



An Investigation of the Challenges Faced in the Implementation of Sustainable Practices: A Case Study of Textile Firms in Faisalabad

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Abstract

Sustainability argues to control the current needs efficiently without risking the resources for future generations. Although the concept of sustainability has received a considerable attention in textile market, little is known about the implementation struggles of textile firms across industrial sectors. The textile industry is also very pollutant industry as compared to other industries globally. This study provides a deep qualitative and descriptive analysis of the sustainability concepts, its goals, certification requirements and the challenges faced by textile firms in implementing sustainability in Pakistan. The challenges textile industry face while implementing sustainability are many. From product designing to manufacturing and to post-processing activities, the process of creating green products and recycling these products is a real task. Maintaining the quality of recycled fiber, emission of GHG, Complexity in raw material and component parts, Complexity in the structure of product, Complexity in developing the functionality of product, degree of recycling after usage, business model challenges are one of many challenges faced by firms. Sustainable practices include using lowest possible amount of chemicals, water, pesticides, fertilizers and adopting production processes that are eco-friendlier like using less energy for production.

1. Introduction

Sustainability is a broad concept that focuses on protecting the climate and earth and promoting social development to protect life on earth without endangering or leaving anyone behind. Sustainability argues to control the current needs efficiently without risking the resources for future generations (Purvis, Mao, & Robinson, 2019).

Sustainability postulate that the resources of our world are scarce and must be used conservatively and efficiently keeping in view the long-term goals and consequences to use such resources. Sustainability is a concept of long-term welfare of the world, while sustainable development is the process or ways to achieve sustainability (UNESCO, 2015). Sustainability has three basic pillars i.e. Economic, Environmental and Social. Commonly they are known as Profits, Planet and People (Purvis, Mao, & Robinson, 2019).

1.1 Textile Sector of Pakistan

Textile industry of Pakistan is very large and it is the eighth largest exporter of textile goods in Asia. There are estimated 432 industries of textile are currently running in Pakistan. It has a huge impact on the economy of Pakistan and 60% of the total exports of Pakistan constitute textile products. Pakistan is a very large producer of raw cotton due to which they give support to more than 10 million farming families.

In order to survive in the global competition, textile sector of Pakistan needs to adopt more sustainable practices throughout their supply chain in order to enhance their production capacity and to provide more value in a competitive global market. Ministry of textile sector has set new goals to accomplish by the end of 2024/2025. That is, to increase exports of textile products and becoming more competitive in competitive global market. Textile industry consumes a large amount of resources including water. The resources in our nature are not inexhaustible, they are scarce and must be balanced by sustainable practices to save Mother Nature (Fog, 2021).

The textile industry is also a very pollutant industry as compared to other industries globally. It plays a major role in environmental pollution (pollution of water bodies, waste generation, and air pollution) throughout the supply chain. Therefore, Textile industry has to rethink its strategies and adopt more sustainable practices to reduce excessive water consumption and reduce carbon and greenhouse gas emissions to save the life on earth.

THE SUSTAINABILITY CHALLENGE



Sustainable practices include using lowest possible amount of chemicals, water, pesticides, fertilizers and adopting production processes that are more eco-friendly like using less energy for production and adopting 3Rs—Reduce, Reuse, and Recycle (UNESCO, 2015).

Every step in the textile chain focuses on different aspects of sustainability, which can be summarized as follows:

1. Production factors, including water and energy consumption
2. The availability of sustainable raw materials
3. The effects of waste production
4. The social responsibility of the companies towards the employees and the communities surrounding the plants
5. The use of chemicals, including dyes and coatings
6. Health risks for textile workers and consumers
7. Animal welfare (procurement of wool or down)

1.2 Circular Economy

Circular economy (CE) is a sustainable approach against the linear economy approach. The model of circular economy involves producing, distributing, collecting, repairing, and recycling of resources and products as long as possible (Lieder & Rashid, 2016)

In contrast, linear economy is a model of take-make-waste. The resources are used to manufacture product and after its consumption it become waste due to the way it is created and used.

