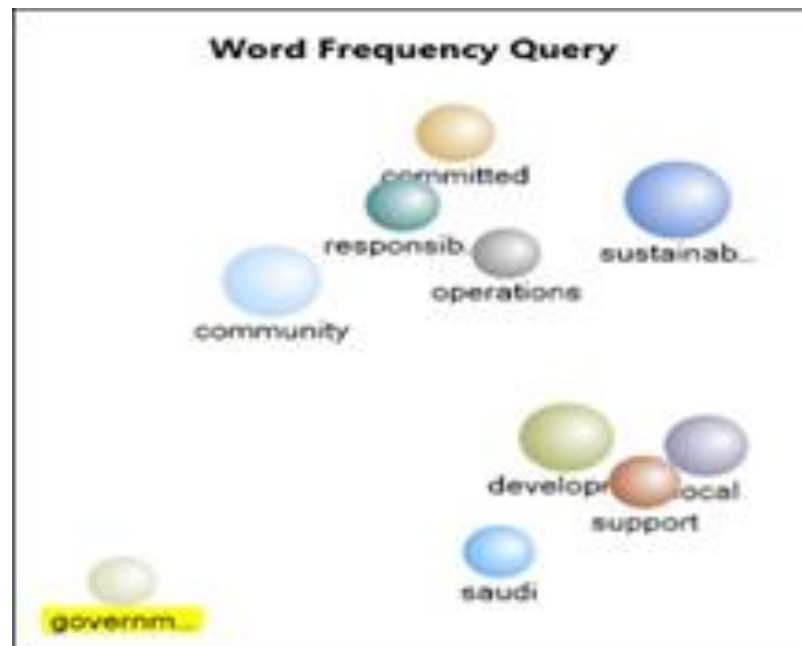


Figure 5.2: Word frequency of stakeholder in the data related to the motive of SSCM

Based on the figure above, “community”, “committed”, “responsible”, “support”, “Saudi”, “local” and “develop” appear to be the most significant elements of the stakeholder category, indicating the important theme of the “responsibilities of business to internal and external stakeholders”. All the sample companies mentioned businesses’ responsibility towards internal and external stakeholders as the primary motive for their SSCM adoption. The procurement manager at CC said the main motive behind sustainability adoption in the supply chain was associated with the company’s “citizenship” and “transparency” towards stakeholders. Two members of the focus groups mentioned that the main factor motivating large Saudi manufacturing companies to adopt SSCM was originated from “the firm’s internal responsibility” (industry expert).

Figure 5.3 illustrates that this chief motivating theme is split into four sub-themes: business (1) responsibility towards the community, (2) responsibility towards local suppliers and entrepreneurial development, (3) responsibility towards industry development, and (4) responsibility towards employees’ health and safety.

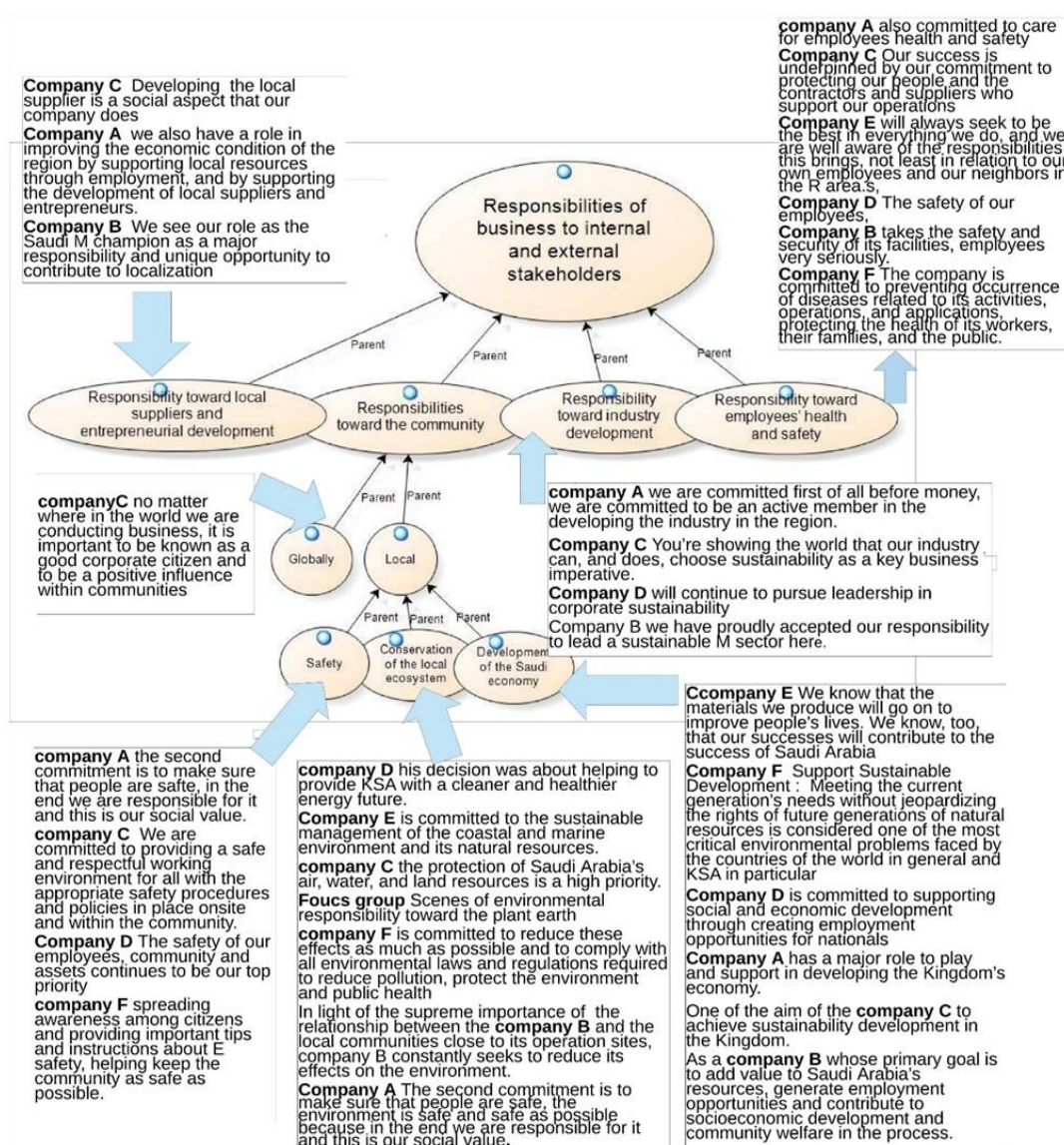


Figure 5.3: Quotations from the sample cases and focus group on the responsibilities of businesses to internal and external stakeholder.

The above figure clearly showed that developing local suppliers and local industry, preservation of national resources, ensuring employees' and the wider community's health and safety, and improving the Saudi economy were all sub-motives of business responsibility, associated with the companies' adoption of sustainability practices in the supply chain. This was highlighted by the sustainability manager at CB as follows:

The purpose of the economy is not generating money. The purpose of the economy is to make people, if I can say, happy and having a very good standard of living in a very liveable ecosystem — an ecological system. So, this is the reason behind the whole economy thing.

The founders of those companies played a critical role in this by disseminating their belief in business responsibility to all stakeholders. The background information about the companies revealed that the Saudi government, through the administering of public funds, was found to be driving SSCM implementation, either as an outright owner or as a major company shareholder. The procurement manager at CC commented, "top management view of sustainability is important, because they want to improve the image of the company in the eyes of the investor, which is the government here". The sustainability manager of CB pointed out that the government had founded the company as a way to open up and develop new sectors in the Kingdom, in "which decent jobs are provided, natural resources are managed, and this is part of the sustainability idea". Three participants from FG agreed that the motivating factor in the adoption of SSCM in Saudi Arabia was the government's ownership of large manufacturing companies.

The result above indicated that the Saudi government was not putting pressure on large manufacturing companies through policies and legislation, but through the capital that had provided them with a voice when directing the large companies in the Kingdom to consider all the stakeholders in their decision-making process.

CA, however, was an exception as the government was not a shareholder in the company. It is owned solely by Saudi investors. This result clarifies that it is typically the company founder, whether the government or another investor, that motivating the adoption of SSCM. Therefore, the company founder's personality, commitment and beliefs about sustainability had been related positively to SSCM adoption by the sample companies.

Further analysis showed that the sample companies had not only adopted SSCM to demonstrate their responsibility towards the Saudi community, but also to achieve short- and long-term benefits. The sustainability manager at CB 'thinks' the motive for his company

adopting SSCM could be explained as a ‘kind of layers building up’ of benefits and responsibility. CC procurement manager also highlighted that the company’s motives for adopting SSCM were not just related to benefits for the community but also to the company. As an example, he reported a time when his company took responsibility in the early stages to develop the logistics sector in the Kingdom; they had proven beneficial in the long term to both the company and the community. CF supply chain managers mentioned that ‘the company has a responsibility towards the adoption of sustainability initiatives, and it will achieve benefits in the long term’.

This study identified eight benefits attained through the adoption of SSCM by the companies investigated. Appendix 7 presents the breakdown of the benefits that each company achieved from SSCM adoption. It includes: (1) economic, (2) operational, (3) reputational improvement, (4) managing the risks to the business environment, health and safety, (5) local supplier benefit, (6) competitive advantages, (7) strengthening employee loyalty, and (8) market opportunities for business growth globally. Figure 5.4 lists the most frequent words in the benefit category nodes, which helps to identify possibly important themes.

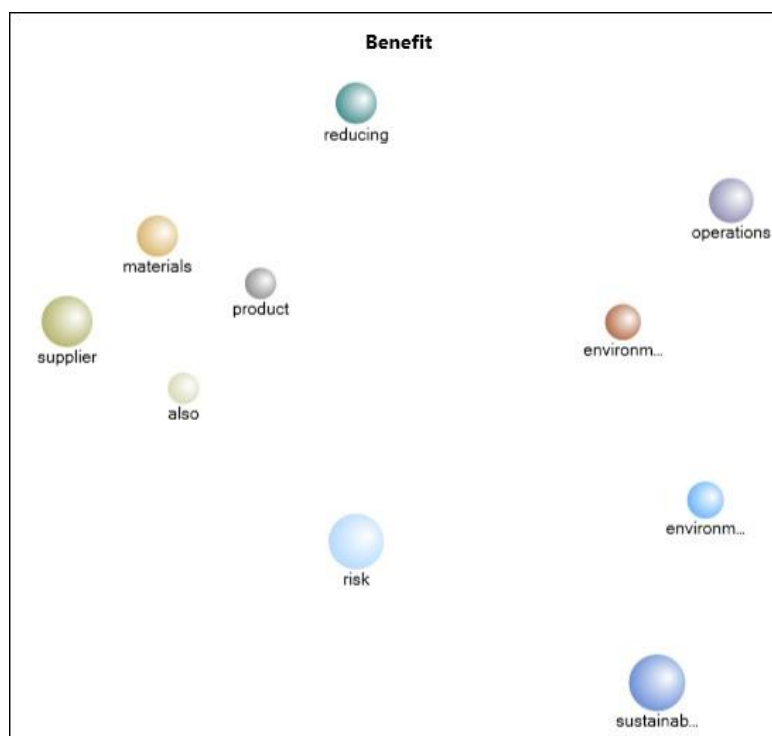


Figure 5.4: Word frequency of benefits in the data related to the motives for SSCM

Based on the figure above, “risk”, “environment”, “operation”, “supplier” appeared the most frequently in the benefits category, which pointed to the importance of the theme “managing risks to the business environment, health and safety”. The sustainability manager mentioned that his company’s motive for SSCM adoption were associated with the need to identify and manage “the risks that we need to mitigate in the economic, social

and governance? What are the opportunities to tap into?” (CB). The logistics manager at CA observed that their product “is highly risky, it is serious”. Thus, integrating sustainability into the company’s practices ensured they were able to “reduce economic, environmental and compliance risks”. This view was shared by the distribution manager at CD. He mentioned that its product is high-risk and needs to be managed “throughout their product life-cycle value chain”. The supply chain managers at CF noted that adopting SSCM enabled them to ensure the safety of their “customers, contractors, and employees”.

One of the risks that CC for example, wanted to avoid involved reducing the dependency on international suppliers, as there was potentially a risk of not “having the raw materials in the right time and place” (The procurement manager). The procurement manager then concluded that there are benefits from being near “the core resources (raw materials) reducing the risks in purchasing”. This was also supported by one FG industry expert, who said that large Saudi manufacturing companies wished to develop local suppliers, as they “may want to maintain and save the security of materials; it is not depending on companies from other countries in providing the materials”.

This was explained further by the supply chain manager of CF, who stated that when suppliers were close to them, the risk of materials being fake or low-quality would be eliminated, because they could inspect them at any moment. This then “ensured the safety and the quality of the material received from them”.

The logistics manager at CA highlighted that choosing suppliers (i.e. service providers) with sustainability practices already in place assisted his company in reducing and managing risk “when the company product transported from point A to point B”. He illustrated this point by suggesting that:

if the company deals with a service provider who does not have safety standards and treats its workers badly and has not trained them... let’s say, I would save money, but the risks of something going wrong in transit would increase. [For example], if the truck crashes for any reason and it burns out completely. Now, I would lose the shipment, time, customer confidence, and jeopardise the community’s safety. All these risks could potentially be avoided by collaborating with a sustainable supplier.

Another example mentioned was that minimising the risk of damaging the environment during the operation. Thus, all the companies investigated had adopted sustainable operations. CC mentioned that implementation of its sustainable operations was considered during the design of the company plant, as environmental damage was “A risk we weren’t willing to take” (sustainability report). CE admitted their operations “posed risks to the environment”. This served to reduce the risk of environmental damage by “developing new processes and procedures to enhance the quality of our day-to-day activities” (sustainability

report). The CA logistics manager claimed that 70% of companies employ integrated sustainability practices in their operations to “optimise the use of resources”, which assists in protecting the environment by reducing emissions.

This study also found that managing and monitoring environmental, and health and safety risks through the SC arose from an economic perspective. CA logistics manager stated that “the risk is, in the end, money”. CB and CD found that a failure to manage environmental, as well as health and safety, risks throughout their supply chain could result in serious personal injury, operational disruption and financial losses. This could therefore impede the ability of the company to meet its obligations to its stakeholders (sustainability report).

Interestingly, this empirical study found that the adoption of environmental and social practices in the supply chain had helped those sample companies to improve their economic performance. The logistics manager of CA mentioned, “It was natural things for the company to focus on the supply chain when addressing issues such as cost and emissions problems, which helped to improve the economic performance”. He remarked that his company’s focus on SSCM adoption resulted in increasing net profit of at least 2 %. CB, CC, CD and CE confirmed this claim, stating that SSCM adoption resulted in a variety of economic advantages, particularly arising from the recycling of materials, the saving of energy and lower levels of carbon emissions and it would support the company’s effort to find investment (sustainability report).

Participants from FG agreed with the above. One interviewee claimed that large manufacturing companies “will not engage in the sustainability initiatives in the supply chain if there is no economic benefit”. Another participant stated, “top management of the large organisations listed in the stock exchange, their decision to invest is justified by how much the return”. He therefore commented that “economic benefit considers as number one motive”. Another participant explained that large manufacturing companies achieved benefits from SSCM adoption, such as “reputation, stakeholder satisfaction, employee attraction, and appealing to customers from outside the country”, which then affected the business’ economic performance.

In summary, it can be suggested that the adoption of sustainability practices throughout the SC can be inspired by two interrelated categories: the stakeholder and benefits, including economic benefits.

5.4 Presentation of the findings on SSCM barriers for the sample cases

The previous section examined the drivers that motivate the sample organisations to implement sustainability strategies in their supply chain. It found that the sample companies were motivated by their responsibility towards stakeholders to address sustainability in their supply chain, and this contributed to them achieving several benefits that improved the company's long-term economic performance.

However, interview respondents highlighted that the transition to SSCM in their companies was not easy, because of the existence of internal and external barriers. The empirical findings of the main barriers and their impacts on the adoption of sustainability are summarized in Figure 5.5 below.

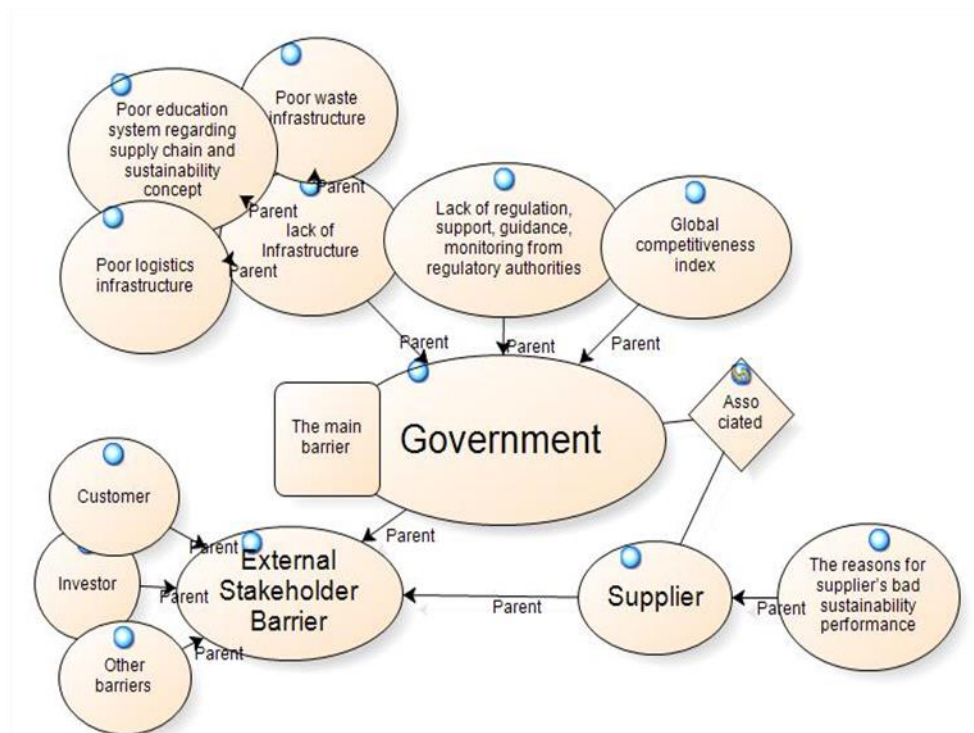


Figure 5.5: Key barriers to the adoption of SSCM in sample case

The sample companies were found to encounter barriers associated with external factors (38) to a greater extent than internal factors (3) during SSCM implementation. Evidence for this was explicitly referenced by representatives of CC commented that “the company part of the supply, it does not operate alone. It is working within an external environment including supplier and government that be the cause of barriers” of sustainability implementation. For representative from CA,

The problem is external, because of the nature of the functioning of the supply chain. To be sustainable, the supply chain needs to meet certain criteria. Sustainability logistics means delivering the product more rapidly and at a lower cost, as well as eliminating any social and environmental risks. This is a very challenging aspect, due to the existence of many external barriers.

One expert from the FG agreed with the above, explaining that the external factors generally constituted more significant obstacles to large manufacturing companies than the internal factors.

The external barriers included supplier, government, customer, investor, and other barriers, were found to have negative impacts that prevented the investigated companies from fully implementing SSCM. Table 5.21 shows the main negative effects that were common to multiple external categories.

Table 5.21: The negative impacts shared the most between the external categories

| External barriers impact | CA | CB | CC | CD | CE | CF | FG |
|--|----|----|----|----|----|----|----|
| 1 Customer/ Economic implication | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Financial risk will emerge from losing the customer when sustainability measures are included in the agreement | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 Government/ Economic implications | 0 | 0 | 4 | 0 | 0 | 0 | 1 |
| Decreasing profitability | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| Increasing shipment costs | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 Investor/ Economic implication | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Focusing on short term results | 0 | 2 | 0 | 0 | 1 | 0 | 1 |
| 4 Supplier/ Economic implication | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Risks will emerge from losing the supplier when sustainability measures are included in the agreement | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 5 other barriers, lack of collaboration with other large Saudi organizations/ Economic implication | 0 | 0 | 4 | 0 | 1 | 1 | 1 |
| Increasing cost of supplier auditing | 0 | 0 | 1 | 0 | 0 | 0 | 0 |

As can be seen from table 5.21, the negative economic impact is a particularly significant factor among these reported barriers. The logistics manager of CA explained that lack of sustainability commitment from customers would mean that including sustainability measures in the contract agreement would not be possible. As the company “wants to sell its products and could not afford to lose its customer”. Losing customers would mean that the company must deal with other risks, such as a “high level of inventory,” which lead to economic disadvantages.

Not finding a customer to buy the company waste was another issue highlighted, which not only has a negative economic impact but an environmental and social impact too. One panel expert from the FG provided an example where one company introduced a technology to save water used in its production process. Then sell it to another company, but the company had difficulty selling the surplus water, causing a health problem for the employees and the community, as mosquitoes formed in the stagnant water. The company did not achieve its objectives, as it had been assumed that the implementation of this measure would enhance the economic and environmental performance of the company. On the contrary, the company had created new ecological and social risks that could be costly to them.

Another negative economic impact is related to the increased cost of supplier auditing, as each company “is not having the same evaluation criteria and, therefore, cost savings by

combining audits with other partners would not be possible” (CC procurement manager). The lack of collaboration between large Saudi organisations is, therefore, a barrier that inhibits SSCM implementation (CC procurement manager).

Furthermore, the lack of pressure and support from investors other than public government funds was considered to be an essential external barrier to SSCM implementation (CB and CE, and FG). The marketing and sale manager of CE mentioned that a foreign investor in the company, with a seat on the board and a management role, challenged the sustainability implementation in the company supply chain, especially if the economic return was not guaranteed. The CB sustainability manager claimed that investors did not have the patience to wait “six, seven, eight years to see a return on the company’s sustainability investment”. A further panel expert from FG mentioned that: “investors want their profit year after year”. This lack made the top management focus on delivering short-term profit to attract these investors, which resulted in a lack of support for the sustainability initiatives, as these initiatives needed time to pay off. These results indicate that external stakeholder barriers, such as investors, have had a negative influence on the internal stakeholders (top management) during SSCM implementation.

This problem above was worsened as the CB sustainability manager claimed that a lack of top management commitment for sustainability adoption at Saudi organisations was the norm. He concluded therefore it would be challenging to transform the company’s sustainability plan into action in the supply chain, as he believed that sustainability requires a “top-down approach”.

Moreover, the issue regarding lack of sustainable suppliers, lack of supplier commitment, and the time required to identify sustainable suppliers, represent supplier barriers to SSCM implementation at the sample companies. For example, the logistics manager at CA stated that the company had no other choice but to partner with supplier with a poor sustainability performance.

When we looked at what we need, we see that the supplier has them in terms of an awareness of the team, as well as safety and availability, and an understanding of our product. But the supplier underperformed when it came to some social aspects, such as the wages paid to his employees and the condition of their residence. The supplier also had a negative impact on the environment, as its trucks were not eco-friendly.

The logistics manager of CC observed their suppliers were not committed to sustainability as “they do it because of us”. One of the FG member agreed with this manager. He mentioned that lack of commitment from small and medium-size Saudi suppliers resulted in them not “accepting the terms and conditions of the company” regarding sustainability.

Representatives from the four companies and FG participants explored some of the reasons for suppliers' poor sustainability performance. One of the reasons was limitation of the company resources affect the companies' ability to influence sustainability to their suppliers. The logistics manager of CD stated that their company resources, compared with other large companies in the sector, were limited. It, therefore, would be difficult "to enforce all elements of sustainability on all company suppliers". One industry expert from FG confirmed that "resource limitations" was the main issue preventing large Saudi manufacture from improving their suppliers' sustainability performance. Respondents also mentioned other reasons for poor supplier sustainability performance were related to the supplier itself. For example, the logistics manager of CD claimed that 90% of the logistics managers did not consider sustainability as necessary because "they do not have sustainability awareness" nor do they have "a good understanding of sustainability".

The sample companies also blamed lack of sustainability commitment in the government for the suppliers' poor sustainability performance. Managers at CA and CC argued that the lack of support from the Saudi government and pressure to implement sustainable practices was causing supplier to resist their efforts to improve their sustainability performance. One industry expert from the FG agreed with, stating that a lack of "government framework" that included "good reward" and "sustainable policy" had not helped sustainable companies to pressure or motivate their suppliers to implement sustainability practices.

The lack from the government represented a significant challenge for the companies in improving the sustainability performance of their suppliers, which is a barrier to SSCM implementation. The manager from CA, along with one expert from FG, suggested that a company taking responsibility for improving suppliers' sustainability performance was not sufficient without the government pressuring and motivating suppliers towards more sustainable practices. The logistics manager from CA stated that, whatever the company's commitment to sustainability, "I do not trust them, as the supplier may influence the companies by giving them a lower price because, in the end, they want to achieve economic benefits." Therefore, he explained, to provide "a radical solution" the government must give as much focus to this subject as in Europe. The Saudi government should start by first establishing policies and guidelines, which would help to bind all suppliers to the same rules.

5.4.1 Government role in inhibiting the implementation of SSCM

The government however was found to be the critical barrier that inhibited SSCM implementation at the sample case companies, as Figure 5.6 shows that this theme was dominant in the dataset.

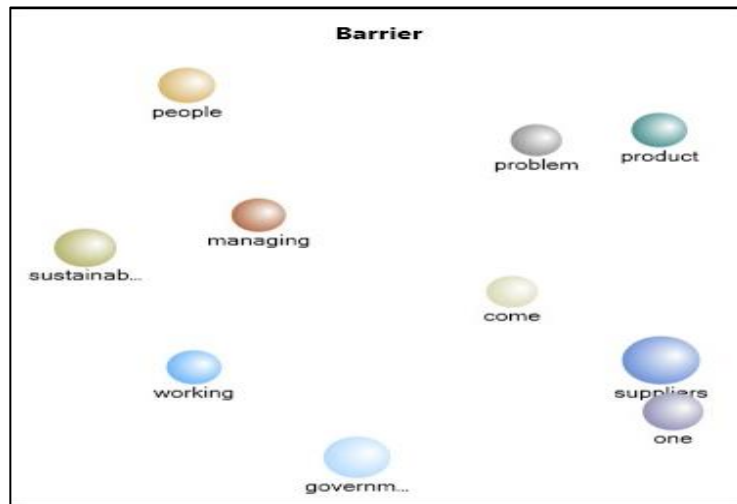


Figure 5.6: Word frequency of barriers in the data relating to the barrier to SSCM

The Saudi government's failure to establish a sustainability policy, apply pressure and give support, the lack of logistics, waste, and education infrastructure, and low ranking in the global competitive index were factors associated with this barrier. These factors were further found to have negative social, environmental, and economic negative impacts on the sample companies that hindered their SSCM implementation. The governmental barrier was also found to exert a direct negative impact on the barriers facing suppliers, including their hesitation to engage with the sample companies in order to improve their sustainability performance. This therefore represents a further obstacle to SSCM implementation.

The investigated companies, however, mentioned that the Saudi government, especially with the Saudi 2030 Vision, has been working to improve sustainability policy and the Kingdom's infrastructure. They have also taken action themselves to mitigate government barriers, to ensure successful implementation of SSCM. Next section provides an explanation to this important theme.

5.4.1.1 Government infrastructure

This study identified a lack of logistics, waste, and education infrastructure as barriers that inhibit SSCM implementation for large manufacturing companies in Saudi Arabia. Each of these three barriers is discussed in the subsections below.

5.4.1.1.1 Lack of logistics infrastructure

Logistics is a crucial element for the industrial sector and the supply chain success (CC procurement manager). The possibilities, therefore, for the successful implementation of sustainability in the supply chain depend on the availability of reliable logistics infrastructure (CC procurement manager). The same point was mentioned by the logistics manager at Company A, who said that reducing "cost in the supply chain is important" and that this would depend on having efficient logistics infrastructure.

All cases except CB mentioned the lack of logistics infrastructure as the main barrier inhibiting the implementation of SSCM. The logistics manager of CA revealed that “here in the Gulf, we have tremendous growth in resources, especially in the Kingdom, and this, unfortunately, was not matched by rapid growth in logistics”. The lack of logistics infrastructure has meant that technology, special roads for trucks, qualified Saudi experts, an automation process, advanced warehousing, and government support have been lacking. (CD, CA, CC, CE, CF, FG).

Those factors had caused the logistics sector in Saudi Arabia to be weak and inefficient in supporting the companies’ sustainability initiatives. The CC procurement manager noted that because of the lack of logistics infrastructure, it was hard for the company to fulfil its social and economic responsibilities in the supply chain. For instance, the company was trying to attract one of its overseas suppliers to open a new plant in the Kingdom but faced a challenge as the supplier told them “there is no logistics infrastructure, and there are no Saudi citizen experts to work in this important sector”. This indicated that the company had missed an opportunity to fulfil its social responsibilities to the community by attracting suppliers who could also bring in technology and create local employment.

Another logistics manager at CD said that “if we have a train between the industrial city and the main city and the port, we will save money and save the life of employees and community”. He explained that the use of a train could resolve the current problem of employing hundreds of trucks loaded with dangerous materials, which, in the event of an accident, could result in a catastrophe. In addition, a train could be used by industrial employees to travel to work, rather than using their cars, thus avoiding the potential for traffic accidents. He concluded that this would result in considerable environmental, social, and economic benefits.

5.4.1.1.2 Lack of waste infrastructure

Another factor that inhibited the sample, Saudi manufacturing companies in pursuing SSCM implementation was mentioned by the managers of two companies (A, B, and FG). They pointed out that waste infrastructure, which is “required to receive and dispose of waste in a safe and environmentally sound manner,” was lacking in Saudi Arabia (CA sustainability report). This, therefore, prevented an innovative “management waste approach” because of “inconsistent waste regulations and enforcement” (CA sustainability report).

One panel expert from FG provided an example of the impact of a lack of waste infrastructure on the environment:

If an investor wishes to open a new plant in an industrial city, while at the same time also wishes to take care of the environment by reducing his company's waste, this will raise an issue if there is no appropriate infrastructure in place. Thus, if the investor is told that the company will need to ship its waste 100 miles away, or dump it, this will have an impact on the company's approach, most probably resulting in negative outcomes for the environment.

He also claimed that the Kingdom has only two industrial cities capable of enabling companies to adopt environmental practices, and that it is the government's responsibility to improve all industrial cities.

Another example, according to CB recycling director, Saudi Arabia is among the largest consumers of beverage cans in the Middle East, with "no real recycling programme" (PDF report). This has resulted in 290,000 tons of recyclable material being sent to landfill, thus impacting the environment, rather than allowing the community to benefit by turning this recyclable material into reusable products. These results show that environmental improvement in the companies' supply chains has been affected by the lack of waste infrastructure in the Kingdom.

5.4.1.1.3 Lack of education infrastructure

Education on sustainability and supply chain principles is lacking in the Saudi education system, which may create negative practical implications for the companies in pursuing SSCM implementation. These negative implications are related to challenges in recruiting skilled and experienced people who understand supply chains and sustainability. The procurement manager from CC mentioned that "Public universities do not offer anything to support supply chain management and its technical work". One participant from FG noted that "only one university offers supply chain major as an undergraduate course, and this is a problem for companies". Another FG participant noted that "the limited experience of Saudi people in the supply chain field and lack of awareness about sustainability in the context of SCM" was a barrier that inhibited SSCM implementation in Saudi manufacturing.

The procurement manager of CC reported that the company was interested in solving this issue and reached out to one public university to collaborate on establishing a supply chain major but failed as a result of government bureaucracy. These results indicate that the external barriers may have an impact on each other, as the lack of Saudi government policy has resulted in a weak education system in the Kingdom.

5.4.1.2 Lack of regulation, support, and monitoring from Saudi regulatory authorities

The second most cited barrier to the implementation of SSCM concerns Saudi regulations, along with the related policies and governance. This significant aspect is discussed in the following section.

5.4.1.2.1 Lack of pressure and monitoring from Saudi authorities

The lack of pressure from Saudi regulatory authorities was reported to be a barrier to SSCM implementation (CD, CA, focus group). The reasons for the lack of government pressure were discussed by one panel expert, who said that “Saudi Arabia is a third world country” that wants to become an industrialised country. The government must, therefore, focus on improving the manufacturing activities that are associated with negative environmental impact. Ultimately, it will be difficult for the government to put pressure on “companies to consider the environment above social and economic” (academic expert).

This view was also supported by a further panel expert, who highlighted that a company’s focus on sustainability was determined by a country’s standards, general principles and environment. He claimed that it was generally considered that, to date, government standards had failed to support companies in focussing on environmental issues rather than economic and social concerns.

The CB sustainability manager had a different view regarding the reasons for the lack of pressure, stating that the government was committed to enforcing sustainability implementation, but that this needed leadership and skills that were not available within the government domain. Another panel expert said that that “the laws and regulations are there but where is the government monitoring?”.

5.4.1.2.2 Lack of support from Saudi authorities

The lack of support from Saudi authorities in terms of providing accurate information and commitment was highlighted as a barrier that inhibits SSCM implementation (CC, CA, and FG). The CC procurement manager noted that “we contacted a government agency to give us information about the number and type of factories that operate in the Kingdom, but they do not have accurate information”. Thus, the localisation strategy concerning the sourcing of materials, which helps to improve social responsibility in the supply chain, will be affected because “it is difficult to know which industrial sector needs support and which is mature enough so, we can buy our materials from”. The same manager concluded that

“cooperation with government agencies is ineffective,”. They force us do everything with regard to sustainability efforts by ourselves. This result in the depletion of the company’s resources “money, people, time etc”. Ultimately, this means that integration of sustainability initiatives in the supply chain will be “very, very challenging”.

The logistics manager at CA reported that the government authority does not allow Saudi companies to pursue new social initiatives in the supply chain. He further stated that: “government procedure is supposed to open the way for companies to take control over development, and facilitate sustainability policies within the supply chain, including safety

standards”. On the contrary, they “complicate things and, sometimes, they make you change your sustainability procedure” in the supply chain.

5.4.1.2.3 Changes and inconsistency in the law

The speed of changes in-laws from the regulatory authorities was identified as another barrier to SSCM implementation (CF supply chain managers). It appeared to the managers at CF that the fees and new laws implemented by one government authority caused their local supplier to suffer financial difficulties. This, therefore, exposed the company to high “risk” as the local supplier was either bankrupt or experiencing serious financial issues, which made it difficult for the company to support local supplier.

Inconsistency in laws issued by the Saudi authority was another issue experienced by Saudi manufacturers during SSCM implementation. In the FG, one government expert mentioned that each agency has a special law in which there is no integration with other laws. Therefore, there is no clarity, which inhibits SSCM implementation in Saudi manufacturing. Global companies, for example, are hesitant to do business in the Kingdom because of the inconsistency in the government regulation (CC procurement manager).

5.4.1.3 Examples of Saudi government authority barriers

One industry expert from FG noted that the government authority responsible for monitoring and establishing the specifications of products in the Kingdom could be considered a hindrance to SSCM implementation. He explained that some of the products entered the Kingdom without specifications. Meaning that Saudi organizations had no idea about the way these products were produced and about the level of their quality and reliability. This could thus impact the efforts of large Saudi manufacturers to support local suppliers, due to being unwilling to buy from any supplier lacking the requisite standards and specifications.

Another critical example mentioned was the customs authority (CC, CA, and CD). Respondents pointed out that custom clearance delays and a lack of transparency, policies, safety standards, technical expertise, advanced technology, and collaboration with other Gulf customs were factors associated with the customs barrier that impeded SSCM implementation in their organisation.

Customs infrastructure, such as ports in Jubail and Dammam, “are working at full capacity”, and cannot keep up with the demand, which increases the congestion in those ports (CA logistics manager). This resulted in delays at customs which generate environmental pollution. The procurement manager from CC gave an example where lack of technology adoption in customs caused the company to decide not to purchase from a local supplier. The issue arose from the customs inability to provide a description for all equipment and

materials to determine if they produce responsibility or not. This made it impossible to determine when a product complied with the international standards.

The CA logistics manager and the CC procurement manager referred to all issues that the customs had to the government lack of transparency and too much centralisation and bureaucracy. The Logistics manager pointed out that “the government policy is not efficient at first, to support the customs”. “For example, if I need anything, I have to speak up, or sometimes I have to go to Riyadh to finish my work. I think they should give some power of decision making to the manager of the port”. The managers concluded by stating that the “government guideline to the customs is lower than expected and with regret, it is not in the level that you want”.

The customs barrier was reported to have economic implications for SSCM implementation (CA and CC). It caused an increase in the cost of shipments, by the “fine that we pay for the delay” (CA logistics), and paying tax twice, to the customs and other Gulf customs because of the lack of trust between the two (CC procurement). The logistics manager at CA concluded that the customs achieves “nothing but stop the export of the country and stop the productivity of the country, causing you to lose money, and this is a supply chain issue.”

5.4.1.4 Action taken to mitigate the government barrier

Despite the negative impacts of government barriers on the sample companies, some managers and experts are optimistic about the future regarding government support of their efforts towards the implementation of sustainability in general, and in the supply chain in particular. One expert from FG noted that “I cannot claim that the government is a barrier because the government is changing”. The logistics manager at CD also mentioned that the government “is changing very fast with the 2030 Vision, with a different implementation and more open-minded”. For example, in customs, the Authorised Economic Operator has been introduced to ease congestion and speed up the process (CD, FG). This is an example of what the logistics manager at CA advised the government to do, namely, to focus on “digital technology adoption,” which he identified as among the solutions for the successful implementation of SSCM.

The same manager also stated that “the solution is in progress,” regarding the improvement of the country’s logistics infrastructure, such as roads and trains. Another manager said that with the government’s 2030 Vision, there is a “real desire from the government to develop the logistics sector, which is the cornerstone of any company working in the industrial sector” (CC procurement).

The respondents also said that the government is supportive of sustainability implementation in the Kingdom. The logistics manager from CA believed that the government is going to focus more on sustainability. The government has now started to make changes by supporting non- government organizations. For example, one of the NGO is now responsible for supporting, training, increasing awareness, and establishing sustainability standards in the manufacturing sector (CA, CB, CE). Yet, the government needs time to change of mindset both with the industry and the government organizations.

Thus, CA and CC were found to be unwilling to wait for any potential governmental change, but had already engaged with authorities to ensure the successful implementation of SSCM. The CA logistics manager noted that: “there is a gap between the industry and government, including in many areas of customs, such as transparency, problems related to delays, along with safety standards in the port and sustainability awareness. But we are working with them to solve this issue”.

Lobbying for policy change is one of the tactics used by the two companies. The logistics manager of CA mentioned that “we always talk with customs and demand experts in chemicals to be available at all times in the port. Lobbying is not the only strategy used; CA and CC also sent a recommendation to the government authority to increase their awareness of sustainability. For example, the procurement manager at CC claimed that his company’s social and environmental standards were high, exceeding those applied by government organisations. He also stated that his company was working with government organisations to develop their standard of sustainability, for example through: (1) sharing information; (2) sending company employees for appropriate training; and (3) working with government organisations to develop number of initiatives.

In summary, the above discussion identified the main barriers, and those that are critical for the adoption of SSCM. The discussion also provided evidence of the sample companies’ attempts to navigate the critical barriers’ negative implications.

