

Strategic Framework for Achieving Sustainability in Telecom Supply Chain: A Case Study of Pakistan

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Abstract

Current research aims to unpack the issues faced by the telecom sector of Pakistan to sustain its supply chain management. While using the qualitative case study method, this research has analyzed the available framework to achieve sustainability in the supply chain. The study used data triangulation and extracted data from Telecom company's documentation, on-site observation & semi-structured interviews. Based on primary and secondary data, we have proposed a strategic framework for developing sustainability in the supply chain of telecom companies. The framework provides the step-by-step implementation of all dimensions of sustainability upstream of a supply chain. The developed framework can be used as a roadmap by the Telecom sector to make their supply chain more sustainable. The research focuses on the upstream supply chain, and the findings argue that telecom supply chains can only use the proposed framework upstream to achieve sustainability.

Keywords: Sustainability, upstream, supply chain, telecom, framework, Pakistan.

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Introduction

Earth provides natural resources for all human needs and not only for the planet's present population but for all the generations to come. These natural resources are limited, and we should utilize them optimally. Cernev and Fenner (2020) also observed that the sustainability of Earth is at risk due to current manufacturing trends. Thus there is a need to develop environmentally friendly processes. The industry requires processes to resolve such issues as the world's top 2000 plus companies, and their supply chains operations contribute an additional 20% to gas emission (Sugak, 2021). Walmart's SC processes, for example, produce 90% of its total emissions (Birchall, 2010). While using these resources, preserving the natural ecosystem and providing natural resources for further development are necessary. This approach to resource utilization is known as sustainable development, classically defined as utilizing resources for the present generation and leaving sufficient resources for future generations (Bengtsson et al., 2018; Ghadge et al., 2019).

Given the above arguments, sustainability/ sustainable development has become popular with policymakers and regulatory bodies. Access to information through the internet and social media exposure has increased consumers' concern about using environmentally friendly products. Consumers in the present era expect firms to use environmentally friendly materials in their supply chain process (Su, Liu & Du, 2020). The supply chain is an important area to initiate such change because supply chains and global supply chains affect environmental sustainability (Abbasi & Nilsson, 2012; Li, Fang & Song, 2019). Pakistan is ranked 71st out of 223 countries for its foreign exports. It has a population of 19 million, out of which 38% of the population lives in cities and uses various products and services (Raza, Ramish & Nazar, 2020; Hanif, 2021). Also, the location and significant cotton producer make Pakistan an important player from an export perspective. Developing sustainable SC is significant for Pakistan to continue exporting its products and remain competitive. Abbasi (2012) in a comprehensive study, attempted to find the general sustainability SC practices in the manufacturing industries of Pakistan, including electronics, automotive, leather, chemicals, etc. Despite being comprehensive, Abbasi's (2012) study did not cover service sectors like health care, hospitality, and telecommunication.

The telecommunication industry is important from Pakistan's perspective. It has more than 182 million subscribers as of 2021. Its contribution to the National exchequer in 2020 was Rs. 287 billion and raised \$622.5 million in foreign direct Investment (FDI). With the introduction of 3G and 4G cellular technology in Pakistan, the sector will grow further, requiring the companies to work with various suppliers to improve and expand their network (Hanif, 2021).Based on an extensive literature review on Supply Change

Management (SCM) and sustainability, the authors found a significant gap between sustainability literature and practical implementation in the industry (Ejsmont et al., 2020). Most past studies on SSCM are theoretical, focusing on triple-bottom-line criteria and lacking a framework that can be practically used applicable in the industry (Ashby, et al., 2012; Allaoui et al., 2019).

Studying sustainability in the supply chains of Telecom companies can help to identify the best sustainable SC practices which the telecom sector can adopt to improve efficiency, reduce cost & waste, and gain a competitive advantage. This research is a case study that analyzes the sustainable SCM practices of a Telecom company in Pakistan. This study aims to develop a comprehensive framework for achieving sustainability in the telecom sector's upstream supply chain. A case study is selected as the authors study a contemporary phenomenon over which the researchers have no degree of control (Yin, 2013). Although a case study mainly focuses on the "how?" or "why?" type of questions, it is equally applicable to exploratory research (Yin, 2013).

Literature Review

Supply Chain Management & Sustainable SCM

Ayağ (2015) defines Supply Chain Management as a "process of integrating/utilizing suppliers, manufacturers, warehouses, and retailers so that goods are produced and delivered at the right quantities, and at the right time while minimizing costs as well satisfying customer requirements." Supply Chain Management is also defined as "a mix of predominantly cooperative events and associations that connect businesses to provide the end customer with the suitable product and service through value creation procedures" (Braziotis et al., 2013). A more specific definition related to organizations is stated by Pojasek (2012), which defines sustainability/ sustainable development as "the ability of an organization to achieve its tasks for ecological stewardship, community welfare, and financial success over the years although being held responsible to its shareholders." It should also be noted that within the literature, the terms "sustainable development" and "sustainability" have been used interchangeably by authors (Kiewiet & Vos 2007; Presley et al., 2007).

Perhaps the most comprehensive definition of sustainable supply chain management is provided by United Nations Global compact initiatives, which defines it as "Supply Chain sustainability is the managing ecological, communal and financial effects, and the reinforcement of good governance practices, through the developments of goods and services. SC sustainability aims to make, protect, and produce long-term ecological, communal and financial value for all shareholders involved in carrying products and

services to market.” (Orzes et al., 2018).