Circular economy is a more sustainable model of economy where the products and resources are manufactured, shared, recollected, remanufactured and recycled to reduce the impact of pollution created by industries on our environment and human kind. Thus, circular economy minimizes the use of raw materials and natural resources reduce waste, prevent pollution and excessive carbon and greenhouse gas emissions (Lieder & Rashid, 2016).



1.3 Certificates

In order to achieve sustainability there are several standards developed after thorough research and certificates are issued if the implementation of these standards are followed properly. Sustainability certificates ensure the security of our Mother Nature, consumer, manufacturer, worker and society as a whole. Each industry has a goal to achieve the maximum level of sustainability that can only be achieved if three pillars of sustainability are satisfied—environmental, social and economic (T.Tsoulfas & Pappis, 2006).

There are certain standards set for each dimension of sustainability and certificates are provided if these standards are being met or not. Sustainability certificates ensure that the textile production processes has a least possible impact on environment. They also play a role to secure the labor rights, to make sure the labor is in good health and working conditions are not hazardous. Companies are bound to get certified in order to gain trust of consumers that they practice processes that are harmless for everyone.

There are many types of standards and certificates. Some of the certificates that are more relevant to sustainable practices are (TEAM, 2022):

1. Global Organic Textile Standard (GOTS)
2. OEKO-TEX® Certification
3. ISO 14000 Environmental Management
4. Cradle to Cradle Certified Standard
5. Textile Exchange (TE) Standards
 - GRS—Global Recycle Standard
 - RDS—Responsible Down Standard
 - RCS—Recycled Content Standard
 - OCS—Organic Content Standard
 - CCS—Content Claim Standard

1.4 Research Problem

The textile industry is the largest manufacturing industry in Pakistan but it is very pollutant and plays a major role in environmental pollution throughout a supply chain. Since, Pakistan is the 8th largest exporter of textile products. So in order to compete in global competitive market, Pakistan has to utilize its resources efficiently to protect our planet parallel to the needs and demands of economic growth of Textile Industry which is the second source of GDP growth. The purpose of this study is to investigate the real challenges faced by firm to implement the sustainable practices in real terms.

2. Literature Review

Textile industry provides vital roles in our lives and it is one of the largest industries of the world (Lieder & Rashid, 2016). Textile industry of the world is about 1 trillion dollars in worth. Global textile industry constitutes 7 percent of total exports of the world and it gives employment to about thirty five million people globally (Larson & York, 2008).

Due to increase in global competition in textile sector, the demand to increase production has increased along with employment (King & Berchicci, 2022). Textile industry has a major role in providing employment but it is very pollutant industry worldwide. Textile industry consumes large amount water, fuel, chemicals and other resources in large amounts. It has been reported that more than 35% of the chemicals in the environment are the by-products of textile dyeing and manufacturing processes (Hasanbeigi & Price, 2015). Textile industry worldwide consumes around 3 trillion gallons of water to produce 50 billion kg of fabric (Missimer, Robèrt, & I Broman, 2016)

There are also some comments on the technical aspects of the textile industry. However, none of the researchers explored existing work in the context of implementing these problems for the industry. However, the literature exists on a variety of topics such as textile companies' motivations for adopting environmental practices, their strategic responses and the types of strategies followed, and barriers to implementing these strategies (Larson & York, 2008)

Sustainability prerequisites and practices are based on a triple bottom line (TBL) approach, which includes the economic, environmental and social dimensions of sustainability

Sustainable Supply Chain Management (SSCM) is defined as "the management of the flow of materials, information and capital and the cooperation between companies along the supply chain, while integrating the objectives of all three dimensions of sustainable development, namely economic, environmental and social.