5.5 Presentation of the findings on SSCM enablers for the sample cases

The previous section focuses on identifying the main barriers inhibiting the implementation of SSCM in the companies taking part in this study. The current section assesses the enablers facilitated the implementation of SSCM. These findings are summarised in Figure 5.7.

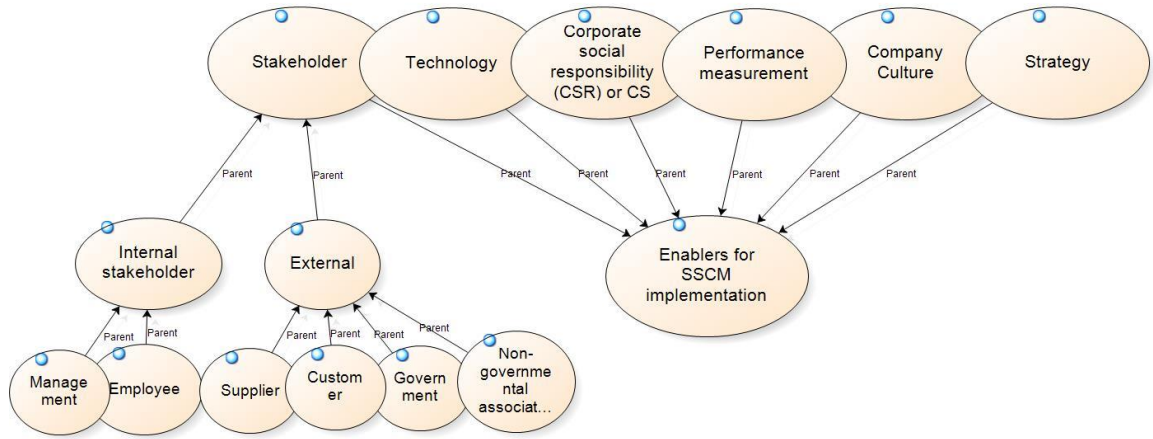


Figure 5.7: key enablers to the adoption of SSCM in the sample cases

The companies in this study were found to inquire enablers associated with: (1) stakeholders; (2) CSR; (3) technology; (4) sustainability strategy (5) culture; and (6) the performance measurements. Stakeholder engagement was comprised of (1) internal (management-employees) and (2) external (supplier-customer-government and non-government). Each category was found to have positive impacts on the implementation of sustainability in the supply chain. For example, this study found that a company's inclusion of a CSR philosophy or mindset had facilitated the shift towards SSCM, due to: (1) allowing the company to "balance between the company objective and the community objective" (CF webpage); (2) permitting the integration of sustainability in all company decisions, including those related to supply chains (CC and CB managers); (3) allowing each company to act responsibly and with a commitment to wider stakeholders (CA, CB, CC, CD, CE and CF); (4) ensuring a continued commitment to economic, social and environment integration in the supply chain (CB and CA); and (5) ensuring businesses can "create a driven sustainability performance" (CB).

Sustainability culture was highlighted as an enabling factor by all the investigated cases. Supply chain Managers of CF stated that the company culture that values "human, achieve excellence and continuity" was one of factors that enabled the adoption of "environmental, economic and social practices". The procurement manager of CC mentioned that the value of the company which based on "integrity, safety, accountability, excellence and citizenship" have a role to play in valuing sustainability practices in the supply chain. The CEO of CD in his message stated that sustainability culture was "an integral part of the company's value" by balancing its commitment towards the environment and the community with the drive for continuous business growth (sustainability report). These views suggest that a culture of sustainability has reinforced those companies to take responsibility in their supply chain.

All the companies in this study also pointed to sustainability indicators as enablers in the development of SSCM. The manager of CA pointed out that “KPI is a meaningful word, inferring that the only job of the company is to meet the KPI”. For example, due to the company looking to measure the progress of sales and revenues, it needed to consider sustainability measures concerning: (1) how the product was produced; (2) how it was delivered; and (3) the progress of sustainability training for company employees, contractors and service providers measure. CF supply chain manager noted that sustainability indicators were vital for reviewing the company’s progress in the area of sustainability, as well as permanently improving its performance.

Moreover, the companies in this study had considered technology as an enabler of SSCM implementation. For example, the sustainability manager of CB pointed out that information technology allowed his company to see things that “they cannot see before”. He provided an example of how the management system reduced the company’s carbon emissions through the use of data obtained from an emission analyser (CB). The manager of CC emphasised the role of information technology in enhancing his company’s relationship with stakeholders, including suppliers. He said for example the electronic supplier portal enabled the company to exchange information regarding the specification of materials easily. It could also inform suppliers of their “annual assessment and how they can improve their work”. The system also ensured that there was no potential compromising of the cash flow of the company supplier, resulting in the financial sustainability of the supply chain. For example, the system notified the arrival of materials to the finance department, so that (once checked and signed by the company workers) the payment process could be undertaken immediately.

A further factor concerned the companies’ adoption of green technology to improve its environmental impact, along with health and safety (CA, CB, CC, CD, CE and CF). CA pointed out that reducing the demand for freshwater was achieved by means of technology for wastewater treatment and the implementation of closed-loop recycling (sustainability report). CB highlighted that the adoption of green technologies helped to reduce the consumption of both energy and water, as well as lowering its level of emissions (sustainability report). CC noted that green technology helped to reduce energy and water emissions, boosts economic growth and job creation” (sustainability report).

This study also found that the sample companies followed specific strategies designed to ensure the effective implementation of SSCM. For example, the sample companies had adopted Product stewardships strategy’ or ‘environmental management strategy’ (CA, CB, CC, CD, CE and CF), defined as ensuring that whoever “designs, produces, sells, or uses a

product takes responsibility to ensure that health, safety and environmental protection is an integral part of designing, manufacturing, marketing, distributing, using, recycling and disposing of our products”. Another strategy was about the local content strategy, which helped to localise materials produced in the Kingdom and promote the development of local suppliers (CB, CC, CD, CE and CF).

This study also found that stakeholder engagement had enabled the sample companies to achieve number of positive impacts, resulting in the implementation of SSCM. These are demonstrated in Table 5.22 (below).

Table 5.22: The positive impacts of stakeholder engagement in the implementation of SSCM

| Sample cases | A | B | C | D | E | F | FG |
|--|---|---|----|---|---|----|----|
| Positive impacts | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Building momentum toward sustainability issues | 6 | 2 | 4 | 1 | 1 | 10 | 0 |
| Defining the company sustainability strategy and its success | 1 | 0 | 0 | 0 | 0 | 2 | 0 |
| Helping in delivering social and environmental programs | 3 | 9 | 14 | 3 | 4 | 7 | 0 |
| Helping in learning process | 0 | 4 | 3 | 0 | 0 | 11 | 0 |

One positive impact consisted of building momentum towards addressing issues of sustainability in the Kingdom, enabling SSCM implementation for the companies in this study. CA noted that collaboration with stakeholders was central to building momentum towards sustainability for both the company and its stakeholders (sustainability report). The sustainability manager of CB pointed out that large corporations were required to collaborate with their supply chain partners to: “enable the supply chain to have the right balance between economies and to be sustainable”.

Another positive impact experienced by the companies, in relation to stakeholder engagement, consisted of executing the social and environmental programmes within the SC. For example, the employees with the appropriate skills and commitment to sustainability had led to their companies achieving a high rate of sustainability performance. For instance, the logistics manager from CA claimed that his employees’ understanding the type of contracts such as Cost and Freight (CAF), were economically vital for improving the supply chain. He gave the following example to illustrate his point.

Say I bought this product from you for £3, but this price includes the shipment to your location. There is also the issue of who is responsible for payment if there is any delay, as well as for covering the social and environmental responsibility of the shipment and the cost of any damage, etc.’ There are fourteen types of contract agreements. Our people need to know this, because it has economic consequences, particularly as the type of contract determines who is responsible for any problem that may occur related to social and environmental issues.

Another example was the fact that CF employees’ skills and efforts engendered the localisation of the manufacturing of the spare parts used in power plants. This localisation

helped to reduce the company's purchase price and delivery time, compared with that of foreign factories (SC manager). It also caused a reduction in emissions from the transport involved, which assisted in improving the environmental aspect.

Furthermore, engaging with non-government organisations such as Gulf Petrochemicals and Chemicals Association (GPCA) and obtained accreditations from some international organisation standardisation such as ISO 14001 (CA, CE, CB, CD and CF) had influenced the companies to (1) become "part of the global and regional industry in adopting the best practice in operations and sustainability and advocate measures that are important for the industry to serve its consumers and communities" (CB sustainability report); (2) collaborate with other members to innovate "proactive approaches to understanding the environment, health safety and security (EHSS) issues in the region" (CA sustainability report); (3) enhance the companies' commitment to sustainability by offering diverse platforms for the sharing of management and technical knowledge for establishing a common sustainability measure and vision for the region (CC, CB and CE). The logistics manager of CA illustrated the benefit from the GPCA association that had been established to promote the adoption of sustainability in the supply chain among companies operating in the region's industry. He stated:

Sustainability is a fact, so we need to follow certain rules and procedures, such as specific standards for a supplier, standards for the producers, receivers and end-users. We need a guideline for everything. These guidelines must be monitored by a non-government body, to ensure the development of such standards for the company, suppliers, customers and all members and to monitor the progress. In the end, we will have a common set of sustainable performance metrics followed by all member companies.

Moreover, collaboration with the customer had resulted in reducing the environmental impact of the supply chain in particular through utilising a new shipment approach (CD).

The logistics manager of CD commented:

We used to ship the products by truck to our customers located in other Gulf countries, but we collaborated to convince this particular customer to change to shipment approach. We worked with him to add a new section into his plant, enabling us to ship products by sea. This is a win-win initiative for everyone in relation to the economic, social and environmental aspects. The customer now receives his product in a shorter amount of time, while it is also more economical and the environmental by reducing the use of a truck and consolidating the shipment, with the carrier using the customer's port then continuing its journey to India and Pakistan. Without any noticeable impact, the community will be safer by eliminating road transport.

The sample companies also all concluded that engaging with appropriate suppliers was essential for achieving the sustainability goals of their company. An example of this was the availability of "local approved vendors for waste handling and recycling" enabling CA,

CD and CE to reduce their environmental impact (sustainability report). A further example was CB collaboration with its international suppliers, which resulted in the adoption of new technology to improve the company's ecological and sustainability record (sustainability report). CA noted that selecting a recognised contractor to design and build the company plant resulted in its operation becoming more sustainable (sustainability report). For example, the logistics manager of CD illustrated how his company was collaborating with a local supplier to produce material that they need:

We have supported one of our suppliers by eliminating the use of imported essential raw materials required for packaging. Following years of experimentation at the company's facility, we succeeded in improving the social aspect through the development of a local supplier, which ensured the availability of a close, reliable supplier and reducing the environmental burden of transport, while also improving the economic return to the supplier.

The Saudi government's role as an enabler was found to depend on the high level of commitment to the sustainability of each government authority engaging with the sample companies. For example, the manager of CA pointed out that the industrial park's regulation, guidelines, penalties, encouragement and effective infrastructure helped to ensure effective implementation of the environmental and safety aspects of the supply chain, including the international aspects. These results generally indicate that the government has not yet adopted a strategy capable of providing such legislation, guidelines and infrastructure to all companies in the Kingdom.

However, the government could play a role in the future through its 2030 vision, which could help to unifying issues of sustainability among all stakeholders in Saudi Arabia and as stated by the managers from CB, CE, CF and CD. For example, the manager of CB noted that the discussion has now moved on from the reason why companies integrate sustainability, into how such sustainability can be integrated into their strategies because this vision.

5.5.1 The role of management in enabling the implementation of SSCM

The development and achievement of the aforementioned enablers can be influenced by the engagement of top management. Indeed, the logistics manager at CA emphasised that top management are "the first enabler, and without them, nothing will happen". Moreover, the sample cases identified top management commitment and support, skills, and vision as essential enablers for SSCM implementation, indicating that the level of importance varied between these enablers. Figure 5.8 shows extracts from the case studies supporting the enabling factors associated with the management category.

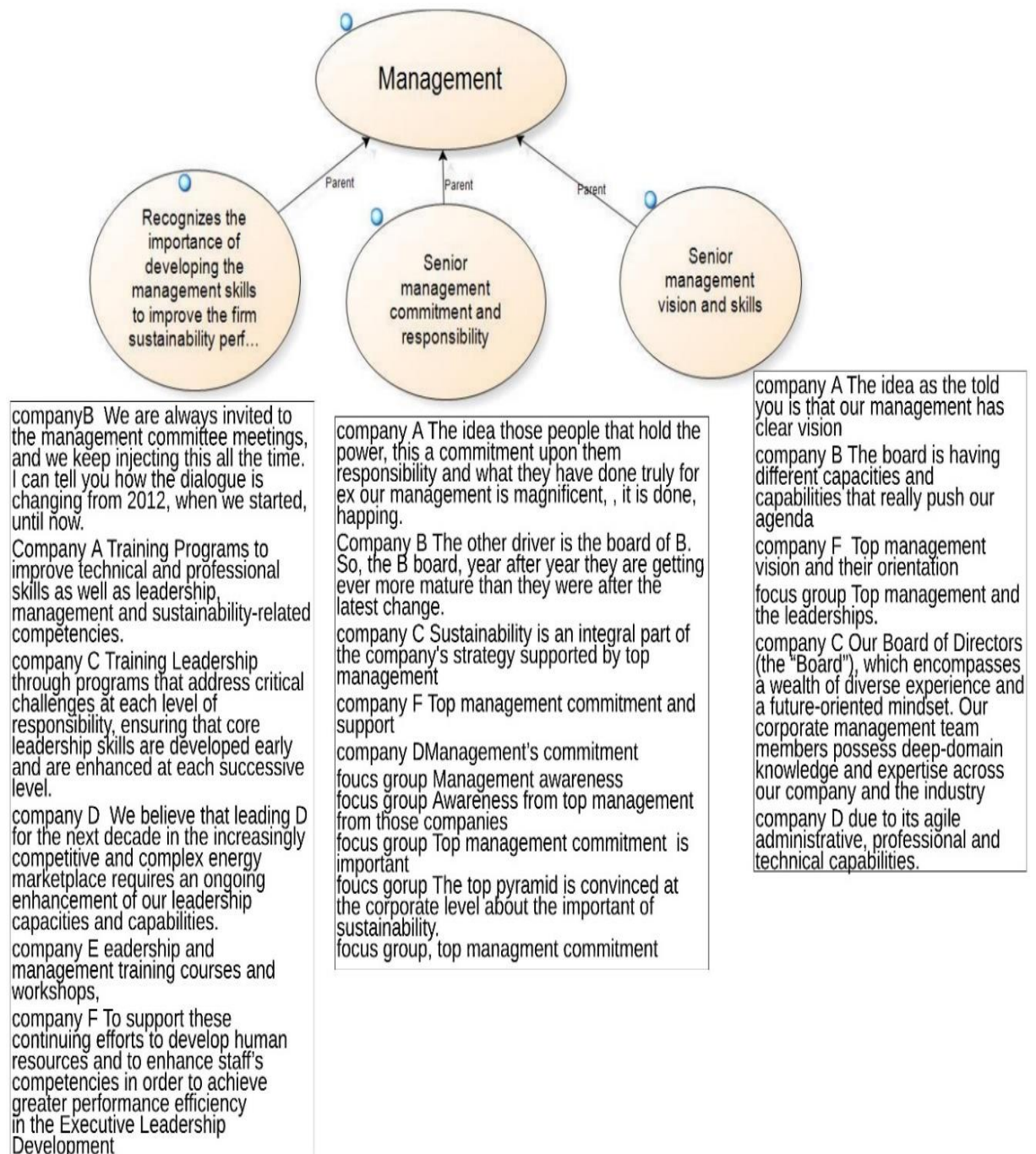


Figure 5.8: Quotations from the sample cases and focus group on management enabler

Table 5.23 also addresses the positive impacts of top management in SSCM implementation.

Table 5.23: The positive impacts of top management in the implementation of SSCM

| The positive impacts of the top management | A | B | C | D | E | F | FG |
|---|---|---|---|---|---|---|----|
| Creating a sustainability culture will be hard to change | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Defining roles and responsibilities | 2 | 0 | 1 | 0 | 1 | 0 | 0 |
| Establishing and supporting sustainability teams | 3 | 2 | 1 | 4 | 0 | 6 | 0 |
| Guidance, providing information, mentoring for the employees or leadership | 5 | 0 | 1 | 0 | 0 | 0 | 0 |
| Influential on other CEO partners | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Overcoming any internal barriers to the sustainability implementation | 3 | 4 | 0 | 0 | 0 | 0 | 0 |
| Showing the importance of the KPI for monitoring sustainability performance | 6 | 1 | 2 | 1 | 2 | 0 | 0 |
| Support the company when collaborating with non-governmental organizations | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Supporting sustainability plans, policies, and strategy | 9 | 1 | 0 | 1 | 1 | 0 | 0 |

Table 5.23 reveals that the majority of the cases studies indicated that, when top management was committed, the companies tended to focus on developing sustainability indicators for driving and monitoring sustainability performance in the supply chain. The logistics manager from CA pointed out that: “the top management focuses on sustainability indicators, positioning them as major KPI so that the business will be driven based on the achievement of those KPI”.

Evidence of progress in SSCM implementation was managed by means of an effective sustainable performance management system reviewed by both top management and board members (CA, CB and CE). The logistics manager of CA noted that:

Top management always ask about KPI. They tell us that this is evidence of our work, and we need to show them how things have improved in comparison to the previous year, as well as full details of what has been done to achieve this improvement. Environmental indicators can provide evidence of any lack of efficiency.

The support of both the board and top management for the implementation of sustainability resulted in incorporating high levels of a culture of sustainability with supply chain management practices (CA, CC and CD). One interviewee explained that his “management is magnificent” in spreading sustainability culture to company employees, and that even new employees’ behaviour is now driven by this culture.

Another procurement manager at CC cited the support of his top management as being the only reason local content implementation had been made in the supply chain, particularly as the Financial Department had, due to its higher levels of cost, resisted the initiative many times. The supply chain manager at CF noted that the key success of its development in the field of health and safety was due to the support of top management. The sustainability

manager at CB stated: “we came to the point where we had a very mature kind of board pushing it even further to implement sustainability in the supply chain”. Further, as part of the top management commitment, in order to promote sustainability objectives across the organisation, the sustainability department had strong authorisation to make changes in the sample companies (CA, CB, CC, CD and CE).

A further positive role played by top management was highlighted by CA, CD, and CE, who mentioned that it would not be possible to engage with non-government sustainability organisations without the support of top management. For example, a manager at CA noted: “We have been asked through our top management when this association open to engage with them and change our procedures according to its guide”.

An additional positive impact of top management commitment was on the company employees, who were found to engage in implementing SSCM in response to influence from top management. The top management of the sample companies believed that empowering employees had a positive influence on their engagement with sustainability. CA, CD and CE highlighted that it was vital to empower employees to ensure they made their views known and engaged with top management to ensure their participation in sustainability development. CC and CD and CF had introduced a programme to encourage their employees to present their ideas and opinions, in order to generate sustainability initiatives. In general, these results indicated that building strong and lasting relationships with employees was an essential aspect of eliminating barriers to SSCM development (CB, FG).

Further investigation into why the sample companies attracted employees with such skills and commitment identified that this is related to their strategy of hiring the most talented individuals in the labour market. The procurement manager of CC pointed out that satisfactory results of the business in term of sustainability performance is enhanced by the company’s hiring the most highly skilled employees. CA, CB, CC, CD, CE and CF noted that the ability to attract, recruit and retain the most talented employees was vital to the development of sustainability. The companies therefore developed a comprehensive and attractive programme aimed at motivating and retaining their employees, including: (1) annual leave entitlement; (2) social security benefits; (4) medical insurance; (5) inflation adjustments; (6) moving expenses; (7) housing scheme benefits; (8) employee retirement plans; (9) company stock plans; (10) educational assistance; (11) saving schemes; and (12) a programme of allowances.

In summary, the above discussion identified the main enablers to sustainability, and the impact of its adoption, in the SC. Top management was found to be a critical enabler for the successful implementation of SSCM. The next section focuses on the creation of road maps to demonstrate how the sample companies implemented their SSCM.

5.5.2 The road map to the adoption of SSCM in sample cases

The approach behind the implementation of SSCM is demonstrated in the below Figure 5.9. This current study found that all the investigated companies claim they had embedded CSR or CS strategy into their business strategy. CB sustainability manager pointed out that having a CSR has guided and motivated managers at the company to expand their implementation of sustainability to the supply chain. One industry expert from the FG commented that CSR was considered the most important enabler, as it “drives all the company departments together towards the development of a sustainability strategy, so changes in SCM process will be easier”. It can be suggested therefore that CSR is a core starting point for enabling the implementation of different sustainability practices in the supply chain, which (as discussed in the motive section) empowers the sample companies to achieve their CSR objectives.

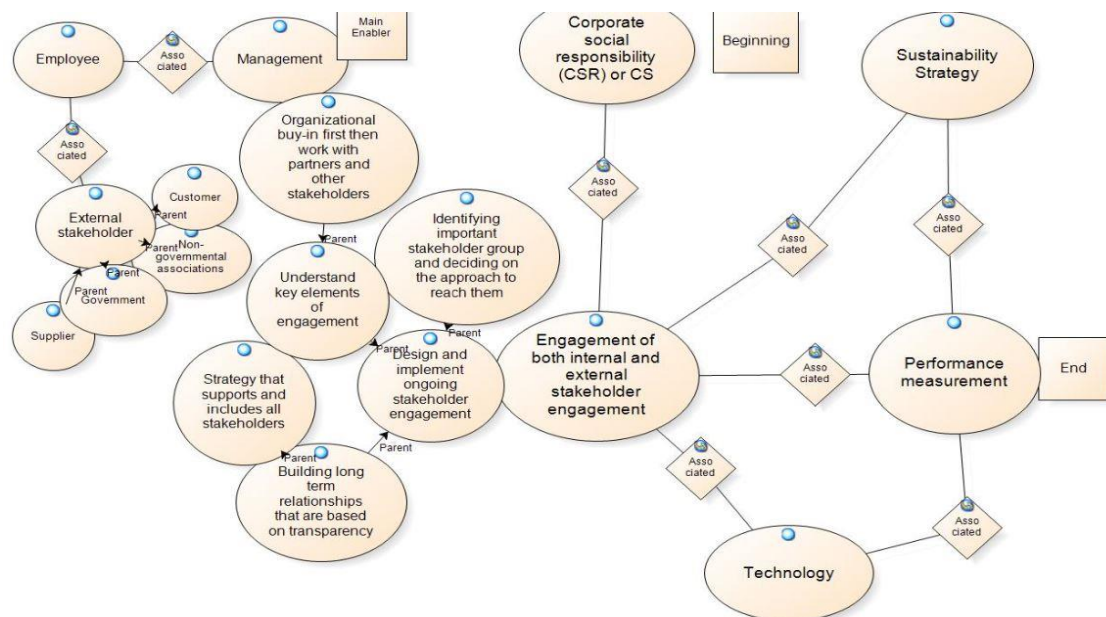


Figure 5.9: The road map to the adoption of SSCM in sample cases

Once the companies in this study identified the motive for SSCM adoption, they engaged with their internal and external stakeholders to achieve this adoption. However, the engagement needed to be designed in relation to an ongoing process, in order to ensure active stakeholder engagement. Table 5.24 (below) illustrates the key elements of this approach, as discussed in the following section.

Table 5.24: Proposal for developing an effective stakeholder engagement

| Sample cases | A | B | C | D | E | F | FG |
|--|---|---|---|---|---|---|----|
| Design and implement active and ongoing stakeholder engagements | | | | | | | |
| Building good relationships that are based on transparency | 3 | 1 | 2 | 1 | 1 | 6 | 0 |
| Strategy that supports and includes all stakeholders | 1 | 1 | 2 | 1 | 0 | 2 | 0 |
| Identifying important stakeholder group and deciding on the approach to reach them | 3 | 7 | 0 | 3 | 0 | 1 | 0 |
| Understand key elements of engagement | 4 | 6 | 1 | 1 | 1 | 1 | 0 |
| Organizational buy-in first then work with partners | 3 | 3 | 0 | 0 | 0 | 2 | 0 |

The sample companies stated that it was crucial to firstly, identify the key stakeholder group appropriate for collaboration and secondly, identify the approach to use during the engagement. The CEO manager of CA noted that “the first step in stakeholder engagement is identifying important stakeholder groups and understanding how they impact each other” (sustainability report). The sustainability manager from CB explained that the level and method of engagement depended on both the type of stakeholder and the level of impact as illustrated in the following quote: “We have a specific engagement for the officials, specific engagement for non-officials, and there’s a particular technique we use for this”.

When he was asked if the stakeholders were awarded identical significance, he commented:

We always prioritise, and this means that sometimes we do not give them all the same weight. I think the weight itself changes from time to time, and from situation to situation. We focus on a group of stakeholders, rather than other groups, based on their stakeholder engagement plan.

A further key element in designing ongoing stakeholder engagement consisted of building strategic relationships between the sample companies and their key stakeholders based on trust and transparency. CA highlighted that “it is important to build a relationship in a transparent manner with your stakeholders to continue to innovate in a responsible manner” (sustainability report). While CEO of CB stated that “all of our sustainability initiatives are pointless unless they are supported by transparent communication with all stakeholders” (sustainability report). Communication with stakeholders enhanced the understanding of each stakeholder group in relation to the “interests, needs and expectations” regarding the issue of sustainability (CA CEO, sustainability report).

The study results also found that the internal stakeholder, and in particular top management was vital for ensuring the effectiveness of the stakeholder engagement approach, enabling the implementation of SSCM (CA, CB, CF). For example, CF supply chain manager noted that communication with the outside world based on fairness and transparency regarding sustainability implementation would initially depend on building “strong capabilities

internally”. The logistics manager of CA stated that the development of supplier sustainability could not prove feasible if, from the outset, the company failed to adopt safety standards, etc. The sustainability manager from CB stated: “(I) cannot question partners about their level of sustainability and join forces before I’ve done my homework”.

It was therefore considered important to the internal stakeholders to be engaged first in the development of sustainability practices prior to making any commitment to engage with an external stakeholder (CA logistics manager). This finding was supported by one member of FG, who stated that large companies tend to focus on ensuring that they have the appropriate sustainability standards, strategy and skilled employees in place, along with commitment from management before they encourage an equivalent action from their suppliers and customers.

The importance of the internal stakeholders’ engagement was due to their role in communicating, monitoring, and developing sustainability with the SC partners and other stakeholders. For example, the logistics department was found to be responsible for collaborating with the customer to improve sustainability within the supply chain (CD manager). In addition, it was also responsible for reporting its performance to the sustainability department. Another manager from CA highlighted that his logistics and sales department was responsible for selecting the service provider, as well as monitoring and developing the company’s sustainability performance and sustaining a long-term relationship. The quotation from the logistics manager from CA illustrates his department’s approach to communicating the required sustainability standards to the service provider, in order to improve the sustainability of the supply chain.

When it comes to the downstream, I am responsible for training and increasing the awareness of my service provider, as he is going to deliver the product to my customer. This customer will do the same with his own service provider, etc. So, in the end, the final customer will receive the product safely and in good shape.

While the Department of Logistics and Sales dealt with the downstream activities of the supply chain, the Procurement Department was in charge of the upstream activities. CD contracting, supply chain and technical departments were found to be responsible for selecting suppliers and monitoring and developing their sustainability performance (sustainability report). A procurement manager from CC noted that his department’s procurement role was primarily focused on maintaining good supplier relationships based on strong cooperation, trust, reliability and communication. In addition, the department had negotiated several issues relating to sustainability, including employee wages, local spending, and an environmental assessment. The Sustainability Steering Committee (SSC)

(companies A, D and E) or the Sustainability Department (CB) role was to enhance the coordination within departments and with stakeholders.

The engagement of internal and external stakeholders, along with their overall positive impact, tended to enhance the implementation of SSCM through their role in influencing other important enablers. For example, the sustainability practices and how it can be measure in the supply chain were developed based on material assessment involving a range of internal and external stakeholders. CA illustrated its process of developing sustainability indicators based on the following steps: (1) identifying key stakeholders; (2) identifying sustainability indicators from GRI and prioritising major sustainability indicators, including checking their alignment with all stakeholders; (3) conducting brainstorming sessions within the sustainability team, in order to identify all relevant and potential aspects after developing a questionnaire to obtain stakeholder feedback in relation to sustainability aspects (sustainability report).

Another example was related to the development of the appropriate green technology for SSCM implementation, many of the sample companies focused on Research and Development (R&D) as the empowerment arm of their companies (companies C, D and F). The R&D to be efficient, it collaborated with other company departments, research centres, universities, partners, affiliates and competitors to develop and test technology (companies C, D and F). For example, CC had set up research centres located outside the Kingdom, helping it to open a global network of innovation contributing to “developing high-impact technologies that help grow business” (sustainability report).

Further, the development and execution of a sustainability strategy were underpinned by the active engagement of stakeholders (CA, CB, CD and CE). CA pointed out that this engagement ensured “developing distinctive and effective sustainability strategies” (sustainability report). CB mentioned the need to coalesce “a community’s goals, strategies, implementation plans, and metrics”, in order to develop and execute a sustainability plan (sustainability report). CD noted that it was not possible to develop a strategy to promote sustained business growth without “the engagement of the community, customers, employees and all other stakeholders” (sustainability report).

Above discussion suggested that the companies in this study inquired enablers associated with: (1) stakeholders; (2) CSR; (3) technology; (3) sustainability strategy and culture; and (4) the measurement of performance. Stakeholder engagement was comprised of (1) internal (management-employees) and (2) external (supplier-customer-government and non-government). The categories relating were found to have a positive impact on the

delivery of social and environmental programmes and the building of momentum towards sustainability within supply chains. The level of influence was, however, found to vary between these categories, with the top management had the most influence role in the SSCM implementation.

5.6 Chapter Summary

This chapter discussed the detailed findings of the empirical fieldwork, including the individual results for each company. There was an examination of both the major themes and related sub-themes, based on: (1) the views of the respondents from each company taking part in the case studies; (2) the associated secondary data; and (3) discussions with members of the focus group. Finally, a number of quotations were extracted from the data, in order to enhance the reliability and validity of the arguments.

The following chapter discusses the main findings in relation to the existing literature. This discussion will have the potential to establish a number of assertions and highlight any discrepancies concerning the motives, barriers, and enablers related to SSCM in developing nations and KSA.

Chapter 6 : Discussion

6.1 Introduction

This chapter discusses the key findings that emerged from the empirical evidence presented in the previous chapters and compares them with those of the findings from the literature review. In order to determine whether the primary motives, enablers, and barriers involved in the adoption of SSCM described by the cases in the present study matched or contradicted those mentioned in the existing literature, and whether new concepts emerged.

The empirical evidence of this study was obtained from six cases of large sustainable companies operating in the KSA's manufacturing industry, and a focus group. Thus, the emergent concepts are not generalizable to all the companies operating in the KSA's manufacturing industry, and are limited to companies possessing the same characteristics as those of the case study companies.

The empirical findings are discussed in relation to the research questions and the literature reviewed and are divided into four sections. The first three sections discuss the empirical findings of the main motives, barriers, and enablers for SSCM development in light of the literature review, while the last section highlights the conceptual framework developed from the case study companies, and compares it with that developed as a result of the literature review.

6.2 Motives for the adoption of SSCM

The first question addressed by this study sought to determine the critical factors that motivate an organisation to adopt SSCM. The findings of the literature review revealed that the majority of the theoretical studies were concerned with identifying external factors or pressures, rather than internal motivators, for the adoption of sustainability in the supply chain. Most of the extant theoretical studies reported that organizations are generally reactive to pressure from outside stakeholder groups, especially government regulation (Mathiyazhagan and Haq, 2013; Xu *et al.*, 2013; Zhu, Sarkis and Lai, 2007; Zhu, Sarkis and Geng, 2005), customer pressure (Sajjad, Eweje and Tapping, 2015), and community pressure (Chkanikova and Mont, 2015; Mont and Leire, 2009; Beamon, 2008; Walker, Di Sisto and Mc Bain, 2008;).

However, the obtained results of the analysis challenged this view. It found that there are more internal than external motivators for adopting the SSCM approach, revealing that the key motivators for embracing the SSCM approach originated in the company's responsibility to their internal and external stakeholders and achieve benefits, not in the stakeholder pressure evidenced in the SSCM motive field.

Moreover, this sense of responsibility expressed by the organisations in the case studies had been in place since their establishment, with the company founders incorporating the concept into the business. This empirical finding therefore supported the theoretical notion that investors can pressure firms to adopt a sustainable approach, and that firms will respond by adopting an effective sustainability strategy (Sharma and Henriques, 2005). This is in response to firms considering their investors being, due to their financial support, the most significant members of the stakeholder group (Qi *et al.*, 2013).

The founder of the five companies involved in the case studies was the government. This finding extended the work of previous studies by considering new aspects of the government's role that can be used to motivate companies to adopt SSCM. Specifically, the fact that the government is able to act not only by enforcing regulation. But by using the public authority fund to influence a private company to consider sustainability to be central to the company's objectives and respond to internal and external stakeholder demand. One of the implications of this is the possibility that when government public funds invest in a company, this company is more likely to prioritise a sustainability strategy, and to be a vanguard of the adoption of sustainability in the supply chain. This result was a key contribution of this study to the field of SSCM.

Government control of financial power can be explained in terms of the political system in Saudi Arabia, which is based on the centralisation of management (Giunipero and Flint, 2001). This indicates that the centralisation of power into a small number of officials (particularly when it comes to decision making and the distribution of resources) can play a role in influencing the implementation of SSCM. This empirical evidence supports the theoretical notion that centralisation in management, with a small number of leaders being in control, and those at a lower level being required to implement their decisions, can be useful in facilitating the development of sustainability (Roy and Tisdell, 1998).

This study also found that the sample companies involved hoped that by valuing the responsibility to their internal and external stakeholders as a central premise of their business, they would obtain several benefits in both the short and long term. This empirical finding concurred with recent research contending that SSCM can provide benefits for organizations beyond reducing stakeholder pressures or increasing their satisfaction, since it can contribute to the improvement of operational performance (Sajjad, Eweje, and Tappin, 2015), provide benefits resulting from the suppliers' innovation capacity (Ageron, Gunasekaran and Spalanzani, 2012), promote competitive advantage (Zhu and Sarkis, 2004),

assist in managing health and environmental risks (Sajjad, Eweje and Tappin, 2015), and enhance reputation (Wolf, 2014; Zhu, Sarkis and Lai, 2007; Maloni and Brown, 2006).

Indeed, this study extended the benefits that organisations receive as a result of embracing their social responsibility to enhance their local suppliers' performance, showing that they benefited from (1) shorter lead times, (2) reductions in emissions from reducing transportation requirements, (3) actively supporting the community by selecting local suppliers and (4) saving money. For example, CF company had experienced a number of issues when attempting to source from international suppliers, i.e. lengthy delivery times and delays in addressing issues surrounding defective parts. However, these aspects were eliminated when the company selected a local supplier, leading to a significant reduction in cost, alongside the support given to the local supplier. Therefore, if the company assumes the responsibility to develop local suppliers, the resulting range of benefits engender improvements in the SC, in terms of the environment, social, and economic aspects concerned.

Furthermore, the largest number of benefits reported by the organisations involved in this study were related to managing the risks to the business environment, and to health and safety, as the case study companies acknowledged the risks arising from their operations and partners in the SC that impacted their financial performance. For example, CB and CD noted that a failure to manage environmental, and health and safety risks throughout their SC activities could result in serious financial losses, indicating a link between managing environmental and social risks in the SC, and the company's financial performance.

Interestingly, the adoption of environmental and social practices throughout all supply chain activities found to be improving the economic performance. For example, one participant explained that large manufacturing companies achieved benefits from SSCM adoption, such as "reputation, stakeholder satisfaction, employee attraction, and appealing to customers from outside the country", which then affected the business' economic performance. This empirical finding extended what is currently known about the adoption of a green supply chain approach and the improvement of a company's economic performance (Gardas, Raut and Narkhede, 2019; Xu et al., 2013; Gomis et al., 2011), and also endorsed the value of adopting the environmental, social, and economic aspects in the SC that engender these benefits. This finding constituted a valuable contribution to the field of SSCM.

The above discussion indicated the presence of several factors related to motivating business to embrace sustainability initiatives within their SC. While previous studies in the field focussed on identifying the motivating factors, this thesis provided a broader perspective that reflected the critical factors and, more importantly, offered an understanding of these factors, thereby providing a more comprehensive view of sustainability adoption in the SC. For instance, this study found that a crucial motivation for SSCM adoption was related to the company's responsibility to their stakeholders, and the investigation of the reasons for this identified the new role of the government. Crucially, this study highlighted the importance for the successful implementation of SSCM of managers and industries prioritising the identification and comprehension of the relevant factors involved.

6.3 Barriers to the implementation of SSCM

This study also sought to explore the barriers encountered by organisations that inhibit their adoption of SSCM practices. This empirical study identified 47 factors acting as barriers, a greater number than that identified by the theoretical studies that employed a qualitative approach. For example, Walker and Jones (2012) identified 29 barriers, Sajjad, Eweje and Tappin (2015) identified nine barriers, and Zaabi, Dhaheri and Diabat (2013) identified 13. A possible explanation for this greater number may be that this empirical study analysed a range of documents related to each case study, as well as interviewing the company managers, who were well qualified to answer the research questions.

Another possible explanation may be the method employed in the analysis of the findings. This empirical study employed a thematic template, which has the advantage of obtaining a greater level of details through an in-depth analysis of each case. According to Govindan *et al.* (2014), it is desirable to determine a large number of barrier factors, as the exploration of as many inhibitors as possible can lead to a greater understanding of what can impede the effective implementation of SSCM of organisations in developing countries such as KSA, which are still encountering a high level of internal and external constraints. Moreover, the number of barrier factors identified by this empirical study also helped to fill the gaps in the extant literature as suggested by Sajjad, Eweje and Tappin (2015).

The classification of these 47 barriers was organized according to stakeholders, whether internal or external. While this was not the intention from the outset, as the study commenced with 14 existing themes, the themes relating to the stakeholder categories were salient for all of the participants' responses. The previous theoretical studies sought to identify the barriers according to a variety of categories. For example, Sajjad, Eweje and Tappin (2015), Walker and Jones (2012), and Balasubramanian (2012) categorized them according to internal and

external factors, while Govindan *et al.* (2014) classified them according to the four categories of outsourcing, technology, knowledge, and financial involvement and support.

While the previous researches in the field employed a range of approaches to the categorization of barriers in the adoption of SSCM, the present study differed in its approach due to the depth of the analysis of each category. The empirical findings of this study focussed on categorizing the barriers according to their relative importance in SSCM implementation, together with highlighting their negative impacts, how these could be mitigated, and the relationship between the categories. Therefore, this study is unique among the extant studies in the field as it provides a thorough understanding of each category, a matter that Govindan *et al.* (2014) claimed was a necessary addition to the field.