The effort to develop and manage such a supply chain is known as sustainable supply chain management (SSCM). In SSCM, firms use resources efficiently from one end to another end of the supply chain (Li, Fang & Song, 2019). Given its importance, firms globally use SSCM for sustainability and growth. Managing such a sustainable supply chain is becoming an essential strategic aspect for organizations around the globe (Seuring, 2013; Laosirihongthong et al., 2020). The terms “sustainable supply chain management (SSCM)” and supply chain sustainability have been interchangeable. Sustainability refers to the skill of sustaining or ability to tolerate (Zailani et al., 2012). Similarly, Seuring and Muller (2008) define SSCM as managing material, data, and monetary flows along with collaboration among organizations along with the SC while taking areas from all three magnitudes of sustainable development, i.e., economic, environmental, and social, into considerations which are resulting from buyers and stakeholder needs.

Dimensions of Supply Chain Sustainability

Since 2011 Sustainable Supply Chain Management (SSCM) has been a thriving area of research (Seuring & Muller, 2008). Supply chain sustainability has three dimensions: environmental sustainability, economic sustainability, and social sustainability. Considering all these dimensions, Fish (2015) asserts that SSCM is the “tactical, apparent integration and success of a company’s social, environmental, and economic objectives in the complete harmonization of essential inter-organizational corporate procedures for refining the long term financial performance of a company and its supply chains” (Fish, 2015). Most definitions of SSCM have focused on adding Triple Bottom Line approach criteria into the definition of Supply Chain Management (Elkington, 1998; Vega-Mejía, Montoya-Torres & Islam, 2019). The supply chain sustainability is a result of combining sustainability and SCM. Sustainability is a conceptual framework for aligning social, environmental, and economic dimensions (Fish, 2015). These three dimensions in light of Fish (2015) and other authors are:

1. Environmental Sustainability: Reduce the utilization of natural resources consumed in the end product and the production process.
2. Economic sustainability: sustainability efforts must be economically sustainable, or the business will lose and might be closed.
3. Social Sustainability: The dimension of sustainability with minimal research is based on internal and external factors such as motivation & value addition to society.

Extant literature has discussed it in terms of environmental sustainability. Also, researchers have used the terms sustainability and green interchangeably. One example is Genchev et al.'s (2011) research on reverse logistics, in which terms like sustainability and green are used interchangeably with one another and side by side. Many researchers, including Genchev et al. (2011), green practices will make companies environmentally sustainable, reduce costs, increase customer loyalty and enhance brand image. To name them, a few are green logistics, reverse logistics, green manufacturing and Eco-packaging. Researchers also assert that SSCM practices can help Pakistani manufacturers get ISO 14001 certification (Abbasi, 2012).

Stakeholder Theory

Researchers have extensively used stakeholder theory in explaining sustainability management research (Schaltegger, Hörisch & Freeman, 2019). A review of extant literature suggests that many researchers have vaguely discussed the theory or misinterpreted it (Freudenreich, Lüdeke-Freund & Schaltegger, 2020). Given these deficiencies, researchers believe that there is a need to focus on sustainability challenges and how this theory addresses these challenges (Torelli, Balluchi & Furlotti, 2020). Sustainability management is a process of formulating, implementing, monitoring, and evaluating decisions related to the sustainability of the environment (Govindan, Shaw & Majumdar, 2021).

Researchers believe that apart from developing a sustainability framework, researchers can extend traditional theories for understanding sustainability management (Schaltegger, Hörisch & Freeman, 2019). For understanding the fit between stakeholder theory and sustainability management, it is important to conceptualize stakeholders. Stakeholders are "groups and individuals who can affect or be affected." In value creation of supply chain (Freeman, 2010). There are different definitions of stakeholders, and all of them cannot be aligned with sustainable management. Therefore, we have focused on the actual use of the theory. The stakeholder theory does not refer to the company but the relationship between a firm and its stakeholders (Freeman, 2010). Thus, it is necessary to focus on the actual use of the stakeholder theory.

Bell, McGillivray and Pedersen (2013) assert that sustainability management and stakeholder theory focus on the aim and purpose of business entities to create value for the stakeholder. Stakeholder theory, in broad terms, focuses on the interdependencies between an organization and the societal environment (Schaltegger, Hörisch & Freeman, 2019). At the same time, while focusing on the societal and ecological environment, corporate sustainability highlights the association between organizations and the

societal environment (Freeman, 2010).

In short, researchers argue that both concepts are not limited to-short term shareholders’ value, but they, in broad terms, refer to understanding a firm and stakeholder “embeddedness, dependencies, obligations, abilities” (Hussain et al., 2018). Sustainable management and stake theory assume that ethical issues do not conflict with business activities but are interlinked (Loorbach & Wijsman, 2013). Thus, firms should not be part of the supply chain with poor sustainability practices.

Structure of a Telecom Supply Chain

For developing a sustainable upstream supply chain in the telecom sector, it is essential to understand the structure of a telecom SC. Below is the structure of the telecom supply chain that which we have adapted from the work done in telecom supply chain management by (Reyes, Raisinghani & Singh, 2002).

