
Achieving Sustainability in Telecom Supply Chains

Raza, S.H.^a Ramish, A.^b and Nazar, N.^c

^{a,b} University of Management and Technology, Lahore, Pakistan

^ahassanraza074@gmail.com

^bbasher@umt.edu.pk

^c Service Sales Corporation Pvt. Ltd. (A footwear organization)

^cnimranazar@gmail.com

Abstract

This paper investigates issues that telecom companies' face when developing sustainability within their supply chain. It also develops a comprehensive framework for a telecom company to attain sustainability in their supply chain, focusing particularly on the upstream supply chain. Qualitative research method case study was selected to study upstream supply chain challenges a telecom supply chain faces, and then a framework for achieving supply chain sustainability is proposed. Data was collected from Telecom Company's documentation, on-site observation, and semi-structured interviews with ten supply chain personnel at the company. The originality of this paper is established by the fact that this paper proposes a strategic framework for developing sustainability in the supply chains of telecom companies. The framework provides step by step implementation of all dimensions of sustainability into an upstream supply chain. Also it is to be noted that this is one of the few studies that explores Sustainable SC in the telecom sector. The developed framework can be used by telecom supply chain personnel to assess and develop sustainable supply chains. The stance of the focal firm in the case study is defensive towards developing sustainable links, processes, and relations with its suppliers. The developed framework can be used as a roadmap by the focal firm to make its supply chain more sustainable along all dimensions of sustainability. The research focuses on upstream supply chains and the findings argue that the proposed framework can be used only by telecom upstream supply chains to achieve sustainability.

Keywords: Framework, Pakistan, Sustainability, Supply Chain, Telecom

1. Introduction

An observation made by Abbasi & Nilsson (2012) is that sustainability of the earth is at risk due to the current manufacturing trends, and there is a vital need to develop environmental friendly processes. This applies to the services sector too. Developing sustainable supply chains is a significant factor for Pakistan, as it can cause competitive advantage for businesses regardless of sector or country. A research was done by Abbasi (2012) to discover about sustainability practices in supply chains of Pakistani manufacturing firms, in which industries like electronics, automotive, leather, chemicals and etc. were included. While this research reveals a lot about the manufacturing sector, information regarding service and I.T industries, such as health care, hospitality and telecommunication was unavailable. Telecommunication industry is particularly important since Pakistan has more than 131 million mobile users (Pakistan Telecommunication Authority, April 2015) with revenue of PKR. 465,547 million, and with the introduction of 4G network in Pakistan, the sector will boom further. This requires companies to work with suppliers for expansion of their networks for ultimate sustainability. Ashby, (2012) emphasized that there is a significant research gap of tools and framework for service supply chains that needs to be covered.

1.1. Research Question

The main research question is: “What is the strategic framework to achieve sustainability in the upstream telecom supply chain in Pakistan”?

1.2. Research Problem

Evident from the literature review, a gap exists between theory and practice (Hamdouch & Zuindeau, 2010). Ashby (2012) suggests to researchers to tackle this problem by developing tools for SSCM application in the industry. However, the gap has not yet been fulfilled, especially with respect to the Pakistani telecom industry. This paper solves this problem by developing a framework for Telecom companies in order to achieve sustainability in their supply chains.

1.3. Potential Contributions to the Field

Following are the important contributions to the research phenomena chosen.