This empirical study found that each barrier category did not share the same negative impacts as the others in inhibiting the implementation of SSCM in the case study companies. This was reflected in the findings of other studies, including those of Govindan *et al.* (2014), Zaabi, Dhaheri and Diabat (2013) and Walker and Jones (2012), who reported that there were a number of critical barriers that must be addressed and resolved in order to facilitate the successful implementation of SSCM. It is essential to note that these barriers cannot be assumed to be the same across all countries, industries, and companies, as context plays a crucial role in determining the challenges of adopting SSCM (Silvestre, 2015a). The differences that emerged between the cases studies in the present research confirmed this fact. For example, a solo contractor who built the company plant in one industry was found to be among the barriers that were not relevant to other sectors, and foreign investors were another example found to be an issue for one company, but not for others.

Nevertheless, this empirical study also found that the sample companies shared a number of specific barriers, which might be explained by the fact that they possessed certain shared similarities in terms of size, high degree of sustainability adoption, and the position of the manager interviewed for the study. This finding concurred with that of Govindan *et al.* (2014), whose survey identified 47 barrier factors, and found that 25 of these were of particular significance as they were shared across different Indian industries. These findings suggested that managers must examine all existing barriers present and select those which are most critical to the context of their operations and relevant industry.

This empirical study also found that the most important factors that were currently hindering the progress of SSCM adoption for the case study companies were external, and included government, suppliers, customers, and investor barriers. This was consistent with the findings of Balasubramanian (2012), who reported that the external barriers are more critical

to the inhibition of GSCM implementation in the UAE. However, in contrast, Walker and Jones (2015) found that the seven UK firms in their study that were considered to be large and sustainable faced more barriers (19) that were linked to internal factors, and only 10 external barriers. This finding supported the earlier statement regarding the importance of context for determining the critical barriers, as Saudi Arabia and the UAE share many similarities in terms of the role of the government in their society, culture, and business operation, and are located in the same geographical region, while they share no similarities with the UK. Further studies regarding barrier factors in different contexts are therefore necessary to assess whether context plays a role in determining the barriers.

Several of the extant theoretical studies reported the challenges that external stakeholders impose on the adoption of SSCM. The barrier of suppliers was found to be a challenge to establishing a sustainability report, or produce a sustainable product (Bernon *et al.*, 2017), while the barrier of customers was found to affect companies employing SSCM practices, due to low customer demand for the sustainable products offered (Faisal, 2010a; Seuring and Müller, 2008a). Meanwhile, the barrier of investors was found to affect companies that were required to source the money necessary for developing sustainability in their supply chain (Govindan *et al.*, 2014; Jayant and Azhar, 2014), and the barrier represented by the government was found to hinder a company's ability to convince their customers and suppliers to engage in sustainability practices (Hasle and Jensen, 2012).

These findings above were confirmed by the current empirical study, which also found that external stakeholder barriers such as customers, suppliers, investors, and government had an economic implication for the case study companies, alongside the social and environmental impacts that inhibited their SSCM implementation. For example, one of the companies introduced water-saving technology into its production process. The company then experienced difficulties in selling the surplus water to another company. This subsequently resulted in health problems for both the company's employees and the local community, due to mosquitoes thriving in the stagnant water. The company did not achieve its objectives, as it had been assumed that the implementation of this measure would enhance its economic and environmental performance, rather than creating new and costly ecological and social risks.

The most critical barrier that required addressing in order to improve the SSCM implementation in the case study companies was that of the government. The literature review reported that government regulation, guidance, support, and leadership are critical barriers that inhibit the implementation of SSCM (Ansari and Kant, 2017; Govindan *et al.*, 2016; Tay *et al.*, 2015; Alexander, Walker and Naim, 2014; Jayant and Azhar, 2014; Morali

and Searcy, 2013; Balasubramanian, 2012; Shaw, Grant and Mangan, 2010). However, studies conducted in developed nations, such as the UK (Walker and Jones, 2012), and New Zealand (Sajjad, Eweje and Tappin, 2015) found that the government was not among the main barriers that inhibited the implementation of SSCM. This implied that the government constitutes a greater barrier for companies located in developing nations than in developed nations.

As discussed in the literature review chapter, these studies assessed the regulation and policy aspects of government, but in the case of Saudi Arabia and the current study, the barrier represented by the government go beyond the lack of policy, regulation, and support. This empirical study found that the Saudi government was also blamed by the participants for the lack of a logistics infrastructure, the lack of education regarding sustainability and the concept of the supply chain, the lack of a waste infrastructure, and the low rank of the country in the global competitive index. A possible explanation for this is that Saudi Arabia is a top-down country, in which the government controls and dominates every aspect of the Kingdom. It is responsible for developing the infrastructure, improving education, and providing houses and jobs to its citizens. Hence, any lack in these areas is automatically blamed on the government. This study therefore extended the findings regarding the barrier factors represented by the government to include other aspects that were not mentioned in the existing literature.

As reported by several extant theoretical studies, the government barriers to the supply chain have a negative effect. One of the issues reported by a number of theoretical studies is that the government barriers make the incorporation of the sustainability requirements with the company's customers and suppliers extremely challenging (Tay *et al.*, 2015; Luthra and Haleem, 2015b; Muduli *et al.*, 2013; Hasle and Jensen, 2012; Hassini, Surti and Searcy, 2012; Giunipero, Hooker and Denslow, 2012). This was supported by the findings of the current empirical study, as the lack of government support, and the pressure on suppliers to adopt sustainability policies made them resistant to engaging with the case study companies to improve their sustainability performance. This indicated that the external stakeholder barriers, such as the government, influenced other barriers, such as the suppliers, as the current empirical study found that the lack of commitment to sustainability by large Saudi organisations influenced supplier resistance to engaging in sustainability practices.

This empirical study also found additional factors related to the negative impacts of the government barrier that were not previously reported by the extant literature. These barriers (i.e. a lack of information concerning the number and type of factories operating in the Kingdom, as well as the implementation of fees and new laws) resulted in impacting the

sample companies' implementation of the local content strategy aimed at adding value to the Saudi community through the development of the workforce and investment into supplier development.

The empirical study also found that the government inhibited the implementation of safety initiatives innovation by failing to support the companies' desire to innovate. Moreover, there were found to be economic implications for the companies caused by congestion in customs. These results indicated that an awareness of the negative impacts associated with the critical barrier factors is essential for an in-depth understanding of how these barriers effect the adoption of SSCM, and this where the research findings can help.

Some of the existing literature in the field explained the reason for the lack of governmental support, and concurrent pressure to adopt sustainability practices, observing that political instability, corruption, and lack of leadership skills are issues that engender a lack of support by the government, and pressure on companies to adopt sustainability in the supply chain (Govindan *et al.*, 2016; Luthra and Haleem, 2015b; Govindan *et al.*, 2014; Morali and Searcy, 2013).

However, these reasons may not be relevant to the specific Saudi Arabian context, specifically political instability. The current empirical study found that there were two additional reasons why the government failed to support businesses in adopting a SSCM approach, but also pressurized companies to adopt sustainability. Firstly, the Saudi government seeks to make Saudi Arabia an industrialized manufacturing country, a motive associated with the easing of pressure on environmental regulation, and the pressurizing of companies to adopt more social aspects, such as hiring Saudis, the localisation of material sourcing, and the empowering of women, therefore the companies were required to respond to these demands. Secondly, the lack of skills and leadership concerning the sustainability concept among government employees.

Resolving these government-related issues can be tackled by companies collaborating with government authorities, and the current study found that some of the case study companies had worked with the government to address these issues by sending them recommendations, and demanding changes to improve infrastructure and regulation. In addition, the participants observed that as a result of the Saudi 2030 Vision, the government would improve many areas such as the logistics infrastructure and support of sustainability practices.

As noted in Chapter Three, this vision is generally in line with sustainability goals and objectives (Alshuwaikhat and Mohammed, 2017). Thus, we can assume that the Saudi

government, through its Vision 2030, has altered its attitude towards sustainability and its approaches to its implementation. As a result of Vision 2030, the government exerts pressure on companies, and this may influence the implementation of SSCM in the future.

These findings endorsed the conceptual framework adopted by this study, which suggested that in order to gain an insight into the role of barriers in inhibiting the implementation of SSCM, these barriers should be investigated by (1) identifying a collective set of barriers with shared similarities, including their environmental, social, and economic impacts; (2) identifying whether the key factors of a barrier influences other barriers; (3) identifying the critical barriers in consideration of the context; and (4) identifying the ways those barriers can be mitigated. For example, the sample companies were found to adopt a variety of methods to improve the sustainability performance of their suppliers, such as training, collaboration with a third party partner to improve supplier performance, and providing suggestions for improvement to the supplier.

6.4 Enablers of the implementation of SSCM

The third question addressed by this study sought to identify the enabling factors that facilitate SSCM practices. This empirical study identified 45 enablers that can facilitate the implementation of SSCM in the case study companies. These findings support and complement the growing body of evidence addressing the need to identify as many enablers as possible to accelerate the adoption of SSCM, and to fill the gap in the literature regarding the number of SSCM enablers (Gopal and Thakkar, 2016; Diabat, Kannan and Mathiazhagan, 2014; Walker and Jones, 2012; Giunipero, Hooker and Denslow, 2012).

The number of enablers identified by the present empirical study can essentially be related to the fact that the investigated companies possessed resources such as money and people that promoted their strong capability to adopt SSCM. They were also found to have been in the process of adopting CSR since their establishment, which provided them with a degree of experience of sustainability practices. The number of enablers identified may also be due to the methodology employed by this study, since the case study approach helped to generate a significant number of enabling factors, as each case study was investigated in more depth.

The most important finding of this empirical study was that many of the enablers that guided the activities involved in the implementation of SSCM were internal to a company. This concurred with the theoretical findings reported by Walker and Jones (2012) who investigated seven large sustainable companies in the UK. It can therefore be assumed that large organizations that are considered as responsible and sustainable have the capability to implement SSCM, as it apparently requires more internal than external enabling factors.

However, it should be noted that both studies employed a case study approach, therefore broader generalisation of the findings may not be possible.

This empirical study found that internal stakeholders play a more significant role in SSCM implementation than external stakeholders, which concurred with the findings of a number of previous theoretical studies, including those conducted by Mirvis, Googins and Kinnicutt (2010), Hu and Hsu (2010), Dubey and Gunasekaran (2015), Diabat, Kannan and Mathiazhagan (2014), and Govindan *et al.* (2016), which reported that top management and employee involvement are vital to the implementation of SSCM, and that without their skills and involvement, SSCM implementation is not possible.

Moreover, this empirical study found that top management is the critical enabler for ensuring the successful implementation of SSCM, a finding that was consistent with that of Dubey *et al.* (2015), Seuring and Müller (2008b), Ansari and Kant (2017), Giunipero, Hooker and Denslow (2012), Walker and Jones (2012), and Luthra, Garg and Haleem (2016). These theoretical studies, together with the present empirical study, have all linked strong SSCM implementation to top management support, skills, and vision. The most important positive aspects of top management impact on the adoption of SSCM identified by the current study aligned with those observed by the previous theoretical studies are placing resources (Luthra, Garg and Haleem, 2015b), and supporting collaboration with partners and driving innovation (Waite, 2013; Ageron, Gunasekaran and Spalanzani, 2012).

Top management also influences other enablers involved in SSCM implementation (Ageron, Gunasekaran and Spalanzani, 2012). One example highlighted by the current empirical study is the high degree of influence that top management has on employee commitment to developing and executing SSCM implementation. Designating roles and responsibility, spreading the sustainability culture, empowering employees to innovate in the sustainability field, and supporting the sustainability team and other relevant company departments in their engagement with external stakeholders are all factors employed by the top management to ensure their employees' engagement with the SSCM processes. Some of these elements were reported by a number of previous studies in the literature, including management empowering employees (Dubey and Gunasekaran, 2015), the presence of a good workplace environment (Muduli and Barve, 2013), and rewarding employees (Luthra, Garg and Haleem, 2013).

Another interesting finding of the current study is that top management commitment to the SSCM adoption is often related (or often leads) to a greater focus on sustainability indicators for reporting the progress in the SSCM implementation. This concurred with the findings of

the study conducted by Singh, Rastogi and Aggarwa (2016), who reported that sustainability indicators were the central focus of the company when there was top management commitment. These findings suggested that top management's commitment, skills, and vision are vital, as their involvement have a positive impact and influence on other enabling factors that facilitate SSCM implementation.

This empirical study also found that active engagement on the part of internal stakeholders may explain the presence of effective strategies for the case study companies in hiring the most talented employees in the labour market and recognizing the importance of developing their skills that enabled the development of SSCM. This finding confirmed that obtaining new hard skill such as TBL frameworks, green packaging and soft skills such as teamwork, ability to learn among the top management team is vital for promoting sustainable practices in the supply chain (Dubey and Gunasekaran, 2015). Therefore, it is vital for successful SSCM implementation to invest in the development of their staff's capabilities as well as recruiting and retaining the most talented employees. As Dubey and Gunasekaran (2015) reported, the human resources department is an important enabler for SSCM implementation.

This combination of findings identified the enablers, along with their positive impact on other enabling factors, including the potential for improvement. This promotes an improved understanding of the role of enablers in facilitating the implementation of SSCM. Thus, endorsing the conceptual framework of this study.

6.5 The implementation of SSCM according to the case study and the focus group findings

One of the aims of this study was to explore how the investigated organisations developed and implemented SSCM. The study found that the case study companies-maintained enablers associated with stakeholders, CSR, technology, sustainability strategy and culture, and performance measurement. Their stakeholder engagement included internal aspects, namely those regarding the management and employees, and external aspects including those related to suppliers, customers, government, and non-governmental factors. All of these categories were reported in various extant theoretical studies as enabling factors for SSCM implementation. However, the degree of their effectiveness was found to vary between the categories concerned.

This study found that the case study companies adopted CSR before they considered adopting sustainability in the supply chain, and that this approach justified why sustainability was subsequently introduced to the supply chain. This finding echoes Walker and Jones's

(2012) emphasis on the importance of selecting a specific SSCM strategy, and linking it to the existing corporate strategy, such as CSR, or corporate sustainability (CS). Other studies, such as those conducted by Govindan *et al.* (2016), Luthra, Garg and Haleem (2015b), and Luthra, Garg and Haleem (2016), highlighted the importance of a company establishing CSR, as it empowered the adoption of sustainability in the supply chain. Indeed, the current study found that CSR ensured that all of the stakeholders were considered when a company took decisions regarding the supply chain. This supported the findings of Leppelt *et al.* (2013), and it can therefore be assumed that CSR is a fundamental factor that must be adopted before commencing the integration of sustainability in the supply chain.

Perhaps the most significant finding of the current study was the fact that when the case study companies identified the objectives or the motives for their SSCM adoption, they engaged with both their internal and external stakeholders in order to achieve it. This engagement was found to be vital for the adoption of sustainability in the supply chain, as reported by a number of previous theoretical studies, such as those conducted by Gopal and Thakkar (2016), Taticchi, Tonelli and Pasqualino (2013), Oelze (2017), Walker and Jones (2012), Zhu, Sarkis and Lai (2007), Ansari and Kant (2017), and Gimenez, Sierra and Rodon (2012). These results demonstrate the importance of stakeholder engagement in SSCM development.

This engagement was found to be as an ongoing process to ensure active stakeholder engagement, commencing with the identification of the key stakeholders, and determining the best approach for engaging with them. This concurred with the findings of Meixell and Luoma (2015). In addition, and in line with the findings reported by Blome, Paulraj and Schuetz (2014), this empirical study identified the importance of case study companies understanding key elements of the engagement, as each group has a role to play, and their positive contribution varied according to their importance concerning SSCM implementation.

As previously discussed, internal stakeholders, and especially the members of the top management team, have a significant role to play in SSCM implementation that can promote the positive engagement of employees in the process. This empirical study found that the engagement of employees forged a long-term relationship with external stakeholders, as well as achieving other results such as achieving a high rate of sustainability performance. This indicating that the case study companies focused on ensuring the involvement of their internal stakeholders, who helped to develop strong internal capabilities, before engaging with their external stakeholders. This concurred with the findings of many previous theoretical studies, which reported the importance of developing internal capabilities by

ensuring a commitment on the part of the internal stakeholders before the company engaged with their partners and other external stakeholders (Abdullah, Mohamad and Thurasamy, 2017; Blome, Paulraj and Schuetz, 2014; Porter and Derry, 2012; Waddock, 2001).

This empirical study found that the possession of a strong internal capability for sustainability has important implications for developing SSCM, as it enhanced the participating companies' ability to benefit from the collaboration with their partners and other stakeholders. This was echoed by Blome, Paulraj and Schuetz's (2014) observation regarding the fact that the possession of strong internal sustainability practices allows a company to absorb the benefits of the engagement with its supply chain members. This highlights the importance of developing strong internal sustainability practices before expanding to integrate the external activities.

After ensuring that strong sustainability practices were a part of all their internal activities, the case study companies took responsibility for influencing and developing their supply chain partners and other stakeholders' engagement in sustainability practices. For example, the sample companies were found to adopt a variety of methods to improve the sustainability performance of their suppliers such as training, collaboration with third party partner to improve the supplier performance, suggestions for improvement transfer to supplier.

This responsibility may have been due to the fact that the companies concerned were among the largest companies in Saudi Arabia, and therefore possessed sufficient resources to influence and develop their partners' engagement in sustainability practices. Moreover, this finding supported the notion of the focal firm's responsibility to organize, connect, and develop the sustainability performance of their supply chain members, in order to ensure that sustainability practices are implemented in the supply chain (Seuring and Müller, 2008b).

The empirical evidence also found that the logistics and sales department had a responsibility to ensure the engagement of their partners in sustainable practices, and the development of their sustainability performance downstream, while the procurement department was responsible for ensuring the engagement and development of the partners' sustainability performance upstream. This concurred with the observations of Silvestre (2015a), who suggested that the same approach should be employed to influence and develop supply chain partners' sustainability performance, thereby integrating sustainability practices in the supply chain. Hence, it could be argued that large organizations have the responsibility to influence and develop their supply chain partners' sustainability performance, in order to integrate sustainability practices in the supply chain as a whole.

Moreover, this study also found that the case study companies acknowledged stakeholder engagement as a strategy that included the firm and its supply chain partners, and expanded to include other stakeholders, which reflected the observations of Blome, Paulraj and Schuetz (2014), and Faisal (2010), who highlighted the importance of a strategy that includes all of the stakeholders to facilitate a successful SSCM implementation.

Ultimately, this empirical study found that success in developing and implementing a sustainability strategy and technology, together with sustainability indicators that are vital for improving SSCM performance are reliant on both internal and external stakeholder engagement in the process, as each group of stakeholders adds value to the implementation. This reflected the importance of the involvement of all supply chain partners and other stakeholders in the SSCM implementation, without which it will fail (Hall, Matos and Silvestre, 2012). These results illuminated the fact that the success of the adoption of sustainability practices in the supply chain is not reliant on one company alone, rather on the members of the entire supply chain, and other stakeholders, who must collaborate to ensure the success of the adoption.

6.6 Revised framework for the implementation of SSCM

The analysis of the qualitative data analysis discussed in Chapter Five resulted in the development of an updated conceptual framework considering the newly identified component facilitating understanding of the motives, barriers and enablers of SSCM implementation. This component is related to key factors and their environmental, social, and economic impact, as well as the influence of other dimensions on SSCM implementation. The aim of this updated framework is to outline and demonstrate the key components which can improve the understanding of the implementation of SSCM (as shown in Figure 6.1) with regards to the aspects of motive, barriers and enablers. Thus, this framework is appropriate for this current study and any similar cases.

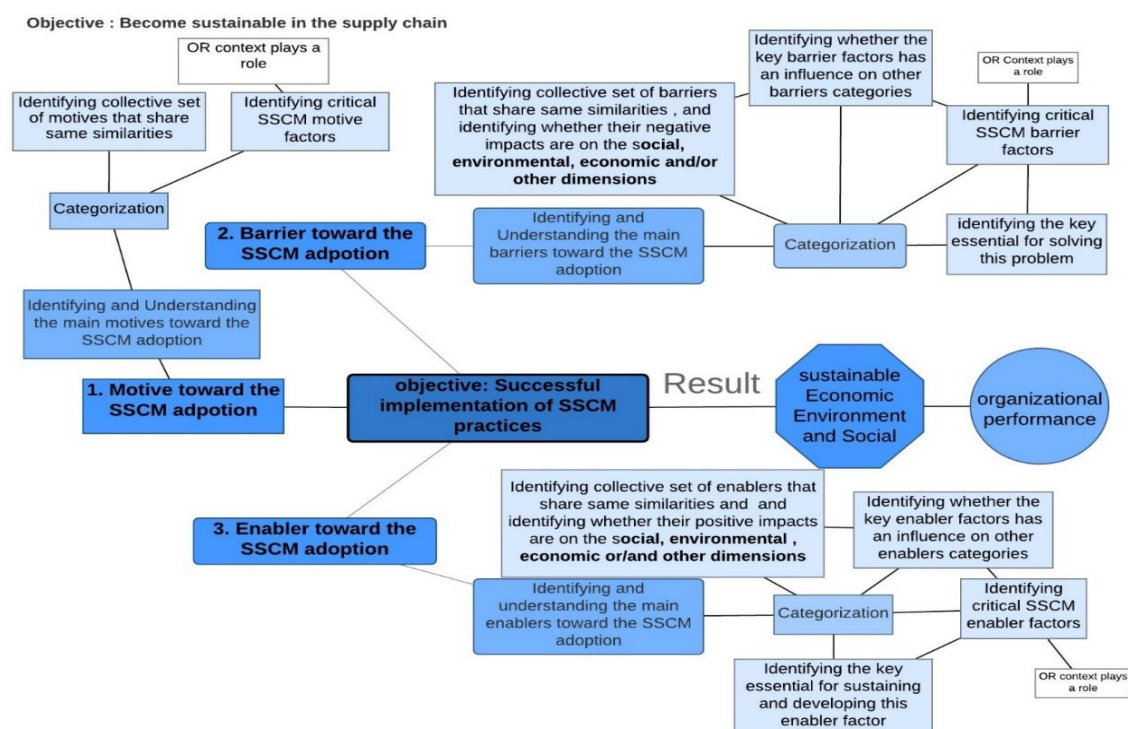


Figure 6.1: Updated framework for the development of SSCM

The following tables have been developed to test this framework. It consists of a summary of the combination of both the theoretical and empirical findings concerning the motives, barriers and enablers of SSCM. The tables in the appendix 8, 9, 10 and 11 show the role of these categorizations in the implementation of SSCM, particularly as the majority belonged to the aspects of the relevant motives, enablers and barriers.

However, it is important to note that the process employed in the development of the tables only employed the extraction of key factors discussed in Chapter Two and Chapter Five. Therefore, the table in the appendix 8, 9, 10, 11 displays the aspects subjectively identified in terms of the motives, enablers, and barriers through an examination of general patterns, similarities, and differences. In addition, the main aim of these tables is to outline and demonstrate the key factors, along with their impact on the environmental, social, and economic dimensions. It also identifies their key elements for development, thus ensuring they are more easily accessible to others.

6.7 A model of SSCM development for the organizations in Saudi manufacturing industry

One of the gaps noted in the literature by this current study concerned a lack of practical solutions for the adoption of SSCM by the Saudi manufacturing sector, as discussed in Chapter Two. There is a gap between the theory and practice, and therefore By recalling the SSCM framework (Figure 6.1) developed from both the literature review, and the empirical findings, it is possible to propose a model for use by manufacturing enterprises to improve

their SSCM development. So, the proposed model can help to narrow the gap between the academy and the industry.

The construction of this model, which corresponds to the main specificities of the Saudi context, was informed by the findings of the six case studies of large manufacturing companies, and the focus group conducted in Saudi Arabia. Thus, the proposed model can be used for any company possessing similar characteristics.

The model as illustrated in the Figure 6.2 consists of several phases, and each phase includes practical steps as discussed in chapter 5. After, the company justifies why sustainability is subsequently introduced to the supply chain. The new model (Figure 6.2) demonstrates there are thirteen elements that can enable and/or inhibit the SSCM implementation in the Saudi manufacturing Context. The model shows that the categories of culture, performance measurement, CSR, and technology should be considered as enablers to the process. Stakeholders appear under both the enabler and barrier sections, with the exception of non-governmental organizations, which appear only in the enabler section.

This reiterates that identifying the barriers and enablers, and understanding them, is vital for successful SSCM development. The understanding can be enhanced by following the step mention in the framework. The proposed framework suggests that the company has first to create a categorisation, which includes a collective set of barriers that share the same similarities. The model also sets to those categorisations can be explained in depth, by identifying their specific barriers, including negative impacts on the social, environmental, economic and/or other dimensions, their influence on other barriers, and how these can be eradicated. In addition, it is necessary to evaluate which barriers are critical to SSCM adoption.

The same approach can be applied to the enabler side to identify relevant enablers categorised in relation to their importance to the adoption of SSCM. In addition, it set out their categorisation roles in depth, by identifying their specific enablers, including their positive impacts, their influence on other enablers, and how this category can be developed, and which from the categorisations are critical to the adoption of SSCM. Summary of findings of those categorisations and elements can be found in appendix 8, 9, 10 and 11.

As this study found the barriers and enablers are not carry the same impact, and it is very challenging for companies to eradicate or maintain the development of all barriers and enablers simultaneously at the beginning of adoption. Thus, it is vital for the company to identify the critical enablers and barriers that enable or inhibits the SSCM implementation.

It is imperative to notice that critical barriers and enablers are variable from country to country, industry to industry, and firm to firm.

In the case of sample cases, the critical barrier constituted by the government, a discussion of which, including the factors involved, their negative environmental, social, and economic impact, and how to mitigate the issues was included in section 5.4.1. Thus, companies need to start to eliminate the most dominant barriers that are preventing them from adopting SSCM related to the government. Thus, these barriers must be mitigated first to ensure the successful implementation of SSCM in the context of the Saudi manufacturing industry.

The model also highlights the main enabling factor of the top management, which was discussed in Section 5.5.1 along with the factors involved, and their positive environmental, social, economic impact and development. Thus, these enablers are essential pre-cursors to successful SSCM as they have the high positive impact on the SSCM implementation.

From the model, it can be argued that the top management team at the case study companies encouraged the development of sustainability in the supply chain, as they recognized the importance of SSCM implementation for improving the firm's sustainability performance. However, they faced the barrier of the government that inhibited the implementation, and therefore recognized the importance of engaging with the government to resolve this issue. These two stakeholders were found to be critical in the literature review in enabling and/or inhibiting the SSCM adoption. It therefore indicates that SSCM development in the developing nations such as Saudi Arabia require a commitment and respondent actions from the top stakeholders such as governments and top management.

The use of this model, highlighting and explaining the critical barriers and enablers involved in the process can result in the implementation of sustainability throughout the entire supply chain of the organizations in the case study, as well as companies sharing similar characteristics.

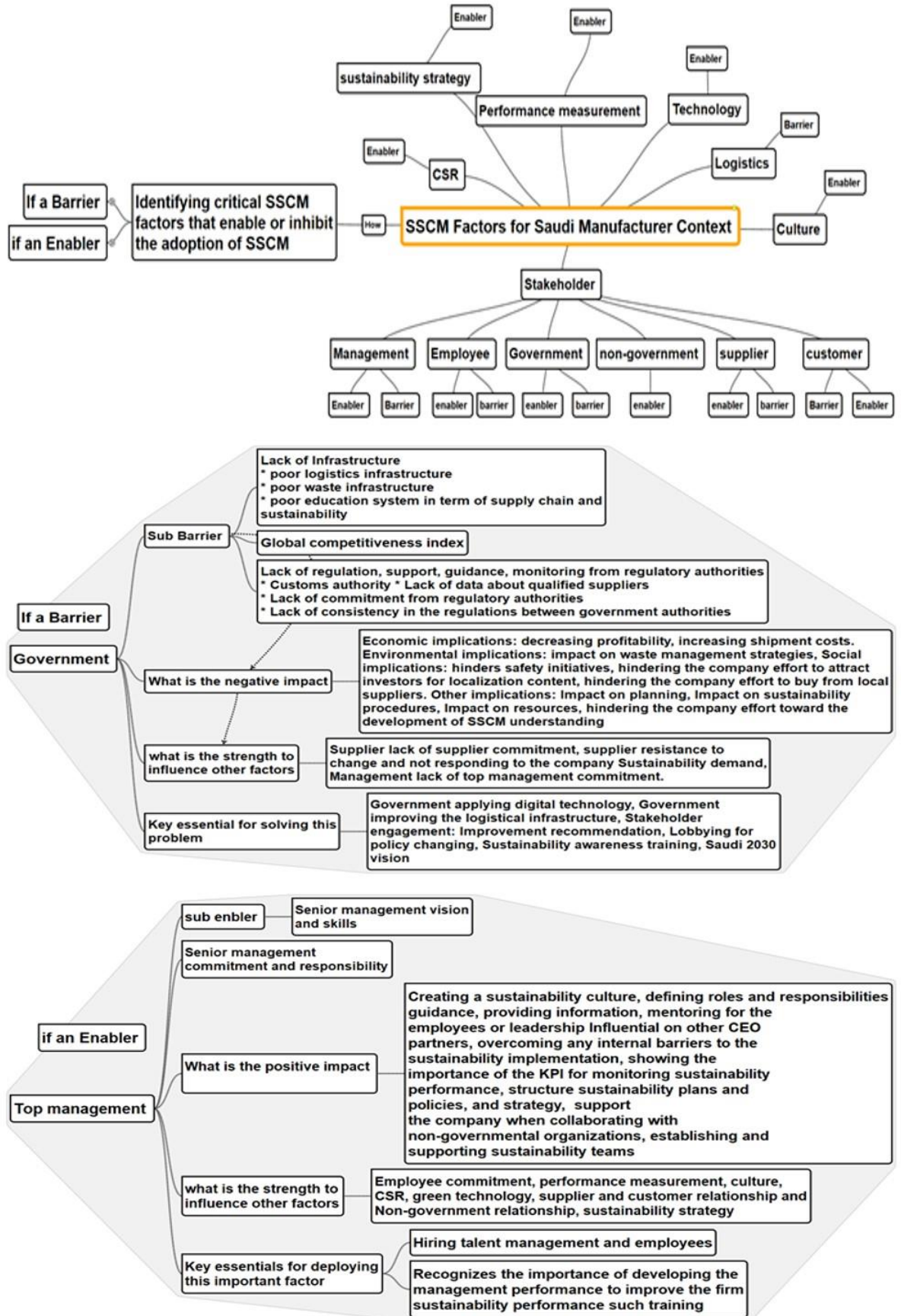


Figure 6.2: Model of SSCM development for Saudi manufacturing industry

6.8 Chapter summary

This chapter addressed all the research questions of this study and linked them with the topics discussed in the literature review. The four questions with which this study was concerned were addressed using the findings of the case studies of six large manufacturing companies from different industry sectors, and the focus group conducted in Saudi Arabia.

The empirical findings of this study shared similarities with, but also differed from, those of the previous studies included in the literature review. While it confirmed certain factors in the literature, this study also added new enablers, barriers, and motives not previously reported. Similarly, while some of the concepts identified concurred with those in the extant literature, new concepts were also added.

The second part of the chapter highlighted the relationship between the empirical findings of this study with those of previous theoretical studies. This enabled the current research to enhance understanding of the development of SSCM and to propose a more relevant SSCM framework for use in the context of developing nations. In addition, the chapter introduced a model capable of improving the implementation of SSCM in Saudi manufacturing companies.

The next chapter summarizes the main points of this thesis, including its theoretical and practical contributions to the field, together with discussing the limitations of the research study, and highlighting possible areas of future research.

Chapter 7 : Conclusion

7.1 Introduction

This chapter aims to summarise and unite chief areas of discussion covered in this thesis, followed by a discussion of theoretical and practical contributions, concluding with limitations and suggestions for future research.

7.2 Thesis summary

Business is currently under pressure to reconcile the issue of sustainable development. This can be undertaken by means of Sustainable Supply Chain Management (SSCM), which integrates the environmental, social, and economic dimensions of a supply chain. However, the implementation is complex, particularly when it comes to developing nations.

The aim of this thesis, as highlighted in Chapter One, is to examine the implementation of SSCM in Saudi Arabia. The present study was designed to identify and discuss the key factors motivating, inhibiting, and enabling the implementation of SSCM, in order to highlight opportunities for Saudi manufactures to improve their approach.

The literature review in Chapter Two developed an understanding of current concepts of sustainable supply chain management. It was divided into four sections. The first section offered an overview of the origin and definition of sustainable supply chain management. The second, third and four sections examined a large number of studies in order to identify its key motives, barriers and enablers, focussing primarily on developing nations. The examination of such theoretical studies led to the creation of various categories of SSCM motives, barriers and enablers. Each categorisation was discussed in-depth, in order to clarify its role in the implementation of SSCM. This included an exploration of the key factors and their impact, along with their relationships, and ways each categorisation can be either sustained or mitigated. The theoretical findings of each categorisation are summarised in appendix 8, 9, 10 and 11.

The review of this section also discussed the research gaps and their significance, along with how they could be fulfilled with the assistance of the current study. The research gaps were identified through an evaluation of existing theoretical studies according to their focus on sustainability, context, method and the number of factors.

Moreover, the literature review assisted in the development of the conceptual framework guiding the empirical study. The framework was constructed based on three components, with each being attached to further elements in order to enhance the understanding of each component. One significant subcomponent attached to the three components concerned the

ability to identify the critical motives, barriers, and enablers from a set of factors. The theoretical findings demonstrated that the identification of critical factors required a good understanding of the general environment of each company, including: (1) size; (2) capability; (3) type of industry; (4) country of origin; and (5) its importance to the country's development.

It was therefore imperative that the Saudi context was outlined in Chapter 3, in order to clarify the general environment capable of impacting either directly or indirectly the implementation of SSCM. The chapter therefore outlined additional factors (i.e. tribal, religious, political, social, economic, and environmental) of concern to a country during the implementation of SSCM, as well as the requirements of Saudi vision 2030.

Chapter Four examined the research methodology adopted for this study. It discussed the philosophical paradigm and justified the choice of the research design and method. This study followed a constructionist (subjectivist) philosophy, in which the researcher views the nature of reality as being socially constructed. This was followed by a discussion of the research design. The present study adopted an approach in accordance with the constructionism paradigm, resulting in the need to apply a qualitative inductive approach.

Moreover, this was subsequently followed by a description of the adopted research method, including: (1) examining the type of case study, with the benefits of a single, as opposed to a multiple, case study; (2) a description of the case studies, as well as their selection; (3) the data collection and analysis; and (4) the reliability and validity of the case studies. This current research adopted the multiple case study approach. The exploratory and descriptive case study research method was considered to be the most suitable for this study, due to it enabling an in-depth exploration of the relevant phenomena.

The study sample was chosen based on the judgemental/purposive theory technique with a homogeneous focus. This ensured that the researcher understood that the sample contained the appropriate elements to represent the population and the purpose of this research (Saunders, Lewis and Thornhill, 2009). The six cases were selected from the following Saudi manufacturing sectors: (1) oil and gas; (2) chemical and plastics; (3) mining and mineral; and (4) energy. The method of data collection consisted of semi-structured interviews, along with an analysis of documentation obtained from the companies' websites.

The analysis of the primary and secondary data was conducted using King's (2012; 2008; 2004) thematic technique. The identification of both coding and themes was undertaken by means a computer-assisted qualitative software programme known as NVivo. The chapter also outlined the validity and reliability of the approaches employed, i.e. the triangulation

approach, involving the use of different data sources. This study developed the case studies by means of multiple sources, including interviews and documents, as well as a focus group.

Chapter Five was divided into two sections. The first section identifies the salient factors in term of motive, barriers, and enablers associated with each case study, along with the focus group. These empirical findings generally indicated that the sample cases agreed when it came to their motives for the adoption of SSCM. This study revealed that the sample cases were closely aligned with two themes of firstly, responsibility towards internal and external stakeholders, and secondly, the achievement of benefits in both the short and long term. Moreover, the findings of the focus group revealed that the adoption of SSCM by large Saudi manufacturers tends to be more closely associated with government pressure and benefits more than their responsibility to the stakeholder.

Furthermore, all of the case studies, along with the focus group agreed on the existence of external barriers, particularly those related to the theme of the governmental barrier, which was viewed as one of the top inhibitors of the adoption of SSCM by large manufacturing companies. The majority of case studies, as well as the focus group, agreed that internal stakeholders tended to be enablers, in particular the top management of large manufacturing companies.

The second section focused on a thematic discussion of the cross-case investigation, examining the motives, barriers, and enablers to the implementation of SSCM. This included identifying: (1) the key factors and their positive and negative impacts; (2) the link between categorisations; (3) critical factors; and (4) how such categorisation could be mitigated or maintained. The discussions were supported by the quotations obtained from managers, alongside the secondary data relating to each company and members of the focus group.

Chapter Six included a discussion of the key empirical findings examined in Chapter Five. The aim of this chapter was to evaluate the similarities and differences between the empirical and theoretical findings. This chapter contained five sections. The first section highlighted the differences and similarities relating to the motives prompting a company to adopt SSCM. The second section highlighted the difference and similarities of the findings in terms of SSCM barriers. The third section focused on the differences and similarities of the findings in terms of SSCM enablers. The four sections evaluated the approach adopted by the cases studies, then compared this with the approach taken in the studies in the literature review.

The five sections of this chapter provided an updated discussion of the framework of SSCM implementation according to the data analysis undertaken in Chapter Four and Five. A separate element, consisting of the key factors and their impact on environmental, social,

and economic aspects were added to the second and third components of the framework. The chapter concluded with a model of SSCM implementation, with the facility to assist in the improvement of SSCM implementation of the sample cases, as well as provide opportunities for further similar cases to develop SSCM.

7.3 Fulfilling the Aim of this Study

This thesis set out to explore the phenomena that inform SSCM motives, enablers, and barriers in the context of Saudi Manufacturing industry. This study achieved the aim by investigating four main questions:

1) What are the critical motives for Saudi manufacturing companies to adopt SSCM?

This empirical study revealed that the chief motivation for the case study companies consisted primarily of a sense of responsibility towards both internal and external stakeholders. The founders played a critical role in disseminating their belief in the responsibility of the business towards all stakeholders. The background information revealed that the Saudi government was either a founding member, or owned a share, in five of the six target companies. This revealed the government as an important stakeholder and critical influencer of the companies' decision to move towards adopting SSCM. The empirical findings also demonstrated that the sample companies' adoption of environmental and social practices in the supply chain was associated with several benefits, which contributed to improving economic performance. In general, the empirical findings of this current study concurred most closely with theoretical studies of Morais and Silvestre (2018), Paulraj, Chen and Blome (2017), and Köksal *et al.* (2017). These studies, as well as the current research, established that the motivating factors were associated with firstly, normative aspects, i.e. the ethical and moral responsibility of a company; and secondly, instrumental factors, i.e. the achievement of benefits, including enhancing the company's profits and reputation. These were considered vital elements in motivating a company to adopt SSCM.

2) What are the critical barriers inhibiting Saudi manufacturing companies from the adoption of SSCM?