The Textile industry is very pollutant industry for environment and it is very socially challenged. Some of the issues of sustainability are: (1) non-recyclable materials and mixtures, (2) use of water, (3) use of hazardous chemicals, and (4) human rights (McDonough & I Braungart, 2002)

Dry processes cause serious environmental damage. Natural fibers require a large amount of chemicals and water intake, along with pesticides, herbicides during their harvesting time (M. Armstrong, Niinimäki, iKujala, & lang, 2015). Another major issue related to textile is the contamination of water after use. It contains dangerous hazardous chemicals including mutagens, carcinogens and many more. If not treated properly before discharge it can leave a hazardous footprint on environment (Hasanbeigi & Price, 2015).

Another issue is the emission of GHG from the processing of yarns created out of synthetic fibers. In developing countries, another big issue is the lack of labor rights and proper working conditions. It is known that in developing countries child labor, forced labor, ill structured working environments, low wages and safety of employees are very common (Su, Heshmati, Geng, & Yu, 2013). These are few of many challenges faced by textile sector to implement sustainability in collection of resources, yarn to fabric manufacturing, distribution and recollection after use and waste management (Renzo Mori Junior John Fien and Ralph Horne, 2002) so it is very important to deeply analyze the challenges faced by textile sector to implement sustainability.

To speed up the revisions, we've worked hard to ask governments to redefine their urgency and mediate more forcefully, and we want to know if businesses and manufacturing are prepared for all the changes that may come. The Real World Mission is designed for those who work in the construction industry using energy, recycled materials and surplus while determined to find a green and ethical business status. Work for organizations that operate within budget but also report on their sustainability metrics and triple bottom line (environmental/economic/social) performance. (S. Parkin F. Sommer and S. Uren, 2021)

Sustainable development goals are a very beneficial way for organizations and society as a whole to put their efforts alone or collectively to solve major sustainability issues. Hence, it is not an easy task to implement them and must be taken seriously. It should be a prime duty of everyone to incorporate the sustainability in each step of their business decisions; as a result the accountability of the firms will increase. The processes of implementing sustainability development goals must be transparent and must be incorporated by policy making, decision making, operational functions to achieve SDGs (Renzo Mori Junior John Fien and Ralph Horne, 2002)

There are also some comments on the technical aspects of the textile industry (Larson & York, 2008). However, none of the researchers explored existing work in the context of implementing these problems for the industry. However, the literature exists on a variety of topics such as textile companies' motivations for adopting environmental practices, their strategic responses and the types of strategies followed, and barriers to implementing these strategies (MacArthur, 2013)

3. Methodology

In this study an inductive research design has been used as it is best to study the phenomena. The qualitative data approach is used from multiple case studies, meaning a deep analysis of proposed concept has been used to investigate the issues in real practical terms. Multiple case studies is very helpful to make a strong base, bringing more clarity about the subject under study. It also allows the overlapping of processes among several cases to make more generalizable and testable conclusions (Eisenhardt, 1989).

A focus group discussion along with unstructured interviews will be conducted from three selective mills i.e. Interloop, Kalash and Sadaqat mills limited. These industries are one of the largest textile industries located in Faisalabad that claim to practice sustainability at maximum possible level. Hence, descriptive study will prove to be best to answer research questions.

The study used snow balling sampling method to select the sample and conducted unstructured interviews with employees of well-known designations at Interloop Limited, Kalash pvt Limited and Sadaqat limited.

Unstructured interviews are conducted with our sample and results have been generated about the sustainability challenges and the implementation of pre-requisites of certification bodies. A detail analysis about how each textile industry is contributing toward more sustainable world has conducted and at how much degree each industry is using and

taking into account the concept of circular economy. Interviews that have been conducted are recorded and decoded using qualitative data analysis software. First, we created case stories from the interviews conducted directly (primary Data) and second, the data from previous studies have also taken in account through internet (secondary data) to provide overall view of sustainability challenges in textile sector.

