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Determination of drivers in embedding environmental sustainability practices in the apparel sector of Sri Lanka

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Abstract

Apparel is the second most polluted industry in the world after oil. Therefore, implementing environmental sustainability practices in the apparel sector is a buzzing topic discussed worldwide. The apparel industry is the prominent export revenue generator of Sri Lanka which contributes to more than 40% of its export income.

This research was done to determine the drivers in embedding environmental sustainability practices in the apparel sector of Sri Lanka. Data was collected using a mixed method approach using quantitative data collected through an online questionnaire survey (205 respondents) and qualitative data gathered via semi-structured interviews (30 interviews). Sample size and data analyzing methods were decided using globally accepted scientific methods.

The researcher didn't find any previous scholarly work of a similar study about the apparel sector of Sri Lanka even though many studies were found on the same topic related to other major apparel manufacturing countries in Asia and Africa. Thus, five drivers namely pressure from brands and retailers, enhancing organizational reputation, reduction of operational cost, government regulations, and safety of workers were extracted through the extensive literature survey conducted using previous scholarly work of other countries which were further evaluated for Sri Lankan context using above mentioned quantitative and qualitative data. It was found that all these drivers were relevant to the apparel sector of Sri Lanka while pressure from brands was the most influential and safety of workers was the least influential driver. No other drivers were mentioned by any of the respondents apart from the above-mentioned factors.

Keywords: Environmental Sustainability; Drivers; Apparel Sector; Sri Lanka

1. Introduction

The apparel industry is the world's second-largest consumer of water, accounting for 20% of global wastewater (Dehghani and Goyal, 2022). One cotton shirt requires 2700 liters of water, the amount a human drinks in 2.5 years (Liu et al., 2021). The apparel industry accounts for 10% of global carbon emissions (Okafor et al., 2021), and cotton farming accounts for 24% of insecticides and 11% of pesticides despite using only 3% of the world's arable land (Ahirwar & Behera, 2021). Also, 85% of all apparel goes to the dumps each year, and washing several types of clothes sends thousands of bits of plastic into the ocean (Gupta et al., 2022). The apparel industry has emerged as one of the biggest and most rapidly expanding industries in the world. There are many operations throughout the value chain of the apparel sector from yarn manufacturing to final product finishing such as but not limited to dyeing, printing, washing, cutting, sewing, bonding, and packaging. If the current consumption trends continue, there will be three times as many natural resources required by 2050 as there were in 2000 (United Nations, 2019).

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Sri Lankan apparel manufacturers and suppliers have built a strong global reputation for producing premium-quality apparel trusted by global fashion brands over the years. The apparel sector of Sri Lanka is the most important and active contributor to the nation's economy. There are about 300 apparel factories operated in Sri Lanka (Varshney, 2022). All apparel factories are fully privately owned and operated (Export Development Board Sri Lanka, 2022). As per 2021 data released from the Sri Lanka Export Development Board, export revenue from apparel is $5.42 billion in 2021 which is 44.24% of the 2021 total national export revenue. The targeted export revenue of this industry is $8 billion by 2025 (Export Development Board Sri Lanka, 2022).

For many years, the Sri Lankan apparel sector has championed the cause of sustainable manufacturing. This dedication has resulted in significant changes in manufacturing processes, sourcing strategies, and product innovation, establishing Sri Lanka as a leading destination for brands concerned about the environmental impacts of their clothing. Sri Lanka is delighted to own the first custom-built green clothing factory in the world as well as Asia's first carbon-neutral certified factory. It also has several of the world's first apparel manufacturing plants to be certified as "Net-zero carbon." (AWGNM, 2021). However, with the growing demands of brands to incorporate more and more environmental sustainability requirements throughout the supply chain, it is a must to identify the drivers to capitalize on them for the continuous improvement in environmental sustainability practices. Therefore, this research is conducted to address this research gap since this is a vital research area to investigate to cater to this increasing demand for environmentally sustainable fashion and increase the market share for the Sri Lankan apparel industry to achieve its above-mentioned 2030 target.