The empirical findings also highlighted that the case study companies found it challenging to achieve specific objectives from the adoption of SSCM, with the empirical evidence revealing a large number of barriers and challenges. The empirical findings revealed that the most significant critical barrier consisted of the government, both due to its more negative impact and its influence on other categories. In general, the findings of this empirical study concurred with the theoretical studies, including those of Ansari and Kant (2017); Govindan *et al.* (2016); Tay *et al.* (2015); Alexander, Walker and Naim (2014);

Jayant and Azhar (2014); Morali and Searcy (2013); Balasubramanian (2012); and Shaw, Grant and Mangan (2010). This indicates that the critical barriers inhibiting the implementation of SSCM consisted of government regulations, guidance, support, and leadership. Table 7.1 summarises the empirical findings relating to key government barriers, including their impact and how any negative influence can be mitigated.

Table 7.1: Summary of empirical findings relating to government barriers

| Government | Environmental impact |
|---|--|
| lack of government regulation, monitoring, guidance, and support for adopting SSCM | Having an impact on waste management strategies |
| Customs authority Customs clearance delay Lack of transparency Lack of policies Lack of safety standards Lack of technical expertise Lack of advanced technology Lack of collaboration and trust with other Gulf customs | |
| lack of government leadership, and sustainability skill | Social impact |
| Presence of government corruption | Inhibiting safety initiatives |
| lack of government Infrastructure for adopting SSCM Poor logistics infrastructure Poor waste infrastructure Poor education system regarding supply chain and sustainability concept | Inhibiting the company effort to buy from local suppliers |
| Lack of government global competitiveness index | Economic impact |
| Lack of data from the government about the qualified suppliers | Increasing shipment costs |
| Lack of consistency in the regulations between government authorities | Inhibiting the establishment demand for sustainable product |
| Key essential for solving this problem | Other impacts |
| The company Collaborating with regulatory agencies through Recommendation Lobbying for policy changing Sustainability awareness training Joint work | Inhibiting the sustainable relationships between the buyer and the suppliers |
| Government applying digital technology Government improving the logistical infrastructure Government develop sustainability skills of their top management and employees | Having an impact on sustainability procedures adopted in the supply chain |
| | Having an impact on resources which results in less focus on the SSCM implementation |
| | Inhibiting sustainability awareness among customers and suppliers |
| | Supplier lack of commitment Supplier not responding to the buyer sustainability demand. |
| | Managers are not motivated enough to integrate sustainability in the supply chain |

3) What are the critical enablers facilitating Saudi manufacturing companies' adoption of SSCM?

Despite the large numbers of barriers identified, the empirical evidence highlighted that the case study companies had obtained enablers facilitating SSCM implementation. One critical enabler concerned the top management, as they had the most significant positive impact and broadly influenced the other categories such as employees. The empirical findings generally concurred with theoretical studies such as those of Dubey *et al.* (2015), Ansari and Kant (2017), Giunipero, Hooker and Denslow (2012), Walker and Jones (2012), and Luthra, Garg and Haleem (2016). This demonstrates the relationship between effective implementation of SSCM and the support, skills, and vision of top management. Table 7.2 summarises the critical top management enablers and their positive impact, as well as how they can be developed.

Table 7.2: Summary of empirical findings relating to management enablers

| Management | |
|--|--|
| Senior management commitment and responsibility | Other impacts |
| Senior management vision and skills | Allocating the resources such as funding, human capital, ideas and strategy development, technology. |
| Middle management commitment | Enhancing the collaboration with partners |
| . | Supporting and driving innovative practices, |
| Key essentials for deploying this important factor | Creating a sustainability culture will be hard to change |
| Pressure from the stakeholders will have an impact on the top management | Defining roles and responsibilities |
| Government responsibility Introducing investment responsibility policies (VIP) Introducing the concept in the education system | Guidance, providing information, mentoring for the employees or leadership |
| Company responsibility Find or create sustainability champions Hiring talent management. Recognises the importance of developing the management performance to improve the firm sustainability performance Measures to improve the board's understanding of sustainability impacts Evaluation of the board with respect to sustainability impacts Provide training to senior management in sustainability skills | Influential on other CEO partners |
| Manager responsibility: having skills such as Soft skills, Open-minded, Passionate, Visionary, value the teamwork Hard skills. green logistics, green packaging, and TBL frameworks | Overcoming any internal barriers to the sustainability implementation |
| Sustainability professional's responsibility Doing a case study to show evidence of the importance of sustainability | Showing the importance of the KPI for monitoring sustainability performance |
| | Establishing and supporting sustainability teams |
| | Influential on company employees |

4) What is the most appropriate method employed by Saudi manufacturing companies to develop SSCM?

The empirical study also revealed the methods used by the sample companies to implement SSCM. The empirical findings suggested that, in general, the companies taking part in the case studies pursued procedures to ensure the implementation of sustainability practices in the supply chain, in particular through the adoption of CSR and the adoption of efficient and effective long-term engagement with all stakeholders along with sustainability indicators, appropriate technology, strategies towards achieving sustainability and culture. In general, the empirical findings indicated that the sample cases relating to SSCM implementation tended to be supported by studies in the literature review, including those of Gopal and Thakkar (2016), Taticchi, Tonelli and Pasqualino (2013), Oelze (2017), Walker and Jones (2012) and Zhu, Sarkis and Lai (2007). For example, these studies demonstrated the importance of stakeholder engagement in SSCM development.

7.4 Theoretical and practical contributions

This study was original in the following ways: (1) it emphasised a more holistic approach to sustainability implementation in the SC that was not explored sufficiently by the previous literature. Specifically, this concerned the development of an approach to SSCM that included the environmental, social, and economic aspects; (2) it investigated SSCM in terms of the key motives, barriers, and enablers involved, focusing on developing countries, as such Saudi Arabia, a context rarely explored in the extant literature. Since the KSA and its manufacturing sector possesses characteristics that differ from those of other contexts, the investigation of SSCM development in this field was essential for providing a deeper understanding of the concept, according to the perspective of those concerned. The outcomes of the investigation of this context contributed to, and extended the current understanding of SSCM in the following ways:

1. This study contributed to the current understanding of SSCM by conducting a comprehensive literature review of SSCM studies that identified the factors involved, in terms of the key motives, barriers, and enablers that affect the adoption of SSCM in developing countries. This comprehensive review enriched the knowledge of SSCM by proposing eight motivating categories, twelve barrier categories, and ten categories of enablers (see Appendix 1 and 3). Some of the categories appeared under more than one of the three key factors. It is vital that a company identifies the impact of these factors when they present as an enabler or a barrier.

2. The gap in the literature, in terms of the provision of an in-depth understanding of the motives, barriers, and enabler of SSCM was identified in Chapter 2, and to overcome this, the thesis proposed a conceptual framework for use as a guide to enhance the understanding of these aspects. This framework also shaped the study's theoretical basis, contributing to the development of the interview questions, and guiding the analysis in Chapters 4 and 5. A revised framework, based on the case study findings, was the proposed in Chapter 6. This framework enriched the understanding of SSCM by suggesting that the barriers and enablers to the process may affect the adoption of SSCM under three themes: environmental, social, and economic.

3. The analysis of the results presented in Chapters 4 and 5 engendered the creation of new categories and factors that were highlighted in a template. This template, provided in Chapter 4, constituted an easily-accessible summary of the study's findings for other researchers. The resulting 25 factors that motivated the adoption of SSCM in the sample companies were divided under two themes: stakeholder, which addressed the potential factors related to an organisation's responsibility to its stakeholder and their demands, and benefits, which included all the potentially beneficial factors involved in adopting SSCM. This thesis also explored the critical factors, and the links between the categories, enhancing the understanding of the motivations for adopting SSCM.

The 41 factors that were found to potentially inhibit the adoption of SSCM among the sample companies were divided into five categories: government, suppliers, investors, customers, and other barriers. The critical factors, their negative impacts, and their relationships with other factors were also explored, along with the mitigating actions taken by the companies during their SSCM implementation. This facilitated understanding of the role of these barriers in the implementation of SSCM.

The 45 factors that were found to enable the adoption of SSCM among the sample companies were formed into six categories: (1) stakeholders, (2) performance measurements, (3) technology, (4) sustainability strategies, (5) culture, and (6) corporate social responsibility (CSR). The critical factors involved, and their impact and potential interrelationships with other factors were also explored, together with how the sample companies attracted these enablers. This enhanced understanding of the role of enablers in SSCM implementation.

4. This study provided a roadmap to guide manufacturing industries in Saudi Arabia in developing better SSCM (see Chapters 5 and 6). In addition, this thesis also proposed a model that employed a set of factors for implementing SSCM successfully in Saudi industries. This model proposed the creation of thirteen groups of factors that should

primarily be heeded in the SSCM adoption process, since they exerted a significant influence on the implementation in Saudi industries. The model also highlighted the top management as a critical enabler that encouraged the development of sustainability in the SC, as these individuals recognised the importance of SSCM implementation for improving a firm's sustainability performance. The model also noted the critical barrier of the government that inhibited the implementation of SSCM, and therefore recognised the importance of engaging with the government to resolve this issue. These two contributory factors helped to overcome the divergence between theory and practice, and provided the manufacturing sector in Saudi Arabia with a useful roadmap facilitating their rapid progression towards implementing SSCM.

This study also offers the following recommendations to the Saudi government and leaders of Saudi manufacturing to improve the implementation of SSCM.

This research has clarified that the Saudi government has an important role to play in improving the implementation of SSCM, due to the political system being based on the centralisation of management. For example, the industrial park in Jubail and Yanbu supports companies during their implementation of SSCM. Nevertheless, this is not true of a number of government agencies, including the customs and environmental agencies, which therefore need to play a more active role in encouraging and pressuring companies to adopt SSCM.

The recent government 2030 Vision, which is aligned with the development of sustainability, can change the orientation of government agencies, encouraging them to become more committed to sustainability. This may influence the implementation of SSCM, while also highlighting the need for official training in terms of sustainability skills.

The government can support the implementation of SSCM by: (1) establishing regulations; (2) providing guidance; (3) enhancing public awareness; (4) improving the country's infrastructure (i.e. logistics and waste facilities); (5) supporting the educational system to include the concept of sustainability; (6) facilitating collaboration between industries; and (7) using public funds to influence companies to implement SSCM.

In addition, the following recommendations can be made to managers at the manufacturing sectors.

1. Managers can use environmental, social, and economic dimensions as a means of understanding the nature of sustainability development.

2. Managers should understand that the adoption of sustainability in the supply chain requires investment and a long-term strategy, and any return on this investment will not be immediate, but will enhance their company's future performance.
3. Managers need to acquire a CSR strategy linked to their business strategy prior to integrating sustainability practices in the supply chain. This will assist managers in understanding why and how the supply chain can play a role in achieving a company's CSR objectives.
4. Managers need to understand that SSCM implementation is not the responsibility of a single company. Partners in the chain (i.e. suppliers, customers and other stakeholders) also have a significant role to play. Thus, managers need to identify and develop long-term relationships with critical stakeholders.
5. Managers need to understand that large companies have the responsibility for developing the sustainability performance of their partners, including suppliers and customers, in particular through assessment and collaboration.
6. Managers need to understand that it is crucial to ensure the involvement of internal stakeholders, including managers and employees, as they lead the adoption of SSCM. Thus, the company needs to employ responsible workers and design a conducive work environment, i.e. appropriate training and reward mechanisms.
7. Managers need to understand that the implementation of SSCM is likely to fail without their commitment, skills and vision.

7.5 Limitations and future research directions

This study also provides various opportunities for future research. For example, this study included a broad range of key factors (i.e. motives, barriers, and enablers), each of which deserves further investigation. Thus, further research could be undertaken to: (1) investigate the relationship between top management commitment to sustainability and employee engagement with SSCM implementation; (2) explore the relationship between top management's commitment to sustainability and the development of sustainability indicators in the supply chain; (3) examine the role of public government funding in influencing the implementation of SSCM; and (4) empirically validate the conceptual framework and model developed in this study, through the use of different industries in various contexts.

The objective of this research was to enhance the current understanding of the phenomena under study within the manufacturing sector. It was, however, beyond the scope of this study to investigate whether a company responds differently to the motives, and barriers to and enablers of SSCM in the event of any change of context, either internal or external. The

researcher considers that a longitudinal case studies would be more appropriate for investigating whether these factors change over time.

The empirical findings of this research were based on an investigation of six cases and the views of a focus group, along with a limited number of interviews, rendering it impractical to generalise these findings to Saudi manufacturing industries as a whole. However, such generalisation not the objective of this research and the findings remain relevant to many businesses in KSA and other developing nations sharing similar characteristics to the sample cases.

Thus, the current research considers that it will prove beneficial to use the template developed in this study through large-scale online, on-site and e-mail/mail surveys across manufacturing sectors. This approach can help to mathematically rank and explore relationships between key factors, as well as to assess both the dependent and independent variables influencing the adoption of SSCM. In addition, it can assist in generalising the template findings across the manufacturing sectors in KSA, or other developing nations, i.e. the UAE.

The current research focused on understanding SSCM development in six companies selected from four manufacturing sectors in Saudi Arabia. These are of considerable size and oriented towards the use of sustainability practices. It could therefore prove beneficial to employ a larger sample (including businesses from different sizes and sectors, as well as those possessing different orientations toward sustainability), in order to gain an improved understanding of the main factors impacting on the effective implementation of SSCM.

For example, the supply chain encompasses many members. Therefore, a study that looks at a focal enterprise, supplier, and customer perspectives of the enabler, barrier, and motive can help to understand these factors from different perspectives, and thus improve the implementation of SSCM. Furthermore, SSCM is an emerging concept, so identifying the enablers, barriers and motives from an SME perspective will be very interesting as a way to evaluate SME preparation for the transformation to sustainability in the supply chain.

This current chapter has summarised and united the main areas covered in this thesis, followed by a discussion of the theoretical and managerial contributions, concluding suggestions for future research. This thesis set out to explore the phenomena informing the motives for, enablers of, and barriers to, sustainable supply chain management in the context of the Saudi manufacturing industry.

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Appendix 1: Theoretical findings regarding SSCM barriers

| Barrier toward the adoption of SSCM | Source | Negative impact | Source |
|--|--|---|---|
| Regulation | | | |
| lack of regulatory bodies policy | Srivastava (2007). Ansari and Kant (2017) | challenging in identifying how and what practices should be measured | Shaw, Grant and Mangan (2010) |
| lack of government regulation, monitoring, guidance, and support | Singh, Rastogi and Aggarwal (2016). Govindan <i>et al.</i> (2014). Hassini, Surti and Searcy (2012); Tay <i>et al.</i> (2015); Jayant and Azhar (2014). Giunipero, Hooker and Denslow (2012) Narayanan, Sridharan and Ram Kumar, 2018 Pakdeechoho and Sukhotu, 2018 | challenging in maintaining sustainable relationships between the buyer and the suppliers | Hasle and Jensen (2012) |
| lack of government political instability | Luthra and Haleem (2015) | challenging to impose environmental aspect on firm supply chain located in developing nation | Muduli <i>et al.</i> (2013) |
| lack of government leadership and decision making | Morali and Searcy (2013); Govindan <i>et al.</i> (2016) | Inhibiting innovation | Porter and Van de Linde (1995) |
| lack of legislative framework and policies | Luthra and Haleem (2015) | challenging in establishing demand for sustainable product | Luthra and Haleem (2015) |
| lack of self- industry regulation | Zaabi, Dhaheri and Diabat (2013) | challenging to impose obedience regarding economic and social aspect | Hassini, Surti and Searcy (2012) |
| lack of international regulation | Hasle and Jensen (2012) | challenging in spread awareness to customers and suppliers | Luthra and Haleem (2015) |
| lack of the environmental management regulation and guidance | Shaw, Grant and Mangan (2010) Tumpa <i>et al.</i> , (2019) | challenging to identify who's responsible when problem happens in the supply chain | Hasle and Jensen (2012) |
| lack of regulation and support in developing countries | Muduli <i>et al.</i> (2013) | challenging in pressuring and motivating firms and their top management to integrate sustainability in the supply chain | Tay <i>et al.</i> (2015). Giunipero, Hooker and Denslow (2012) |

| | | | |
|--|--|---|--|
| | | | Narayanan, Sridharan and Ram Kumar, (2018) |
| Lack of government commitment and corruption | Köksal <i>et al.</i> , 2017 Govindan <i>et al.</i> (2016) | Challenging in motivating the company and its supply chain members to collaborate to improve sustainability performance | Pakdeechoho and Sukhotu, 2018 |
| Design | | | |
| lack of supply chain perspective decision in the design of the sustainable product | Bernon <i>et al.</i> (2017) | challenging in designing sustainable supply chain that leads to sustainable product | |
| complexity in design of sustainable supply chain | Zaabi, Dhaheri and Diabat (2013); Ansari and Kant (2017). Govindan <i>et al.</i> (2014) Majumdar and Sinha, 2019; Bernon <i>et al.</i> (2017).; | Challenging in implementing green design, green procurement, green transportation and green operation | Majumdar and Sinha, 2019 |
| | | Challenging in designing reuse and recycle for the product | Govindan <i>et al.</i> (2014) |
| | | Challenging in designing a product that use fewer resources, process and energy in the production | Bernon <i>et al.</i> (2017).; Ansari and Kant (2017) |
| | | cost increases | Majumdar and Sinha, 2019 |
| Employee | | | |
| lack of motivation | Carter and Rogers (2008). Barve and Muduli (2013) | challenging in the achievement of sustainability strategy | Beckmann and Pies (2008) |
| lack of employee union pressure | Mani, Agrawal and Sharma (2016) | challenging in the adoption of social sustainability in the supply chain | Mani, Agrawal and Sharma (2016) |
| lack of people resources | Morali and Searcy (2013) | challenging in the implementation of environmental sustainability in the supply chain | Balasubramanian (2012). Wang <i>et al.</i> (2015) |
| lack of employee training toward sustainability concept understanding | Wang <i>et al.</i> (2015). Govindan <i>et al.</i> (2016); Zaabi, Dhaheri and Diabat (2013); Bohdanowicz, Zientara and Novotna (2011). Ansari and Kant (2017) | low involvement in sustainable supply chain practices | Barve and Muduli (2013). Bohdanowicz, Zientara and Novotna (2011) |

| | | | |
|---|--|--|---|
| lack of higher education and sustainability profession skills | Barve and Muduli, (2013). Govindan <i>et al.</i> (2016). Bohdanowicz, Zientara and Novotna (2011). Balasubramanian (2012). Ansari and Kant (2017) | low pressure on firms to adopt environmental/ sustainable practices in the supply chain | Govindan <i>et al.</i> (2016) |
| The lack of investment regard employee's development toward sustainability subject The lack of appropriate working environment | Barve and Muduli, (2013) | | |
| Resistance to change | Bohdanowicz, Zientara and Novotna (2011) | | |
| Management | | | |
| lack of top management commitment | Ansari and Kant, (2017). Luthra and Haleem (2015). Zaabi, Dhaheri and Diabat (2013) Moktadir <i>et al.</i> , 2018 Narayanan, Sridharan and Ram Kumar, 2018) Kaur <i>et al.</i> , (2018) | challenging in the implementation of SSCM as the top management has an effect on other barriers such as | Ansari and Kant (2017) Zhu and Sarkis (2004) |
| lack of management skills and experience, and training | Zhu and Sarkis (2004) Narayanan, Sridharan and Ram Kumar, 2018) Kaur <i>et al.</i> , (2018) | Lack of infrastructure facilitates, Lack of training and motivating of the employees Lack of using performance measurement | Narayanan, Sridharan and Ram Kumar, 2018) |
| lack of interest and skill from all management level | Chu <i>et al.</i> (2017) | Lack of revers logistics practices | Moktadir <i>et al.</i> , 2018 |
| lack of support and transparency from middle management | Seidel, Recker and Pimmer (2010) | challenging in motivating firms to innovate in SSCM | Luthra and Haleem (2015) |

| | | | |
|--|--|--|---|
| | | challenging in establishing the SSCM strategy | Wittstruck and Teuteberg (2012) |
| | | challenging in valuing the benefit of the environmental sustainability aspect in the supply chain | Govindan <i>et al.</i> (2014) |
| | | Challenging in adopting sustainable procurement | Islam <i>et al.</i> , (2017) |
| | | Lack of integration among supply chain | Singh, Rastogi and Aggarwa (2016) |
| | | Lacking trust and knowledge among SC members | Luthra and Haleem (2015) |
| | | Lack of organization culture, | Luthra and Haleem (2015) |
| | | No proper reward system to supplier | (Majumdar and Sinha, 2019) |
| Financial (cost and return) | | | |
| <p>higher cost in the development of SSCM programmes and practices such as</p> <p>higher Cost for disposal of hazardous wastes (Zaabi, Dhaheri and Diabat, 2013).</p> <p>higher Cost for environmentally friendly packaging (Zaabi, Dhaheri and Diabat, 2013).</p> <p>Cost of sustainability (Zaabi, Dhaheri and Diabat, 2013)</p> | <p>Seuring and Muller (2008); Ageron, Gunasekaran and Spalanzani (2012); Ansari and Kant (2017).</p> <p>Tay <i>et al.</i> (2015).</p> <p>Zaabi, Dhaheri and Diabat (2013).</p> <p>Min & Galle (2001).</p> <p>Govindan <i>et al.</i> (2014).</p> <p>Grimm, Hofstetter and Sarkis (2014).</p> <p>Hsu and Hu (2008).</p> <p>Shrivastava (1995)</p> <p>Walker and Jones (2012)</p> <p>(Narimissa, Kangarani-Farahani and Molla-Alizadeh-Zavardehi, 2019)</p> | <p>challenging in finding the money to develop technology and innovation initiatives to implement the sustainability practices in the supply chain</p> | <p>Govindan <i>et al.</i> (2014)</p> <p>Jayant and Azhar 2014)</p> <p>Panigrahi and Rao, 2018</p> <p>Balasubramanian (2012)</p> |
| | | Challenging in hiring and maintaining employee stability in the organization | (Panigrahi and Rao, 2018) |
| | | | |
| The lack of financial resources | Luthra and Haleem (2015). | challenging in getting the support from buyer (top management) and supplier to adopt SSCM due to the conflict with firm's objective to reduce | Tay <i>et al.</i> (2015) ; Sajjad <i>et al.</i> (2015). |

| | | | |
|--|--|---|--|
| | Walker and Brammer (2009). Govindan <i>et al.</i> (2014) ; Jayant and Azhar, (2014) ; Morali and Searcy (2013) (Panigrahi and Rao, 2018 (Narimissa, Kangarani-Farahani and Molla-Alizadeh-Zavardehi, 2019 | the cost. Plus, the higher risk associated with the adopting of the SSCM | Giunipero, Hooker and Denslow (2012) (Majumdar and Sinha, 2019) |
| The return uncertainty from the adoption of SSCM | Giunipero, Hooker and Denslow (2012). Nguyen and Slater (2010). Esfahbodi <i>et al.</i> (2017) ; Luan, Tien and Wu (2013) ; Yu and Zhao (2015). Morali and Searcy (2013). Zhu and Sarkis 2007 | challenging to compete with firms that do not comment on sustainability | Min and Galle (2001). Morali and Searcy (2013) |
| The lack of incentive system | Zaabi, Dhaheri and Diabat (2013) (Tumpa <i>et al.</i> , 2019) | challenging in establishing regulatory compliance because the lack of competitive pressure | Mani, Agrawal and Sharma (2016) |
| The lack of competitive sustainable pressure | Mani, Agrawal and Sharma (2016) | | |
| Business strategy | | | |
| lack of Corporate social responsibility (CSR) and corporate sustainability (CS) models | Govindan <i>et al.</i> (2014) ; Zaabi, Dhaheri and Diabat (2013) ; (Kaur <i>et al.</i> , 2018). | challenging in making firms understand what sustainability means in corporate and supply chain domain | Walker and Jones (2012) |
| lack of supportive business structure | Tay <i>et al.</i> (2015) | challenging in linking the short-term goal with long one | Zaabi, Dhaheri and Diabat (2013) |
| lack of an example of how CS improves the bottom line | Carroll and Shabana (2010); Gao and Zhang (2006) | challenging to link sustainability issues with operating activities | Pagell and Wu (2009) |
| | | Challenging in getting firm commitment | Kaur <i>et al.</i> , (2018) |

| | | | |
|--|--|---|--|
| Customer | | | |
| desire for lower price | Tay <i>et al.</i> (2015). Walker and Jones (2012). Young, Fonseca and Dias (2010) | Challenging in convincing customers to buy sustainable product that results from the SSCM activities | Seuring and Müller (2008) |
| time to research | Young, Fonseca and Dias (2010) | Challenging in convincing firms to involve in SSCM practices because the low demand | Faisal (2010a) Tumpa <i>et al.</i> , 2019 |
| inadequate information about the benefit of SSCN | Young, Fonseca and Dias (2010). Wang <i>et al.</i> (2015) | Challenging in convincing firms and their supplier to involve in SSCM practices because the low demand, which will result in financial risk | Köksal <i>et al.</i> , 2017) |
| lack of customer support and demand | Winter and Knemeyer (2013); Zhu and Geng (2013). Luthra and Haleem (2015) Tumpa <i>et al.</i> , 2019 | | |
| lack of awareness about sustainability concept | Govindan <i>et al.</i> (2014). Morali and Searcy (2013) Moktadir <i>et al.</i> , 2018) | | |
| Supplier | | | |
| lack of green suppliers and developers | Balasubramanian (2012) | Challenging in making sustainability report | Bernon <i>et al.</i> (2017) |
| lack of environmental system capability in the supplier location | Al Zaabi, Dhaheri and Diabat (2013) | Challenging in making sustainable product | Bernon <i>et al.</i> (2017) |
| resistance to comply | Drohomeretski Lima and (2014) Morali and Searcy (2013) | Challenging in engaging supplier in the decision that related to sustainability in the supply chain | Beske, Land and Seuring (2014) |
| developing nation supplier is more complex | Morali and Searcy (2013) | | |
| complexity in monitoring and measuring supplier's practices regarding sustainability issue | Govindan <i>et al.</i> (2014) | | |

| | | | |
|--|---|--|---|
| different standard, culture, language between suppliers | Walker and Jones (2012) | | |
| higher prices for sustainable product from supplier | Walker and Brammer (2009) | | |
| lack of supplier commitment | Ansari and Kant (2017). Walker and Jones (2012); Zaabi, Dhaheri and Diabat (2013) | | |
| lack of communication, trust, and information sharing between supplier and buyer | Walker and Jones (2012); Zaabi, Dhaheri and Diabat (2013); Luthra and Haleem (2015) | | |
| lack of resources such as money and other resources to audit supplier | Mont and Leier (2009). Morali and Searcy (2013) | | |
| the difficulty to ensure that supplier fulfil the code of conduct | Mont and Leier (2009) | | |
| the differences in culture and management style between focal organisations and their suppliers, | Mont and Leier (2009) | | |
| lack of social responsibility aspect and supplier located in corrupt countries | Mont and Leier (2009) | | |
| traditional purchasing system does not support the sustainable purchasing | Jayant and Azhar, (2014); Sajjad, Eweje and Tappin (2015) Delmonico <i>et al.</i> , 2018 | | |
| lack of transparency from supplier | Morali and Searcy (2013) | | |
| Logistics | | | |
| inadequacy facility for upgrading toward reverse logistic practices | Ansari and Kant, (2017); Agrawal, Singh and Murtaza (2016); Zaabi, Dhaheri and Diabat (2013); Govindan <i>et al.</i> (2014) | challenging in ensuring the recovery and collection of end-of-life products, recycling, remanufacturing and refurbishing the life of product while diminishing waste in the supply chain | Sarkis, Gonzalez-Torre & Adenso-Diaz (2010) |
| lack of awareness of reverse logistics | Zaabi, Dhaheri and Diabat (2013); Govindan <i>et al.</i> (2014) | | |

| | | | |
|---|--|---|---|
| | | | |
| | | | |
| Performance measurement | | | |
| lack of adequate sustainability performance measurement | Ahi and Searcy (2015). Singh, Rastogi and Aggarwa (2016). Sajjad, Eweje and Tappin, (2015); Zaabi, Dhaheri and Diabat (2013) | Challenging in measuring the impact of an environmental, social and economic aspect of the supply chain (partners). | Seuring (2008) King, Lenox & Terlaak, 2005 (Narayanan, Sridharan and Ram Kumar, 2018) |
| complexity to measure the internal activities and the external one in the supply chain | Grosvold, Hoejmosse and Roehrich (2014) | Challenging in ensuring the alignment of short-term and long-term strategic goal | Walker and Jones (2008) |
| mismatch between internal measure and the supply chain measure | Lehtinen and Ahola (2010) | | |
| lack of connection with strategy Insufficient focus on customer, Lack of holistic focus | Shepherd and Günter (2006) | | |
| lack of trust among SC members lack of connection with strategy difficulty in coordination of competencies lack of regulatory bodies performance measures change all the time | Hassini, Surti and Searcy (2012) | | |
| Lack of metrics agreement between the actors Lack of metrics that can measure broad sustainability practices | Ahi and Searcy (2015) | | |
| Lack of guide of how, when, and which metrics to use | Hassini, Surti and Searcy (2012) | | |

| | | | |
|--|---|--|--|
| current accounting method does not support sustainability decision | Tay <i>et al.</i> (2015) | | |
| Lack of social metrics | Hasle and Jensen (2012) | | |
| Organisational culture | | | |
| culture challenge to change | Carter and Rogers (2008); Luthra and Haleem (2015); Walker and Jones 2012). Govinaden <i>et al.</i> (2014) | challenging in ensuring individual, adopt new techniques or modifications in the previous method | Muduli <i>et al.</i> (2013) |
| culture differences in the supply chain | Zaabi, Dhaheri and Diabat (2013) | challenging in convincing the organisation of the benefit of SSCM adoption | Govinaden <i>et al.</i> (2014) |
| poor organization culture | Jayant and Azhar (2014) | | |
| Technology | | | |
| lack of availability of suitable and supporting technology | Govindan <i>et al.</i> (2014) ; Mathiyazhagan <i>et al.</i> (2013) Singh, Rastogi and Aggarwa (2016); Zhu, Sarkis and Geng (2005) | Challenging in motivating and pressuring firms toward the adoption of SSCM | |
| lack of innovating new technology | Govindan <i>et al.</i> (2014) | Challenging in developing vendor and skills of the employees | Singh, Rastogi and Aggarwa (2016) |
| complexity in the technology develop | Govindan <i>et al.</i> (2014) | | |
| lack of information technology implementation | Zaabi, Dhaheri and Diabat (2013). Ansari and Kant (2017) (Narayanan, Sridharan and Ram Kumar, 2018) | Challenging in monitoring and control of supply chain partners performance | (Narayanan, Sridharan and Ram Kumar, 2018) |

Appendix 2: Approved letter of the subject was not investigated in the KSA



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الموضوع لم يتم بحثه

| | |
|-----------------|---|
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| التاريخ | 10/10/1439 |
| اسم الجامعة | جامعة الملك فيصل |
| الدرجة العلمية | باحث دكتوراه |
| موضوع البحث | البحث الذي اقوم به الان يتمحور حول تحديد وفهم ل المعوقات والوسائل التكنولوجية التي تساهم او تعيق في تبني الشركات السعودية الصناعية لممارسات الاستدامة في ادارة سلسلة الامداد. اللغة المستخدمة في هذا البحث هي اللغة الانجليزية. شكرا لكم. عبدالعزيز |
| مدير الإدارة | صالح بن سالم الغامدي |




للمزيد نفضلو بزيارة بوابتنا الالكترونية
For More Info, Navigate to our Portal

Appendix 3: Theoretical findings regarding SSCM enablers

| Enabler factors | Sources |
|--|--|
| Collaboration | |
| Collaborating with other actors and disciplines. | Gao and Zhang (2006); Ratiu and Anderson (2015) |
| Collaborating with internal and external stakeholders. | Gopal and Thakkar (2016); Taticchi, Tonelli and Pasqualino (2013); Oelze (2017) |
| Manager engagement in collaboration across functions inside and outside the firm. | Grosvold, U. Hoejmose and K. Roehrich (2014); and Ahi and Searcy (2015) |
| Working with a sustainable leader in the same sector or/ and different sectors. | Walker and Jones (2012) |
| Working with competitors that are interested in the integration of sustainability. | Walker and Jones (2012); Zhu, Sarkis and Lai (2007); Oelze (2017) |
| Collaborating with research institutes, universities. | Zhu, Sarkis and Lai (2007) |
| Collaborating with product designers and suppliers. | Diabat and Govindan (2011) |
| Collaborating with partners. | Ansari and Kant (2017); Gimenez, Sierra and Rodon (2012) Agi and Nishant, (2017) |
| Collaborating with suppliers | Khan, Hussain and Saber, 2016 |
| Collaboration role | |
| Supporting the absorption capacity of the firm. | Van Hoof and Thiell (2014) |
| Constructing and encouraging practices around SSCM. | Van Hoof and Thiell (2014) |
| Ensuring the sustainability performance of product's total life cycle are taken into account simultaneously in the supply chain. | Gold, Seuring and Beske (2010) |
| Creating substitute materials and innovative technology | Zhu, Sarkis and Lai (2007) |
| Ensuring better use of resources by joining audits of the supplier. | Oelze (2017) |
| Enhancing economic performance | Khan, Hussain and Saber, (2016) |
| Enhancing environmental performance | Agi and Nishant, (2017) |
| Stakeholder | |
| Identifying firm critical stakeholder. | Meixell and Luoma (2015) |
| External stakeholder | |
| Supplier | |
| The supplier must improve its sustainable performance. | Ahi and Searcy (2013); Carter and Easton (2011); Seuring and Müller (2008); Govindan <i>et al.</i> (2016); Testa and Iraldo (2010) |
| The relationships quality between buyer and supplier. | Touboulic and Walker (2015); Dubey <i>et al.</i> (2015) |

| | |
|---|--|
| Buyer has to pressure supplier to change its existing practices | Faisal (2010); Drohomerski, Costa and Lima (2014) |
| Selecting sustainable supplier | Krause, Scannell and Calantone (2000); |
| Selecting and collaborating with the green supplier. | Kannan, De Sousa Jabbour and Jabbour (2014); Drohomerski, Costa and Lima (2014); |
| Selecting a leader supplier in green practices. | Zhu, Sarkis and Lai (2007) |
| Selecting moral supplier | Chen and Chen, (2019) |
| Firm finding resources to improve supplier performance | Krause, Scannell and Calantone (2000) |
| Firm using reward and intensive for the supplier. | Muduli <i>et al.</i> (2013) |
| Firm transferring technology to supplier | Simpson, Power and Samson (2007) |
| Firm developing programme and training for supplier | Dou, Zhu and Sarkis (2014); Grosvold, U. Hoejmosé and K. Roehrich (2014) |
| Firm purchasing commitment from the supplier. | Faisal (2010) |
| The firm is ensuring sustainable purchasing. | Lamming and Hampson (1996); Handfield <i>et al.</i> (2002); Zhu, Sarkis and Lai (2007) |
| Firms have assessment tools to evaluate supplier | |
| the, meeting and audit. | Lippmann (1999) |
| Code of conduct, formal sourcing process, auditing and questionnaire. | Grosvold, U. Hoejmosé and K. Roehrich (2014) Jia <i>et al.</i> , (2018) |
| Integration of collaboration with the assessment | Sancha, Gimenez and Sierra (2016) ; Jia <i>et al.</i> , (2018) |
| Collaborating with small and medium-sized supplier | Winkler (2010) |
| Collaborating and sharing the knowledge with supplier | Pagell and Wu (2009); Tay <i>et al.</i> (2015). Hu and Hsu (2010); Carter (2005); (Mani, Gunasekaran and Delgado (2018) |
| Firm linking company objective with supplier practices | Dubey <i>et al.</i> (2015) |
| Customer | |
| Customer role in the adoption | Ahmad <i>et al.</i> (2016) |
| Customer purchasing of sustainable product | Walton, Handfield and Melnyk (1998); Hall (2000) |
| Customer requirement and preference | Walker and Jones (2012); Tajbakhsh and Hassini (2015); Mani, Agrawal and Sharma, (2015) |
| Firm Linking customer requirement with green design, product recovery and reverse logistics | Jayaram and Avittathur (2015) |
| Collaborating with customer | Abdullah, Mohamad and Thurasamy (2017) |
| Buyer-customer relationship | Seuring <i>et al.</i> (2004) |
| Joint development with customer | Drohomerski, Costa and Lima (2014) |
| Customer management, support and awareness | Luthra, Garg and Haleem (2016) |

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| Government | |
| Government role in the adoption | Luthra, Garg and Haleem (2015) Ansari and Kant (2017) |
| Remuneration, tax reduction and direct regulation | Sajjad, Eweje and Tappin (2015); Esfahbodi <i>et al.</i> (2017) |
| Government encourage certification of the global environmental system standard ISO 14001 | Zhu, Sarkis and Geng (2005) |
| Government introduce the regulatory framework and execute them | Ahmed <i>et al.</i> (2016) ; Dubey <i>et al.</i> , (2017) |
| Government pressure | Faisal (2010); Dubey <i>et al.</i> , (2017); Wu, Ding and Chen (2012); Walker, McBain and Darian (2008). Dubey <i>et al.</i> (2015) Esfahbodi <i>et al.</i> (2017) ; Luthra <i>et al.</i> , (2018) ; Biswal <i>et al.</i> , (2019) |
| Regulation pressure firm toward adopting environmental certification | Diabat and Govindan, 2011; |
| Government regulation has to be developed in the initial stage. | Esfahbodi <i>et al.</i> (2017) ; (Luthra <i>et al.</i> , (2018) |
| Regulation pressure firm toward adopting eco-environmental design | Gardas, Raut and Narkhede, (2019) |
| Government industrial parks | Faisal (2010); Sarkis (2001) |
| Collaborating with regulatory agencies and specifically the government | Jones (2007) |
| Government pressure the internal factors such as top management to introduce sustainability practices | Wu, Zhang and Lu, (2018); Gardas, Raut and Narkhede, 2019) |
| Government pressure industry to introduce sustainability practices | Wu, Zhang and Lu, (2018) |
| Non- governmental organisations | Hassini, Surti and Searcy, 2012 |
| National legislation and international conventions guideline that firms can follow in the SSCM implementation | Faisal (2010); Prasad <i>et al.</i> , (2018) |
| Non-government organisations pressure | Hassini, Surti and Searcy, 2012 |
| Auditing suppliers | Jia <i>et al.</i> , (2018) |
| Firm can use Global Reporting Initiative guide in developing indicators | Morali and Searcy (2011); Beske-Janssen, Johnson and Schaltegger (2015). Shaw, Grant and Mangan (2010) |
| Internal stakeholder | |
| Management and employees have to communicate with each other. | Mirvis, Googins and Kinnicutt (2010) |
| Involvement of management and employees. | Hu and Hsu (2010) |
| The talent of management and employees. | Dubey and Gunasekaran (2015) |
| Management | |
| The management role in the adoption. | |