Table 1: Major contributions to the SSCM field

Year	Authors	Approach to study	Research Objective	Limitations
2008	Carter & Rogers	Wide scale literature review	To introduce sustainability & Environmental, Social & Economic factors of sustainability in Supply chains	Conceptual framework is developed but not tested through quantitative or qualitative methods.
2008	Seuring & Muller	Conducts a literature review	Develops a conceptual framework in order to propose strategies to develop supply chains more sustainably	Focuses more on area/ topic or interest rather than methodology.
2014	Schaltegger & Burritt	Conceptual framework development	Studies sustainability performance of supply chains and offers a different approach to change supply chain design to improve sustainability	Supply chain designs and Sustainability performance of supply chain strategies are for supply chains with fixed and single products
2014	Beske & Seuring	Analyzes literature & different frameworks	To identify structures, values and processes common in SSCM & SCM.	Framework is based on theory rather than practical the application of a study of an organization
2016	Schulz & Flanigan	Literature review	Developed strategic framework for managers by integrating competitiveness literature with the triple-bottom line model.	Needs to be tested on firms and at industry level
2016	Dubey, Gunasekaran, Papadopoulos, Childe, Shibin, FOSSO, WAMBA	Literature review, Total Interpretative Structural Modeling (TISM)	Develops a framework to identify SSCM drivers and to enable and the relations between them.	Solely relying on a survey for data collection poses some limitations in statistical testing, which is a drawback caused by using the TISM technique.

2. Literature Review

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 as satisfying customer requirements”. Pojasek (2012) defines sustainability / sustainable development as “the ability of an organization to clearly achieve its tasks for ecological stewardship, community welfare, and financial success over the years although being held responsible to its shareholders”. Supply chain sustainability is defined as: “Supply Chain sustainability is managing the ecological, communal and financial effects, and the reinforcement of good governance practices, through the developments of goods and services. The aim of SC sustainability is to make, protect and produce long-term ecological, communal and financial value for all shareholders involved in carrying products and services to market, (UNGC, 2011)”.

Similarly, Seuring & Muller (2008) define SSCM as managing material, data, and monetary flows along with collaboration among organizations along the SC, while taking areas from all

three aspects of sustainable development, i.e. economic, environmental and social, which result from buyers and stakeholder needs, into consideration.

These three dimensions in light of Fish, (2015) are:

Environmental Sustainability: Reduce utilization of natural resources in the end product and production process.

Economic Sustainability: Efforts must be economically sustainable for business to continue.

Social Sustainability: Least researched dimension, based on internal and external factors, such as motivation and social value addition.

Pakistan is ranked 71st out of 223 countries with respect to its foreign exports, and has a population of 19 million, out of which 38% lives in cities and uses various products and services (CIA World Factbook, 2015). Also, the location and being a major producer of cotton makes Pakistan an important player from an export perspective. As such, developing sustainable SC is a significant factor for Pakistan, as it can cause competitive advantage for businesses in the country. A research was done by Abbasi (2012) to discover about the recent forms of sustainability practices in supply chains of Pakistani manufacturing firms, in which industries like but not limited to electronics, automotive, leather, chemicals etc., were included.

It should be noted, however, that in the work done above by Abbasi (2012) and in most studies done on sustainability and supply chain sustainability, the focus mostly lies on environmental factors (Seuring & Muller, 2008). While this research reveals a lot about the manufacturing sector, information regarding service and information based industries, such as health care, hospitality, and telecommunication, is not available. Telecommunication industry is particularly important, since Pakistan has more than 131,865,579 active mobile users as of April 2015 (Pakistan Telecommunication Authority) with revenue of PKR. 465,547 million; and with the introduction of 3G and 4G cellular technology in Pakistan, the sector will grow further, which would require the companies to work with various suppliers in order to improve and expand their network.

In a lengthy literature review conducted on SCM and sustainability it was noted by the authors that a gap is present between sustainability literature and practical implementation in the industry (Hamdouch and Zuindeau, 2010). Also, a similar problem was discussed by Ashby (2012): the researcher should focus on developing tools for SSCM that can be applied in the industry. Ashby (2012) also highlights the problem that there is a significant research gap of tools and framework for SSCM that needs to be covered.

While there is a quantity of research being done, most work on SSCM have the commonly

observed drawback on being theoretical and focusing on only a specific aspect of the Triple-bottom line criteria, while failing to provide any framework that is applicable to the industry.