2. Literature review

There are no studies found in the available scholarly work on drivers in embedding environmental sustainability practices in the apparel sector of Sri Lanka. However, some studies discuss these drivers in other neighboring South Asian countries such as Bangladesh and India where the apparel sector is a key component of respective economies. These studies provide key points of guidance for the Sri Lankan study.

2.1. Pressure from brands and retailers

In 2019-2020, the apparel industry contributed 83% of Bangladesh's total export earnings, totaling 27.94 billion US dollars (Karim et al., 2021). Two different scholarly works by Bappy et al. (2019) and Sabuj et al. (2020) have found that pressure from brands and retailers is a key driver in embedding environmental sustainability practices in Bangladesh's apparel sector. Selim (2018), Nath (2019), Kumar et al. (2020) and Zhang et al. (2020) have confirmed the same as a key driver that influences Bangladesh's apparel sector to incorporate environmental sustainability practices. As per research done by Desore and Narula (2018), "pressure from brands and retailers" is a key driver in embedding environmental sustainability practices in the apparel sector of India. European brands are the largest importers of apparel from India. These brands frequently have stringent environmental sustainability requirements and supply chain policies that prioritize environmental sustainability. To gain access to the European market and secure export opportunities, Indian apparel manufacturers must adhere to these environmental sustainability requirements. Pakistan's apparel supply chain ranks eighth globally in terms of exports. Since the 1970s, the Multi-Fiber Arrangement has played an instrumental part in the development of their economy (Fontana et al., 2021). Akhtar (2019) has mentioned that pressure from customer brands and retailers is a salient driver in implementing environmental sustainability practices in the apparel sector of Pakistan. Another study done by Jeon et al. (2020) found that pressure on the supply chain due to the environmental sustainability commitments of several international brands is a key driver in embedding environmental sustainability practices in the apparel sector of East Asian countries.

2.2. Reduction of operational cost

A low-cost product is one of the industry's primary motivators for its commitment to environmental sustainability practices (Silvestre et al., 2018). Over the past few years, the circular economy has dominated policy-oriented and academic dialogues about how to make industries, such as fashion, more sustainable. Core to the concept of circular economy is maximizing resource efficacy and minimizing waste. This has become one of the primary motivating factors for many industries, including the apparel industry, to integrate environmental sustainability practices throughout their value chains (Brydges, 2021). Circular economic practices include practices such as reducing, recycling, recovering, and reusing (Kristensen and Mosgaard, 2020). Apparel sector organizations can manufacture low-cost products by reducing their operational costs through embedding environmental sustainability practices throughout their operations. Organizations including apparel interested in reducing operational costs by using energy and water-saving practices (Niinimäki et al., 2020). Some of these practices are incorporating renewable energy like solar to replace conventional energy sources with high costs and installing water-efficient fittings to reduce water consumption to decrease water cost. Nath (2019) and Alam (2021) have identified this factor of reducing operational costs as a key driver that

influences to incorporation of environmental sustainability practices in Bangladesh's apparel sector. As per another study done by Selim (2018) about Bangladesh's apparel sector, operational costs can be reduced by implementing environmental sustainability practices since that will reduce pollution control costs due to manufacturing activities through cleaner production practices. Research studies done by Roy et al., (2020) and Saha et al., (2021) indicated that the reduction of operational cost has become a key driver in the apparel sector of India in embedding environmental sustainability practices such as green energy, reuse of water, utilization of recycling materials and reduction of waste. Another study done by Vishwakarma et al. (2022) has confirmed the same driver of operational cost reduction was a key driver in incorporating environmental sustainability practices in the apparel sector of India by optimizing the use of water.