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| allocating the resources such as funding capital, ideas and strategy development, collaborating with partners, supporting innovative practices, developing sustainable policies, drives innovation. | Luthra, Garg and Haleem (2015) Ageron, Gunasekaran and Spalanzani (2012); Waite (2013); Wittstruck and Teuteberg (2012); Saeed and Kersten, (2019) |
| Top management commitment | |
| Management proactive activities toward the adoption. | Dubey <i>et al.</i> (2015) |
| Management initiatives and commitment. | Seuring and Müller (2008) and Ansari and Kant (2017) Giunipero, Hooker and Denslow (2012); Prasad <i>et al.</i> ., (2018); Saeed and Kersten, (2019); (Narimissa, Kangarani-Farahani and Molla-Alizadeh-Zavardehi, 2019); Agi and Nishant, 2017); |
| Top and middle management commitment. | Walker and Jones (2012); Luthra, Garg and Haleem (2016); (Chacón Vargas, Moreno Mantilla and de Sousa Jabbour, 2018). |
| Top management commitment influences positively employee participation | Graves, Sarkis and Gold (2019) |
| Top management commitment enhances sustainability understanding and introduction of sustainability vision and objectives | Luthra and Mangla (2018) |
| Top management vision. | Ageron, Gunasekaran and Spalanzani (2012) |
| Top management cognition | Wu, Zhang and Lu, (2018) |
| Manager obtains new soft and hard skills. | Dubey and Gunasekaran (2015) |
| Management ethical values, sustainability knowledge, and leadership. | Sajjad, Eweje and Tappin (2015) |
| Employee | |
| Employees, procurement staff and other employees in the supply chain network obtain the sustainability skill. | Roberts (2003) |
| Involvement from the employee. | Diabat, Kannan and Mathiazhagan (2014); Govindan <i>et al.</i> (2016) |
| Employee's commitment, teamwork, and devotion. | Muduli <i>et al.</i> (2013); |
| Hiring employees that obtain knowledge in environmental aspects. | Tornatzky, Fleischer and Chakrabarti (1990) |
| Hiring moral employee | Graves, Sarkis and Gold, 2019 |
| Employee role in the adoption | |
| Performers of the sustainable programmes. | Govindan <i>et al.</i> (2016) |
| Employee pressure. | Mont and Leire (2009) |
| Developing of innovative sustainable technology. | Muduli <i>et al.</i> (2013) |
| Firm uses resources to make employee more involve in the sustainability agenda | |

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| Good workplace environment. | Muduli and Barve (2013); Munny <i>et al.</i> , 2019 |
| Reward and incentive. | Luthra, Garg and Haleem (2013) |
| Management empowering of the employee | Dubey and Gunasekaran (2015) |
| Green training. | Teixeira <i>et al.</i> (2016); Agi and Nishant, (2017) |
| Having a good human resource management. | Dubey and Gunasekaran (2015) |
| Stakeholder role in the adoption of SSCM | |
| Contributing from all supply chain members. | Taticchi, Tonelli and Pasqualino (2013). Hall <i>et al</i> (2011); Ni and Sun, 2019 |
| Focal firm collaborating with stakeholder in the supply chain. | Seuring and Müller (2008); Silvester (2015) |
| Buyer has to identify a common advantage from the collaboration. | Blome, Paulraj and Schuetz (2014); Pakdeechoho and Sukhotu, (2018) |
| Strong internal buyer sustainable practices that link with external practices. | Blome, Paulraj and Schuetz (2014) |
| Strong internal integration of sustainable practices between departments inside the firm before expanding this integration to the external practices with customer and supplier | Abdullah, Mohamad and Thurasamy (2017); (Köksal <i>et al.</i> , 2017) |
| Internal stakeholders should have clear idea about the goal and the process | Abdullah, Mohamad and Thurasamy (2017) |
| External collaboration with supplier and customer side | Blome, Paulraj and Schuetz (2014). Porter and Derry (2012) Factor (2003); Waddock (2001); Ni and Sun, (2019; Pakdeechoho and Sukhotu, 2018 |
| Supply chain integration include supply partners and other stakeholders | Blome, Paulraj and Schuetz (2014) Faisal (2010); Ni and Sun, (2019) |
| SSCM strategy | |
| Development of SSCM strategy | Walker and Jones (2012); |
| SSCM strategy role | |
| Allowing firm to manage sustainable initiatives that related to the supply chain as closely interrelated. | Kleindorfer, Singhal and Wassenhove, (2005) |
| Allowing firms to tackle the triple bottom line and achieve long-term profits. | Gao and Zhang (2006) |
| Allowing firms to recruit candidates who have a proactive commitment toward sustainability management | Chen (2014) |
| Allowing firm to manage and divert the necessary resources for managing the progress made toward the achievement of sustainability. | Gopal and Thakkar (2016) |
| Ensuring the availability of funds to sustainable practices. | Faisal (2010) |

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| Developing a platform to support partners in their initiatives for sustainable practices in the supply chain. | Faisal (2010) |
| The achievement of superior environmental and economic performance in the supply chain | Dubey <i>et al.</i> (2015) |
| Ensuring firm adaptive to the rapid changes in technology and the changing behaviour of the stakeholders. | Sarkis (2003) |
| Participation from partners in the developing of SSCM | Tay <i>et al.</i> (2015) |
| Including every functional level in the organisation and it has an impact on manager decision making on the daily basis | Bremser (2014); Bonn and Fisher (2011) |
| Firm has to think about innovation strategy | Malviya and Kant (2017) |
| Linking corporate social responsibility (CSR) and corporate sustainability (CS) with SSCM strategy | Walker and Jones (2012); Govindan <i>et al.</i> (2016); Luthra, Garg and Haleem (2015) ; Luthra, Garg and Haleem (2016) |
| CSR and CS role (new business model) | Garriga and Melé (2004) Tschopp (2005). |
| Supporting the adoption of environmental practices inside the firms and across the supply chain | Drohomeretski, Costa and Lima (2014) |
| Ensuring business attitudes, behaviours and practices in the present and the future is toward the development of sustainability. | Ciliberti, Pontrandolfo and Scozzi (2008); Taylor (2013); Deng, 2015 |
| Ensuring firm commitment to the stakeholders toward their role in the SSCM adoption | Leppelt <i>et al.</i> (2013) |
| Increasing firm awareness | Biswal <i>et al.</i> , (2019) |
| Adopting a new business model that allows firm to link sustainability issues with their operating activities | Pagell and Wu (2009); Nidumolu, Prahalad and Rangaswami, (2009); Blomqvist and Levy (2006) |
| Measuring SSCM performance | |
| SSCM measurement roles | |
| Enabling to evaluate the entire value chain using sustainability criteria | Tay <i>et al.</i> (2015) |
| Evaluating of how efficient and effective the SSCM strategy develop in the sustainable development. | Beske-Janssen, Johnson and Schaltegger (2015) |
| Allowing firm to report their activities to the external environment and control the internal activities. | Hervani, Helms and Sarkis (2005) |
| Improving decision-making, defining strategic orientation, and identifying possibilities for efficiency improvements. | McGaughey (2004) |

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| Sustainable indicators that show weaknesses and indicate directional changes | Faisal (2010) |
| Firm provides information about the accomplishment of a new sustainable measurement standard in addition to the traditional one | Grosvold, U. Hoejmosse and K. Roehrich, (2014); Li <i>et al.</i> (2006); Geron, Gunasekaran and Spalanzani (2012). Kraus and Britzelmaier (2012); Bardy and Massaro (2013) |
| Indicators should be representing the social, economic, and environmental aspects, have future goals, and satisfied the stakeholders | Beske-Janssen, Johnson and Schaltegger (2015) |
| The indicator must be implemented as a strategic, tactical and operational plan which include tangible indicator/ quantitative and intangible/qualitative. | Morali and Searcy (2011); Hervani, Helms and Sarkis (2005) |
| Firms can adopt composite indicators | Bardy and Massaro (2013); Hassini, Surti and Searcy (2012) |
| Firm can use Global Reporting Initiative guide | Morali and Searcy (2011); Beske-Janssen, Johnson and Schaltegger (2015). Shaw, Grant and Mangan (2010) |
| Indicators use appropriate for each firm goals and objective in the supply chain. | Hassini, Surti and Searcy (2012). |
| Agreement with partners about the indicators. | Hassini, Surti and Searcy (2012); Hervani, Helms and Sarkis (2005); King, Lenox and Terlaak (2005); Lehtinen and Ahola (2010) |
| Indicators have to be replaced over time to be more sophisticated | Hassini, Surti and Searcy (2012) |
| Collaborating with government and non-governmental organisations regarding the indicators. | Hassini, Surti and Searcy (2012) |
| sharing the sustainable information regarding the intangible practices | Squire <i>et al.</i> (2009) |
| Innovation | |
| Green technology | Dubey <i>et al.</i> (2015) Hu and Hsu (2010) |
| Green technology of suppliers | Hu and Hsu (2010) |
| Mechanism in place to ensure firm continues learning and developing innovation | Dubey <i>et al.</i> (2015); Droghomerecki and Lima (2014) |
| Innovate in any business aspect | York & Venkataraman (2010); Hall <i>et al.</i> (2010) |
| Firms having innovation capability | Shevchenko, Lévesque and Pagell (2016) |
| Collaboration capacity enhance innovation | Blomqvist and Levy (2006) |
| Informal collaboration with partners | Blomqvist and Levy, 2006 |
| The empowerment of internal and external stakeholders to express their ideas and knowledge | Blomqvist and Levy, 2006 |
| Information | |

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| Information technology | Beske and Seuring (2014) |
| Information technology role | |
| Encouraging the sustainability collaboration in the supply chain | Beske and Seuring (2014) |
| Supporting business in optimising resources | Chan <i>et al.</i> (2012) |
| Enhancing the communication and the coordination of the supply chain activities | Chan <i>et al.</i> (2012) |
| The achievement of high-green supply chain performance | Tseng, Wu and Thoa (2011) |
| Sharing sustainable information among supply chain members | Beske and Seuring (2014); Luthra, Garg and Haleem (2015) |
| Sharing sustainable information role | |
| More coordinated innovative ideas, | Luthra, Garg and Haleem (2015) |
| enhancing the communication inside and outside the firms | Luthra, Garg and Haleem (2015) |
| Creating a firm sustainable culture | Luthra, Garg and Haleem (2015) |
| Sharing sustainable information among collaborating stakeholder | Kuo <i>et al.</i> (2013) |
| Every supply chain member should know about what happened in the network | Turner (1993) |
| Logistics integration | Beske and Seuring, 2014 |
| Reverse logistic | Gonzalez-Torre and Adenso-Diaz (2010) Ansari and Kant (2017) (Gardas, Raut and Narkhede, 2019) |
| Including sustainability from the design stage. Fewer materials used and operation processes energy consumption and its related emission for the product may be reduced | Bernon <i>et al.</i> , n. d |
| Organisational Culture role Guide the manager and employee to decide with the respect of the environmental, social, economic aspect | Bonn and Fisher (2011) |
| Impact other members of the supply chain such as supplier by acting as a good example | Amaeshi, Osuji and Nnodim (2008) |
| Successful implementation of sustainability strategies in the organisation | Bonn and Fisher (2011) |

Appendix 4: Interview questions

| Context | Questions | Purpose |
|----------------------|---|---|
| Personal information | <p>1. Please indicate your position within the company</p> <p>2. What is your educational qualification?</p> <p>3. Year of experience</p> | |
| General | <p>1. What do you think about SSCM and its importance to businesses and societies?</p> <p>2. How long has your organisation been involved in sustainable SCM?</p> <p>3. In your organisation, what is the primary motivation for adopting sustainable supply chain management?</p> <p>4. Who has been involved in the adoption of SSCM?</p> <p>5. How is sustainability understood and diffused into your firm SC? (e.g., How do your firm approach the balance of economic, environmental and social performance in the supply chain?</p> <p>6. How did you go about adopting SSCM in your business?</p> | <p>To study the reasons and motivations for adopting the SSCM</p> <p>To evaluate a firm understanding of SSCM</p> |
| Barriers | <p>7. What have been the barriers or constraints you feel have held back your firm's progress toward the adoption of sustainability pillars in the supply chain?</p> <p>8. Which factors have been most important</p> <p>What are the causes of this barrier? (e.g.: What types of barriers have the strongest effect of holding employees back from engaging in SSCM in the workplace?</p> <p>What is the impact of this important barrier mentioned by you in SSCM adoption Or why is this factor important? (e.g.: How can the employees impede your firm's efforts in the adoption of SSCM?)</p> <p>How do you think this important factor has influenced other barriers (e.g.: To what extent does the lack of employees influence the commitment of management to the adoption of SSCM?</p> <p>In your organisation, what are the appropriate actions that have been used to mitigate the barriers? How can your firm encourage employees to engage in a sustainability agenda?)</p> | <p>To study whether the factor is important or not</p> <p>To find out the specific dominant factor</p> <p>To find out the negative and positive factor impact</p> <p>To find out the relationship between the factors</p> <p>To find out new factors that may contribute to inhibiting or enabling SSCM adoption</p> <p>To find out the appropriate solutions/ recommendations on the best way to overcome any difficulties about the important factors</p> |
| Enablers | <p>9. What has been the enabler you feel has helped your firm make progress in the adoption of sustainability in the supply chain?</p> | <p>To study whether the factor is important or not</p> <p>To find out the specific dominant factor</p> |

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| | <p>10. Which factors have been most important?</p> <p>What are the causes of this enabler? Or what is an employee's enabler to SSCM adoption?</p> <p>What is the impact of this important enabler mentioned by you in SSCM adoption Or why is this factor important? (e.g.: How can the employees facilitate your firm's efforts in the adoption of SSCM?)</p> <p>How do you think this important factor has influenced other enablers? (e.g.: To what extent does the employees' commitment influence the commitment of management to the adoption of SSCM?)</p> <p>What is the key essential for deploying this important factor mentioned by you in the supply chain? (e.g.: How can your firm encourage employees to engage in a sustainability agenda?)</p> | <p>To find out the negative and positive factor impact</p> <p>To find out the relationship between the factors</p> <p>To find out new factors that may contribute to inhibiting or enabling SSCM adoption</p> <p>To find out the appropriate solutions/ recommendations on the best way to deploy the important factors.</p> |
| | <p>11. Looking to the next three to five years, how do you see the future for sustainable SCM practices?</p> | <p>To find out the future of SSCM</p> |

Appendix 5: Participant information sheet and Interview consent

1. Title of the study

“Investigating motives, barriers and enabling factors associated with the implementation of sustainable supply chain management practices in certain Saudi Arabian manufacturing industries”

2. Invitation to participate

You are invited to participate in my research study. Before you agree to participate, I would like to ensure that you understand the research objective and how you can help. Please take your time in reading this information, and feel free to share it with your colleagues. Do not hesitate to contact my supervisor or me if you would like further explanation with regard to any of this information. I appreciate your time, and would be delighted to have the assistance of you and your company. Thank you for your consideration!

3. What is the purpose of the study?

The purpose of this study is to identify, examine, and discuss the relevance of key barriers and enabling factors and their impact in influencing the adoption of sustainable supply chain management (SSCM) practices in the context of certain Saudi manufacturing industries. Also, this research will lead to the development of a roadmap on how to maintain the key enabling factors and mitigate the main barriers to successful adoption of SSCM. This study started in January 2016, and I expect it to be complete in approximately one year.

4. Why have I been chosen?

Your company and others have been chosen based on the following criteria. First, your company is in one of these four manufacturing sectors: oil, petrochemicals, energy, or mining. Second, your company has a high net income, high total assets, and a large number of employees. Third, and most importantly, your company has explicitly recognised sustainability as part of its strategy. You are being chosen because of your knowledge, expertise, and experience with regard to the research topic.

5. Do I have to take part?

It is entirely up to you whether you participate or not. If you choose to take part, you will be provided with an information sheet and a consent form. The information sheet is yours, and we will request that you kindly sign and return the consent form. Signing the consent form does not obligate you to participate in this study, nor it will affect your company in any way if you decide not to participate. Keep in mind that you and your company are free to withdraw at any stage of the study, and no questions will be asked.

6. What will happen if I choose take part and what do I have to do?

If you and your company agree to participate, I will ask you to nominate potential study participants from different departments in your company who have varying functions and management levels within the organisation. Your help with this is greatly appreciated, as I need to recruit a minimum four people to interview. Those potential study participants should have some knowledge about supply chain management or sustainability.

For the interview, we will arrange a time that is convenient for you, and the meeting will take place in your office at the company. The interview will be guided and directed. It will begin with a presentation by the interviewer that reiterates the reason for the meeting and the study objective. Then, the interviewer will outline and if necessary discuss the topics for discussion (for example, the company motive with regard to the

adoption of sustainability in supply chain management). All of the interview questions will be sent to the participant before the meeting takes place. Each meeting will take 45 to 60 minutes, and the interviewer will record the entire interview using both written notes and an audio recording device.

7. What are the possible disadvantages and risks of taking part?

I can assure you that there are no risks involved in participating in this study.

8. What are the possible benefits of taking part?

You and your company may benefit from participating in this study. For example, you are giving back to the community by supporting this research through your participation, and social responsibility is good for the reputation of your company. Also, results of this study will enable your manager to identify and understand the key enabling factors and barriers in implementing strategies that can improve the economic, social, and environmental performance of your company's supply chain.

9. What if something goes wrong?

If you or your company feel dissatisfied with the performance of the interviewer, you are free to contact the director of studies who is responsible for monitoring the performance of the interviewer. If the problem is not resolved at that level, you can contact the University of the West of England.

10. Will my taking part in this study be kept confidential?

I can assure you that any information collected from you and your company will remain confidential, and neither your name nor that of your company will appear in any form of this study.

11. What will happen to the results of the research study?

The results of this study will be used in partial fulfillment of the requirements of the researcher's Ph.D. coursework, and results will also be published in a journal. A copy of the researcher's Ph.D. will be provided to your firm.

12. Who is organising and funding the research?

This study is being done by a Ph.D. student under the supervision of three faculty members from the Management department at the Bristol Business School-UWE Bristol. The project is funded by King Faisal University and the Saudi Cultural Mission in London.

13. Contact for further information

If you have any questions or concerns, please contact either my director of study or me. Thank you for your time, and I look forward to your response.

My research is supervised by

Mohammed Saad

Professor of Innovation and Technology Management

Bristol Business School

Frenchay Campus

Bristol BS16 1QY

Tel 00 44 117 3283463

Email: Mohammed.Saad@uwe.ac.uk

Yours Sincerely,

Abdulaziz Aljoghaiman

Researcher in Sustainable Supply Chain Management

Tel 00 44 7521093871

Tel 00 966 532119996

Email: Abdulaziz3.aljoghaiman@live.uwe.ac.uk

Interview consent

If you agree to be interviewed according to the information presented below, at the bottom of this form please add your name, signature, and the date in the appropriate areas.

- This research study, “Investigating barriers and enabling factors associated with the implementation of sustainable supply chain management practices in certain Saudi Arabian manufacturing industries” is being conducted by a Ph.D. researcher at the University of West England. This study aims to gain an in-depth understanding of the dominant barriers and enabling factors that influence the adoption of sustainability in supply chain management in the context of certain Saudi Arabian manufacturing industries. The research is funded entirely by King Faisal University and the Saudi Cultural Mission in London.
- This research will benefit your company by enhancing your and your company’s understanding of the key enabling factors and barriers in order to ensure successful adoption of sustainability practices in the management of your company’s supply chain.
- You have been selected to participate in the study due to your knowledge and experience in terms of either sustainability or supply chain management.
- The meeting will take place in your office at your company at a time that is convenient for you.
- Interviews will be audio recorded by the researcher and also transcribed through note taking and with the aid of computer software.
- Data collected may be processed manually and/or with the aid of computer software.
- A copy of your interview transcript will be provided upon request.
- All data collected during the study will be kept on the researcher’s university PC drive and the student’s personal computer. Notes will be kept in a locked cabinet.
- Your name/your company’s name will not appear in this study or in any outside publication with regard to this study.
- Any participant has the right to withdraw at any time with no questions asked.
- Please contact me via this email abdulaziz3.aljoghaiman@live.uwe.ac.uk or by phone at + 009 665 3211 9996 if you have any questions.
- You may return the signed form via the email provided or you can give it to the researcher on the day of the interview.

Please indicate your agreement by checking the box below.

☐ I/my employer agree that data collected from interviews pursuant to this research study will be archived in the protected database that may be used by other researchers.

Name (printed)

Signature

Date

Appendix 6: Initial template

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| Initial Template: Company A +prior themes + fieldwork + interview questions |
| Overview |
| How is sustainability understood and diffused into your firm SC |
| How long has your organization been involved in sustainable SCM |
| What do you think about SSCM and its importance to businesses and societies |
| Key factors that act as a motive |
| Benefits |
| Competitive advantage |
| Economic Benefit |
| market opportunities and expansion of product market to a global level |
| Operational benefit |
| reduce carbon emissions throughout their operations |
| utilization efficiently of asset |
| Reducing risks to business environmental, health and safety factors |
| Reputational benefit |
| Stakeholders |
| Company responsibility |
| Community |
| local |
| Conservation of the local ecosystem |
| Development of the Saudi economy |
| Safety |
| Whole world |
| Developing local supplier |
| Developing the industry in the region |
| Ensuring employees health and safety |
| External stakeholder pressure |
| Responding and anticipating local rules and policies |
| Responding to competition among responsible organizations |
| Responding to export countries regulation |
| 2.2.2.4 Responding to multinational customers requirement |
| |
| Key factors that act as Barrier |
| stakeholder |
| external |
| Customer |
| Dealing with poor sustainability performing small-size customers |

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| Negative impact |
| Economic implication |
| key essential for solving this problem |
| stakeholder engagement |
| Government |
| lack of Infrastructure |
| Poor logistics infrastructure |
| Poor waste infrastructure |
| lack of regulation, support, and guidance from regulatory authorities |
| Customs authority |
| customs clearance delay |
| lack of transparency |
| lack of policies |
| lack of safety standards |
| lack of technical expertise |
| Negative impact |
| Economic implication |
| Environment implication |
| Other implications |
| effect on planning |
| hinder the company innovation in safety initiatives |
| Revision of procedures |
| Time-consuming for finishing the customs process |
| key essential for solving this problem |
| Government applying digital technology |
| stakeholder engagement |
| Supplier |
| Dealing with poor sustainability performing suppliers. |
| Poor supplier commitment |
| Resistance to digital technology adoption |
| The reasons for supplier bad sustainability performance |
| Difficulty in transforming company sustainability attitudes, awareness and practices into action. |
| Supplier financial limitation |
| Lack of government support and pressure on the supplier to adopt sustainability policies |
| lack of incentive and reward from other companies to supplier |
| Lack of supplier knowledge and awareness about SSCM |
| Negative impact |
| other implication |
| hinder the company to benefit from supplier initiatives |
| problem in maintaining sustainable suppliers that have the same level as the company |
| social implication |

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| hinder the company effort in increasing Saudization |
| key essential for solving this problem |
| company responsibility |
| Training and increasing awareness |
| Government responsibility is more prominent than the company responsibility |
| |
| Key factors that act as an enabler |
| Corporate social responsibility (CSR) or CS |
| CSR Embed in the company core business |
| Positive impact |
| Fostering sustainability culture |
| Social responsibility expansion to all partners and other stakeholders |
| Everything starts from here |
| key essential for deploying this important factor |
| sustainability strategies |
| Performance measurement |
| Acknowledgement the importance of sustainability performance |
| Availability of fund |
| Acknowledgement of social and environmental performance effect on the financial, operation performance simultaneously |
| Sustainability indicators shown in the environment, social, and economic dimensions |
| Economic indicators |
| Environment indicators |
| Social indicators |
| Reporting |
| External sustainability reporting |
| Reporting qualitative indicators |
| Internal sustainability reporting |
| Sustainability indicators changed over time |
| Sustainability indicators shared with partners for later assessment and included in the sustainability reporting. |
| Positive impact |
| Commitment to meet sustainability indicators internally and externally |
| Commitment to the stakeholders |
| Driving sectors toward sustainability practices |
| Monitoring the internal activities or show weaknesses and indicate directional changes |
| Shown transparency |
| key essential for deploying this important factor |
| CSR or CS |
| Employee |
| Environment and operation staff skills and competencies |

| |
|--|
| Procurement and logistics staff skills and competencies |
| Sustainability Steering Committee |
| Engagement with external stakeholders |
| Collecting information for external stakeholders |
| Indicators align with all stakeholders |
| Following non-government organization guide |
| Sustainability strategy |
| Technology |
| Top Management support |
| Stakeholder |
| Stakeholder Engagements |
| Engagements with internal and external stakeholders |
| Positive impact |
| Building momentum toward sustainability issues |
| Define the sustainability strategy success |
| Helping in delivering social and environmental programs which improve performance |
| key essential for deploying this important factor |
| CSR |
| Active Stakeholder Engagements |
| Design & implement ongoing engagement |
| Identifying important stakeholder group and deciding on the approach to reach them |
| Build good relationships that based on transparency |
| Organizational Buy-in first then work with partners |
| strategy that supports and includes all stakeholders |
| Understand key elements of engagement |
| External stakeholder |
| Customer |
| Demand from large-size customers |
| Encouragement from large-size customers |
| Support from large-size customers |
| Positive impact |
| Engaging in external sustainability reporting |
| Monitoring business activities firm practices |
| Opportunity for learning |
| Environment implication |
| key essential for deploying this important factor |
| Commitment to meet the customer requirement (strategy) |
| CSR |
| Engagements with the customers |
| Measuring customer satisfaction |

| |
|--|
| Government |
| Regulation, support, and guidance from regulatory authorities |
| Industrial park authority |
| Financial penalties exist |
| Strict regulations and monitoring |
| Environmental footprint limitations |
| Environmental waste reductions |
| Safety standards |
| Support infrastructure and encouragements |
| Positive impact |
| Environmental implications |
| extra pressure toward environmental aspects adoption |
| other implications |
| Ensuring proper sustainability implementation |
| supporting a regional non-government association |
| Social implications |
| Saudization commitment |
| Support the company local employees |
| key essential for deploying this important factor |
| commitment to meeting law and regulation |
| Stakeholder engagements |
| Non-governmental associations |
| Actively participating and contributing in global and regional Non-governmental associations |
| Obtaining environmental, social, and quality management system accreditation |
| Positive impact |
| Changing the management view of KPI |
| Collecting sustainability information about SC partners |
| Encouragement to adopt sustainability practices |
| Ensuring the materials used is not harming the environment |
| Facilitating shared learning and understanding of sustainability aspects with other companies |
| Govern businesses with integrity, responsibility, and transparency |
| Introducing a common set of performance metrics for all member companies |
| Introducing a common set of standards among its members and monitoring |
| Management system enhancement |
| Selection, assessment, and responsibility of supplier sustainability performance and development |
| key essential for deploying this important factor |
| Commitment to continuing participating with those associations |

| |
|---|
| Demand from large size customers |
| Top management support |
| Supplier |
| Pressuring local supplier to change its existing practices and engage in training. |
| Selecting certified supplier |
| Selecting a well-recognized contractor |
| Recognizes the importance of improving the supplier sustainability performance to the firm sustainability performance |
| Availability of Indicators to assess supplier sustainability performance |
| Availability of training to suppliers |
| Compliance with the company code of conduct and Ethics |
| Convincing and training supplier top management of sustainability important |
| Information guide of material safety transfer to supplier |
| Purchasing commitment to local supplier change to another name |
| Suggestions for improvement transfer to supplier |
| Positive impact |
| Environmental implications |
| Supplier recycling facilities |
| Generate sustainable value and enhance supply security |
| Supporting sustainability operations |
| key essential for deploying this important factor |
| Stakeholder engagement |
| Building strong relationships |
| Suppliers are included in the company strategy |
| Sustainability consider in the initial design stage |
| Top management vision |
| Using Non- governmental association in choosing the supplier and its auditor |
| Internal stakeholder |
| Employee |
| Commitment by employee's |
| Benefits from diversity |
| Designate sustainability responsibility to company departments |
| Environment and operation division |
| Procurement and logistics division |
| Sustainability Steering Committee |
| Recognized the important of employees' engagement and the development of their skills |
| Code of conduct and Ethics in place to guide the employee's activities |
| Collaboration with the employees |
| Empowering of the employee |
| Increase employee awareness |

| |
|--|
| Identify gap and set training programmers and measure their effectiveness |
| Proper workplace environment. |
| Regular performance reviews |
| Reward and incentive. |
| Positive impact |
| Achieve higher sustainability performance |
| Identifying risks |
| Building sustainability strategy |
| Internal and external controlling |
| External control |
| Enhance and monitor supplies, customers, and other stakeholders' relationships |
| Internal control |
| Monitoring sustainability operation progress |
| Setting new targets |
| Enhancing the internal coordination |
| Reporting to the top management sustainability |
| Buy in sustainability concept to the top management |
| key essential for deploying this important factor |
| Stakeholder Engagements |
| Top management |
| Hiring talent management and employees |
| Management |
| Top management commitment and responsibility |
| Top management vision |
| Recognized the importance of development management skills |
| Positive impact |
| Creating a culture of sustainability that hard to be changed |
| Defining roles and responsibility |
| guidance, providing information, mentoring for the employees or leadership |
| Influential on other CEO partners |
| Overcome any internal barriers to the sustainability implementation |
| Showing important to KPI for monitoring sustainability performance |
| structure sustainability plans and policies |
| Structure sustainability strategy |
| Support the company participating in non-government organizations |
| Supporting collaboration, creating and supporting of the sustainability team |
| key essential for deploying this important factor |
| Hiring talent management and employees |
| Measures to improve board's understanding of sustainability impacts |
| Evaluation of board with respect to sustainability impacts |
| Employees |

| |
|---|
| Sustainability strategy |
| Designate sustainability strategy to achieve sustainability |
| Product stewardship (environmental strategy) |
| Positive impact |
| continuous performance improvement |
| key essential for deploying this important factor |
| Covering every aspect of company operation internal and external activities |
| Link with a long business strategy plan |
| Long-term planning |
| Participation from all the stakeholders |
| Possessing aim and mission |
| Support from the management system technology |
| Support from the top management |
| Sustainability steering committee |
| Sustainability culture |
| Commitment to EHSSQ culture |
| Positive impact |
| Reinforcement of responsibility |
| Promote S. awareness across the organization |
| key essential for deploying this important factor |
| Familiarity of world class standards and practices |
| Sustainability steering committee |
| Top management |
| Provide training & support to team & employee |
| Technology |
| Technologies applied by government or third parties |
| Recycling facilities |
| Technologies applied by organization |
| Follow up the Last technology |
| Reduction of waste technology |
| Tracking software and hardware technologies |
| Positive impact |
| Encouragement to sustainability advancement and adoption |
| Guiding and supporting decision-making process |
| Change or modify operation machines |
| Support employees in reporting and monitoring sustainability performance |
| stakeholder engagement enablement |
| key essential for deploying this important factor |
| Corporate social responsibility (CSR) or CS |
| Non-governmental associations |
| Stakeholder engagement |

| |
|--|
| the availability of supplier sustainability technology |
| Top management support |
| Future of SSCM |
| Government vision 2030 |
| Support and initiatives from all gulf countries |
| Support and initiatives from large Saudi organizations |

Appendix 7: Final template

| Final Template | Company A Initial template | Company B | Company C | Company D | Company E | Company F | Focus group |
|--|-------------------------------|-----------|-----------|-----------|-----------|-----------|-------------|
| Overview | | | | | | | |
| How is sustainability understood by your firm SC? | | | | | | | |
| How long has your organization been involved in sustainable SCM? | | | | | | | |
| What do you think about SSCM and its importance to businesses and societies? | | | | | | | |
| Key factors that act as a motive | | | | | | | |
| Benefits | • | • | • | • | • | • | • |
| Competitive advantages | • | • | • | • | • | | |
| Economic benefits | • | • | • | • | • | | • |
| Market opportunities for business growth globally | • | | | | | | • |
| Operational benefit | • | • | • | • | • | • | |
| • Reducing carbon emissions | • | • | • | • | | | |
| • Maintaining an efficient use of company resources. | • | • | | • | • | | |
| Reducing risks to business, environmental, health and safety factors | • | • | • | • | • | • | |
| Local Supplier benefit (company C) | | | • | | | • | • |
| Reputational benefit | • | • | | • | | • | • |
| Strengthening employee loyalty | | • | | | • | • | • |
| Stakeholders | | | | | | | |
| Responsibilities of business to internal and external stakeholders | • | • | • | • | • | • | • |
| • Responsibilities toward the community | • | • | • | • | • | • | • |
| 1. Local | • | • | • | • | • | • | • |
| Conservation of the local ecosystem | • | • | • | • | • | • | • |
| Development of the Saudi economy | • | • | • | • | • | • | • |
| Safety | • | • | • | • | • | • | |
| 2. Globally | • | • | • | | | | |
| • Responsibility toward local suppliers and entrepreneurial development | • | • | • | | | | |
| • Responsibility toward industry development | • | • | • | • | | | |
| • Responsibility toward employees' health and safety | • | • | • | • | • | • | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Pressure on business from external stakeholders | • | • | • | • | • | • | • |
| • Responding to and anticipating local rules and policies | • | • | | | | • | • |
| • Responding to competition among responsible organizations | • | • | | | | | |
| • Responding to export countries regulation or responding to global regulations | • | | | | | • | |
| • Responding to multinational customers' requirements | • | | | | | | |
| • Responding to government public fund pressure (founder) (Company B) | | • | • | | • | | • |
| • Responding to government Saudi Vision 2030 (Maybe work as benefit) | | • | • | • | • | • | • |
| • Responding to local community pressure who live near the company operation | | • | | | | | |
| | | | | | | | |
| Key factors that act as Barrier | | | | | | | |
| stakeholder | | | | | | | |
| external | | | | | | | • |
| Lack of collaboration with other large Saudi organizations | | | • | | • | • | |
| • Different understanding of sustainability concept | | | • | | | | |
| • Different ownership | | | • | | | | |
| • Different business structure | | | • | | | | |
| • Lack of information sharing | | | | | | | |
| Negative impacts | | | | | | | |
| Social implications | | | • | | | | |
| • Supplier resistant to engaging in sustainability practices | | | • | | | | |
| • Hindering the company effort to attract investors for localization content | | | • | | | • | |
| Economic implication | | | • | | | | |
| • Increasing cost of supplier auditing | | | • | | | | |
| Key essential for solving this problem | | | | | | | |
| Stakeholder engagement | | | | | | | |

| | | | | | | | |
|--|---|---|---|---|---|---|---|
| Lack of awareness about SSCM in the Kingdom (focus group) | | | | | | | • |
| Complexity in the sustainability design | | | | | | | • |
| • Technology | | | | | | | • |
| • Higher costs and return on investment | | | | | | | • |
| • Quality | | | | | | | • |
| Negative impacts | | | | | | | • |
| Economic implications | | | | | | | • |
| • Focusing on short term results | | | | | | | • |
| • Challenge in the adoption of sustainability | | | | | | | • |
| Customer | | | | | | | |
| Dealing with small-size customers that lack sustainability adoption | • | | | | | | • |
| Lack of end customer awareness | | | | | | • | |
| Lack of business customers buying company waste product | | | | | | | • |
| Negative impacts | | | | | | | |
| Economic implication | • | | | | | | |
| • Financial risk will emerge from losing the customer when sustainability measures are included in the agreement | • | | | | | | |
| Key essential for solving this problem | | | | | | | |
| Stakeholder engagement | • | | | | | | |
| • Sustainability awareness training | • | | | | | | |
| Government | | | | | | | |
| lack of Infrastructure | • | • | • | • | • | • | • |
| • Poor logistics infrastructure | • | | • | • | • | • | • |
| • Poor waste infrastructure | • | • | | | | | |
| • Poor education system regarding supply chain and sustainability concept | | | • | | | • | • |
| Global competitiveness index | | | • | | | | |
| Lack of regulation, support, guidance, monitoring from regulatory authorities | • | | • | • | | • | • |
| • Customs authority | • | | | | | | |
| Customs clearance delay | • | | | | | | |
| Lack of transparency | • | | | | | | |
| Lack of policies | • | | | • | | | |
| Lack of safety standards | • | | | | | | |