2.1. Stakeholder Theory

When it comes to sustainability work in the industry and the academia, stakeholders are important and a major driving force, as research is more inclined towards stakeholder rather than shareholder values (Freeman, 2010). Stakeholders are important for the development of sustainability; it is, thus, of vital importance to find out about the following:

Freeman (2010) defines stakeholder as “groups or individuals who are either valued or are damaged by, and whose privileges are dishonored or appreciated by business practices”. Shareholders also consist of individuals or groups that can hold a certain level of influence, which can be used to alter or change an organization’s actions (Savage et al., 1991). One type of Stakeholders, therefore, is Internal Stakeholders, which as discussed by Schulz & Flanigan (2016) includes administration, employees, mid-level management, shareholders, customers, and suppliers. It should be noted that these are the type of stakeholders that are directly related to the product, or provide value to the product’s / services’ end user (Golicic and Smith, 2013).

Another type of stakeholders is external stakeholders, who are not directly related to the product, and are neither related to the delivery of product to its end users. They are adequately defined by Henriques & Sadorksy (1999) as community stakeholders (community groups, environmental organizations, N.G.Os), regulatory bodies (governments, trade associations, agencies) and media.

Stakeholder theory, as proposed by Freeman (2010), states that an organization should keep in mind the wellbeing and the interests of all stakeholders when making strategic decisions, rather than just the shareholders of the company. The stakeholder theory also proposes that acting in the interest of the stakeholder’s interests and addressing their concerns also results in improved financial performance (Porter and van der Linde, 2005; Waddock and Graves, 1997). It is with these theoretical lenses that we can see that developing a sustainable supply chain results in developing a good reputation among stakeholders, which can lead to improved financial performance.

The phenomenon this paper investigates (i.e. research question) is from the stakeholders’ perspective i.e. professionals in the upstream telecom supply chain, and the resultant framework can be applied by stakeholder in focal firms, as well as by other telecom firms and other firms to acquire supply chain sustainability. Our conceptual framework explains the importance of stakeholders, e.g. role of component suppliers, contract manufacturers,

hardware OEM, and distributors, along with the focal firm, that forms the telecom supply chain.

2.2. Conceptual Framework

From literature, overlapping themes are observable. In an upstream supply chain of a telecom firm there exist various kinds of suppliers for component procurement, manufacturing, and distribution. In order to successfully implement SSCM in any supply chain's upstream flow, the following six should exist.

Setting criteria for supplier selection (minimum: social and environmental standards), Communication with supplier (Seuring & Muller, 2008), SSC management (certification, supplier training and development) and SSC measurement (Supplier Audit, KPI's to measure performance, evaluating supplier progress) (Stefan et al., 2014), Collaboration with the Supplier (developing communication channel, logistical and technical integration) and Risk Management (Beske & Seuring, 2014).

A pictorial presentation of the important sustainability oriented factors is given below:

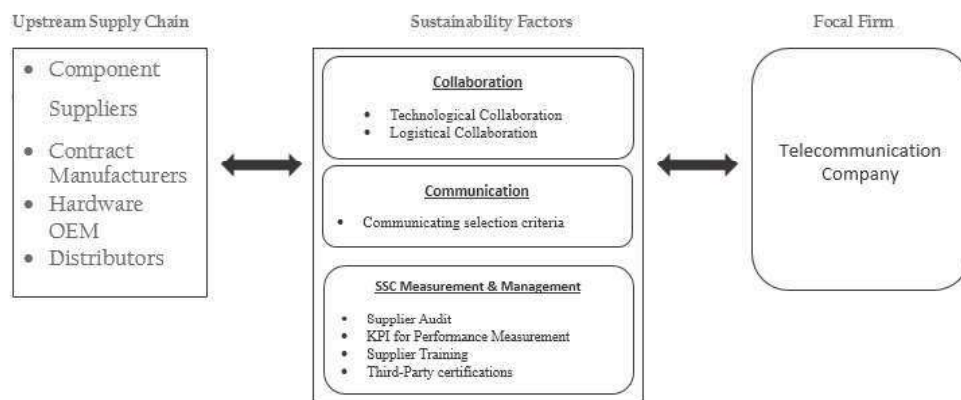


Figure 1: Initial framework for upstream Sustainable supply chain management in the telecom sector