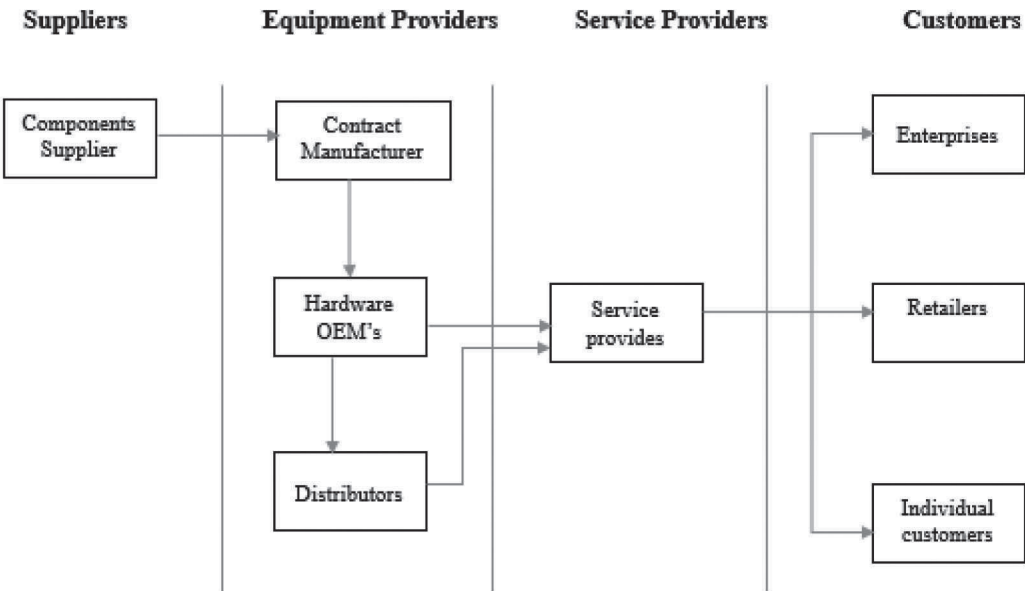


Figure 1: Telecom Supply Chain (Reyes, Raisinghani & Singh, 2002)

In the context of the current research, the selected organization is a service provider. Since the focal firm is a service provider, its upstream supply chain consists of suppliers and equipment manufacturers with whom the firm obtain raw materials.

Related Works

Research on SSCM has significantly increased in the last few years (Seuring & Muller, 2008; Seuring, 2013). The study has discussed some relevant and existing frameworks regarding SSCM below. Apart from a few recent studies (Faroqi, Siddiquee, Ullah, 2019; Ahmadi, Petrudi & Wang, 2017), most papers have focused on conceptual/ theoretical/ literature-based frameworks. A literature review suggests that most past studies have limitations in terms of context generalizability. We also found that most developed frameworks have focused on the green aspect of a sustainable supply chain. This paper contributes to the body of knowledge by developing a strategic framework for all three areas of sustainability: people, profit, & planet. Our findings can help the telecom industry achieve sustainability in its supply chain.

Carter and Roger (2008) developed a theoretical framework based on an extensive literature review. The author concluded that integrating social, economic, and environmental factors from the triple bottom line (3BL) perspectives is beneficial for firms. The authors believe that SC would help firms compete with other business entities. The competitors would not replicate their SC model, resulting in substantial profit in the long run. Similarly, Seuring and Muller (2008) reviewed 191 articles from 1994 to 2007 and highlighted issues, incentives, and opportunities in SSCM, followed by a framework that summarized the major literature related to SC. The study also proposed strategies: (1) for reducing risks associated with supplier management and performance, and (11) how firms can structure their SC for using sustainable products. Given these discussions, we argue that most researchers have focused on green and environmental issues and have neglected social aspects and the integration of the three dimensions of sustainability.

After a thorough review of the literature and analyzing different frameworks, Beske & Seuring (2014) identified various areas essential for SSCM implementation presented below, and a framework for best practices, presented in Figure 2.

1. Orientation/Mindset towards SSCM.
2. Plans and initiatives for SSCM.
3. Collaboration with stakeholders for SSCM.
4. Managing risk in SSCM projects.
5. Proactive action for increasing Sustainability in Supply Chain Management.

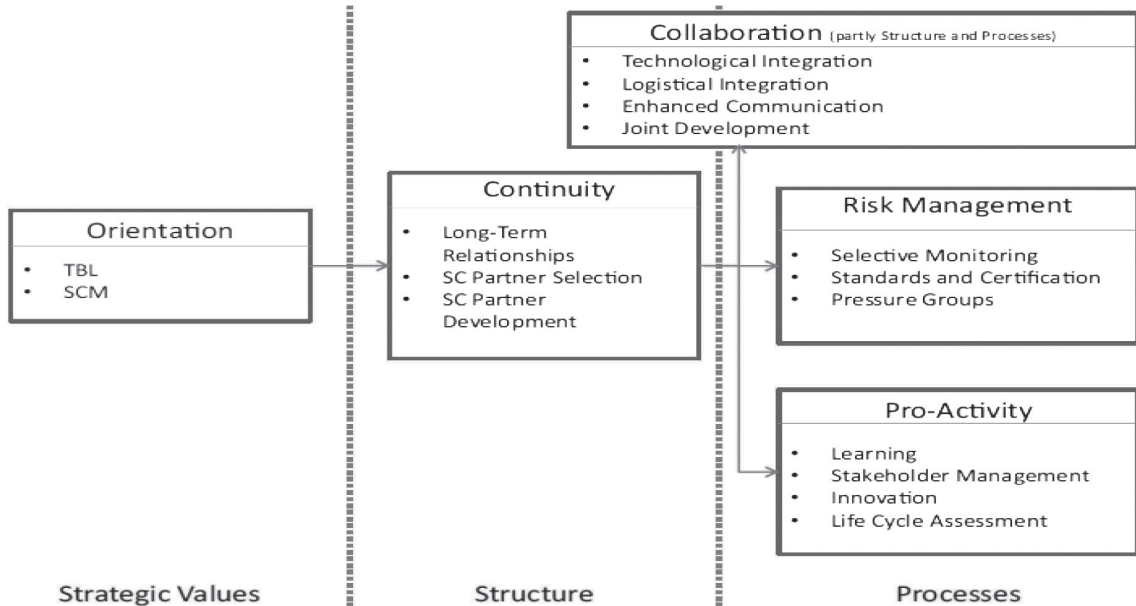


Figure 2: SSCM Practices & Categories adopted from Beske and Seuring (2014)