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|--|---|--|---|--|--|---|---|
| Lack of technical expertise | • | | | | | | |
| Lack of advanced technology | | | • | | | | |
| Lack of collaboration and trust with other Gulf customs | | | • | | | | |
| • Lack of data about qualified suppliers | | | • | | | | • |
| • Lack of commitment from regulatory authorities | | | • | | | | |
| • Lack of consistency in the regulations between government authorities | | | • | | | | • |
| Negative impacts | | | | | | | |
| Economic implications | • | | | | | | |
| • Decreasing profitability | • | | | | | | |
| • Increasing shipment costs | • | | | | | | |
| Environmental implications | • | | | | | | |
| • Impact on waste management strategies | • | | | | | | |
| Social implications | • | | | | | | |
| • Hinders safety initiatives innovation | • | | | | | | |
| • Hindering the company effort to attract investors for localization content | | | • | | | • | |
| • Hindering the company effort to buy from local suppliers | | | • | | | | |
| • Hindering local content strategy | | | • | | | | |
| • Hindering the company effort toward the development of SSCM understanding | | | • | | | | |
| Other implications | • | | • | | | | |
| • Impact on planning | • | | | | | | |
| • Impact on procedures | • | | | | | | |
| • Impact on resources | • | | • | | | | |
| Key essential for solving this problem | | | | | | | |
| Government applying digital technology | • | | | | | | |
| Government improving the logistical infrastructure | • | | | | | | |
| Stakeholder engagement | • | | | | | | |
| • Improvement recommendation | • | | • | | | | |
| • Lobbying for policy changing | • | | • | | | | |
| • Sustainability awareness training | • | | • | | | | |
| Company its own capability exceeds the challenges imposed by the government | | | • | | | | |

| | | | | | | | |
|---|---|--|---|---|--|---|---|
| Supplier | | | | | | | |
| Dealing with poor sustainability performance of suppliers | • | | • | • | | | • |
| Poor supplier commitment | • | | | | | | • |
| Lack of suppliers that share the same level of sustainability thinking as the company | • | | | | | | |
| Dealing with solo international contractors | | | | | | | • |
| Lack of reliable information about local suppliers | | | | | | | • |
| The reasons for supplier's bad sustainability performance | | | | | | | |
| Difficulties in transforming company sustainability attitudes, awareness and practices into action | • | | | • | | | • |
| Supplier financial limitations | • | | | | | | |
| Lack of government support and pressure on the supplier to adopt sustainability policies | • | | • | | | | • |
| Lack of incentive and reward from other companies to supplier | • | | • | | | | |
| Lack of supplier knowledge and awareness about SSCM | • | | | • | | • | • |
| Lack of supplier digital technology | • | | | | | | |
| Negative impacts | | | | | | | |
| Other implications | • | | | | | | |
| <ul style="list-style-type: none"> Missing an opportunity to benefit from supplier sustainability initiatives that can help improve company sustainability performance | • | | | | | | |
| <ul style="list-style-type: none"> Risks will emerge from losing the supplier when sustainability measures are included in the agreement | • | | | | | | • |
| Social implications | | | | | | | |
| <ul style="list-style-type: none"> Hindering the company effort to buy from local supplier | | | • | | | | • |
| Key essential for solving this problem | | | | | | | |
| Company taking responsibility toward its supplier sustainability performance | • | | | | | | |
| <ul style="list-style-type: none"> Training and increasing awareness | • | | | | | | |

| | | | | | | | |
|---|---|---|--|--|---|---|---|
| • Influencing the supplier to engage in sustainability non-government associations | • | | | | | | |
| • Facilitating collaboration with forging partners with focusing on R&D (Company F) | | | | | | • | |
| • Choosing certified suppliers | | | | | | | • |
| Government responsibility is more prominent than company responsibility | • | | | | | | |
| • Establishing policies and guidelines | • | | | | | | |
| Investor | | | | | | | |
| Lack of investor interest except for government public investment funds | | • | | | • | | • |
| Negative impacts | | | | | | | |
| Economic implications | | • | | | • | | |
| • Focusing on short term results | | • | | | • | | |
| Social implication (Company E) | | | | | • | | |
| • Hindering the company effort to buy from local suppliers | | | | | • | | |
| Key essential for solving this problem | | | | | | | |
| Hiring sustainability champions on the board | | | | | • | | |
| Government responsibility | | | | | | | • |
| Internal | | | | | | | |
| Lack of clear strategy | | | | | • | | |
| Employees | | | | | | | |
| Sustainability managers lack authority in Saudi organizations | | • | | | | | |
| Resistant to change | | | | | | | • |
| Key essential for solving this problem | | | | | | | |
| Commitment and persistence | | • | | | | | |
| Senior management direction | | | | | | | • |
| Management | | | | | | | |
| Lack of sustainability champion on board at organization | | • | | | | | |
| Lack of senior management sustainability understanding | | | | | • | | |
| Negative impact | | | | | | | |
| • Lack of commitment toward sustainability implementation | | • | | | • | | |
| • Focusing on the economic return | | | | | • | | |

| | | | | | | | |
|--|--|---|--|--|--|--|--|
| Key essential for solving this problem | | | | | | | |
| <ul style="list-style-type: none"> Sustainability employee push the management toward sustainability | | • | | | | | |
| Senior management and board at Saudi organizations (can be moved to external) | | • | | | | | |
| <ul style="list-style-type: none"> Lack of senior management and board level commitment | | • | | | | | |
| <ul style="list-style-type: none"> Lack of senior management commitment toward sustainability external reporting | | • | | | | | |
| The reasons that senior management in Saudi organizations have poor commitment toward sustainability adoption | | | | | | | |
| The difficulty of convincing senior management of sustainability importance | | • | | | | | |
| The difficulty of training senior management in sustainability | | • | | | | | |
| The difficulty of getting consensus from senior management of sustainability importance | | • | | | | | |
| Lack of specific training for senior management | | • | | | | | |
| Negative impacts | | | | | | | |
| The difficulty in transforming the company sustainability agenda into action, or less commitment toward sustainability implementation Possibility of implementing sustainability is 0 | | • | | | | | |
| Focusing on short term result | | • | | | | | |
| Key essential for solving this problem | | | | | | | |
| Find or create sustainability champions <ul style="list-style-type: none"> VIP | | • | | | | | |
| Government responsibility | | • | | | | | |
| <ul style="list-style-type: none"> Introducing investment responsibility policies (VIP) | | • | | | | | |
| <ul style="list-style-type: none"> Introducing the concept in the education system | | • | | | | | |
| Manager responsibility | | • | | | | | |
| <ul style="list-style-type: none"> Open-minded | | • | | | | | |

| | | | | | | | |
|--|---|---|---|---|---|---|---|
| • Passionate | | • | | | | | |
| • Visionary | | • | | | | | |
| Non-government responsibility | | • | | | | | |
| • Strengthening the manager competencies | | • | | | | | |
| University responsibility | | • | | | | | |
| • Educating the manager about sustainability important | | • | | | | | |
| • Introducing the concept in leadership courses in elite schools | | • | | | | | |
| Sustainability professional's responsibility | | • | | | | | |
| • Doing a case study to show evidence of the importance of sustainability | | • | | | | | |
| | | | | | | | |
| Key factors that act as an enabler | | | | | | | |
| Corporate social responsibility (CSR) or CS | | | | | | | |
| CSR Embedded in the company core business | • | • | | • | • | • | • |
| Positive impacts | | | | | | | |
| Fostering a sustainability culture | • | | | | | | |
| Engaging in awareness activities to educate the public about sustainability | • | • | | • | • | • | |
| Everything starts from here | • | | | | | | |
| Produce business-driven sustainability performance | | • | | • | • | | |
| Key essentials for deploying this important factor | | | | | | | |
| Sustainability strategies | • | • | | | | • | |
| Performance measurement | | | | | | | |
| Acknowledge the importance of sustainability performance | • | | • | • | • | • | • |
| Availability of funds | • | • | • | • | | • | • |
| Acknowledgement of social and environmental performance and its effect on the financial and operation performance simultaneously | • | • | • | • | • | | |
| Sustainability indicators shown in the environment, social and economic dimensions | • | • | • | • | • | • | |
| • Economic indicators | | • | | • | | | |
| Contribution to GDP, | | • | | | | | |
| Economic diversification | | • | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|--|
| Increase in market capitalization | | • | | • | | | |
| ROI for shareholders | | • | | | | | |
| • Environmental indicators | • | • | • | • | • | • | |
| Carbon emissions | • | • | • | • | • | | |
| Effluent and Waste | • | • | • | • | • | | |
| Conservation of resources | • | • | • | • | • | | |
| Compliance with RC Environment Regulations | | • | | | | | |
| • Social indicators | • | • | • | • | • | • | |
| Safety | • | • | | • | • | • | |
| Health | • | • | | • | | | |
| Job creation | | • | | | | • | |
| Community engagement | | • | | | | • | |
| Local content | | • | | | | | |
| • Other indicators | • | • | • | • | | | |
| • Sustainability indicators improved over time | • | • | • | | | | |
| • Sustainability indicators shared with partners for later assessment | • | • | • | • | | • | |
| Sustainability Reporting | • | • | • | • | • | • | |
| • External sustainability reporting | • | • | • | • | • | • | |
| Reporting qualitative indicators | • | • | | | | | |
| • Internal sustainability reporting | • | • | • | • | • | • | |
| • Supplier sustainability performance included in company sustainability report | • | | | | | | |
| Positive impacts | | | | | | | |
| Focusing on meeting sustainability targets | • | | | | | • | |
| Showing company responsibility and transparency to stakeholders | • | • | | • | • | • | |
| Driving industry sectors toward solving sustainability issues | • | • | • | | | | |
| Monitoring the activities or showing weaknesses and indicating directional changes | • | • | • | • | • | • | |
| Opening new opportunities | | • | | | | | |
| Key essentials for deploying this important factor | | | | | | | |
| CSR or CS | • | • | | | | | |
| Engagement with external and internal stakeholders | • | • | • | • | • | | |

| | | | | | | | |
|--|---|---|---|---|---|---|---|
| • Sustainability indicators developed based on the stakeholder perspective | • | | • | | | | |
| • Procedure to collect sustainability information from the external stakeholders | • | | | | | | |
| • Senior management support | • | | | | | | |
| • Designate employees | • | | | | | | |
| • Following non-government associations guidelines | • | • | | • | • | | |
| Sustainability strategy | • | | | | | | |
| Technology (also can be used in technology) | • | | • | • | | | |
| Stakeholder | | | | | | | |
| Stakeholder Engagements | • | • | • | • | • | • | • |
| • Engagements with internal and external stakeholders | • | • | • | • | • | • | • |
| Positive impacts | | | | | | | |
| Building momentum toward sustainability issues | • | • | • | • | • | • | |
| Defining the company sustainability strategy and its success | • | • | | | | • | |
| Helping in delivering social and environmental programs | • | • | • | • | • | • | |
| Helping in learning process | | • | • | | | • | |
| Key essentials for deploying this important factor | | | | | | | |
| Active Stakeholder Engagements | • | • | • | • | • | • | |
| • CSR | • | | | | | | |
| • Design and implement ongoing engagement | • | • | • | • | • | • | |
| Identifying important stakeholder group and deciding on the approach to reach them | • | • | | • | | • | |
| Building good relationships that are based on transparency | • | • | • | • | • | • | |
| Organizational buy-in first then work with partners | • | • | • | • | • | • | |
| Strategy that supports and includes all stakeholders | • | • | • | • | | • | |

| | | | | | | | |
|--|---|---|---|---|--|---|---|
| Understand key elements of engagement | • | • | • | • | | • | |
| External | | | | | | | |
| Customer | | | | | | | |
| Demand from large-size customers | • | | | | | | • |
| Encouragement and support from large-size customers | • | | | • | | | |
| The availability of business customers that can buy the company waste (Company D) | | | | • | | • | |
| Positive impacts | | | | | | | |
| Other implications | • | | | | | | |
| • Engaging in external sustainability reporting | • | | | | | | |
| • Monitoring business activities or linking customer social and environmental requirement with firm practices | • | | | | | | |
| • Opportunity to learn | • | | | | | | |
| Environmental implication | • | | | • | | | |
| • Participating with partners to deal with climate change | • | | | | | | |
| • Reduction in the company's emissions | | | | • | | | |
| Economic implications | | | | | | | |
| • Type of income | | | | • | | • | |
| • Saving in shipment costs | | | | • | | | |
| • Commitment to invest | | | | | | | • |
| Social implications | | | | | | | |
| • Safety | | | | • | | | |
| Key essentials for deploying this important factor | | | | | | | |
| Stakeholder engagement | • | | | • | | | |
| Commitment to meet the customer requirements (strategy) | • | | | • | | • | |
| Measuring customer satisfaction | • | | | • | | | |
| Following the non-governmental organizations' guidelines | | | | • | | | |
| Increasing customer awareness | | | | | | • | |
| Technological enhancement | | | | • | | • | |
| Government | | | | | | | |
| Regulation, support, and guidance from regulatory authorities | • | • | • | • | | • | • |
| Industrial park authority | • | • | | • | | | • |
| Financial penalties exist | • | | | • | | | |
| Strict regulations and monitoring | • | | | • | | | • |

| | | | | | | | |
|--|---|---|--|---|---|---|---|
| Environmental footprint limitations | • | | | • | | | |
| Environmental waste reductions | • | • | | | | | |
| Safety standards | • | | | | | | |
| Support infrastructure and encouragements | • | | | • | | | • |
| Designated National Authority | | • | | | | | |
| General Authority of Meteorology and Environmental Protection (GAMEP) | | • | | | • | • | • |
| The Electricity and Co-Generation Regulatory Authority | | | | | | • | |
| Saudi Vision 2030 | | • | | • | • | • | • |
| Positive impacts | | | | | | | |
| Environmental implications | • | • | | • | | | |
| Extra pressure toward environmental implementation | • | • | | • | • | | |
| Supporting the company effort in emissions reductions | | | | • | | | |
| Other implications | • | | | | | | |
| Ensuring proper sustainability implementation | • | | | • | • | • | |
| Supporting a regional non-government association | • | | | | | | |
| Unifying the discussion among all actors | | • | | • | • | • | |
| Acceleration in sustainability adoption from why to how | | • | | | • | | |
| Source of information | | • | | | | | |
| Developing industry sustainability indicators and policies | | | | | | • | |
| Social implications | • | • | | | | | |
| Extra pressure toward Saudization hiring | • | • | | | | | |
| Support the company in setting the retirement plan for its local employees | • | | | | | | |
| Extra pressure/support toward content localization | | • | | | • | • | |
| Economic implications | | | | | | | |
| Saving money from consolidation in logistics | | | | • | | | |
| Key essentials for deploying this important factor | | | | | | | |

| | | | | | | | |
|--|---|---|---|---|---|---|---|
| Stakeholder engagements | • | • | | • | | • | |
| Commitment to meeting laws and regulations | • | • | | • | | • | |
| Non-governmental associations | | | | | | | |
| Actively participating and contributing to global and regional non-governmental associations | • | • | • | • | • | | • |
| Obtaining environmental, social, and quality management system accreditations | • | • | | • | • | • | • |
| Positive impacts | | | | | | | |
| Changing management views on KPI | • | • | | | | | |
| An opportunity to collect sustainability information from SC partners | • | | | | | | |
| Motivation to continue working in sustainability development | • | | • | • | | | |
| Checking the environmental safety of materials | • | | | • | | | |
| Facilitating shared learning and understanding | • | • | • | | • | | |
| Governing businesses and its supply chain with integrity, responsibility and transparency | • | • | • | • | • | | |
| Introducing a common set of sustainability indicators for all member companies | • | • | • | • | • | | |
| Introducing a common set of standards among its members | • | • | | • | • | | |
| Strengthening the company operating systems to manage environmental, social, and safety aspects | • | • | | • | • | • | |
| Increasing company responsibility in selecting the right supplier, monitoring their behaviours and developing them | • | | | • | • | | |
| Key essential for deploying this important factor | | | | | | | |
| Stakeholder engagement | • | • | • | | • | | |
| Commitment to continue participating in non-government associations | • | • | • | | • | | |
| Demand from large-scale customers | • | | | | | | |
| Senior management support | • | • | | | | | |
| Supplier | | | | | | | |
| Pressuring local suppliers to change its existing practices to be more sustainable | • | • | • | • | • | • | • |
| Selecting certified suppliers | • | • | • | • | • | • | • |

| | | | | | | | |
|--|---|---|---|---|---|---|--|
| Selecting a well-recognized contractor | • | • | | | | • | |
| Recognizing the importance of improving the local supplier sustainability performance to the firm sustainability performance | • | • | • | • | • | • | |
| Availability of indicators to assess supplier sustainability performance | • | • | • | • | • | • | |
| Availability of training to suppliers | • | • | • | • | • | • | |
| Compliance with the company code of conduct and ethics | • | • | • | • | • | • | |
| Convincing and training supplier's senior management of the importance of sustainability | • | | | | | | |
| Information guide for material safety and other information transfer to suppliers | | • | • | | • | | |
| Procurement department commitment and strategy | • | • | • | • | • | • | |
| Local content strategy (may be included in the strategy) | | • | • | • | | • | |
| Suggestions for improvement transfer to supplier | • | • | • | • | • | • | |
| Collaboration with third party partners (investor-government, etc) to develop SME suppliers | | • | • | • | • | • | |
| Positive impacts | | | | | | | |
| Environmental implications | • | • | | | • | | |
| Supplier recycling facilities | • | | | | • | | |
| Introducing new technology to reduce waste | | • | | | | | |
| Reductions in emission | | | | • | | | |
| Other implications | • | | • | | | | |
| Generating sustainable value and enhancing supply security | • | | • | • | • | | |
| Supporting sustainable production | • | | | | | | |
| Social implications | | • | • | | • | | |
| Saudization hiring | | • | • | | | | |
| Supporting the local content strategy | | | • | | • | • | |
| How to know the transfer | | | | | | • | |
| Economic implications | | | • | • | | | |
| Direct investment to the Kingdom | | | • | | | | |
| Development of the Saudi economy | | | • | | | | |
| Cost savings | | | | | • | • | |

| | | | | | | | |
|--|---|---|---|---|---|---|---|
| Key essentials for deploying this important factor | | | | | | | |
| Stakeholder engagement | • | • | • | • | • | • | |
| Building strong relationships with supplier | • | • | • | • | • | • | |
| Sustainability considerations in the initial design stage | • | | | | | • | |
| Senior management vision | • | | • | | | | |
| Using non-governmental associations in choosing the supplier and its auditor | • | | | • | | • | |
| Using government rules and policies when auditing suppliers | | • | | | | • | |
| Including suppliers in the company strategy | • | • | • | | | | |
| Integration with supplier through technology | | | • | | • | • | |
| Internal | | | | | | | |
| Employee | | | | | | | |
| Commitment by employees | • | | • | | • | • | |
| Benefits from diversity | • | • | | • | | | |
| Designate sustainability responsibility to company departments | • | • | • | • | • | • | • |
| Environment and operation division | • | • | • | | • | | |
| Procurement and logistics division | • | • | • | | | | |
| Sustainability Steering Committee | • | • | | • | • | | |
| Corporate Affairs Department (CAD) | | | | | • | | |
| Corporate Planning Risk Department | | | | | • | | |
| Safety Department | | | | | • | | |
| Localization and Qualification Department | | | | | | • | |
| Recognizing the importance of developing employee performance to improve the firm sustainability performance | • | • | • | • | • | • | • |
| Code of conduct and ethics in place to guide employees' activities | • | • | • | • | | • | |
| Collaboration with employees | • | • | | • | | • | |
| Empowering of employees | • | | • | • | | • | |
| Build up employee awareness of sustainability | • | • | | • | • | • | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Identify gaps, set training programmes and measure their effectiveness | • | • | • | • | • | • | |
| Proper workplace environment | • | • | • | • | • | • | |
| Regular performance reviews | • | • | | • | | | |
| Reward and incentive | • | • | • | • | • | • | |
| Positive impacts | | | | | | | |
| Achieving higher sustainability performance | • | • | • | • | • | • | |
| Introduction of new initiatives | | | | • | | | |
| Identifying risks | • | • | | | • | | |
| Building sustainability strategy | • | | | • | | | |
| Internal and external controlling | • | • | | • | • | | |
| External control | • | | | | | | |
| Building a good relationship with partners and other stakeholders | • | • | • | • | • | • | |
| Internal control | • | • | | • | • | | |
| Monitoring the sustainability production progress | • | • | | • | • | | |
| Setting new targets | • | | | • | • | | |
| Enhancing the internal coordination | • | | | • | | | |
| Reporting to the senior management about sustainability progress | • | • | | • | • | | |
| Buying in sustainability concept to the senior management | • | • | | • | | | |
| Key essentials for deploying this important factor | | | | | | | |
| Stakeholder engagements | • | • | • | • | • | • | |
| Senior management support | • | • | | | | | |
| Engaging with universities, partners, etc. in employee training | • | • | • | • | • | • | |
| Hiring talent management and employees | • | • | | • | • | | |
| Management | | | | | | | |
| Senior management commitment and responsibility | • | • | • | • | | • | • |
| Senior management vision and skills | • | • | • | • | | • | • |
| Recognizes the importance of developing the management performance to improve the firm sustainability performance | • | • | • | • | • | • | |
| Measures to improve the board's understanding of sustainability impacts | • | • | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Evaluation of the board with respect to sustainability impacts | • | • | | | | • | |
| Positive impact | | | | | | | |
| Creating a sustainability culture will be hard to change | • | | | | | | |
| Defining roles and responsibilities | • | • | • | | • | | |
| Guidance, providing information, mentoring for the employees or leadership | • | | • | | | | |
| Influential on other CEO partners | • | | | | | | |
| Overcoming any internal barriers to the sustainability implementation | • | • | | | | | |
| Showing the importance of the KPI for monitoring sustainability performance | • | • | • | • | • | • | |
| Structure sustainability plans and policies | • | • | | | | | |
| Structure sustainability strategy | • | | | | | | |
| Support the company when collaborating with non-governmental organizations | • | | | • | | | |
| Establishing and supporting sustainability teams | • | • | • | • | | • | |
| Key essentials for deploying this important factor | | | | | | | |
| Hiring talent management and employees | • | • | | • | | | |
| Stakeholder engagements | • | • | | • | | | |
| Employees aware of sustainability to senior management | • | • | | • | | | |
| Strategy | | | | | | | |
| Designate a strategy for sustainability improvement | • | • | • | • | • | • | • |
| Product stewardship (environmental strategy) | • | | • | • | • | | |
| Sustainability Improvement Strategies or Transformation Roadmap framework | • | • | • | • | • | • | |
| Risk and opportunities strategy | | • | | | | | |
| Procurement strategy | | | • | • | | | |
| Carbon management strategy | | | • | | | | |
| Positive impacts | | | | | | | |
| Continuous performance improvement | • | • | • | • | • | • | |
| Anticipating government rules and policy | | • | | | | | |
| Key essentials for deploying this important factor | | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Covering every aspect of company operation's internal and external activity | • | • | • | • | • | • | |
| Link with a long business strategy plan | • | • | • | • | • | • | |
| Long-term planning | • | | • | | | | |
| Participation from all the stakeholders | • | • | | • | • | • | |
| Possessing aims and missions | • | • | • | • | • | • | |
| System management technology | • | • | | | | | |
| Senior management Support | • | • | | | | | |
| Employees | • | • | | | | | |
| Company Culture | | | | | | | |
| Commitment to EHSSQ culture | • | | • | • | • | | |
| The availability of sustainability vision and mission | | • | • | | • | • | • |
| Positive impacts | | | | | | | |
| Reinforcement of responsibility | • | | | | • | | |
| Promote sustainability awareness across the organization | • | | | | | | |
| Directing employee behaviour | | | • | | | | |
| Key essentials for deploying this important factor | | | | | | | |
| Familiarity of world-class standards and practices | • | | | | | | |
| Sustainability steering committee | • | | | | | | |
| Senior management | • | | | | | | |
| Provide training and support to employees | • | | | | | | |
| Technology | | | | | | | |
| Technologies applied by the government or third parties | • | • | | • | | | |
| • Recycling facilities | • | • | | • | | | |
| • Auditing the company facilities (Company E) | | | | | • | | |
| Technologies applied by the organization | • | • | • | • | • | • | • |
| Applying the latest technology | • | • | • | • | • | • | |
| Reduction of waste technology | • | • | • | • | • | • | |
| Tracking software and hardware technologies | • | • | • | • | • | • | • |
| Positive impacts | | | | | | | |
| Encouragement of the adoption of advanced sustainability | • | | • | • | | | |
| Guiding and supporting the decision-making process | • | • | | | • | • | |
| Changing or modifying operating machines | • | • | | | | • | |

| | | | | | | | |
|--|---|---|---|---|---|---|---|
| Monitoring and reporting sustainability progress | • | • | • | | • | | |
| Strengthening stakeholder engagement | • | • | • | | | | |
| Allowing improvement of sustainability performance | | • | • | • | • | • | |
| Key essentials for deploying this important factor | | | | | | | |
| Part of the strategy | • | • | • | • | | • | |
| Stakeholder engagement | • | • | • | • | | • | |
| The availability of supply chain partner sustainability technology or the availability of supply chain partners technology and knowledge | • | • | • | • | | • | |
| Non-governmental associations | | | | | | | |
| Engaging with research centres | | | • | | | • | |
| Engaging with universities | | | • | | | • | |
| Senior management support | | | | | | | |
| Advance research centres | | | • | • | | • | |
| Future of SSCM | | | | | | | |
| Government Vision 2030 | • | • | | | | • | • |
| Support and initiatives from all Gulf countries | • | | | | | | |
| Support and initiatives from large Saudi organizations | • | • | | | | | |
| Support and initiatives from all countries | | • | | | | | |

Appendix 8: Component one of SSCM framework, Motives of SSCM

| Component one of SSCM framework, Motives of SSCM | Theoretical findings (TF) | Empirical findings (EF) |
|---|---------------------------|-------------------------|
| 1. Motives related to regulation/ government | ✓ | ✓ |
| ➤ Responding to government public fund pressure | | ✓ |
| ➤ Responding to government holistic sustainability strategy in the country | | ✓ |
| ➤ Responding to and anticipating local rules and policies pressure | ✓ | ✓ |
| 2. Motives related to the globalized market | ✓ | ✓ |
| ➤ Responding to competition pressure among responsible organizations | ✓ | ✓ |
| ➤ Responding to export countries regulation pressure or responding to global regulations | | ✓ |
| ➤ Obtaining competitive advantages | ✓ | ✓ |
| 3. Motives related to reducing risks to business, the environment and health and safety | ✓ | ✓ |
| A. Supplier risk | | ✓ |
| ➤ Reducing the dependency on international suppliers. | | ✓ |
| ➤ Reducing the risk of materials being fake or low-quality. | | ✓ |
| ➤ Reducing safety risk when the company product transported from point A to point B | | ✓ |
| ➤ Reducing the risk of losses associated with unethical behaviours or practices | ✓ | |
| ➤ Reducing the reputational risks associated with outsourcing and purchasing materials from a supplier | ✓ | |
| B. Customer risk | | ✓ |
| ➤ Reducing the safety and environmental risks when the customer receives the product | | ✓ |
| C. Operation risk | | ✓ |
| ➤ Avoid the risks of environmental damage during the operation | | ✓ |
| 4. The motives of suppliers | ✓ | ✓ |
| ➤ Improving the company's operations by adopting a just in time, less lead time | ✓ | ✓ |
| ➤ Ensuring greater quality and reliability of the company product | ✓ | ✓ |
| ➤ Effective control of the inventory. | | ✓ |
| ➤ Improving relationships with supplier. | ✓ | ✓ |
| ➤ Cost reduction | ✓ | ✓ |
| ➤ Reduction in emission through reducing in transportation process | | ✓ |
| ➤ Supporting local supplier means supporting the community. | | ✓ |
| ➤ Enhancing the company public image | ✓ | |
| ➤ Freeing of the capital to be invest in other sustainability projects | | ✓ |
| 5. The motives of customers | ✓ | ✓ |
| ➤ Market opportunities for business growth globally | ✓ | ✓ |
| ➤ Develop long-term strategic relationships | ✓ | |
| ➤ Avoid losing sales | ✓ | |
| ➤ Responding to multinational customers' requirements | ✓ | ✓ |
| 6. Reputational motives | ✓ | ✓ |
| ➤ Creating a reputation for being a 'good citizen' | ✓ | ✓ |
| ➤ Enabling a business to increase its legitimacy and access to essential resources | ✓ | |
| 7. Strengthening employee loyalty | | ✓ |
| 8. Operational benefit | ✓ | ✓ |
| ➤ Reducing carbon emissions | | ✓ |
| 9. Financial motives | ✓ | ✓ |
| ➤ Enhance long-term profits for the company | ✓ | ✓ |
| ➤ Addressing issues such as cost, and emissions, safety, and health problems and recycling materials, saved energy ultimately result in improving the economic performance. | | ✓ |
| 10. Community motives | ✓ | ✓ |

| | | |
|---|---|---|
| A. Responsibility to the Local community | ✓ | ✓ |
| ➤ Conservation of the local ecosystem | | ✓ |
| ➤ Development of the country economy | | ✓ |
| ➤ Safety | | ✓ |
| B. Responsibility toward local suppliers and entrepreneurial development | | ✓ |
| C. Responsibility toward industry development | | ✓ |
| D. Responsibility toward employees' health and safety | | ✓ |
| E. Avoid negative media attention on issues of industrial waste and energy consumption. | ✓ | |

Appendix 9: Component two of SSCM framework, Barriers of SSCM

| Component two of SSCM framework, Barriers of SSCM | TF | EF | Negative Impact (barrier) | TE | EF |
|---|----|----|--|----|----|
| 1. Regulation | | | Environmental impact | ✓ | ✓ |
| lack of government regulation, monitoring, guidance, and support for adopting SSCM | ✓ | ✓ | Having an impact on waste management strategies | | ✓ |
| Customs authority Customs clearance delay Lack of transparency Lack of policies Lack of safety standards Lack of technical expertise Lack of advanced technology Lack of collaboration and trust with other Gulf customs | | ✓ | Inhibiting environmental innovation | ✓ | |
| Government political instability | | | Managers are not motivated enough to integrate sustainability in the supply chain | ✓ | ✓ |
| lack of government leadership, and sustainability skill | ✓ | ✓ | Social impact | ✓ | ✓ |
| Presence of government corruption | ✓ | ✓ | Inhibiting safety initiatives | | ✓ |
| lack of self- industry regulation | ✓ | | Inhibiting the company effort to buy from local suppliers | | ✓ |
| lack of international regulation | ✓ | | Economic impact | ✓ | ✓ |
| lack of government Infrastructure for adopting SSCM Poor logistics infrastructure Poor waste infrastructure Poor education system regarding supply chain and sustainability concept | | ✓ | Increasing shipment costs | | ✓ |
| Lack of government global competitiveness index | | ✓ | Inhibiting the establishment demand for sustainable product | ✓ | ✓ |
| Lack of data from the government about the qualified suppliers | | ✓ | Other impacts | | |
| Lack of consistency in the regulations between government authorities | | ✓ | Inhibiting the identification of the sustainability practices requiring measurement and the methods used | ✓ | |
| | | | Inhibiting the sustainable relationships between buyers and suppliers | ✓ | ✓ |
| | | | Impacting on sustainable procedures adopted in the supply chain | | ✓ |
| | | | Impacting on resources, resulting in less focus on SSCM implementation | | ✓ |
| | | | Inhibiting an awareness of sustainability among customers and suppliers | ✓ | ✓ |
| | | | Inhibiting knowledge of the individuals responsible for any issue arising in the supply chain | ✓ | |
| 2. Product design | ✓ | ✓ | | | |

| | | | | | |
|---|---|---|--|---|---|
| Lack of perspective when it comes to supply chain decisions relating to the design of sustainable SCM | ✓ | | Other impacts | | |
| The complexity in designing reuse and recycle for the product. | ✓ | ✓ | Inhibiting the design of a sustainable supply chain, resulting in a sustainable product | ✓ | |
| The complexity in designing a product that use fewer resources, process and energy in the production. | ✓ | ✓ | Environmental impact | | ✓ |
| complexity in design of sustainable supply chain | ✓ | | The recycling of a product involving a complex process, which may result in higher levels of emissions into the air. | | ✓ |
| | | | Economic impact | | |
| | | | The cost of producing recycling materials may prove higher, and also result in issues surrounding quality | | ✓ |
| 3. Management | ✓ | ✓ | | | |
| lack of top management commitment | ✓ | ✓ | Environmental impact | | |
| lack of management skills tools and experience | ✓ | ✓ | Lack of any adoption of environmental practices by members of the supply chain | ✓ | |
| lack of interest and skill from all management level | ✓ | | Economic impact | | |
| lack of support and transparency from middle management | ✓ | | Focusing on short term result | | ✓ |
| lack of willingness to engage in proper training about sustainability and its applications | ✓ | ✓ | Not valuing the benefit from the SSCM implementation | ✓ | |
| | | | Social impact | | |
| | | | Lack of the adoption of social practices in the supply chain | ✓ | |
| | | | Other impacts | | |
| | | | Inhibiting a business from adopting new strategies required to support the implementation of SSCM | ✓ | |
| | | | Insufficient reverse logistics practices, which are unable to facilitate the implementation of SSCM | ✓ | |
| | | | lack of SSCM training for employees | ✓ | |
| | | | low of employee involvement in SSCM practices | ✓ | |
| | | | Lack of investment in development of the required infrastructure facilities to support the implementation of SSCM | ✓ | |
| | | | Inhibiting the introduction of SSCM strategy | ✓ | |

| | | | | | |
|--|---|---|---|---|---|
| | | | Lack of commitment toward the implementation of SSCM | ✓ | ✓ |
| | | | Lack of senior management commitment toward sustainability external reporting | | ✓ |
| 4. Employees | | | | | |
| Lack of employee motivation | ✓ | | Environmental impact | | |
| lack of employee union pressure | ✓ | | Inhibiting in the implementation of environmental practices in the supply chain | ✓ | ✓ |
| Lack of employee training related to effective sustainability practices | ✓ | | Social impact | | |
| Lack of higher education and professional skills concerning sustainability | ✓ | | Inhibiting the adoption of social practices in the supply chain | ✓ | ✓ |
| lack of investment in the developing of the employee capability | ✓ | | | | |
| The lack of appropriate working environment | ✓ | | | | |
| Resistance to change | ✓ | ✓ | | | |
| 5. Customer | | | | | |
| Desire for lower price | ✓ | | Economic impact | | |
| Time taken to research sustainable products | ✓ | | Financial risk will emerge from losing the customer when sustainability measures are included in the agreement | | ✓ |
| Inadequate information about the benefit of SSCM | ✓ | | Other impact | | |
| Lack of customer support | ✓ | | Firms will be convinced enough to involve in SSCM practices because the low demand from the customer. | ✓ | ✓ |
| Lack of business customers buying company waste product | ✓ | ✓ | | | |
| Lack of customer awareness of the concept of sustainability | ✓ | ✓ | | | |
| Dealing with small-size customers that lack sustainability adoption | | ✓ | | | |
| 6. Supplier | | | | | |
| Lack of green suppliers | ✓ | ✓ | Other impact | | |
| lack of supplier engaging in socially responsible practices | ✓ | ✓ | Inhibiting sustainability report practices | ✓ | |
| Lack of environmental capacity in the location of the SME supplier | ✓ | ✓ | Difficulty in producing a sustainable product | ✓ | ✓ |
| Resistance to comply | ✓ | ✓ | Engaging with supplier in a project that related to enhance sustainability in the supply chain is missed. | ✓ | ✓ |
| Complexity of monitoring and measuring a supplier's practices regarding issues of sustainability | ✓ | ✓ | Missing an opportunity to benefit from supplier sustainability initiatives that can help improve company sustainability performance | | ✓ |
| Different standard, culture, language between suppliers and the companies | ✓ | | Risks will emerge from losing the supplier when sustainability measures are included in the agreement | | ✓ |

| | | | | | |
|--|---|---|---|---|---|
| Higher prices for sustainable product from supplier | ✓ | | Social impact | | |
| lack of supplier commitment | ✓ | ✓ | Hindering the company effort to buy from local supplier | | ✓ |
| lack of communication, trust, and information sharing between supplier and buyer | ✓ | ✓ | | | |
| lack of resources such as money and other resources to audit supplier | ✓ | | | | |
| The difficulty to ensure that supplier fulfil the code of conduct | ✓ | | | | |
| Traditional purchasing system does not support the sustainable purchasing | ✓ | | | | |
| lack of transparency from supplier | ✓ | | | | |
| The complexities inherent in reaching a common understanding of the concept of sustainability, along with socio-economic differences | ✓ | | | | |
| Dealing with solo international contractors | | ✓ | | | |
| Lack of reliable information about local sustainable suppliers | | ✓ | | | |
| Difficulties in transforming company sustainability attitudes, awareness and practices into action | | ✓ | | | |
| Supplier financial limitations | | ✓ | | | |
| Lack of supplier knowledge and awareness about SSCM | ✓ | ✓ | | | |
| 7. Organisational Culture | | | | | |
| Poor cultural awareness among the members of a supply chain | ✓ | | Other impact | | |
| Change of culture in the supply chain can raise issues due to: | ✓ | | Inhibiting the company to convince the supply chain members of the benefit of SSCM adoption | | |
| Differences between the cultures of firms within the supply chain | ✓ | | | | |
| Differences between political and geographical cultures | ✓ | | | | |
| Fear of adopting techniques or modifications used by the previous method | ✓ | | | | |
| 8. Business strategy CS/CSR | | | | | |
| lack of Corporate social responsibility (CSR) and corporate sustainability (CS) models | ✓ | | Other impacts | | |
| lack of a coherent explanation of how CSR strategy can improve company performance | ✓ | | Inhibiting firms to understand what sustainability means in corporate and supply chain domain | ✓ | |
| | | | Inhibiting firms from identifying a relationship between short- and long-term goals | ✓ | |

| | | | | | |
|---|---|--|---|---|--|
| | | | lack of commitment to sustainability implementation in the supply chain | ✓ | |
| 9. Performance measurement | | | | | |
| lack of adequate sustainability performance measurement | ✓ | | Other impact | | |
| complexity to measure the internal activities and the external one in the supply chain | ✓ | | Inhibiting any measuring of the impact of company supply chain practices on environmental, social and economic aspects | ✓ | |
| Mismatch between internal measure and the supply chain measure | ✓ | | Inhibiting the alignment of short- and long-term strategic goals | ✓ | |
| lack of connection with strategy | ✓ | | | | |
| Lack of holistic focus | ✓ | | | | |
| lack of trust among SC members | ✓ | | | | |
| lack of regulatory bodies | ✓ | | | | |
| Lack of metrics agreement between the stakeholder | ✓ | | | | |
| Lack of metrics that can measure broad sustainability practices | ✓ | | | | |
| Lack of guide of how, when, and which metrics to use | ✓ | | | | |
| Current accounting method does not support sustainability decision | ✓ | | | | |
| Lack of social metrics | ✓ | | | | |
| The social and environmental dimensions are more complicated and difficult to understand and measure. | ✓ | | | | |
| 10. Cost of sustainability and the level of returns on investment | | | | | |
| higher cost in the development of SSCM programmes and practices such as | ✓ | | Economic impact | | |
| higher Cost for disposal of hazardous wastes | ✓ | | Inhibiting the company to support the adoption of sustainability practices in the supply chain | ✓ | |
| higher Cost for environmentally friendly packaging, | ✓ | | Inhibiting in getting the support from buyer and supplier to adopt SSCM due to the conflict with firm's objective to reduce the cost. | ✓ | |
| | | | It is challenging to compete with firms lacking a focus on sustainability | ✓ | |
| Cost of sustainability | ✓ | | Other impacts | | |
| The lack of financial resources | ✓ | | Higher risks associated with low adoption of SSCM | ✓ | |
| conflicts with the enterprise's goal to minimise the cost in the supply chain. | ✓ | | Inhibiting the establishment of regulatory compliance because the lack of competitive pressure | ✓ | |
| The return uncertainty from the adoption of SSCM | ✓ | | | | |
| The lack of incentive system | ✓ | | | | |
| The lack of competitive sustainable pressure | ✓ | | | | |

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|---|---|---|---|---|---|
| Banks do not support sustainable programme | ✓ | | | | |
| 11 Logistics | | | | | |
| Inadequacy facility for upgrading toward reverse logistic practices | ✓ | ✓ | Environmental impact | | |
| lack of awareness of reverse logistics | ✓ | | Inhibiting the recovery and collection of end-of-life products, recycling, remanufacturing and refurbishing the life of product while diminishing waste in the supply chain | ✓ | ✓ |
| 12 Innovation / technology | | | | | |
| lack of availability of suitable and supporting technology | ✓ | | Other impact | | |
| lack of innovating new technology | ✓ | | Inhibiting a company's desire to adopt SSCM Resulting in a lack of pressure from other stakeholders in the company to adopt SSCM | ✓ | |
| Complexity in the technology develop | ✓ | | | | |

Appendix 10: Component three of SSCM framework, Enablers of SSCM

| Component three of SSCM framework, enabler of SSCM | TF | (EF) | | TF | (EF) |
|---|----|------|---|----|------|
| 1. Regulation | | | | | |
| Government introduce the regulatory sustainability framework and be able to execute them. | ✓ | | Environmental impacts | | |
| The government ability to inspect the firm operations | ✓ | | Government encourage or pressure firm toward obtaining a certification of the global environmental system | ✓ | |
| Government introduce the regularity framework in the initial stage. | ✓ | | Supporting the company effort in emissions reductions | | ✓ |
| Support and the policy of the industrial park authority | | ✓ | Extra pressure toward environmental implementation | | ✓ |
| ➤ Financial penalties exist | | ✓ | Social impacts | | |
| ➤ Strict regulations and monitoring | | ✓ | Extra pressure toward local hiring | | ✓ |
| ➤ Environmental footprint limitations | | ✓ | Extra pressure/support toward content localization | | ✓ |
| ➤ Environmental waste reductions | | ✓ | Economic impacts | | |
| ➤ Safety standards | | ✓ | Remuneration, tax reduction to encourage the company to adopt social and environmental aspects. | ✓ | ✓ |
| ➤ Support infrastructure and encouragements | | ✓ | Saving money from consolidation in logistics | | ✓ |
| Government has a vision that support sustainability | | ✓ | Other impacts | | |
| | | | Ensuring proper sustainability implementation | | ✓ |
| | | | Supporting a regional non-government association | | ✓ |
| | | | Unifying the discussion among all stakeholders | | ✓ |
| | | | Acceleration in sustainability adoption from why to how | | ✓ |
| | | | Source of information | | ✓ |
| | | | Developing industry sustainability indicators and policies | | ✓ |
| 2. Product design | | | | | |
| Integrating SSCM in product design in initial stage of the process. | ✓ | | Other impact | | |