3. Methodology

The case study method was selected as Yin, (2013) has emphasized that we may use it if there is less or no control on the occurrence of the event. Moreover, the research is of exploratory nature. The selected organization is a well-known telecom company, and is being studied as it is developing a sustainable supply chain that focuses on sustainability criteria: economic,

environmental and social. The name is not mentioned due to confidentiality issues. The case is at supply chain level. The research approach is qualitative, as the researchers are studying participant views of an existing phenomenon in a certain context, by using multi-source data collection (Yin, 2015).

3.1. Data Collection

For the study, data collection methods are summarized as follow:

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"> Pakistan Sustainability report 2014. Global Sustainability report 2015. 	<ul style="list-style-type: none"> 1st visit; Interview 2nd visit; follow-up questions, discussions interview guide approval Company Website visit Visit to company for conducting rest of the interviews

Semi-structured interview consisted of ten questions and additional ten follow-up questions. Questions investigate about the sustainable supply chain management practices and strategies that the focal firm utilizes to make its supply chain more sustainable. Furthermore, all interviewees were presented with an interview guide and the questions beforehand. Participants for data collection include company personnel (directors, manager etc.) responsible for the firm's sustainability initiatives, and the firm's upstream suppliers. Total of 10 participants were selected, these included 1 director for occupation, health & safety, 1 warehouse manager, 1 Manager Corporate social responsibility, 2 Regional SC manager, 3 Assistant supplier chain manger, 1 Auditor, 1 Director Administration call-center (out-sourced to supplier)

External validity is established by comparing theories with findings, i.e. analytical generalizability. For reliability, case study protocol was followed throughout the study (Yin, 2013). Thus, a successful triangulation was achieved.

4. Findings

For the case firm, it is observed that collaborations are standard, as established partners are

hired. Despite the importance of supplier's social and environmental practices, financial capacity is the key factor. In such partnerships the case firm is dominant. Collaboration is done with suppliers only in the form of outsourced services. Some of the supplier employees are retained within the case firm's premises. Communication with suppliers for SSCM consists of communicating selection criteria, and communicating that the company highly values sustainability. These are the criterions, pre-selection. Post selection criteria are:

- Enhancing communication.
- Providing feedback.

While partnering with new suppliers, globally accepted environmental, health, and safety criteria are communicated. The suppliers sign legal contracts to follow the company's code of conduct. The suppliers that are below standards or violate them are penalized. The firm enhances communication by conducting meetings, calls, emails and visits. Supplier performance result sharing depends upon relations with the suppliers. For outsourced call centers, the performance is measured within a day, for technical services it can take months. For long-term suppliers, performance reviews are done twice annually, and feedback is provided to poor performing suppliers, with suggestions.

Many tests are present to measure and manage SSCM with suppliers:

- KPIs,
- Audits
- Monitoring and evaluating performance
- Risk assessment
- Training
- Third part certifications

For desired results the company has provided training to the outsourced call center. Audits of the firm and its suppliers are conducted by third party auditors and results are shared for transparency. Quarterly inventory and supply chain audits are conducted for smoother operations. KPI are pretty standards, call center performance is measured by standard call service KPI. The firm expects their vendors' supply chain to be developed, certified and be in-line with ISO 14001 standards. Site visits are conducted to assess the supplier's ecological, safety and health conditions.

A sustainable SC results in cost reduction and positive reputation, a viewpoint endorsed by Freeman (2010) in the stakeholder theory and by recent consumer demands. Dimensions for supply chain sustainability are environmental, social, and economic (Carter & Rogers, 2008).

To ensure sustainable management of the supply chain, the focal firm starts by focusing on the vendors first. Targeting vendors is also mentioned in previous literature (Muller & Seuring, 2008). Before any suggestions regarding sustainability is given, the current supply chain needs to be studied. The focal firm's attitude towards SSCM is standard, i.e. not reactive or proactive, but accommodative.