Underlying Themes in the Literature

We found many overlapping themes from the previous literature analysis and review of frameworks. We also found that sustainability literature of the supply chain has mainly focused on providing suggestions & improvements to better collaborate with suppliers to gain advantages in SSCM. Literature also suggests that organizational commitment is necessary for effective supply change management. The firms should adopt the following to implement SSCM in any supply chain's upstream flow successfully. (i) Setting Criteria for supplier selection (Minimum requirements being social and environmental standards) (Seuring & Muller, 2008), (ii) Communication with the supplier (communicating selection criteria and operational standards, enhanced communication with supplier) (Seuring & Muller, 2008), (iii) SSC management (Managing supplier, Certification, supplier training, and development), (Schaltegger & Burritt, 2014), (iv) SSC measurement (Supplier Audit, KPI's for measuring performance, evaluating supplier progress) (Schaltegger & Burritt, 2014), (v) Collaboration with Supplier (developing communication channel, logistical and technical integration) (Beske & Seuring, 2014), and (vi) Risk Management (Standards & certifications, monitoring, risk assessment, backup & multiple suppliers) (Beske & Seuring, 2014). A pictorial presentation of the said factors is depicted in Figure 3. Firms can use this framework to evaluate SSCM management upstream of an organization:

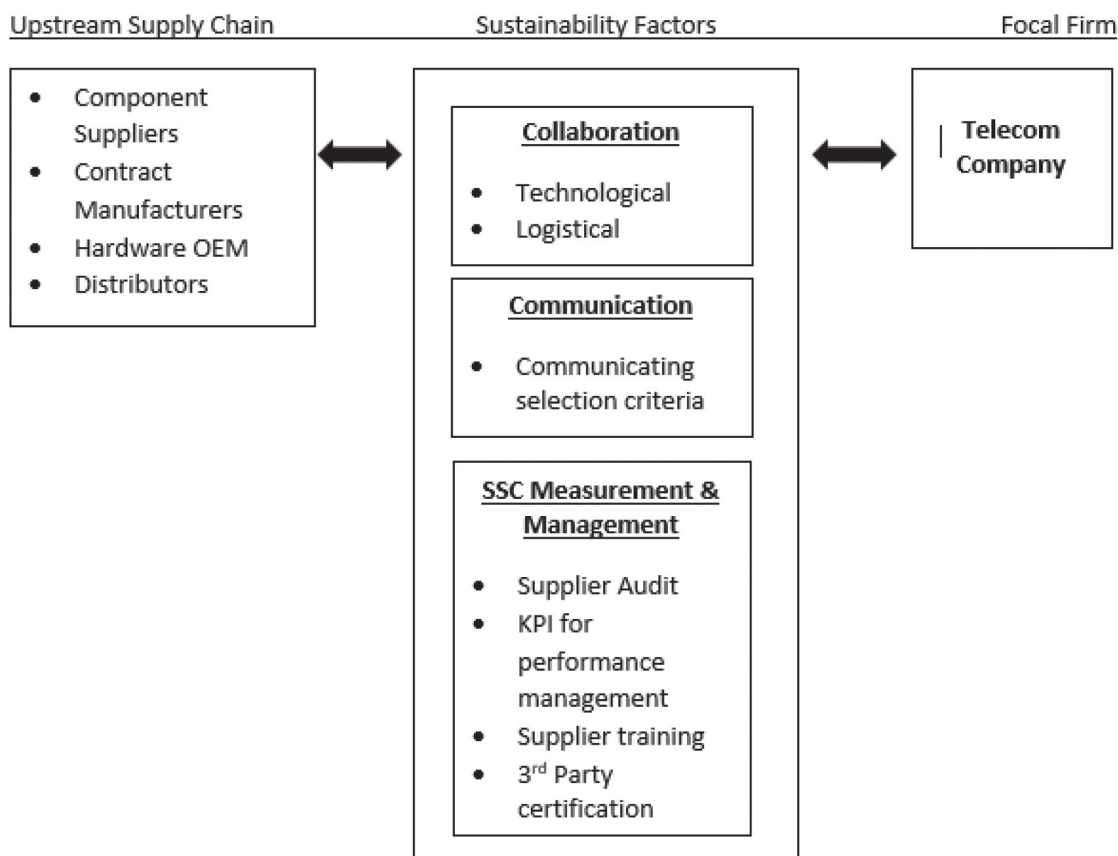


Figure 3: Initial Framework for Upstream Sustainable Supply Chain Management In The Telecom Sector

Strategic Framework

All the above-discussed frameworks are adapted from the literature. Ashby (2012) asserts a need to develop a practical strategic framework rather than a conceptual framework to improve SSCM in an industry. A strategic framework (Clearpath, 2016) is different from a conceptual framework as it provides a pictorial view of an organization's strategy. It also includes drives of accomplishment (both internal & external), lists objectives & resources, and highlights prospects to power assets. It is essential to differentiate the nature and functions of a strategic framework from a conceptual framework.

Methodology

Yin (2015) believes that research methodology is essential as it brings a "Methodic-ness" to research by placing specific research procedures to follow, avoiding carelessness,

and bringing depth in research, while improving credibility and removing any biases, especially in the case of qualitative research (Yin, 2015).