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|--|---|---|--|---|---|
| | | | <p>Including sustainability in the supply chain design result in:</p> <p>Fewer materials used and operation processes</p> <p>energy consumption, and its related emission for the product may be reduced</p> <p>determining the cost and the advantage</p> | ✓ | |
| 3. Non- governmental organisations | | | | | |
| <p>Non- governmental organisations guideline and pressure such as</p> <p>Actively participating and contributing to global and regional non-governmental associations</p> <p>Obtaining environmental, social, and quality management system accreditations</p> | ✓ | ✓ | Other impact | | |
| | | | Changing management views on KPI | | ✓ |
| | | | An opportunity to collect sustainability information from SC partners | | ✓ |
| | | | Motivation to continue working in sustainability development | | ✓ |
| | | | Checking the environmental safety of materials | | ✓ |
| | | | Facilitating shared learning and understanding | | ✓ |
| | | | Governing businesses and its supply chain with integrity, responsibility and transparency | | ✓ |
| | | | Introducing a common set of sustainability indicators for all member companies | | ✓ |
| | | | Introducing a common set of standards among its members | | ✓ |
| | | | Strengthening the company operating systems to manage environmental, social, and safety aspects | | ✓ |

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|---|---|---|--|---|---|
| | | | Increasing company responsibility in selecting the right supplier, monitoring their behaviours and developing them | | ✓ |
| 4. Management | | | | | |
| Senior management commitment and responsibility | ✓ | ✓ | Other impact | | |
| Senior management vision and skills | ✓ | ✓ | Allocating the resources such as funding, human capital, ideas and strategy development, technology. | ✓ | ✓ |
| Middle management commitment | ✓ | | Enhancing the collaboration with partners | ✓ | ✓ |
| | | | Supporting and driving innovative practices, | ✓ | ✓ |
| | | | Creating a sustainability culture will be hard to change | | ✓ |
| | | | Defining roles and responsibilities | | ✓ |
| | | | Guidance, providing information, mentoring for the employees or leadership | ✓ | ✓ |
| | | | Influential on other CEO partners | | ✓ |
| | | | Overcoming any internal barriers to the sustainability implementation | | ✓ |
| | | | Showing the importance of the KPI for monitoring sustainability performance | ✓ | ✓ |
| | | | Establishing and supporting sustainability teams | | ✓ |
| | | | Improved understanding of sustainability practices in the company | ✓ | |
| 5. Employee | | | | | |
| Employee's commitment, teamwork, and devotion. | ✓ | ✓ | Other impact | | |
| Employees, procurement staff and other employees in the supply chain network obtain sustainability skill. | ✓ | ✓ | Achieving higher sustainability performance of the sustainability programmes in the supply chain | ✓ | ✓ |
| Benefits from employee's diversity | | ✓ | Enhance the development of innovative technology | ✓ | ✓ |

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|--|---|---|---|---|---|
| Recognizing the importance of developing employee performance to improve the firm sustainability performance | ✓ | ✓ | Internal and external controlling | ✓ | ✓ |
| Designate sustainability responsibility to company departments | | ✓ | Building a good relationship with partners and other stakeholders | | ✓ |
| Environment and operation division | | | Monitoring the sustainability production progress | | ✓ |
| Procurement and logistics division | | | Enhancing the internal coordination through efficient information sharing and process improvement | ✓ | ✓ |
| Sustainability Steering Committee | | | Reporting to the senior management about sustainability progress | | ✓ |
| Corporate Affairs Department (CAD) | | | Buying in sustainability concept to the senior management | | ✓ |
| Corporate Planning Risk Department | | | | | |
| Safety Department | | | | | |
| Localization and Qualification Department | | | | | |
| 6. Customer | | | | | |
| Customer support and awareness | ✓ | ✓ | Environmental impact | | |
| Demand from large-size customers | | ✓ | Participating with partners to deal with climate change | | ✓ |
| Encouragement and support from large-size customers | | ✓ | Reduction in the company's emissions | | ✓ |
| The availability of business customers that can buy the company waste | | ✓ | Economic impact | | |
| | | | Customer purchasing of sustainable product support the economic performance | ✓ | ✓ |
| | | | Collaboration with the customer results in saving in shipment costs | | ✓ |
| | | | Increasing the commitment of the company to invest in SSCM practices, | ✓ | ✓ |
| | | | Other impacts | | |
| | | | Engaging in external sustainability reporting | | ✓ |
| | | | Monitoring business activities or linking customer social and environmental requirement with firm practices | | ✓ |
| | | | Opportunity to become familiar with the sustainability practices implemented by the customer | | ✓ |
| 7. Supplier | | | | | |

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|--|---|---|---|---|---|
| Selecting sustainable supplier | ✓ | ✓ | Environmental impact | | |
| Buyer should pressure supplier to change its existing practices | ✓ | ✓ | improvement of environmental practices adopted in the supply chain | ✓ | ✓ |
| Recognizing the importance of improving the local supplier sustainability performance to the firm sustainability performance | ✓ | ✓ | Supplier recycling facilities that help to reduce company waste | ✓ | ✓ |
| | | | Collaborating with the supplier to introduce new technology to reduce waste | ✓ | ✓ |
| | | | Reductions in emissions by reducing the need for transportation through the use of local suppliers | | ✓ |
| | | | management of environmental risks | ✓ | |
| | | | Social impact | | |
| | | | Saudization hiring | | ✓ |
| | | | Supporting the local content strategy | | ✓ |
| | | | How to know transfer | | ✓ |
| | | | improvement of social practices in the supply chain | ✓ | ✓ |
| | | | Economic impact | | |
| | | | Direct investment to the Kingdom | | ✓ |
| | | | Development of the Saudi economy | | ✓ |
| | | | Cost savings for the company due to using local suppliers | | ✓ |
| 8. Organisational Culture | | | | | |
| Commitment to Environment Health Safety Security and Quality (EHSSQ) culture | ✓ | ✓ | Other impact | | |
| Culture that values “open communication, team collaboration, proactive, innovative and risk-taking behaviour, responsibility, integrity can support the adoption of SSCM | ✓ | ✓ | Directing employee and manager behaviour toward considering the environmental and social aspects of their decisions | ✓ | ✓ |
| | | | Impact on other members of the supply chain such as supplier by acting as a good example | ✓ | |
| | | | Reinforcement of responsibility toward sustainability | | ✓ |
| | | | Promote sustainability awareness across the organization | | ✓ |
| 9. Business strategy CS/CSR | | | | | |
| Adopting CSR or CS and link it to the company core business | ✓ | ✓ | Other impact | | |

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|--|---|---|---|---|---|
| | | | Supporting the adoption of sustainability practices inside the firms and across the supply chain | ✓ | ✓ |
| | | | Ensuring business attitudes, behaviours and practices in the present and the future is toward the development of sustainability. | | |
| | | | Ensuring the firm commitment to the stakeholders | ✓ | ✓ |
| | | | Ensuring business operations incorporate social and environmental aspects and their relationship to the stakeholders in a strategic way by reporting the triple bottom line performance | ✓ | ✓ |
| | | | Allow business entities to realise economic benefits that contribute to the development of well-being of the stakeholders and at the same time improving and protecting the social and the environmental conditions | ✓ | ✓ |
| | | | Fostering a sustainability culture | | ✓ |
| 10. Sustainability strategy | | | | | |
| Designate a strategy for sustainability improvement such as | ✓ | ✓ | Other impact | | |
| Product stewardship (environmental strategy) Sustainability Improvement Strategies or Transformation Roadmap framework Risk and opportunities strategy Procurement strategy Carbon management strategy | | ✓ | SSCM strategy allowing firms to manage sustainability initiatives related to the supply chain, in particular as being closely interrelated | ✓ | ✓ |
| | | | Allowing firms to tackle the triple bottom line and achieve long-term profits. | ✓ | |
| | | | Allowing firms to recruit candidates who have a proactive commitment toward sustainability management | ✓ | |

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| | | | Allowing firm to manage and divert the necessary resources for managing the progress made toward the achievement of sustainability. | ✓ | |
| | | | Ensuring the availability of funds to sustainable practices. | ✓ | |
| | | | Developing a platform to support partners in their initiatives for sustainable practices in the supply chain. | ✓ | ✓ |
| | | | The achievement of superior environmental and economic, social performance in the supply chain | ✓ | ✓ |
| | | | Ensuring firm adaptive to the rapid changes in technology and the changing behaviour of the stakeholders. | ✓ | |
| 11. Performance measurement | | | | | |
| Acknowledge the importance of sustainability performance | ✓ | ✓ | Other impact | | |
| Availability of funds | ✓ | | Enabling to evaluate the entire value chain using sustainability criteria | ✓ | ✓ |
| Acknowledgement of social and environmental performance and its effect on the financial and operation performance simultaneously | ✓ | ✓ | Evaluating of how efficient and effective the SSCM strategy develop in the sustainable development. | ✓ | ✓ |
| Sustainability indicators shown in the environment, social and economic dimensions | ✓ | ✓ | Allowing firm to report their activities to the external environment and control the internal activities. | ✓ | ✓ |
| Economic indicators Contribution to GDP, Economic diversification Increase in market capitalization ROI for shareholders | | ✓ | Improving decision-making, defining strategic orientation, and identifying possibilities for efficiency improvements. | ✓ | ✓ |
| Environmental indicators Carbon emissions Effluent and Waste Conservation of resources Compliance with RC Environment Regulations | | ✓ | Sustainable indicators can show weaknesses and indicate directional changes | ✓ | ✓ |

| | | | | | |
|--|---|---|--|---|---|
| Social indicators Safety Health Job creation Community engagement Local content | | ✓ | Showing company responsibility and transparency to stakeholders | ✓ | ✓ |
| Sustainability indicators have to be improved over time | ✓ | ✓ | | | |
| Sustainability indicators shared with partners for later assessment | ✓ | ✓ | | | |
| Supplier sustainability performance included in company sustainability report | ✓ | ✓ | | | |
| Sustainability Reporting internally and externally | ✓ | ✓ | | | |
| 12. Logistics | | | | | |
| Reverse logistic | ✓ | | Other impact | | |
| The integration of company logistics activities with partners | ✓ | ✓ | Ensure there is a link between supply chain members to share information on sustainability | ✓ | |
| | | | Member connects to the chain from the supplier to end customer throughout manufacturing, warehousing and distribution are expected to be informed about (for example sustainable information) whatever occurred in the network | ✓ | |
| | | | enhance the sustainable collaboration with partners | ✓ | ✓ |
| 13. Collaboration with the stakeholders | | | | | |
| Collaborating with internal and external stakeholders | ✓ | ✓ | Other impact | | |
| Working with a sustainable leader in the same sector or/ and different sectors. Working with competitors that are interested in the integration of sustainability. Collaborating with product designers and suppliers. Collaborating with customer Collaborating with non-government organizations Collaborating with government agencies Collaborating with research centres and universities | ✓ | ✓ | Supporting the absorption capacity of the firm. | ✓ | |
| | | | Constructing and encouraging practices around SSCM. | ✓ | ✓ |

| | | | | | |
|--|---|---|--|---|---|
| | | | Ensuring the sustainability performance of product's total life cycle are taken into account simultaneously in the supply chain. | ✓ | ✓ |
| | | | Creating substitute materials and innovative technology | ✓ | ✓ |
| | | | Ensuring better use of resources by joining audits of the supplier. | ✓ | |
| 14. Innovation / technology | | | | | |
| Technologies applied by the government or third parties such as Recycling facilities Auditing the company facilities | ✓ | ✓ | Environmental impact | | |
| Technologies applied by the organization Applying the latest technology Reduction of waste technology Tracking software and hardware technologies Information technology | ✓ | ✓ | The achievement of high-green supply chain performance | ✓ | ✓ |
| | | | Supporting business in optimising resources | ✓ | ✓ |
| | | | Other impact | | |
| | | | Encouraging the sustainability collaboration in the supply chain | ✓ | ✓ |
| | | | Enhancing the communication and the coordination of the supply chain activities | ✓ | ✓ |
| | | | More coordinated innovative ideas, | ✓ | ✓ |
| | | | enhancing the communication inside and outside the firms | ✓ | ✓ |
| | | | Encouragement of the adoption of advanced sustainability practices | | ✓ |
| | | | Guiding and supporting the decision-making process | | ✓ |
| | | | Monitoring and reporting sustainability progress | | ✓ |
| | | | Allowing improvement of sustainability performance | | ✓ |

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|--|--|--|--|--|---|
| | | | Strengthening stakeholder engagement | | ✓ |
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Appendix 11: Component one and two of SSCM framework, Key requirement for developing the categorisation above of SSCM

| Categorisation | Component one and two of SSCM framework, Key requirement for developing the categorisation above of SSCM | TF | EF |
|---|--|----|----|
| How to engage with the stakeholders | <p>Focal firm/buyer identifies the critical stakeholder</p> <p>Focal firm/buyer is responsible for ensuring that supply chain members contribute toward the adoption of SSCM</p> <p>Focal firm should first focus on establishing strong sustainable practices, which will give internal stakeholders a clear idea of the goals and the process of the adoption. This will enable them to expand the focus on the integration of sustainability in relation to external practices, including collaborating with their suppliers, customers and other stakeholders.</p> <p>All initiatives related to both internal and external practices should be incorporated into a single strategy</p> <p>The integration of technology, information sharing, joint development, and logistical integration, trust, and transparency must be put in place to enhance this collaboration</p> | ✓ | ✓ |
| How Management engages in the SSCM adoption | | | |
| | Pressure from the stakeholders will have an impact on the top management | ✓ | ✓ |
| | <p>Government responsibility</p> <p>Introducing investment responsibility policies (VIP)</p> <p>Introducing the concept in the education system</p> | ✓ | ✓ |
| | <p>Company responsibility</p> <p>Find or create sustainability champions</p> <p>Hiring talent management.</p> <p>Recognizes the importance of developing the management performance to improve the firm sustainability performance</p> <p>Measures to improve the board's understanding of sustainability impacts</p> <p>Evaluation of the board with respect to sustainability impacts</p> <p>Provide training to senior management in sustainability skills</p> | | ✓ |
| | <p>Manager responsibility: having skills such as</p> <p>Soft skills, Open-minded, Passionate, Visionary, value the teamwork</p> <p>Hard skills.</p> <p>green logistics, green packaging, and TBL frameworks</p> | ✓ | ✓ |
| | <p>Sustainability professional's responsibility</p> <p>Doing a case study to show evidence of the importance of sustainability</p> | | ✓ |
| How employee engages in the SSCM adoption | | ✓ | ✓ |
| | <p>Achievements of top management</p> <p>Government has the responsibility to prepare and develop the workforce</p> <p>by updating the education system and applying other initiatives</p> | ✓ | ✓ |
| | <p>Having good human resource management in place</p> <p>Hiring employees with skills in ethical working and sustainable commitment</p> | ✓ | ✓ |

| | | | |
|---|---|---|---|
| | <p>Firm uses resources to make employee more involve in the sustainability agenda like providing</p> <p>Good workplace environment.</p> <p>Reward and incentive.</p> <p>Management empowering of the employee</p> <p>Identify gaps, set training programmes and measure their effectiveness</p> <p>Management should collaborate with the employee in two-way communication.</p> <p>Code of conduct and ethics in place to guide employees' activities</p> <p>Build up employee awareness of sustainability</p> | ✓ | ✓ |
| | | | |
| How government engages in the SSCM adoption | | | |
| | Political stability. | ✓ | |
| | <p>The company Collaborating with regulatory agencies through</p> <p>Recommendation</p> <p>Lobbying for policy changing</p> <p>Sustainability awareness training</p> <p>Joint work</p> | | ✓ |
| | <p>Government applying digital technology</p> <p>Government improving the logistical infrastructure</p> <p>Government improving the education system</p> | | ✓ |
| How customer engages in the company SSCM adoption | | | |
| | The achievement of management and the employee, government, strategy factors. | ✓ | ✓ |
| | Government and Non- government organization have a role to play in increasing the awareness of customers. | ✓ | ✓ |
| | Collaborating with customer to understand the customer sustainable requirement and preference | ✓ | ✓ |
| | <p>Buyer-customer relationship.</p> <p>Joint development with customer.</p> | ✓ | ✓ |
| | Measuring customer satisfaction | ✓ | ✓ |
| How supplier engages in the company SSCM adoption | | | |
| | <p>The achievement of factors related to regulation, management, employees and strategy.</p> <p>For example, the government establishing policies and guidelines</p> | ✓ | ✓ |
| | Selection of a supplier who has already adopted sustainable practices, which requires the company to adopt sustainable purchasing practices and include moral criteria into the selection process | ✓ | ✓ |
| | <p>Firm should have an assessment tools to evaluate supplier meeting and audit.</p> <p>Code of conduct, formal sourcing process, auditing and questionnaire. certification</p> | ✓ | ✓ |
| | <p>Firm finding resources to improve supplier performance</p> <p>Firms using reward and intensive for the supplier.</p> <p>Firms transferring technology to supplier</p> <p>Firms developing of training programme for supplier</p> <p>Firm purchasing commitment from the supplier.</p> <p>Integration of collaboration with the assessment</p> <p>Collaborating with small and medium-sized supplier</p> <p>Collaborating and sharing the sustainable knowledge with supplier</p> | ✓ | ✓ |
| | Facilitating collaboration with forging partners with focusing on R&D to improve the supplier performance | | ✓ |

| | | | |
|--|---|---|---|
| | Influencing the supplier to engage in sustainability non-government associations | | ✓ |
| | Firm linking company objective with supplier practices | ✓ | ✓ |
| How non-government organization engages in the company SSCM adoption | Stakeholder engagement Commitment to continue participating in non-government associations Demand from large-scale customers Senior management support | | ✓ |
| How Organisation culture can be developed | Senior management commitment Embracing the world-class standards and practices Support the Sustainability steering committee Provide training and support to employees | | ✓ |
| Business strategy CS/CSR | Management commitments, and many other enablers in need of being identified, which may bear some similarities to SSCM enablers. However, the identification of such enablers is outside the scope of this current study | | |
| How Sustainability strategy can be developed | | | |
| | SSCM strategy must be link with corporate social responsibility (CSR) and corporate sustainability (CS) (the achievement of business strategy) Participation from partners and other stakeholders in the developing of SSCM. Senior management Support Skill Employees Including every functional level in the organisation | ✓ | ✓ |
| | Firm should be thinking and applying innovation strategy | ✓ | ✓ |
| | The strategy should be Link with a long business strategy plan and to be Long-term planning | | ✓ |
| | The strategy should be Possessing aims and missions | | ✓ |
| | Information management technology will enhance the achievement of strategy | | ✓ |
| | Strategy develop must has an impact on manager decision making on the daily basis. | ✓ | |
| | | | |
| Performance measurement | | | |
| | The achievement of all the above factors (regulation, management, employee, customer, supplier, CSR, SSCM strategy, firm culture, technology). | ✓ | ✓ |
| | Engagement with external and internal stakeholders | ✓ | ✓ |
| | Indicators should be representing the social, economic, and environmental aspects, have future goals, and satisfied the stakeholders. | ✓ | ✓ |
| | The indicator must be implemented as a strategic, tactical and operational plan which include tangible indicator/ quantitative and intangible/qualitative. | ✓ | ✓ |
| | Following non-government associations guidelines. Firms can refer to the Global Reporting Initiative guide to decide which metrics to use. | ✓ | ✓ |
| | Indicators use should be appropriate for each firm goals and objective in the supply chain. | ✓ | ✓ |
| | Firm provides information about the accomplishment of a new sustainable measurement standard in addition to the traditional one | ✓ | ✓ |

| | | | |
|---|--|---|---|
| | Agreement with partners about the indicators. | ✓ | |
| | Indicators have to be replaced over time to be more sophisticated | ✓ | ✓ |
| | Collaborating with government organisations regarding the indicators. | ✓ | ✓ |
| | Sharing the sustainable information regarding the intangible practices with partners. | ✓ | |
| | Sustainability indicators shared with partners for later assessment | | ✓ |
| | Sustainability Reporting practices | ✓ | ✓ |
| | | | |
| Cost of sustainability and return on investment | Identifying the benefit from the adoption of SSCM | | |
| Innovation / technology | | | |
| | Stakeholders have to be collectively leveraging their knowledge in the supply network. | ✓ | ✓ |
| | Strong internal firm sustainable practices | ✓ | ✓ |
| | Sharing sustainable information among supply chain members (Stakeholder engagement) | ✓ | ✓ |
| | Firms having innovation capability | ✓ | ✓ |
| | Informal collaboration with partners | ✓ | |
| | The empowerment of internal and external stakeholders to express their ideas and knowledge | ✓ | |
| | Mechanism in place to ensure firm continues learning and developing innovation | ✓ | |
| | Part of the company strategy | | ✓ |
| | The availability of supply chain partner sustainability technology or the availability of supply chain partners technology and knowledge | | ✓ |
| | Engaging with research centres and Engaging with universities | | ✓ |
| | Senior management support | | ✓ |
| | Having Advance research centres | | ✓ |

Appendix 12: Example of an interview transcript with the manager from CB

Topic 1 General Information

Interviewer: [phonetic][foreign][00:08] BA.

BA: Uh-huh.

Interviewer: Today, we are welcoming , manager of sustainability in B Companies, and we thank him for his nice appreciation for coming with us, to make an interview for one hour, to discuss the enablers and barriers and motives about sustainable supply chains.

We're going to ask to tape it, with your permission, [inaudible][00:39] if I may record this interview?

BA: Sure.

Interviewer: Everything in this interview is going to be confidential. Your name, your company name — any of that information is not going to appear about any client in these studies.

BA: Thank you.

Interviewer: So, feel free to speak whatever you see fit. So, we're going to start with general, personal information. So, we're going to start to indicate your position in these companies.

BA: Sure. My name is [phonetic][01:11]. I work in B, as Manager of Sustainable Programs Development.

Interviewer: Okay. I have our [inaudible][01:27].

BA: Okay. I work in B, in the capacity of manager for sustainable programs development, with a mission to develop the strategy of the company when it comes to sustainability, and to advance the business, generally. When I joined B back in 2012, I had worked with the management to develop the first sustainability strategy for B, and it has been like six years now, implementing and progressing our strategy, generally.

Before that, I worked in BA Systems — the British Aerospace Systems Company — in the area of health, safety and environment. During that period, I worked on my own time on a diploma in international environmental law, from the United Nations.

Before that, I worked in Shell. I was an engineer. I wasn't really a sustainability professional at that time, when I started in Shell, but I was a champion of safety, and with the help of the team and the operation, we got the [inaudible][02:42] facility, the Shell [inaudible][02:44] facility in [inaudible][02:45], from the rank of six, within Shell Middle East and South Asia, to the rank of two. Second rank.

Interviewer: Very nice.

BA: In less than two years. So, this is something I'm very proud of. This got me interested in safety and environment at that time. I was [phonetic][03:11] triple-hatted, actually. Besides doing my other engineering job, I was also handling health, safety and environment at that time.

So, this is basically where I developed an interest in the field. I have a published book about sustainability on Amazon, called "Sustainability Paradox: the Way Out". You don't have to buy it. It's \$9, anyway, but you can get a copy next time, maybe, if you visit me.

That book is just me trying to express and add to the notion of sustainability globally, and express my thoughts about, we don't need more initiatives in the world. What we need is to tap into the best energies that are already there, to get out of the paradox we are in — the tradeoff you have been talking about with sustainability. People think sustainable means keeping things as-is.

Interviewer: Of course.

BA: At the same time. as humans, we are after growth.

Interviewer: Yeah. Absolutely.

BA: So many people, at some point back in years, they have this paradox. Shall we grow, or shall we keep things? So, this book is about how we can get out of this paradox by some of the initiatives that are written there. It's a booklet. A small booklet. Also, I manage and publish my website, called MENASG.org, which is MENA — Middle East and North Africa Sustainable Growth. I express my views there. I publish my papers. I have a published paper with the University of South Africa about the [inaudible][05:00] mining. I publish all my work there. You can find it. It's free online. It's free.

Interviewer: Thank you. So, you said...how long have you been on a sustainability agenda — working with sustainability?

BA: I could say from 2005.

Interviewer: 2005?

BA: Yeah.

Interviewer: Okay. So, let's move on to the general question about sustainable supply chain management. We discussed, earlier, about supply chains — like, about sending your product to the final customers in the right quantity, at the right time, in the right place, and you are required to do some activities in order to achieve this objective.

So, you need to be more efficient and effective, especially now, in the [phonetic][06:03] trade world, you have to combine not one company, but so on can do all these activities. There are many companies. So, it's a chain that's linked together. So, however strong the chain is is how strong your business is. For example, the success of companies depends on how strong the supply chain is.

So, what do you think, in general, about the sustainable supply chain, or integrating sustainability into the supply chain, for society and for businesses? In general, not just about B.

BA: This is absolutely important. The only way to create an ecosystem that respects the planet, people and economy at the same time is by having the big players — like big companies and corporations — enforcing the whole chain to be responsible and sustainable. This is the only way to do it. The challenge is, if the big players are not [phonetic][07:22] radiating — if they are not a good model — then they cannot [inaudible][07:26], as we say in Arabic, [foreign/inaudible][07:28].

Interviewer: Yeah.

BA: So, if you don't have it, you cannot radiate it to the supply chain. You cannot transit it to the supply chain. So, I think it's an obligation on the big corporations, not only to enforce, but to enable the supply chain, and to make sure that the supply chain has the right balance between economy and being sustainable by working with them. So, that is the role companies have to do.

Now, if we step one step back, and talk about the different types of the big players, I think the burden is even heavier when it comes to companies that are owned by the government or the state. That is even more,

because you shouldn't forget that the government or the state, when they establish this company, they are establishing it to generate decent jobs, and to utilize the natural resources in a better way. So, that is going back to the purpose, and that will take us back further, to the purpose of economy.

The purpose of economy is not generating money. The purpose of economy is to make people, if I can say, happy and having a very good standard of life in a very livable ecosystem — an ecological system. So, this is the reason behind the whole economy thing.

So, what usually happens is when people are really immersed in managing companies at a micro-level, they forget the big picture of the macro-level. So, they forget, when they talk about shareholder value, and increasing the shareholder value, they forget the — do you have a meeting here?

Man: No, I just need to —

BA: Because we hijacked this meeting room.

Man: Can I open this?

BA: You can do whatever you want.

Man: Sorry. Sorry for the distraction.

BA: No, that's fine. No problem. So, people, when they are immersed in managing micro-business, the micro part of the economy of managing businesses, they forget that they are part of the bigger picture, which is the economy, and the economy is about people and resources and the planet. It's not about money.

Interviewer: Yeah. I see your point. I see the objective of business is to sustain long-term. Like, we don't say, "Make money now, and in five years you are out of the market because you are just focused on one thing, and ignoring the others that are as important as money."

BA: Absolutely. Absolutely.

Interviewer: So, thank you for your answer. What about B?

BA: Yeah. B is not an exception. B is a company that was established by the government, in order to champion a new sector in Saudi Arabia, and to make sure that decent jobs are provided in this sector, and natural resources are managed in the right way, and in the right market. So, we are not an exception. Actually, we have more of a burden because our sector is one of the...

Interviewer: Important ones, or...?

BA: Well, it's a sector with bad implications.

Interviewer: Again, this is the right word.

BA: And a bad history. It's one of the oldest industries in the world.

Interviewer: Of course.

BA: You know that gold mining is a very ancient [inaudible][11:38] in Saudi Arabia, and all those things, so it's a very ancient industry, which means it's one of the industries that contributed to the wellbeing of humanity for a long, long time, but when the capitalism movement started in the world, this turned into a monster. Countries from the north, working conditions in the south...and doing all the bad things to people,

to work standards and the lifestyles of the miners and all these things, plus all the health issues that came, especially with the coal mining.

So, we are an industry with a bad history. At the same time, we are one of the ancient industries that contributed to humanity. So, working in this industry puts more pressure on us, and more of a burden on our shoulders to prove to everyone that mining can be a contributor to a sustainable economy, not to a bad economy. So, that is even harder.

Interviewer: So, this concept of sustainability, has it been...

BA: Embedded in our strategy.

Interviewer: Embedded in your strategy from the start, or is the strategy shifting from the establishment and division and mission of mining, for example? Is sustainability implemented from the start, or because the dynamics are changing in the mining sector, or with the competitors or something, or a different strategy from top management? Did they decide, "We have to focus, or we have to change our strategy to focus more on sustainability"? Or has it just been established recently?

BA: No. I'll give you a story. B has been established in the...

Interviewer: 1990's?

BA: Sorry?

Interviewer: 1990's?

BA: Yeah. In '97. It has been established with the idea of creating a new sector, creating jobs in the new sector. This is part of the sustainable idea, of a new sector. However, B had some events happen to the operation, where our communities were not happy with our performance, and that put a lot of pressure on us, where there were some allegations about our environmental management.

Some of it has been proved wrong, and some of it, we improved it, and this pressure came from the communities around our mine. It opened the eyes of the top management, and thanks to them, they gave me a job at B.

So, that happened in 2012, because they wanted to formalize a holistic sustainability strategy for the company. That includes the environmental part, the social part, the economic part — all of them together, of course. So, that was good news for me. I was happy for that, but it put, and it's still putting, a lot of pressure on B. So, that was one of the drivers.

The other driver is the board of B. So, the B board, year after year they are getting ever more mature than they were after the latest change. The board is having different capacities and capabilities that really push our agenda. You know, if you interviewed anyone working in sustainability in any company, usually they are frustrated people, because it's very difficult.

Interviewer: Absolutely.

BA: In many cases, they have ambitions without authorities. So, you'll find this if you're in the industry. So, we are used to disappointments, but we are warriors, and that is the — anyone who would work in our area, he has to be a warrior. He has to be persistent. He has to be a long-vision guy. Otherwise, he cannot sustain in this work, in this world.

So, going back to your question, it has been started from the inception of the company, yes, as the intention of the government is to have diversity in the workforce and the job market. However, the pressure from the communities around the mines gives a push to our agenda, and after that we came to the point where we have

a very mature kind of board pushing it even further, for the sustainability. So, I think it's kind of layers. It's kind of [crosstalk][17:16] stages building up.

Interviewer: So...so, let's say...if you could describe it in three points, what are the motives? Let's say government, for example, from the establishment and top management, or because, as you see, the business by itself wished to come with a new strategy and focus on sustainability. The industry, I mean — does it play some roles in changing the top management for focusing on sustainability as a strategy in the company?

BA: To be honest with you, since we started developing the sustainability strategy of B, I was very clear with the management that we need to develop strategy, risk and opportunities. So, it's not about branding. It's not about the reputation in a direct way. It's about risks and opportunities. So, what are the risks that we need to mitigate in the ESG world — economic, social and government? What are the opportunities to tap into?

The strategy...our strategy is around these two. It's risk and opportunity. To get risk and opportunity, you need a third thing, which is a strong engagement with the stakeholders. So, if you're asking me for three bullet points, I put it like this: stakeholder engagement, risk mitigation, opportunity capturing.

I doubt if there's anyone in the sustainability profession who can develop any strategy for any company, regardless of the industry or the country or part of the world — he can't develop an effective strategy if it's not around these three bullets. Stakeholder engagement, risks and opportunities.

Interviewer: So, if we could be more specific about the stakeholders...

BA: Yes?

Interviewer: Do you focus on one or two or three of the stakeholders, or all of the stakeholders? I mean, each company has to...

BA: Prioritize?

Interviewer: To prioritize their stakeholders, of course.

BA: Again, I don't want to claim that we've done it right the first time, but we've come a long way. Today, we have a department for stakeholder management. We call them Corporate Affairs, and as in sustainability, we are always managing the [phonetic][20:12] ESG stakeholders — the stakeholders involved in the environment, the stakeholders involved in social, and the stakeholders involved in governments. So, that has been developed over years.

We adopted a standard called [phonetic][20:31] AA1000SE. It's worth looking at it. It's accountability...you can look it up, but it's AA1000SE.

Interviewer: Yeah. This is for social responsibility?

BA: Well, no. Actually, it's...

Interviewer: Is it the [phonetic][20:52] ISO one, or...?

BA: No, it's not the same as the ISO one. It's a standard. Actually, this organization, the accountability organization, is a non-profit organization. They developed five standards for sustainability. They developed the first one, called the Principles, which is general principles about sustainability, generally.

The second one is Stakeholder Engagement, which is AA1000SE. The third one is — sorry. Four, not five. The third one is Audit and Reporting. The fourth one, which they introduced last year, is Impact Assessment.

Accountability is one of the [phonetic][21:34] reportable organizations, non-profit organizations, in the world, dedicating their life and their work to advancing sustainability in business. So, we adopted AA1000SE, the stakeholder engagement standard. It's how you identify stakeholders, and how you engage with them, and how you identify the material issues and all of these things.

So, this is for the stakeholders. However, your consistent [inaudible][22:06] that we cannot...as a company, we need to prioritize always, and sometimes we do not give them all the same weight. I think the weight itself, it's changing from time to time, and from situation to situation. So, I want engagement with the stakeholders, with the government and stakeholders. It varies from neutral to high; it depends on...sometimes, it makes that change.

Sometimes we focus more on other stakeholders. So, it varies, but it's based on our stakeholder engagement plan. Every mine has a stakeholder engagement plan, especially with the community, and in the community, we divide the community, really, into two types of stakeholders: official stakeholders and unofficial stakeholders.

What we've learned from our history, and from other people internationally, is when you deal with the community, especially in mining, because mines are not like [phonetic][23:19] — it's not within a fence, you know, like industry in cities.

Interviewer: Yeah. I see your point.

BA: We are near to people's houses. We are in the middle of villages, okay? So, when we manage the community stakeholders, we need to keep in mind that the official stakeholders are not necessarily reflecting what the unofficial — well, we call them “unofficial”, but the average community in that area. So, we've learned this lesson the hard way.

Now, we have specific engagement for the officials, specific engagement for non-officials, and there's a technique I use. We have a full management system called the Community Management System: how we identify the stakeholders and community, how we develop the plans, how we manage the grievances and complaints from the community, and how we invest socially. All these things.

We have a full management system, as we have a management system for safety, a management system for [muffled/inaudible][24:28], we have also a system for the community.

Interviewer: Yeah. What we are talking about, the three aspects of sustainability, do you think your employees...how can you spread this concept to your employees, especially the employees in the supply chain, because they are dealing with [phonetic][24:51] preserving supplies, and dealing with it? Do you have some training, or do you have...do they understand sustainability is...

BA: Is everyone...

Interviewer: Yeah.

BA: Yeah. If you asked me in 2012, out of 10, it was like 0 to 1 out of 10. If you ask me today, in 2018, I can say we are almost to 5. So, we're not there yet.

Interviewer: That's good progress.

BA: Yeah. Yeah. We're not there yet. We have invested heavily in developing the buy-in from the top management. Now I'm at the stage where the top management actually take this very seriously, and we are going down and down, and so we would go to the [inaudible crosstalk][25:56] — to job grades, to actually everybody understanding.

Well, generally in sustainability issues, it varies, again. For safety, it's different. Safety, it has to go down consistently, for a long time. Safety is a lot more practice. You've got to practice.

Interviewer: Safety, health, or...?

BA: Safety and health. Environment, we could do more. Social, we need to do more for our employees. We need to do — still, as I said, we're at five out of 10. I'm not happy about this. It's not something we can brag about. We need to be at least, now, at least between eight and nine out of 10. So, we are not there yet.

Interviewer: We talked about the internals. Now, what about the external ones, like your partners? Let's speak about them. Do you have some strategy — like, your partners, for example, they don't care about sustainability. They are a small-to-medium enterprise, and they don't actually have the capability to do it. So, what's your role as a big company, as B, to influence the supplier to expand this concept to your partners? I'm mean, the external ones, or do you focus now on the internal ones, with your workers? The internal ones first, and then when you are strong internally you can expand it externally? Or is there a balance?

BA: No, there is no balance, actually. We need to do more. When it comes to the procurement and contracts, with contracts, we introduced specific annexes in the contract, and integrated them. What about health and safety? What about the environment? What about social, and what about local content development, like offering jobs and offering business to the smaller enterprises? We put this as a contractual annex. It's by contract.

That pushed the discussion further. However, it's not done yet. Yeah. So, we can do this with the big partners, like big [phonetic][28:19] EBCs, when they come to build, and that is fine. Now, we don't work much with the small and medium [phonetic][28:27] variety. Usually, they work with our contractors — major contractors.

Now what we are doing, working on an initiative — I'm not sure if we can disclose it right now, but I'm sharing it with you — with the [inaudible][28:43] Development Bank, to create a fund shared between B and this [inaudible][28:48] Development Bank. This fund will be — it's an investment. It's not a guarantee. It will be an investment, to invest in small and medium enterprises in the mining sector, around the mines, in the villages.

Part of the initiative and the mandate of this investment vision is to advance SME the cities in social, environmental and governments, which is stability of aspects. So, part of that is to advance them, but you cannot really advance this with the SMEs without being on the board of an SME, to be honest with you. We tried that before, and always they continue, "Give me a big contract, and I'll see what I can do." That is not enough. That is an excuse, and this train of, "Give me something; I'll give you something" is not a good basis for negotiation, especially when it comes to advancing sustainability.

So, what we are trying to do is to give them something, but to be very effective in doing that, and doing it by a third party, because they want to be an independent vessel. So, the vendor investment company, and part of their investment is to develop. So, they will sit on the boards of these SMEs, so anyone who they invest in, they will sit in them, and push the agenda from the investment — from the board.

This is what we're trying to do. We've been working with the bank for a year, maybe. In the news, you'll find that we signed an [phonetic][30:45] MOU earlier this year with the bank. We met last year, I think. Hopefully, next year...hopefully things will go the right way, and sometime in the second half of next year we'll establish this.

Interviewer: So, to clarify what you are saying, Mr. BA, it's like you don't have direct involvement with your partners, and implementing sustainability in their activities, or can you explain...?

BA: No. What I'm trying to say is, for big ones, yes. Big ones, yes. Are you asking me about the SMEs?

Interviewer: Yeah.

BA: No. For the big ones, not SMEs. They are giants. Again, they're big. For major contractors, yes. We contractually force them, and there is a monthly report, a quarterly report, and they have to tell us exactly what they are doing, and they have to have the proper environmental license, and good health and safety records and all these things. We gather it, and we discuss it with them.

Now, if you want to take it further, like for example, B, we are working on the ecological footprint. Like, the carbon footprint, the water footprint, for us, as B. Now, when we disclose our numbers for this year, by October, we have a small event when we disclose, to the world, our numbers — carbon emissions, energy efficiency, water efficiency. It will be publicly available to everyone.