4. Results and Discussions

The implementation of sustainability is a challenging task in textile industry as the concepts of linear economy is more common everywhere. From product designing to manufacturing and to post-processing activities, the process of creating green products and recycling these products is a real task. In order to create a green product, it must be designed with multiple perspectives in mind like its manufacturing, usage duration, life cycle and its recycling patterns after usage. Sustainability greatly depends on innovative technologies

4.1 Product Design

- The challenges faced in designing product are:
- Complexity in Raw material and content parts
- Complexity in the structure of product
- Complexity in developing the functionality of product
- Degree of recycling after usage

It is so difficult to find the ecological alternatives of the component parts of textile products. It is the first challenge to find raw material and then its other components required to process the materials. Second challenge is the number of materials required for production that must be limited and specified. Because more components a product need to be manufactured the more difficult it becomes to find a sustainable alternative of those materials. As the concern for sustainability in textile sector has emerged very recently, it is rather difficult to find materials and ecological components to design sustainable products. It is a major constraint in developing sustainable products.

Another challenge about product design is complexity in the structuring of product. When the product or fabric and its components are mixed up together in a product, it is difficult to separate them and recycle them. The solution to this problem is the usage of component that either decomposes or can be retrieved after its useful life. Nonetheless, complexity in structure means the way all components are attached to each other (Correia, 2019). Interloop has found a solution to this problem and they replaces the fiber with upholstery fabric and changes the way components of product attached together so that they can separate and recycle the product after its disposal.

Challenges in designing the textile product functionality are many. First, the company wants to develop the high quality product along with functional loops they want. Various types of physical and chemical treatments are applied to textile products order to achieve the desired quality and features. It includes UV protection, insect protection, water and oil resistance and many more ((Souza, 2012).

4.2 New Product Development

The previous section tells us about the challenges faced by firms by transforming already existing products into sustainable ones. This section will provide a deep insight of challenges faced by firms in developing new and innovative products and maintaining their sustainability. Innovation is the key to success in the textile industry and in order to succeed in the new development of products; buyer-supplier cooperation plays a vital role and determines the 50% success of the product. But there are many hurdles as it took major time and money to invest and follow the vision.

Firms need a high degree of cooperation and rely on firms within their supply chain in order to succeed in innovative product development (Curtis & Mont, 2020). There are several names given to this process such as ecological collaboration (Guyader & Piscicelli, 2019), green project partnership (Vachona & Klassenb, 2006), product-based green supply (Laukkanen & Tura, 2020).

4.3 Price Competitiveness and Low Customer Demand

Low consumer demand for sustainable products is a major and most important issue. As in order to implement sustainability, industries need the customer that not only has the willingness to buy the sustainable products but also wants to pay the price for it. Sustainable products are very expensive due to their high cost in manufacturing the product in an environmentally friendly way and getting the certificates for practicing such practices.

Interloop, Kalash and Saqadat all these firms do not purchase in bulk quantities rather in small amounts to make more sustainable garments. As a result they do not get the advantage of bulk buying and low costs that they could get in a normal procurement process. As the demand is low they also produce sustainable products in small amounts and prices become high.

4.4 Business Models

Business model means value proposition, what is customer need, value creation and delivery, how well firms are able to create and deliver customer value and monetizing the value (Ren, 2000).

There are many challenges in implementing, developing and practicing sustainable products strategies. Therefore, in order to succeed in the market textile firms need to make unique and innovative business models to thrive in the market. They must look for more economical ways to recycle and reuse the products and materials.

With the development of new products a new business model must be developed in order to comply with the product. Not all products can survive in similar business models. None of the firms in the sample are reported to be implementing these strategies.