Overview of the case study

The selected company for the case study falls within the telecom sector. The selected organization for the case study is a well-known telecom company. We are studying it to develop a sustainable telecom supply chain that focuses on all three sustainability criteria: economic, environmental, and social. The focal form is well known globally and locally. A few statistics about it are presented below:

- Provider of telecom services in 13 markets internationally
- The second-largest network in Pakistan
- Operating in Pakistan since 2005
- Has invested at least 2.3 billion USD in the country

The research observes the phenomena at the supply chain level. Respondents for the study include company personnel (directors, managers, and assistant managers) responsible for sustainable SCM and the company's development. We also collected data from the upstream suppliers of the organization. We collected the data based on interviews. The research approach is qualitative as the researcher is studying a social phenomenon in real-world situations while describing the view of participants to the phenomenon within a specific environment and context while using multiple sources for data collection (Yin, 2015). We have used a case study research design for our study. This research approach is contemporary, and the researchers have no level of control over its occurrence (Yin, 2013). The case study followed the protocol for data reliability (Yin, 2013). Below is a summary of the case study protocol.

Table 2: Case Study Protocol

Research Question	What is the strategic framework to assess and achieve sustainability in the telecom industry?
Unit of Analysis	We focused on SC personnel and sustainability enablers in the focal firm, an established business entity in Pakistan's telecom sector.
Organization	
Timeline	
Data source	Data collected from Observations, Documentations & Interviews
Examples of key issues	<ol style="list-style-type: none"> 1. What is the focal firm's stance/ level of effort in achieving SSCM? 2. The overall strategy of supply chain sustainability efforts? 3. Level of collaboration with supplier on sustainability initiatives 4. Measurement & Management of SSCM 5. Communication sustainability initiative to stakeholders in upstream and central parts of supply chain

Data Collection

Researchers can use up to six methods in qualitative research (Levitt, 2001). We have triangulated the data for this study by adopting the following three methods.

Observation

Yin (2013) states that observing the environment and behaviors of the interviewee are important aspects of qualitative analysis. In this study, we have observed the attitude and behavior of the respondents while administering the questionnaire.

Documentations

Apart from using interviews, the study also utilizes data collected from company documents. The documents we tabbed are local and international sustainability reports of the groups

1. Semi-Structured Interviews:

The interview structure used in this study is a mixture of in-depth and semi-structured interviews. This method allows researchers to ask questions related to the research objectives (Saunders, Lewis, Thornhill & Wilson, 2009). The semi- semi-structured interview for this study had ten questions and another ten follow-up questions.

The questions we used in the study were related to sustainable supply management practices and strategies that the focal firm uses to make its supply chain more sustainable.

Before the interview, we gave the interviewee an interview guide and the questionnaire.

Table 3: Data Collection Method Summary

Interviews	Documents	Observation
<ul style="list-style-type: none"> Format: Semi-Structured Participants: 10 Questions: 10 Follow up questions: 10 Duration: 30-45 mins (each interview) Participants selection: via purposive sampling 	<ul style="list-style-type: none"> Sustainability report for the year of 2014 for Pakistan Sustainability report of the year 2015 for the whole group 	<ul style="list-style-type: none"> 1st visit for Interview 2nd visit for follow-up questions and meeting each participant to discuss and get their interview summaries/findings approved Visit the company’s website

Case Validity and Reliability

We followed all the protocols necessary for the case study, including reliability and validity analysis. The authors initially reviewed the interview guide for the interviewee. Subsequently, two senior faculty from academia and three experts of the corporate world vetted the document. In Table 4, we have presented the process for ascertaining the reliability and validity analysis as advised by Yin (2013; Vin, 2015).

Table 4: Case Validity and Reliability Summary

Aspect	Addressing aspects in this study
Construct Validity	<ul style="list-style-type: none"> – Before the interview, we gave the interviewees an interview guide and questionnaire. – Initially, we asked ten questions, followed by another ten questions. – Interviewees reviewed all the questions and interview summaries. They did not find any inconsistency or errors in the measures of the defined concept. – We then built the summaries of the answered questions and aligned them with the initial framework. – The authors compared the interview summaries with the company's sustainability reports website and based on-site observations – We then developed a comprehensive interpretation of each construct (in section findings), which we discussed and obtained the consensus of the interviewees.
Internal validity	<ul style="list-style-type: none"> – After the literature review, the study developed the initial conceptual framework (Figure.3). – As identified by the study, all constructs in the conceptual are supported and valid measures of SSCM.
External validity	<ul style="list-style-type: none"> – The study based on the Stakeholder Theory investigated the phenomena from the stakeholders' perspective. – The stakeholder can apply the developed strategic framework in the focal firm—other telecom firms and firms in other domains can adapt developed SSCM.
Reliability:	<ul style="list-style-type: none"> – We followed the case study protocols and remained focused on the articulated questions. – As such research method is precise and reiterate-able

Results

The proposed framework for the case study explains the sustainable supply chain efforts that firms use with their partners, specifically in collaborating with suppliers, communication with suppliers, and measurement and management of sustainable supply chain. We have summarized the results based on interviews, observations, and company reports.

Collaborating with Supplier

We found that the focal firm's collaboration with its supplier is conventional. The firm collaborates with established and reputable suppliers. Apart from focusing on suppliers' social and environmental practices, the focal firm also pays attention to suppliers' financial capacity. Due to the size of the focal firm, it is in a bargaining position while dealing with the suppliers. The focal firm focuses on its core competencies and

outsource other business processes to others. Consequently, it results in efficiency and decreased costs. The focal firms also make arrangements with their suppliers to allow their employees to work on its premises.

Communication with Supplier

Firms communicate with suppliers in two stages. One is pre-selection communication, and the other is post-selection communication. In the pre-selection stage, firms focus on selection criteria and suppliers' orientation and practices on sustainability. In post communications, firms focus on the following elements.