After that, I can go to the big partners and ask them to join forces. It's very difficult to go to them if I didn't do my homework. We've been elected. We do have all the numbers. We have them since 2013. We did a baseline study in 2013, and internally there is reporting, and there are things happening, but there was a reluctance from the management to disclose the numbers, which I'm against, but they have their own views about it.

Now, it is to the point where we're brave enough to...we already shared it with the shareholders, one by one. We went to a stakeholder engagement with the different entities in the government, with the regulators, and we shared numbers in an informal way. We told them about our plans, and how we are going to...so, now we are more relaxed. The company is more relaxed to disclose all the numbers. That will be an annual practice, so every year you should see all the numbers published in an annual report — a sustainability report.

Interviewer: Yeah. My next question for you is, the numbers...for the product lifecycle, I mean, is it internally? Like, your operation? When you, for example, for the footprint, there are many studies that focus on the whole supply chain. They want to see the footprint for the product from the suppliers to the customers. What the footprint...

BA: I agree with you. We should have the full value chain.

Interviewer: Yeah. For the value chain. Yeah.

BA: But what we are doing now is, first we will get the standard practice by the industry — ruled by the industry industry — which is publishing more numbers, and as I said, we will have more courage and the case to go to our inbound suppliers and outbound suppliers, okay? Our outbound providers.

So, both — either inbound [muffled/inaudible][inaudible crosstalk][34:55] and outbound, like our logistics numbers — to go and make sure that they also report on their numbers, and they disclose them. By that, then, we will have like a full chain of the published...so, that is something we will aim for, but I need to get through the October target of disclosing, and then after that I will [crosstalk][muffled/inaudible][35:21].

Interviewer: Yeah.

BA: If everybody is disclosing the number, and this is something that in Saudi Arabia we really need to look at — if everybody is Saudi Arabia is disclosing their numbers, the economists, the government, everybody can look at — we will have different insights, and we can solve the issues.

Interviewer: The improvement — I mean, if you have numbers, you can make an improvement.

BA: Exactly.

Interviewer: You cannot measure — what you cannot control, you cannot measure it.

BA: The clean development mechanism is a significant national authority here. It's an authority in Saudi Arabia, like in other countries. Every country has — it's part of the Kyoto Protocol. Every country has to have a DNA — a Designated National Authority. Those would be the people who are responsible for disclosing the country's numbers. So, those are the reliable sources of the information about any country when it comes to the clean development mechanism, which is basically the carbon as the measure of things.

So, we are working very closely with that. Their reports are very transparent. Very. Really impressive. Really good.

Interviewer: I'm looking forward to reading them in October, and seeing them.

BA: Yeah. You can. You get the reports?

Interviewer: No, I'm looking forward. I mean...

BA: Yeah. You want to read the reports. Yes. They publish it internationally, through the United Nations. Before doing this, we thought we were worse than [crosstalk][muffled/inaudible][37:01].

Interviewer: Than anything?

BA: Okay?

Interviewer: But you are doing...

BA: No. I'm not saying we are doing fine. What I'm saying is, we sit where we sit, and improvements are possible. Now, based on these reports, now Saudi Arabia is investing in 200-gigawatt renewables. That would put us in the top of clean nations. We'd be in the top, if not the top clean nation in the world. Just imagine — 200 gigawatts renewable energy. That is huge. The consumption of Saudi Arabia is 50 to 60, so that is four times our consumption.

Interviewer: Yeah. The opportunity to export...

BA: Of course. Not only to export, but we will have a better mix in energy. We can sustain the lifetime of the oil longer, because we can use it in part of the mix, not the primary part of the mix. So, we have a little mix to provide the whole world with energy. So, I think Saudi Arabia, we will have an even better place in the world, and it will contribute to humanity even more.

We will contribute to the whole world with this clean energy mix. We will contribute. We will be part of the beautiful story for...as I said, as you get more transparent about your numbers, opportunities will come to you from everywhere. It's not the way we thought before, that when you disclose your numbers it means that you are putting yourself in hot water. That's not true. That's not true.

Interviewer: So, let's move to the barriers. As in B, what do you think about integrating sustainability in the supply chain? What do you see as the most important barriers that inhibit you from successful implementation of sustainability in the supply chain?

BA: I would say education is key. The more you have educated people about sustainability, especially people at the top, the more your life will become easier, and to be honest with you, sustainability is a macro-concept. It's not a micro-concept. It's a macro-concept. All the — personally, at least. This is my view. I hope I'm wrong. All the attempts to do it bottom-up are not successful. It's a macro. You do it top-bottom. You don't do it bottom-up.

Interviewer: Yeah. I see your point.

BA: Just an example. See the world. What's really moving the carbon dialogue is the Paris Agreement. The top things happening. The overall economy in the world. The crisis in access to materials in the world. The global warming and all these things.

So, this is basically the sense of what sustainability is. It's a macro thing; it's not a micro thing, because in a micro thing, people are concerned about the immediate benefits. There's a good saying that says, "Money is yours. Resources are shared."

So, yes. If someone will buy this, and then they recycle it, or instead of using one liter of water, he's using two liters of water that he doesn't need, and when you talk to him he says, "This is my money; I do whatever I want," we say, "Money is yours; resources are shared." So, in the micro-level, that guy who is saying, "This is my money," he's the micro guy. The other guy who is saying, "The resources are shared," he's the macro guy.

So, sustainability is macro. I would be very interested to see any case study that sustainability could happen bottom-up. I would challenge that. It should be top-down. Now, going back to the barriers. People are the barriers; especially the top people. So, the top management, the board, and now in the sustainability trends, there is something called responsible investment. They want to report sustainability from an investment agenda, and that is very important.

I'll give you an example of IFC — the international finance operation, the world bank subsidy. If you are going to invest anywhere in the world, and you want IFC to be your guarantee, then IFC will...they have their code of principles, right? There is something called the code of principles, and they will impose their performance indicators — the eight performance indicators of IFC. Why? Because they want to enforce the investment people to only invest in sustainable, because sustainable is the only guarantee.

They are saying to them, "We are World Bank. Yes, we guarantee it only if that is sustainable, because we always think 10 or 20 years ahead, and the only thing that will serve us, and will get our money back, is when we think 10 to 20 years ahead, not to this investment right now."

So, going back to education, too, people are the barrier and the [phonetic][43:19] enabler at the same time. If they are not educated, if they are used to the lip service about sustainability, they just give you the talk, but they are not walking the walk. You know, they just talk the talk, and this the limit that our businesses in Saudi Arabia, and in the Middle East, is all about. People are talking the talk. Nobody is walking the walk.

Interviewer: Taking the action.

BA: They give you lip service. When you say to anyone in the top management at any company, "Oh, the environment is very important. The world is very important. What are you doing about disclosing your numbers?" Nothing. So, only this.

Some of the executives will say, "You know, it's good to manage our environmental numbers and monitor our performance, but we don't need to expose ourselves to the world." Why? Because he is afraid of committing himself, because he doesn't know exactly why it's important to disclose numbers, and how this will impact. It's only — this will guarantee, even if you are not here, and somebody else will come, he has to continue in the same role because it's already published.

There's a peer pressure. A world pressure. You are creating pressure on yourself to excel, and to advance your career and business. It's very important to get people, and to be honest with you, sometimes it's very hard to educate someone who is used to business as usual.

I was at one of the conferences, and one of the audiences asked me the question, "What is the best way to change the mentality of people, or the top management, about sustainability?" I was laughing with them, and I said, "The best thing is actually to fire them, and then bring them back in," because I believe it's very hard

to change someone who is used to business as usual for 40 or 50 years, to somebody who believes in business as unusual, which is the sustainability way, just like that.

It's not easy. It's very difficult. If he doesn't have this passion, if he is not globally educated, if he is not an economist by himself — and we will talk about economists. Again, the microeconomists? Very bad people.

Interviewer: They are focused on the short-term.

BA: Yeah. Short-term isn't, like, killing them. You need a macroeconomist, and that is very important. So, people are both barriers and enablers. If you get around the right people who really believe in you...I'll tell you why. This would be one of the barriers.

There is a book — a very interesting book, if you want to read it. Very, very beautiful — called “The Art of Thinking Clearly”. It's not about sustainability. It's philosophy, or whatever you call it. It's a book written by a Swiss writer. I cannot remember his name. The book is translated into English.

One of the, I think, 36 different ideas in that book — one of the ideas is, he said, “It's very easy to justify presence. It's very hard to justify absence.” You understand me? In the sustainability world.

It's very easy to present to the management a presentation that if we do one, two, three, four, we will generate more revenue, because there is a presence of revenue. It's very hard to convince the management that if we do one, two, three, four, we will mitigate risk, which is creating absence of risk. It's very hard.

So, you are telling the management, “I'm going to spend \$50 million on various initiatives that will mitigate those risks that might happen, or might not happen.” You got it?

Interviewer: Yeah. I got it.

BA: Unless you have a very educated, long-term visionary people...globally open-minded people who see the value of sustainability, this kind of discussion goes nowhere. I've been in this before B. I've been in this environment, and I've also been in very good conversations right now, going back to before.

So, creating — and I even challenge consultants about this. Convincing people about creating absence is much more difficult than creating presence.

Interviewer: Do you see the market itself, how it operates...effective decisions, like, as investors, for example, in the stock market — B is in the stock market, and as you said, sustainability is even an investment, and if you invest now, you are not going to see the results after three or four years. This is the problem. You're going to see it in the future, like six, seven, eight years.

Do you think the stockholders can wait? And the top management — everyone wants to make this short-term profit to convince the stockholders that the company is a good opportunity for them to invest in. Do you look at this as a barrier for sustainability? It's like need, cost, and the return is not guaranteed.

BA: I agree with you. There is an increasing trend of responsible investment. So, the funds that they are assigned to by a rating initiative called the principle of responsible investment initiative. It's one of the United Nations initiatives in our organization. They need the investment companies and funds to assign to these principles, that they only invest in responsible and sustainable businesses.

So, they are creating momentum right now. This is very good if it happens, but the case in Saudi Arabia is different. Part of the materiality assessment — we do something called a materiality assessment of sustainability, which is basically, what are the most material issues to our business? We examine it internally, and then we go externally.

One of the tests is, we sit with the investors. So, we sit with all of the big investment institutions in Saudi Arabia, and we discuss with them, “What are your concerns?” It’s ESG we’re talking about: environmental, social, and government.

“What are your concerns? How do you see this? Does that affect your investment decisions?” and all these things, and unfortunately they are not concerned about the environment, they are not concerned about social, including health and safety. They are only concerned about government, and even in government, it’s not...it’s the board structure. The board independency. The things that are related to the board. That is a very sad story for me in Saudi Arabia; a very, very sad story.

We need to force all the financial sector to sign to the PRI, and to educate the sector about the importance of imposing sustainability of investment. Otherwise, there will not...the only investor that might have a little concern about it, other than governments, is the PIF — the public investment fund — when it comes to other institutions.

Interviewer: So, you cannot say that the government is a [phonetic][51:44] parent, or does the public investment...it’s a government institution. Can you say that the government is —

BA: [muffled/inaudible][51:55] The government, for us...in our case at B, and even in other cases, by the way, the government has played a beautiful role to push these companies beyond their limits when it comes to hiring locals; developing the skill markets, generally; environmental compliance...

Interviewer: Is it clear?

BA: It is. It is. No, they...just imagine that...the amount of what it...the state-owned companies, like us and [phonetic][52:46] Savik and others, it’s much more than any other audit, and the ethics, like the corruption and all these things, the general audit — the rule, it’s very strict on us, on the companies owned by the government.

So, I see them...strangely enough, I see that our government is an enabler pushing us to be better companies, especially now with 2030. I think 2030 is the best thing to happen to us after oil — the discovery of oil — absolutely, because that unified the discussion among all of us, and nobody can argue with you about the importance of local content development, for example.

When we put it the first time — our strategy — in 2012, it was a big argument. “Why do you need us to go this far?” But today, in 2018, we have a director — director level — looking at local content development.

We have a department looking after local content, and it’s not under sustainability. It’s the beauty of it. It used to be the procurement — that guy, he’s handling now the local content development, and he’s a director-level. He’s not management. He’s a director-level.

So, comparing the discussion, the language, the dialogue of 2012 when we started until now, this only happened, to be honest with you, because of 2030. In these 20 years...God, things changed for us in sustainability. This is why I say it’s a macro thing. Sustainability is a macro thing.

Anyone who wants to...anyone who wants to...I’m not a fan of these initiatives to change the consumer behavior.

Interviewer: To be more responsible, and...?

BA: I understand it’s good. It’s nice. I understand. I understand that the consumer can be a pressure. I understand that, but I still feel like this is the 80 that will give you 20. Sustainability is a macro. I’m ready to change my perception, if someone shows me a real story, but sustainability is a macro concept. It has to come from top to bottom. So, any company — for example, in B, if we have someone on the board who is a

sustainability champion — we don't have one right now — who is really a sustainability guy, or even an advisor on sustainability for the board, I think we would be in a much better position than now.

Interviewer: Yeah. So, let's go back. When I asked about the barriers, you said "people".

BA: Yes.

Interviewer: So, "people" includes management, employees, as a community outside?

BA: Yes.

Interviewer: This is what you mean by "people"?

BA: I focus more on the top management and the board, because those can make it or break it.

Interviewer: So, why are the top management people important? If they believe in something, they can implement it — do you think so, or...?

BA: As I said to you, this is a macro concept. It has to come top-down. If there is a responsible employee at one of our mines, he's worried about water, and he keeps nagging about water, nobody will listen to him, but if someone on the board said, "Show us your water intensity, and why you are not...and where you stand among all the other companies, and where is the benchmark? I want to see," this guy would change the water intensity in less than one year.

Interviewer: I see your point.

BA: That is the kind of dialogue I need to create at B on the board level. Unfortunately, I am not involved in the board, but in the management committee, we do have a VP. We are always invited to the management committee meetings, and we keep injecting this all the time. I can tell you how the dialogue is changing from 2012, when we started, until now.

Things are happening, you know, at a faster pace after the 2030, just because it came from the top. So, people — when I say "people", I mean those people in the key positions, if you educate them. If you get their hearts and minds, if you get them hooked to the idea. If they saw the risk and opportunity of sustainability, and how that will make their job better, and even advance them, and make it more efficient. Those can make it or break it.

Interviewer: Okay. Thank you. So, how do you think you can mitigate...you were asked this question in the conference and you said, "You have to replace them," but really, how can you realistically mitigate this issue? Like, you have top management that do not support sustainability as a strategy.

How can you mitigate this issue? Does the government have to play some role, to pressure? Do stakeholders have to pressure those top management, or...the reason why top management do not want to pursue sustainability — because of its cost, and there is no need — as you said before, why you need to go this far, and why you need to ask us to do it, you know? Do you think this is the reason that top management do not consider sustainability seriously, or just staying on...?

BA: Okay. I'll be very...I'm trying to say that in a polite way. It's very difficult to say it in a polite way, to be honest with you. They're ignorant. For me, that is ignorance.

People who are really educated and open-minded, and they know what's really happening in the world, and people who are really connected to the world day after day — you don't need to spend time to convince them how water is important to your operation, or how emissions are important to your operation, and how people's safety is important to your operation, and how creative jobs for locals is going to improve your maturation in human resources because those people are locals.

They won't go anywhere if you train them and get them in the mine. You will create work for that man. A [phonetic][60:08] sticky workforce — they were not designed to go...where? You are the only source of the...so, if you get the best of them, you train them and you keep them there, it's a benefit for you. So, the benefit of sustainability is very clear.

The problem is, when someone has a doubt, you can convince him, but when someone is ignorant, you cannot. So, don't waste your time — this is my experience with the top management. Find champions.

Every time someone comes to me from — starting his career from other companies, and he asks me what to do I say, "Find champions. Work with them. Make them sustainability champions, regardless of what their position is. Take them to courses. Take them to conferences that are committed to people like them, and tell them. Make him...entrap him. Put him in a situation where he sees his peers talking about sustainability in that way. Create champions."

You don't need that many. You need three good people. Three good champions of management will make it for you.

Interviewer: Do you think the economics plays a role? As we know, top management would like...they link their reward in the end of the year with the company performance. So, do you think if we can link sustainability with — one aspect is how sustainable your company is...

[inaudible crosstalk][61:50]

BA: Well, I don't want to take you in a more philosophical discussion about the idea of linking [phonetic][62:01] KBIs with benefits. This is also a debate in a jar right now. We already have this. It's part of our KBIs.

All the top managers have them. Even the CEO has environmental KBIs, safety KBIs, community KBIs. It's there, and it's part of his dashboard, but to be honest with you — and you can ask about the champions — when you put KBIs, people manage to go around it, okay? Getting KBIs, like getting numbers, is something industrial people are very smart about giving it, but doing it by heart, that is the most difficult thing.

You are a sustainability practitioner and sustainability professional in your company. You cannot wait until something happens in the macro. Like, I wasn't dreaming of 2030, to be honest with you, okay? But it's the best thing that's happened to me, professionally and personally, but I wasn't, at that time in 2012, dreaming that it would happen one day. You shouldn't wait for that to happen. What I should do is, I have to find champions, and I have to convert them to champions.

Interviewer: Do you think the only way to come from inside, the personality of this person as a top management tool, to see the world — it's not the company's. The world depends on your company's activities. You are sustainable, and the world is just...like as you said, money is yours, and the resources are shared.

BA: Yeah. Exactly. You still have to do, also, the standard things that businesses do, like businesses cases, to try to show the management the benefit of doing what we're doing.

We still have to do that. Nothing will change, but as I said, as the guy in the book — "Thinking Clearly" — said, in our area, the majority of it is creating absence of risks, than to be honest with you, creating the presence of opportunities, but now there are also opportunities in sustainability: things like going renewable, which will decrease your reliance on energy, and that will decrease your bill. So, that is a benefit. Yeah.

Interviewer: Or claims like..."reduce this" claims, like if it will be more environmental, especially...I don't know here in Saudi Arabia, compared with more developed nations, about...

BA: Taxation.

Interviewer: Yeah. Taxation...about environmental things, or the claims that you received from outsiders, from a non-government organization, that may be suitable for your operation.

BA: I don't know about this here, but as I said, nowadays there are more opportunities happening, and going forward, but still in Saudi Arabia I can say that 60 percent, if not more, it would be about creating the absence of risks. That is the core of what we are doing. We are trying to create absence of climate change. We're still...all the scientists are still arguing about it.

Interviewer: Yeah. We are not doing enough, or not doing...

BA: The scientists are even arguing if it's human-made, still at this moment. I'm not sure if they're right or wrong. I'm with a team that's saying, and with the scientists that are saying that it's human-made, but maybe I'm wrong. Who knows.

So, it's about creating absence. Now, convincing any person who is not open-minded, and is an ignorant guy, of sustainability, and that it will create absence of risks and unfortunate events that could happen in the future — it's a very difficult ask. I've been in this discussion with the top management, with the board members, with the presidents.

It varies from someone to someone. It's a personal thing. It's the same presentation, it's the same information, it's the same numbers, it's the same [inaudible crosstalk][66:37] analogies, but you face five people and you get different reactions, only because how much this guy is really connected to the world.

That's very...again, it's a macro thing. So, if you are talking to a guy who is not connected to the world, who doesn't know what's happening globally, who doesn't know what's, you know...

Interviewer: That's like the factor, the opportunity...there is an opportunity, as well...

BA: But he doesn't care. He cares only about the share value, by [inaudible][67:09] the quarter, so again, we are sustainability professionals. We should do our homework, whether it's cases, justifications, case studies, some small experiments here, more pilots here and so on. We should keep doing this.

However, this is the 80 that will give you 20. The 20 that will get you to the 80 is, pick three in the top management, turn them into champions — real champions. Those three people will do the work for you. Now, if you can do that with the board — if you can create two or three at the board level — then that is even better.

Interviewer: In reality, is there a company around the world, not in Saudi Arabia...do they have, as you said, the three champions that can lead?

BA: Yes. Yeah. They have. At the management committee, at the management level, and also at the board level. There are companies. If you're doing about Unilever, for example...the CEO of Unilever...I cannot remember his name. He's a very famous guy. He's a global advocate for sustainability, and he's one of the most important CEOs that taught the management of Unilever.

Unilever is one of the good examples. Shell — I worked with Shell; I'm biased. I like it. It's one of my best work experiences, when I worked with Shell, only because of the commitment I found from middle management in Saudi, in the Middle East, and in the world, really — I used to be in contact with people in London and people in [muffled/inaudible][69:24], and they are very competent, especially when it comes to safety. Very, very competent people.

So yes, there are champions in different companies, and I would love to see champions in Saudi Arabia. I'm not sure about [phonetic][69:42] Savik. I'm not with Savik, so I don't know exactly how Savik is. I would have doubts about Savik, but yeah, in the world, there are so many.

Interviewer: Thank you for your answers. Let's move through —

BA: Just to give you an example of how top management can change things, since you are not going to mention the company, I'll give you a story. It's not very interesting; it's very sad to me.

In 2013, I had introduced to HR a policy for workforce inclusion, which means the company will do its best to seek hiring females, and hiring people with disabilities and so on. It had been rejected by that time, in 2013. Things changed. Under 2030, things changed. It's the same CEO. The same management. They are the same people that rejected that.

One time, the HR executive, the HR VP, said, "BA, read back that policy that you introduced back in 2013. It has been [phonetic][71:11] signed, and not only signed. Now we have around five or six ladies working with us in mining."

Interviewer: In mining?

BA: I mean here, but we are a mining company. "We have six ladies." I'm not sure how many — five or six ladies. "Of them, [inaudible][71:31] of them are at the director level." We didn't start with the low-grade jobs for females. If you want to empower them, don't hire them at the low grade. Start hiring them at the...

Interviewer: Director level...

BA: So, we started, and this is — compared to other mining companies in the world, that is not a small achievement. That is very good, because in the mining sector, usually the bar when it comes to integrating females is very low. So, B is doing a beautiful job now, but the irony is, back in 2013, no. We already have five.

Interviewer: So, my question is why? Same people, same management. Why?

BA: The macro changed. The macro changed. There is a power of reform.

Interviewer: [inaudible crosstalk][72:30] Because it's come from the government?

BA: Absolutely. 2030 changed the world for us. It's a haven for us. The 2030 saved integration of females in the workforce, and it happened like that.

Interviewer: Of course. Opportunity.

BA: We have a lady on our board. Did you know that? [inaudible][72:49] is a board member in B. [inaudible][72:57] even pushed for her. So, it's a macro thing that pushed for a lady.

Interviewer: So, let's say, if you've concluded, I'll move to the en. So, the government is not a barrier, and correct me if I'm wrong, but it's an enabler. It's more than —

Topic Enabler

BA: An enabler.

Interviewer: In the case of B, do you see...do you have the support of the government to...or your top management is empowered to do sustainability because there's some government pressure or government motive, or government support?

BA: Saudi Arabia before 2030 is different than Saudi Arabia after 2030. Before 2030, the governmental agencies were barriers. 2030, after 2030...governmental agencies are enablers. So, they are enabling the sustainability agenda. Huge difference. It's huge.

Interviewer: So, can you say that the government is playing a critical role in [inaudible][74:11]? Why do you think so? Is it because they can visit you, because they can give money to do something — some initiative — or through policy or pressure, or taxation, or...or, “If you do that, we’re going to give you some benefit if you do these — one, two, three, four, five”?

BA: Absolutely. The government is the biggest investor in B. They are the main stakeholders. The major stakeholders to us. So, B will do whatever the major stakeholder asks for, or even wishes for. So, the government is wishing for more females, and it happened.

The government wished for hiring locals, and it happened. By the way, I’m very proud of B today — the [phonetic][75:10] standardization is very high. We’re talking about 60-70 percent. You can find it in the annual report.

So, 60-70 percent, and we are a young company compared to other companies, in a new industry. So, 60-something Saudis...in the mines, 70 percent of the Saudis are local Saudis, and when you say local Saudis — you need to travel in Saudi Arabia to see these small villages around the mines. We’re talking about villages at the riverhead, about. [inaudible][75:50] Those are even hard to find on the map, and we told the high schools from those villages, and we put them in a Saudi mining polytechnic school that we’ve built in [inaudible][76:21] University — a mining university.

We put them in this...in these institutions for two years, and it’s a full scholarship. Full scholarship. It’s not only for scholarship. It starts with employment, under one condition: that he pass. So, he signs his employment before he goes there, with the condition that he pass the two years, and we take them back toward — beside their families in the mine. And not security jobs, or security kinds of jobs. No. In the core business.

We are building the profession, so tomorrow if the mining sector opens up, they can find other opportunities. So, this is the best story B has, and today 70 percent of Saudis at the mines are local. It’s very, very hard to hire locals. The education at those villages is very low. The dreams are very low.

Interviewer: They don’t have ambition.

BA: They don’t have ambitions. They don’t have dreams. You know, their dreams are just to be a soldier. The distinguished one could dream of being a teacher, and we are taking them to be mining engineers and mining...diploma engineering. Those are different kinds of dreams.

So, that is the best thing, I think, we’ve done to have an inclusive workforce for the locals. Now, if someday we could introduce females in the mines, that would be even better. Now, the plan is only to include females at the administrative works.

Interviewer: So, what enabled you to do this is the government?

BA: It’s 2030. It’s 2030.

Interviewer: So, do you think...how does the government policy influence other players or actors to do their role?

BA: This is Saudi Arabia, and pretty much would be [phonetic][79:01] Nina’s story, but when you go to different parts of the world, where critical parties, critical pressure and public pressure is there, this is a different ball game.

We are talking about countries that are usually [phonetic][79:20] top-down countries like Saudi Arabia. So, the political regime here is a top-down regime, and in this case, it's a different thing, but when it comes to Europe and things, we could go for campaigns and...

Interviewer: Yeah. [inaudible][70:38] democratization there.

BA: Yes. There is public pressure on the parties, and parties will design their plans according to the public pressure, but again, we are taking it from the top down. This is why I said all these campaigns for consumers, to change their behavior — “Take a shower in only four minutes.” God! Why are you putting pressure on this poor guy to take a shower in four minutes, and you are not putting pressure on the water management companies to do something with the network that's leaking everywhere? You get my point?

Interviewer: Exactly. Yeah. Yeah.

BA: So, I'm not a fan of this kind of — I'm not saying it's not important. I'm not saying it's not beautiful, but if I had a choice, I would never join this kind of campaign. I would join the other campaign, like raising the public awareness to put pressure on the parties, the political parties, to change the policies. So, this is something I would love to be a part of. This is something that definitely I want to be a part of.

Now, in countries like Saudi Arabia, where it's a top-down kind of political regime, top-down changes everything.

Interviewer: How? Is it more by policy, or by collaboration with B more, or by enforcement?

BA: It's by policy. For example, as I said, through local content development, it was a question of “why”, and since 2030 has been introduced, a big part of it is local content, and there is a national committee on local content. They really enforce targets with companies.

It changes from the question of “why” to the question of “how”, and now, we've already found out what “how” looks like — we have a department to do that. The question turned from “why” to “how” to “what”. Now, what exactly can we gain from this? What exactly should we do for that? And so on. It's even changing the dialogue.

Interviewer: Yeah, because of the government.

BA: The policies.

Interviewer: Okay. How can we sustain this government support for sustainability? We have government support. How can we make it more? How do you think the government can play more of a role to enforce or encourage or motivate the companies — B, or other big companies in Saudi Arabia — to do more in sustainability?

BA: If you're talking about Saudi Arabia, then —

Interviewer: Of course. And the big companies. The larger.

BA: I would love to work with PIF — the Public Investment Fund — if they want to hire me. I want to work with them —

Interviewer: You deserve it.

BA: [inaudible][inaudible crosstalk][82:43] but they don't know about me, so I would love to work with them on responsible investment. So, if they are a signatory to PRI, the United Nations Principles of Responsible Investment, then I guarantee 80 percent of Saudi Arabian businesses would be responsible and sustainable.

So, that is the first move. We need the Public Investment Fund to be part of it. They are not the only one, by the way. I know the first signatory to the PRI are the [phonetic][83:28] African Investment Fund.

Interviewer: Yeah. In the news, I think two years ago or one year ago, they decided to not invest in —

BA: Anything that wasn't...

Interviewer: Anything not sustainable.

BA: Exactly. Those are very ahead when it comes to sustainability. Talk about the investment — the Sovereign Investment Fund of [muffled/inaudible][83:50].

If I, or anyone else in sustainability, got lucky enough to work with PIF, to be like the [inaudible][84:03] Fund, I think that would guarantee...this is the product that would give you 80. [foreign/inaudible][84:12] We don't need to go through all the discussions. They own 70 percent of B. They own 70 percent of [phonetic][84:19] Savik. They own [phonetic][84:20] Aranco. They own every single major [phonetic][84:26] banker. Just imagine if they are responsible, and they have responsible policies on investment. Everyone would change, and everyone in the industry would change, and everyone in the public would change.

Interviewer: Yeah. Because...

BA: So, the industrial people would be more vibrant in the community. People would look after them, because they are, you know...if you are in any gathering, and you're an industrial guy beside an education guy, you will see that the people looking up to you. This is in Saudi Arabia. I'm not sure about other side.

Interviewer: Yeah.

BA: Now, just imagine if those industrial people are more conscious about it — about the environment, and about social, and about governments, and about ethics in business. This would change the...this is the 20 that will give you the 80. Don't go heedlessly everywhere. Just focus on PIF.

Interviewer: So, we can conclude that the context — like, in more developed countries, this is not the case...

BA: Absolutely. Yes.

Interviewer: So, can we say that sustainability is influenced by its context by itself, like —

BA: It's a macro. I go back to this point. Sustainability is a macro concept, and it dances with the context, as you say it. It doesn't matter if you are a top-down kind of political regime, or a democratic political regime, or whatever kind of political regime. The sustainability concept can dance with that regime, as long as there's a willingness there — a will to be responsible and sustainable.

It doesn't mean that you need to change the regime to be sustainable. You don't have to. Sustainable can dance with any type of regime. It's a macro thing that goes with the context. As you said, if you are in the UK, go on public campaigns. You know, like Brexit and [crosstalk][inaudible][86:52].

Interviewer: Yeah. Whatever is, like...

BA: Yeah. Go for these kinds of campaigns to advocate and put pressure on parties and policymakers. Again, I would not go to the consumers with the four-minute shower challenge.

Interviewer: [laughing] You hate this.

BA: [laughing] It's not that I hate it. It's irony, especially to introduce it in Saudi Arabia, where our water network is leaking, and nobody is putting pressure on the company of water management to get that right, for the last 20, 15 or God-knows years. You got my point?

Interviewer: Yeah.

BA: So, introducing the four-minute shower is just a joke for me.

Interviewer: Yeah. I understand. So, if we leak — as you said, barriers are top management and top people, as enablers and as government, can the government do something to, like... what do you think that governments should do to mitigate these barriers? Is it our education system that has some problems? Do you have to improve our education system, to make some certificate about sustainability, or institutional consulting, or that campaign about sustainability — the awareness of it among top management leaders? Do you think the government has to play some role in this?

BA: Not down to that level, but the government could introduce policies. That's very important — like, PIF is a signatory to PRI. It means, "We agree to the PRI investment principles, and that is enforced by itself, and then everybody has to pay into it." We've come to the education system, especially for training. We need to make sure that in any leadership program, there is a sustainability part of it.

That is very important, because our leaders in Saudi Arabia have not really informed or educated about how sustainability is important. We keep doing this. We keep bringing international speakers to management. We keep taking some of them to conferences, and that is the way to build champions. So, maybe the leadership, and especially schools with very famous leadership courses — like [inaudible][89:41], the French one, and Harvard, and the London Business School, and all those top management, leadership-education institutions.

I wish I could see their programs having a specific part about sustainability, because you know, our people in leadership at Saudi Arabia's top companies, they are either educated — taking these kinds of courses either within [inaudible][90:10] or at Harvard, or the London Business School, or one of these five big institutions. If that is embedded in their curricula, then I think we are in a very good position.

I don't think the government always needs to go down right to this level, but maybe a kind of non-profit organization or professional body on sustainability could play a role in that, in increasing the competencies of the top management people in sustainability. That would be a great thing, but again, if it's not... if the policy doesn't come first, then I think it's, again, the bottom-up approach, and it would be part of the 80 that would give you 20.

Interviewer: Okay. About the future of the sustainable supply chain, in B, as well as in general in Saudi Arabia...?

BA: That's a very good question, because there is a new [phonetic][91:20] unstoppable movement in the world. We're trying to be part of it. It's been part of our strategy for the last two years, and that trend is the circular economy. The circular economy, as a concept, is not a new concept. However, it gets more power after the MacArthur Foundation adopted it, okay? So, what does that mean?

I was at a conference in Toronto, and there was an ex-CEO of a mining company — one of the top five mining companies, by the way. That guy has been fired by the board. He was the CEO of one of the top three mining companies in the world, and he has been fired by the board because the [phonetic][92:25] bank had creditors who said he put the company in so many decisions that he made, and they lost a lot of money. Billions, actually.

At that conference, he was on the panel, and the panel is about sustainability in mining. The head of the panel asked him about, "What do you think about the circular economy?" And he said something very sad to me, and it explains why, for me, why the board fired him, actually. He said that the circular economy is...you

read [inaudible][93:10] business, and it's very sad. Someone like him, who has been, you know, going up the ladder to be a CEO one day, and he says something like this — to me, it's very tragic.

He said, "A circular economy is a European conspiracy, [inaudible][93:38]. It's a European conspiracy against the mining sector. Why? Because Europe is running out of mines."

Now, Europe is running out of mines? Okay, yes. This is a fact. Fine. Conspiracy? Why? Why a conspiracy? That is...even if you are against the concept...

Interviewer: It's a very big world. I mean...

BA: It's a very big world. It seems exactly that...

Interviewer: That the top management [crosstalk][inaudible][94:19].

BA: [inaudible][94:19] So, for me, I've been in contact with the Circular Economy Initiative, and we're trying to be a part of it, and we're trying to find out — we were the first mining company to approach them. Why? Because the circular economy is against mining, in a way. That's true, because the circular economy, they want to reduce extracting fresh and fertile material from —

Interviewer: A closed loop.

BA: Exactly, close up the loop, and use what we already have.

Interviewer: We have too much extraction.

BA: Exactly. Now, this is very — what you said. We are an extractive business. It's very interesting, because what if in the future, the mining, oil and gas — all extractive businesses — in this initiative, would be turned into something different, which is that we would be material companies.

Interviewer: I see your point.

BA: It's not written in stone that we should keep drilling and mining. We might shift our strategy from being mining to materials — metals and mineral resources, okay? Which means the source of the mineral is not important. Is it from the mine? Is it from the garbage? It's not...as long as we are providing the world with the minerals that the world, and the growth of humanity, needs. So, we could change. We could evolve, okay? We don't need to be [phonetic][96:06] Nokia.

Interviewer: That's true.

BA: We could evolve, and we shouldn't be attached to the convention. What if we're not a mining company? We are...for example, [phonetic][96:22] Aranco used to be an oil company, and now they are changing their strategy to being an energy company. That is the right thing to do.

In the future, I can see that the mining companies will be all materials and mineral resources providers or suppliers to the world, regardless of where this comes from. It's not going to be 100 percent recyclable. There should be some of the virgin.

Interviewer: But to reduce, like, the amount...

BA: So, what will happen? Companies like us will optimize. To be honest with you, if the reused materials get to the point of price that's comparable to virgin, why not? Why not? This is exactly what the circular economy is all about. It's to give the material more life. Keep it in the circle.

So, I personally don't see a dead end. Actually, I see an opportunity for mining in the new economy — the circular economy. I'm a fan. I wrote about it in my book back in 2014, I guess, when I published it — I wrote it before that. I'm very much a fan of it. In November, I will go for training in circular economy in London.

So, I think the future for sustainability is keeping materials and resources going. This is one trend. A very important trend. What the PRI is trying to do at the investment part is the second trend, as well. Those two trends, I think, are the biggest two, the major two trends. What will enable these major two trends for sustainability is big data. So, yeah.

Of all new IT things, I can see only big data is really, really [inaudible][98:33] to us. Big data could show us things that we cannot see now. For example, we are trying to manage the carbon in our company. What we are trying is, we are trying not the big data. We are using the small data. The emissions are here, so we have an emission analyzer here. We have this and that, and we gather the data on a quarterly basis, and that is small data.

What if we came to the point where we gathered this information second by second, millisecond by millisecond? That is huge data. Just imagine the opportunity to optimize, and to tap into...you can build algorithms that can optimize your carbon by the millisecond, and that would change things dramatically.

For carbon, for example, again, it's part of the circular economy. What if B, [phonetic][99:40] Savik and [phonetic][99:40] Aranco all gathered their carbon together, and we built a carbon network? A carbon grid? And if someone developed — a country developed, PIF developed — a company that turned this carbon into products like [phonetic][99:58] graphene, a new material, into whatever.

Interviewer: The waste of this company to produce...that makes the circle...

BA: The circle. There's hazardous waste that comes out of aluminum [muffled/inaudible][100:17] and dross. We need to export it to other companies in the world. They use it, and they recycle it, and they make things out of it. Why don't we get an investor, a local investor to get this sort of material, and as the result of that, we could do it again, and take it.

So, I think if the big tool is the circular economy and responsible investment, for me, this would only be enabled by big data. This will only be enabled by big data. I think this is how the future is going to be.

You will not see, in the future...you will see the death of sustainability as a profession. You will not see a sustainability profession, because it will be part of everything. Everyone will be in the sustainability profession. Soon, we will have to change our title. We'll have to find something else. Otherwise, we will die, like Nokia.

Interviewer: Yeah. Thank you so much. I'm going to give you two minutes to add anything into this study that you see as important, and...

BA: I think I've said enough.

Interviewer: Yeah. I appreciate it. Thank you so much. It's valuable information, and I appreciate it.

BA: If I really would like to say something, I would like to say things about, when you finish this Ph.D and you go to your university, I would love to see more and more research taken into sustainability — quantitative research, big data-based, things like this.

It would be very difficult to be funded, just to be very frank with you, so you will have a very hard time funding your research. It's not like engineering research. Your research will be very tough to be funded, because people don't really look at it as they look at engineering, but the best thing is that maybe you can

join forces with engineering, taking the circular economy and lifecycle of the material with engineering. So, it can be something you do. I'm not sure if you are from a management college?

Interviewer: Yeah. I am.

BA: So, maybe something between management and engineering. You can go for funding, and you will get that. I would love to see more and more research on these two topics, based on the big data, because I think this is the future. It's not only this. I wish the engineering colleges would start preparing people to — on the programming languages, like Python, and things like it that are used in big data.

By the way, every sustainability professional in the future has to learn Python or one of these new programming languages that will enable him to work with big data, or with [inaudible][103:38], artificial intelligence and all these things. All these things are specifically to advance sustainability.

We're not doing it because we want to be part of the future. We are doing it because we want to survive as a profession. That's why we need to do it. In the future, if you don't see the program in Python or in [phonetic][104:04] Go or in [inaudible][104:06], or one of these other languages, I think you will not have the value for the industry. That's what I think.

Interviewer: At the end of this interview, we would like to thank Mr. BA for his patience and his valuable information, and I'll stop the recorder.