5. Discussion

From findings it is observed that the firm is taking standard initiatives for SSC that are mentioned in literature, yet advance steps need to be applied for breakthrough SSCM. The findings result in improvements to the initial framework; the criteria for SSCM are now listed according to the firm's conditions and attitude towards sustainability and how to act to increase its commitment to SSCM.

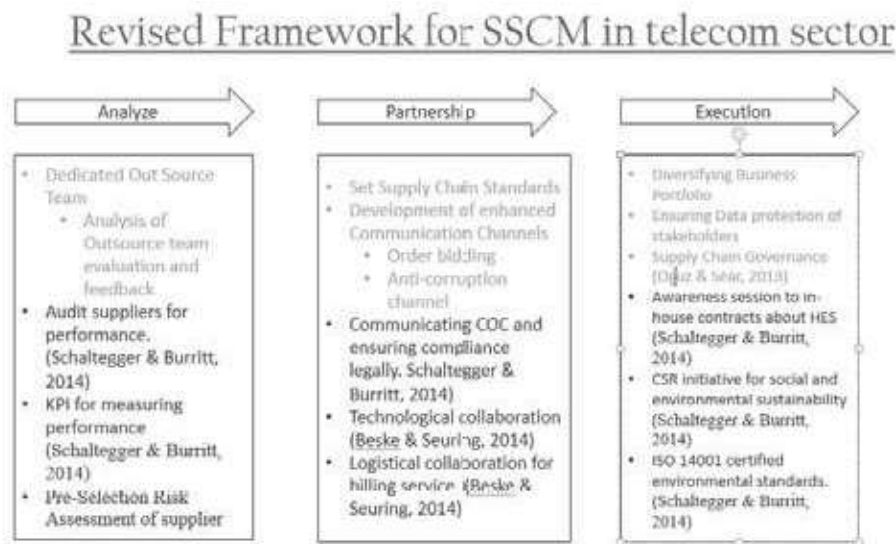


Figure 2: Strategic Framework for Upstream Sustainable SCM.

This proposed strategic framework

- Highlights possible steps to make upstream SC further sustainable.
- Divides pursuable activities into stages to achieve upstream supply chain sustainability.
- States new researched practices that can be used to leverage assets and gain competitive advantage.
- Is developed specifically for the case firm and its industry, i.e. telecom sector.

For a case study to be significant, valid, and reliable, it is important to analyze the collected data. This can be used to achieve construct validity, external validity, internal validity, and reliability. The purpose of reliability is to ensure that the findings of the case are constant regardless of repetition Yin (2013). In the current case reliability is achieved by applying case study protocol. External validity needs to be achieved for making findings generalizable. In case studies the generalizability is analytical, i.e. findings are generalized to a theory (Yin, 2013). This case study is grounded in the stakeholder theory. The findings are generalizable to the telecom sector. For internal validity pattern matching method is used.

6. Conclusion

6.1. Managerial Implications

This paper develops a framework that managers can use to assess current challenges faced in achieving Sustainable SCM, and to identify what steps can be taken to make SC more sustainable. The authors hope that the framework will be used by managers in the supply chain department of telecom companies, in order for self-evaluation within the sector. The self-evaluation should then be incentive to improve the companies' supply chain by introducing more sustainability initiative in the supply chain with the help of their suppliers.

6.2. Theoretical Implications

Similarly the framework will be a positive contribution towards sustainability literature by providing a platform for future research that will lead to similar researches that can improve the final framework and make significant improvements.

6.3. Limitations & Future studies

Future research could focus on complete supply chains, i.e. multi-level stakeholders. For result testing and contribution to current work, multiple case studies can be conducted; this will provide an intra-industry perspective. Future studies should research different strategies to collaborate with their stakeholders, not only with the supplier, but also with other stakeholders to make the supply chain more sustainable.

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