2.3. Safety of workers

The safety of workers is another key driver that influences in embedding of environmental sustainability practices. As an example, the Generalized System of Preferences (GSP) was suspended for Bangladesh by the US in 2013 due to poor environmental and health and safety conditions of workers in Bangladesh apparel factories which resulted in the closure of around 1600 factories (Nath, 2019). The physical and mental health of workers is directly related to workplace safety and hygiene. It also defines hazardous workplace conditions that may have long-term consequences for the worker's health. There are several environmental aspects to be considered when ensuring the safety of workers such as clean water, proper solid and sanitary waste management, wastewater treatment and disposal, adequate ventilation, proper chemical management system, etc. The scholarly work of Kumar et al. (2020) and Alam (2021) has mentioned the safety of workers as a key driver in incorporating environmental sustainability practices in the apparel sector of South Asia. For example, in Dhaka, Water and Sanitation for the Urban Poor (WSUP) in partnership with Kontoor Brands Inc., an apparel company marketing brands such as Lee Wrangler, embarked on a project to improve access to clean drinking water and sanitation services and improve hygiene behaviors for garment factory workers (Wight, 2021). Another study done by Kaizer (2020) has identified ensuring the safety of workers through proper indoor environmental quality and sustainable energy sources as key drivers in embedding environmental sustainability practices in the apparel sector in Asia.

2.4. Government regulations

Government regulations have a significant impact on industries with environmental concerns, such as manufacturing organizations (Gardas et al., 2019). This applies to the apparel sector as well. Therefore, research studies by Tura et al. (2019) and Sabuj et al. (2021) have identified government regulations as a key driver that has influenced the incorporation of environmental sustainability practices in the Bangladesh apparel sector. Not only in Bangladesh, as the focus on environmentally sustainable fashion increases, a variety of new laws and policies are being enacted on a global scale. 2021 by itself has seen significant advancements in fashion's engagement with environmental justice policies. Sweden intends to impose a 'chemical tax' on clothing beginning in 2022, while France is considering legislation prohibiting the incineration of textile waste. In the Netherlands, the adoption of 'Extended Producer's Responsibility' by the fashion industry has yet to receive a parliamentary sanction. In India, all manufacturers are required by law to use approved chemical dyes and to install Common Effluent Treatment Plants (CETPs) that are fully operational and have the necessary approvals from government authorities. Sharma and Narula (2020) also confirmed that government regulation is a key driver of the same objective in the Indian apparel sector. Apparel is included on China's list of sectors that must strive to develop "circular economies" due to the country's new environmental policy. In this approach, the industry focuses on reusing, remanufacturing, and closing the cycle completely so that few resources are lost (SgT Group, 2023).

2.5. Enhancing organizational reputation

India is the second-largest apparel manufacturer in the world. There are several environmental sustainability practices are embedded in the Indian apparel sector and one of the nationwide programmes implemented very recently is the Apparel Industry Sustainability Action (AISA). This was initiated in 2022 by the Indian Apparel Export Promotion Council to motivate apparel sector organizations to incorporate more environmental sustainability practices within their organizations. Apparel Export Promotion Council (AEPC) will inspire sustainable apparel sector organizations, which will be highlighted on a social media site devoted to sustainability for widespread exposure and will ultimately result in a sustainability awards programme. The winners of this programme will be offered the chance to exhibit their apparel collections in an exclusive 'Sustainability Corner' of the India Pavilion at the 2023 Pure London, UK, and Who's Next, Paris fashion hubs. This is the event that apparel sector organizations in India target to showcase their reputation as environmentally sustainable organizations and they conduct many environmental sustainability initiatives to enhance their reputation which they could highlight in this event (Fibre2Fashion, 2022). Abbas and Halog (2021) have identified enhancing organizational reputation as environmentally conservative organizations through circular

economic practices as a key driver to incorporate environmental sustainability practices in Pakistan's apparel sector. Many apparel organizations in Bangladesh tend to obtain Leadership in Energy and Environmental Design (LEED) certification to convey their organizational reputations to the brands and the public since LEED has many environmental sustainability-related criteria to be fulfilled as one of the leading certifications about environmental sustainability (RMG Bangladesh, 2023).