1. To enhance the communication with suppliers.
2. To provide feedback to suppliers.

While partnering with new suppliers, firms ensure that the potential suppliers' values globally accepted environmental, health, and safety regulations. Subsequently, firms sign a legal contract with the suppliers that also code of conduct. The contract generally has a provision that allows firms to penalize the suppliers for violating the agreed code of conduct. The firm enhances communication with the local supplier through meetings, telephonic calls, and emails. With international partners, firms mainly use emails and telephonic calls for communication. The company also measures the performance of its suppliers. In the case of outsourced call centers, firms frequently measure their performance. For technical business processes, firms measure the suppliers' performance less frequently. Firms bi-annually give feedback to the suppliers and suggestions to improve the performance. However, in the case of very poor performance, the firms may increase the frequency of feedback and suggestions.

Measuring & Managing SSCM of Suppliers

For measuring and managing the SSCM of suppliers, firms use different tools, including the following:

1. Using KPIs,
2. Auditing suppliers,
3. Monitoring and evaluating supplier performance,
4. Risk assessment,
5. Supplier training
6. Third-party certifications.

To get the desired results company provides training to the call center representatives. The firms also rely on the third-party audit report of suppliers. Such audits have more

transparency. Firms also rely on supply-chain and inventory audits for smooth operation. The frequency of such audits is four times a year. Firms also assess the performance of the suppliers based on KPI standards. The firm expects its vendors to be certified and has developed a supply chain that is environmentally friendly and in line with ISO 14001 standards. To assess the working conditions of the supplier, the focal firm representatives visit the site to measure the ecological, safety, and health conditions of the supplier. Another method to reduce costs in the long run and have a positive image in the market is to make SC more sustainable. This discussed method is in line with the Stakeholder Theory (Freeman, 2010). Consumers' concerns about environmental products have increased significantly, and they expect all the members of the supply chain to use environment-friendly products.

The dimension along which a supply chain can be made sustainable are; environmental, social, and economic (Carter & Rogers, 2008). To ensure sustainable management of the supply chain, the focal firm ensures that all the supply chain members value and practice sustainability (Seuring & Muller, 2008).

Case Findings & Discussion

In the light of the results above, below in section one is the evaluation of focal firms' SSCM practices and stance on sustainability initiatives. Similarly, section two contains a modified strategic framework developed in light of results, case findings, and discussions that telecom firms can use to achieve sustainability in their supply chain.

Evaluation of Focal Firms SSCM Practice and Stance

The current sustainable supply mechanism of the focal firm is pretty ordinary and conventional. The focal-firm attitude towards SSCM is reactive but not proactive. A few pertinent issues are discussed below:

1. The focal firm signs a contract with the suppliers. It has clauses related to the code and conduct of doing business. In case the supplier violates the terms and conditions, the focal firm can penalize suppliers.
2. Although focal firms give importance to supplier social and environmental practices, it gives more weightage to the financial soundness while awarding contracts to the suppliers.
3. The company only gives basic training to suppliers to achieve desired service level. It does not make investments in vendors to improve the quality of the products and services.
4. Communication with suppliers is also pretty ordinary and conventional, limited to

communication via telephonic calls, emails, and in-person communication.

5. The focal firm gives feedback and suggestions to the suppliers when their performance is too poor.
6. When sharing project information, the focal firm only shares limited information. It inhibits suppliers from delivering what the project demands.
7. The quantum of the Investment for developing suppliers is insufficient, unlike Honda, which spends considerable resources on its vendors and suppliers.
8. Collaboration only exists in outsourcing functions such as call centers and bill delivery; otherwise, there is no robust technological or logistical collaboration.
9. Also, while the firm uses KPIs, they are mostly limited to specific business functions, not sustainability initiatives.

Revised Strategic Framework for a Focal Firm to Achieve SSCM

From all the above discussions, we have inferred that the focal firm has taken a few initiatives for SSCM. We suggest the focal firm should deviate from conventional supply chain practices and adopt sustainable supply management practices. Based on the discussed practices and attitudes of the focal firm, we suggest it must develop a road map to increase the effectiveness of SSCM. A strategic road map contains action, efforts, and strategies for achieving sustainable strategic goals (Clearpath, 2016).

Below is a strategic framework that the focal firm or any company in the telecom sector can use to evaluate its current standing in SSCM and improve accordingly. This framework has the following elements.

1. Highlights what steps a firm can take to make upstream more sustainable.
2. Divide the activities into different stages and pursue them step by step to achieve SSCM in the upstream supply chain.
3. Identify best practices on SSCM that can help leverage assets and give a competitive advantage.