4.5 Quantity, Quality, Timing

Another big challenge to implement sustainability in the textile sector is the post-consumer waste management. The waste recollected must be in adequate amount, size and

price to be recycled. The recollection of disposed of garments need right amount, right quality, right time and right price to be able to reused in order to achieve sustainability. Another challenge is that one must know the difference between biodegradable waste and technical waste. Biodegradable waste is collected and composting occurs. On other hand technical waste after recollection disassembling occurs. What will be the quality of waste depend upon the quality of product at start and its useful life. Textile products mostly become so damages after use that it doesn't remain feasible and become economically useless to reuse the product.

4.6 Comparative Analysis of Sample Firms

Many companies are now taking steps to promote the development of the environment and its sustainability. Large groups are disposing of their waste before discarding it into the environment. For example, boiler gases are filtered; wastewater is treated to reduce its hazard. Even they are striving to achieve zero emissions of harmful chemicals. But before dealing with the outside world, they have an internal community. So instead of using their children as labor, they work for their education. Different people with disabilities get jobs that they can easily manage. Production plants are being installed in uninhabited areas. They also paid for charities. Because changing people's lives and healthy environments is the real development.

Klash (Pvt) Ltd is a knitwear processing and knitting company. They take corporate social responsibility seriously and strive to fulfill their responsibilities to society. The first is to run a charitable foundation. Representatives of this foundation move to different backward areas, looking for children who are working at school age to meet the daily expenses of their family, or even if they are not working but not studying because of lack of money.

The foundation paid for the children's tuition. With the coordination of the hospital, they are paying for free medical care for those in need. Trust Hospital is also a project of the organization dedicated to the education of children with disabilities. Also, pay for some women's colleges to educate women because they are an important part of our society. The La Shan program runs monthly and annually. In addition, in order to protect the environment, a large amount of money is also spent on the effective treatment of hazardous waste discharges. They advocate installing trees to create a clean environment. They offer students an annual internship based on grades, allowing them to study practical work alongside theory. They provide special funding for the brilliant children of their employees to study at excellent universities. They have a three-month internal audit system as well as external inspections to maintain a healthy internal and external environment

Sadaqat Ltd is an integrated textile processing factory mainly exporting garments, denim and bed linen to different countries in USA, Europe and around the world. In addition to maximizing profitability, they also make many efforts towards environmental sustainability. They built a housing complex for the poor to live in for free. They give household grocery monthly and yearly for different parts of the country. They fund different charities. They have a quarterly audit system that checks the emissions to make them non-

toxic. They offer an MTO program to select new graduates on the merits. They pay different school fees for free education for poor students. PF funds are provided to employees.

Interloop limited is a local textile processing company with a strong reputation in the textile market. Their clients are some local brokers and shop owners. They are strictly committed to sustainable development. They pay NGOs to maintain warm homes that take care of the elderly. They spend a lot of their profits on maintaining the machines, so they may reduce the risk of accidents. They also pay for the education of poor children. Despite being a local company, they use green products as environmentally sustainable raw materials. Emission of NOXs and SOXs is strictly prohibited to keep the air clean. They facilitate the installation of trees. They provide farmers with funds to promote agricultural development.

4.7 Impact of Sustainability on Sample Firms

Sustainability improves business reputation. Investors are more likely to put their stake in an organization that is dedicated and serves nature. Gender equality increases the chances of finding great minds. Using gender parity, the size of the global economy can be increased by 26%. Sustainable use of water will make water available for longer and sanitation systems will be easier to manage. Laborers like to work for organizations, even if wages are low, where the environment is peaceful, their lives are safer, and basic rights are granted. Working in a peaceful environment will reduce the chance of management errors and accidents. The corporate environment will increase the opportunities to deal with and identify problems, thereby increasing production. Greenery promotes good health and therefore reduces maternity leave rates. Promoting education leads to an increase in the number of students, which in turn increases the number of problem solvers. The increase in the number of universities leads to an increase in innovations in each field that will develop short-time production processes as well as low-capital cost processes.