Figure 1 Drivers that influence in embedding of environmental sustainability practices in the apparel sector of Sri Lanka (Researcher, 2023)

3. Conceptual model

Five drivers have been derived through the literature review which have influenced in embedding environmental sustainability practices in the apparel sector of Sri Lanka. All these five factors can be considered as independent variables where embedding environmental sustainability practices in the apparel sector is the dependent variable. As per Yin (2009), demonstrating a correlation between variables (between a dependent variable and an independent variable) is important to the internal validity of a research which is one way of evaluating the validity of a research. However, as described in the research limitations, this study is exploratory. This is the case due to the inductive approach of the methodology used. Instead, rather than evaluating hypotheses, this study aims to answer research questions. Thus, the conceptual model of this research can be depicted as below considering the relationship of dependent and independent variables.
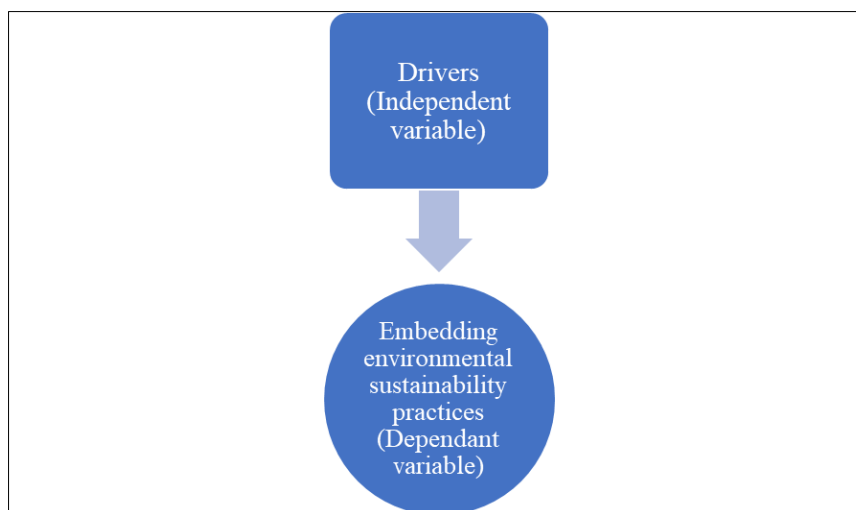
Figure 2 Conceptual Model of the Research (Researcher, 2023)

4. Methodology

There are four basic mixed methods designs explained by Creswell (2014). These are convergent parallel design, explanatory sequential design, exploratory sequential design, and embedded design. The convergent parallel design arises when the researcher utilizes simultaneous timing to implement quantitative and qualitative segments during the same phase of the research process, prioritizes the methods equally, and keeps the segments independent during analysis before combining the findings during the study's overall interpretation. In this research, convergent parallel design was selected as the mixed methods research design since both quantitative and qualitative data have been used simultaneously and equally prioritized during analysis before clubbing the findings to interpret the overall objectives of the research (Creswell, 2014). The below diagram in Figure 3 simply explains this convergent parallel mixed methods design used in this research.
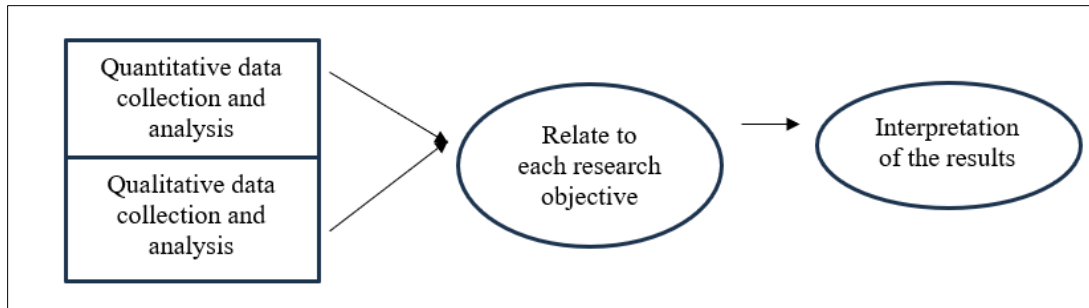
Figure 3 Convergent parallel mixed methods design (Creswell, 2014)