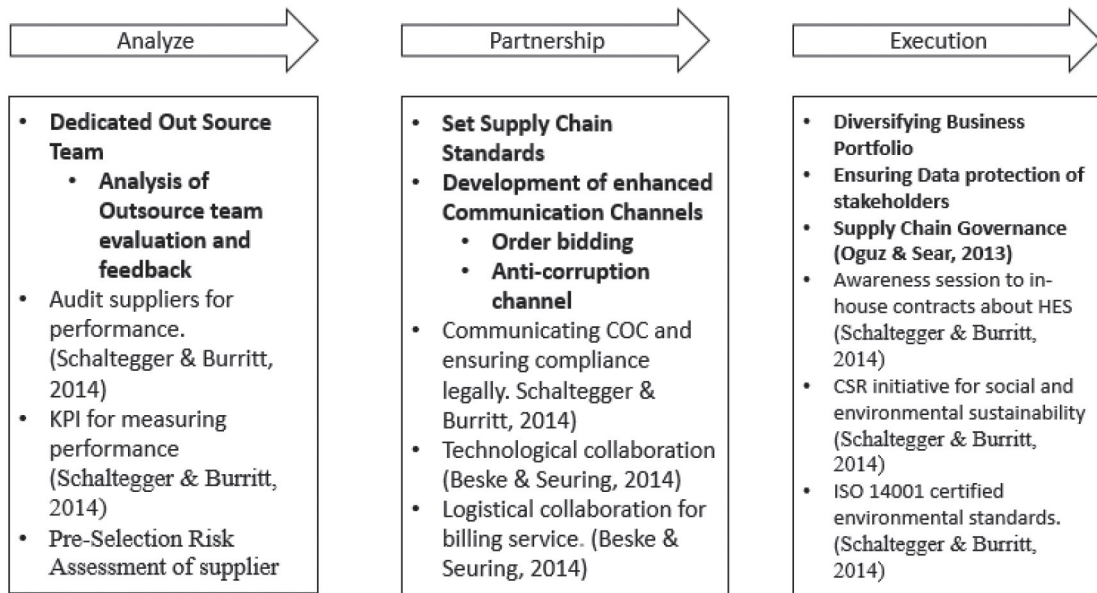


Figure 4: Strategic Framework for the Focal Firm

This case study is grounded in the Stakeholder Theory. The findings are generalizable as other researchers have extended the stakeholder theory, which is widely accepted.

Conclusion and Implications

This paper has developed a framework that managers can use to assess the current challenges that the company faces in achieving sustainable SCM. The company should assess its stance towards sustainability initiatives and what steps it can take to make SC more sustainable. The authors recommend that the managers use the framework in the supply chain department of telecom companies to evaluate where they stand and what they want to achieve. The self-evaluation is a driving force for improving the companies' supply chain by introducing more sustainability initiatives in the supply chain with their suppliers' help. Similarly, we believe that the developed framework will positively contribute to sustainability literature by providing a platform for future research that will lead to similar research that can improve the final framework and make significant improvements.

Limitations and Future Studies

The study focuses solely on the upstream of the telecom SC rather than the complete supply chain. The case study focuses on a single organization within the industry and its supplier. Since the following is a case study that studies an organization within a specific context, results might not generalize to other industries. However, the study

achieved analytical generalizability, and results for other companies in the industry are likely to be similar. Future research could include the complete supply chain of the telecom industry rather than just the upstream supply chain. Multiple case studies can be conducted to further contribute to the topic and test the findings of the current case study. This approach will also provide a more comprehensive view of the industry. Also, the researcher can explore how firms can assess and mitigate risk when partnering with suppliers. Future studies should research different strategies to collaborate with their stakeholders, not only with suppliers but also with other stakeholders for the sustainable supply chain.

References

- Abbasi, M. (2012). Sustainable practices in Pakistani manufacturing supply chains: Motives, sharing mechanism and performance outcome. *Journal of Quality and Technology Management*, 8(2), 51-74.
- Abbasi, M. and Nilsson, F. (2012). Themes and challenges in making supply chains environmentally sustainable. *Supply Chain Management: An International Journal*, 17(5), 517-530.
- Ahmadi, H. B., Petrudi, S. H. H., & Wang, X. (2017). Integrating sustainability into supplier selection with analytical hierarchy process and improved grey relational analysis: a case of telecom industry. *The International Journal of Advanced Manufacturing Technology*, 90(9) 2413-2427.
- Allaoui, H., Guo, Y., & Sarkis, J. (2019). Decision support for collaboration planning in sustainable supply chains. *Journal of Cleaner Production*, 229, 761-774.
- Ashby, A., Leat, M. & Hudson-Smith, M., (2012). Making connections: a review of supply chain management and sustainability literature. *Supply Chain Management: An International Journal*, 17(5), 497-516.
- Ayağ, Z., (2015). CAD software evaluation for product design to exchange data in a supply chain network. *International Journal of Supply Chain Management*, 4(1).30-39.
- Bell, S., McGillivray, D., & Pedersen, O. (2013). *Environmental Law*. Oxford: Oxford University Press.
- Bengtsson, M., Alfredsson, E., Cohen, M., Lorek, S., & Schroeder, P. (2018). Transforming systems of consumption and production for achieving the sustainable development goals: moving beyond efficiency. *Sustainability Science*, 13(6), 1533-1547.
- Beske, P. and Seuring, S. (2014). Putting sustainability into supply chain management. *Supply Chain Management: an International Journal*, 19(3), 322-331.
- Birchall, J. (2010). Walmart to set emissions goals for suppliers. *Financial Times*, 2(25), February 26, 2010. {Available} <https://www.ft.com/content/f981e2c2-224a-11df-9a72-00144feab49a>.
- Braziotis, C., Bournlakis, M., Rogers, H., Tannock, J. (2013). Supply chains and supply networks: distinctions and overlaps. *Supply Chain Management: An International Journal*, 18(6), 644-652.
- Carter, C.R. and Rogers, D.S. (2008). A framework of sustainable supply chain management: moving toward new theory. *International Journal of Physical Distribution and Logistics Management*, 38(5), 360-387.