The development of agriculture will provide opportunities for farmers, thereby increasing the gross domestic product. Unlock \$12 trillion in annual business opportunities with the Sustainable Development Goals. A global partnership can protect the world from different epidemics. Encouraging renewable energy aims to achieve sustainability goals and thus increase profitability as energy is a major/fundamental factor for the industry. Using waste to produce energy helps to clean the environment and provide energy. This will also use the workforce to increase employment opportunities and end hunger in order to achieve the Sustainable Development Goals.

Interloop limited buys products from local sources to support small traders. They even buy from local suppliers, get certified products, an annual audit system, a peaceful environment, and donations to charities. Employees get decent salaries. Research and development are motivated

Sadaqat Ltd provides free housing for single employees, turns to new and better processes through innovation from time to time, and pays for housing for the homeless. Stand with the government in emergencies and regularly inspect plants and machinery. Innovative inspection measures and techniques used make the environment less polluted. Support poor

families and use certified commodities as raw materials. Each employee is also encouraged to express their opinions in a comfortable environment. Invest in research and development, management trainee programs and wastewater treatment prior to discharge.

Klash (Pvt) Ltd takes proactive measures to achieve the Sustainable Development Goals such as regular factory inspections, boiler inspections, regular employee medical examinations, machine inspections, air inspections, waste water inspections, etc. Employees are recruited on merit and gender equality is considered. Plant trees, financially help those in need, and work with governments to actively participate in emergency areas. Research and development, funding for employees, and safety instructions can be seen everywhere.

Revocation is prohibited. All employees have equal rights and make decisions based on the best. The raw materials used are tested and certified by large and renowned organizations around the world. Renewable energy is preferred. Apply innovative procedures and try to reduce energy waste. The environment is comfortable and peaceful, avoiding noise pollution, and employees are strictly prohibited from working during processing without taking appropriate safety measures. Clean the factory to avoid accidents. The medical team is always available, has annual bonuses, and performs well. Pay to educate people in need, expand business to generate new employment opportunities. Mission to overcome hunger, donate to charities and provide free transportation for employees.

5. Conclusion

Sustainability is a broad concept that focuses on protecting the climate and earth and promoting social development to protect life on earth without endangering or leaving anyone behind. It is a pathway to achieve a more sustainable world and life for all. The textile industry is also very pollutant industry as compared to other industries globally. It plays a major role in environmental pollution throughout the supply chain. Therefore, a model of circular economy is developed. Sustainability certificates ensure the security of our Mother Nature, consumer, manufacturer, worker and society as a whole. The challenges textile industry face while implementing sustainability are many. At first, maintaining the quality of used fibers after recycling is a very challenging thing to maintain. Dry processes, on other hand, cause serious environmental damage. Another issue is the emission of GHG from the processing of yarns created out of synthetic fibers. Challenges in designing the textile product functionality include: First, the company wants to develop the high-quality product along with functional loops they want. In order to succeed in the market textile firms need to make unique and innovative business models to thrive in the market. They must look for more economical ways to recycle and reuse the products and materials with the development of new product a new business model must be developed in order to comply with the product.

Recommendations

Textile processing needs to be innovative to reduce waste heat, pollution fumes and noise emissions. Textile dyeing using a continuous sustainable process leads the way in batch dyeing, resulting in reduced time savings and safe processing. Digital printing appreciates the eradication of solution emissions, resulting in a clean process with virtually zero emissions of

harmful gases. Boiler stacks are being treated to reduce harmful emissions to the atmosphere for a safe and healthy environment. Industrial chemicals are used after they have been properly tested and defined as harmless by designated organizations. Sourcing materials locally or in nearby countries. The barriers that factories face in implementing the SDGs will slow down their sustainability progress. This may be due to a lack of proper understanding of the SDGs, which will create barriers to implementing SDG measures. Often small companies or sometimes even large groups do not have enough capital to take sustainability measures, which is why they cannot implement the SDGs even if they wanted to.

With the development of new product a new business model must be developed in order to comply with the product.

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