- Cernev, T., & Fenner, R. (2020). The importance of achieving foundational Sustainable Development Goals in reducing global risk. *Futures*, 115, 1-32. Ahead of Print.
- Clearpath (2016). {Available} 01/10/2016, <http://www.clearpathusa.com/services/strategic-frame-work/>.
- Elkington, J. (1998). Partnerships from cannibals with forks: The triple bottom line of 21st century business. *Environmental Quality Management*, 8(1), 37-51.
- Ejsmont, K., Gladysz, B., & Kluczek, A. (2020). Impact of industry 4.0 on sustainability—bibliometric literature review. *Sustainability*, 12(14), 1-29.
- Farooqi, M. G., Siddiquee, N. A., & Ullah, S. (2019). Sustainability of telecentres in developing countries: Lessons from Union Digital Centre in Bangladesh. *Telematics and Informatics*, 37, 113-127.
- Fish, L. A. (2015). Managerial Best Practices to Promote Sustainable Supply Chain Management & New Product Development. In *Applications of Contemporary Management Approaches in Supply*. {Available}, <https://www.intechopen.com/chapters/47842>
- Freeman, R. E. (2010). *Strategic Management: A Stakeholder Approach*. Cambridge: Cambridge University Press.
- Freudenreich, B., Lüdeke-Freund, F., & Schaltegger, S. (2020). A stakeholder theory perspective on business models: Value creation for sustainability. *Journal of Business Ethics*, 166(1), 3-18.
- Genchev, S.E., Glenn-Richey, R. & Gabler, C.B. (2011). Evaluating reverse logistics programs: a suggested process formalization. *The International Journal of Logistics Management*, 22(2), 242-263.
- Ghadge, A., Kidd, E., Bhattacharjee, A., & Tiwari, M. K. (2019). Sustainable procurement performance of large enterprises across supply chain tiers and geographic regions. *International Journal of Production Research*, 57(3), 764-778.
- Govindan, K., Shaw, M., & Majumdar, A. (2021). Social sustainability tensions in multi-tier supply chain: A systematic literature review towards conceptual framework development. *Journal of Cleaner Production*, 279, 1-60.
- Hanif, U. (2021). Telecommunication sector shines. *The Express Tribune*, December 26, 2021. {Available}. <https://tribune.com.pk/story/2335665/telecommunication-sector-shines>.
- Hussain, M., Ajmal, M. M., Gunasekaran, A., & Khan, M. (2018). Exploration of social sustainability in healthcare supply chain. *Journal of Cleaner Production*, 203, 977-989.

- Kiewiet, D.J. and Vos, J.F., (2007). Organizational sustainability: A case for formulating a tailor-made definition. *Journal of Environmental Assessment Policy and Management*, 9(01), 1-18.
- Levitt, P., 2001. Transnational migration: taking stock and future directions. *Global networks*, 1(3), 195-216.
- Li, J., Fang, H., & Song, W. (2019). Sustainable supplier selection based on SSCM practices: A rough cloud TOPSIS approach. *Journal of Cleaner Production*, 222, 606-621.
- Laosirihongthong, T., Samaranayake, P., Nagalingam, S. V., & Adebajo, D. (2020). Prioritization of sustainable supply chain practices with triple bottom line and organizational theories: industry and academic perspectives. *Production Planning and Control*, 31(14), 1207-1221.
- Loorbach, D., & Wijsman, K. (2013). Business transition management: exploring a new role for business in sustainability transitions. *Journal of Cleaner Production*, 45, 20-28.
- Orzes, G., Moretto, A. M., Ebrahimpour, M., Sartor, M., Moro, M., & Rossi, M. (2018). United Nations Global Compact: Literature review and theory-based research agenda. *Journal of Cleaner Production*, 177, 633-654.
- Pojasek, R. B. (2012). Understanding sustainability: An organizational perspective. *Environmental Quality Management*, 21(3), 93-100.
- Presley, A., Meade, L. and Sarkis, J. (2007). A strategic sustainability justification methodology for organizational decisions: a reverse logistics illustration. *International Journal of Production Research*, 45(18-19), 4595-4620.
- Raza, S. H., Ramish, A., & Nazar, N. (2020). Achieving Sustainability in Telecom Supply Chains. *Proceedings 9th International Conference of Management and Economics*, London.
- Reyes, P., Raisinghani, M.S. and Singh, M. (2002). Global supply chain management in the telecommunications industry: the role of information technology in integration of supply chain entities. *Journal of Global Information Technology Management*, 5(2), 48-67.
- Saunders, M., Lewis, P., Thornhill, A. and Wilson, J. (2009). *Business Research Methods*. London: Prentice Hall.
- Schaltegger, S., & Burritnability supply chain management framework. *Supply Chain Management: An International Journal*, 19(3), 232-241.
- Schaltegger, S., Hörisch, J., & Freeman, R. E. (2019). Business cases for sustainability: A stakeholder theory perspective. *Organization & Environment*, 32(3), 191-212.

- Seuring, S. (2013). A review of modeling approaches for sustainable supply chain management. *Decision Support Systems*, 54(4), 1513-1520.
- Seuring, S. and Müller, M. (2008). From a literature review to a conceptual framework for sustainable supply chain management. *Journal of Cleaner Production*, 16(15), 1699-1710.
- Su, C., Liu, X., & Du, W. (2020). Green supply chain decisions considering consumers' low-carbon awareness under different government subsidies. *Sustainability*, 12(6), 2281.
- Sugak, E. V. (2021). Environmental Risk as an Indicator of Sustainable Development of Industrial Regions of Russia. In *IOP Conference Series: Earth and Environmental Science*, 666(6), 1-7.
- Torelli, R., Balluchi, F., & Furlotti, K. (2020). The materiality assessment and stakeholder engagement: A content analysis of sustainability reports. *Corporate Social Responsibility and Environmental Management*, 27(2), 470-484.
- Vega-Mejía, C. A., Montoya-Torres, J. R., & Islam, S. (2019). Consideration of triple bottom line objectives for sustainability in the optimization of vehicle routing and loading operations: a systematic literature review. *Annals of Operations Research*, 273(1), 311-375.
- Yin, R.K. (2013). *Case study research: Design and Methods*, California: Sage Publications.
- Yin, R.K. (2015). *Qualitative Research from Start to Finish*, New York: Guilford Publications.
- Zailani, S., Jeyaraman, K., Vengadasan, G., & Premkumar, R. (2012). Sustainable supply chain management (SSCM) in Malaysia: A survey. *International Journal of Production Economics*, 140(1), 330-340.