4.1. Quantitative Data Collection and Analysis

Although the use of a questionnaire survey has benefits and downsides, the benefits are believed to outweigh the downsides (Nayak and Narayan, 2019), and therefore an online questionnaire survey was utilized to collect quantitative data in this research. Questionnaire variables, which are the independent variables utilized in the study (five drivers), were derived from the preliminary literature review. Specific questions were constructed with a focus on the response process, the usefulness of individual questions, and the overall structure and aesthetic appeal of the questionnaire. Since the research is primarily relevant to drivers in embedding environmental sustainability practices in the apparel sector of Sri Lanka, it is sensible to choose a population among the people who are involved in the same sector. Therefore, the chosen population is the executive and above category in the apparel sector of Sri Lanka who have been involved in environmental sustainability-related decision-making. Based on the available information from over 300 apparel manufacturing facilities in Sri Lanka, there are 440 executive and above grade (board members, directors, and managers) employees working as environmental sustainability professionals in the apparel sector of Sri Lanka. Therefore, the population size considered for this study is 440. Krejcie and Morgan (1970) have devised a procedure to find the optimum sampling size out of a population at a 95% confidence interval. According to the results stated in the above procedure, a sample of 205 executive and above grade employees was selected using purposive sampling out of the total population of 440 and emailed the questionnaire survey to them. A 4-point Likert scale was utilized in the questionnaire. Respondents were asked to indicate the level of importance of the five drivers derived from the literature survey on a four-point Likert scale ranging from "Not at all important (1)", "Fairly important (2)", "Important (3)", and "Very Important (4)". Data analysis was performed, providing descriptive statistics in "The Statistical Package for the Social Sciences" (SPSS 28.0).

Questionnaires sent for all 205 respondents were received fully completed. Therefore, the overall response rate was 100%. According to Saunders et al. (2016), the minimal number of effective responses required for statistical analysis should be thirty. Therefore, the statistical analysis of the 205 responses collected for this study is deemed appropriate and effective for data interpretation.

4.2. Qualitative Data Collection and Analysis

Semi-structured interviews have been used to collect qualitative data for this study. According to the database of Sri Lanka's export development board, there are approximately 300 apparel manufacturing facilities under 40+ organizations. Murry and Hammons (1995) estimated that ten to thirty subject matter specialists may be required for the qualitative decision-making process. Purposive sampling was utilized to increase dependability and transferability (Creswell, 2014). In qualitative research, information saturation is a crucial aspect of sample size. (Braun and Clarke, 2021) Saturation is the term used to characterize the point at which adding additional data produces no new insights

or range of ideas. This investigation collected data until no new sustainability-related obstacles were identified. In this investigation, data saturation occurred before the twenty-sixth interview. Consequently, only 30 interviews were conducted. Each of these thirty interviewees was the director of an environmental sustainability division at one of thirty apparel industry organizations. These interviews were conducted via the online "Microsoft Teams" platform. The length of the interviews varied between 20 and 30 minutes. The interviews were evaluated using content analysis. Following the interviews, the researcher requested participant feedback on the data analysis. Participants were validated by transmitting significant theme codes to the original interviewee and requesting affirmation of the codes' accuracy.

5. Results and Discussion

5.1. Quantitative Analysis

Since this research is not focused on validating any hypothesis through data analysis, mean value analysis was used to interpret the data. Mean value analysis provides a straightforward, precise, and practical method for interpreting and comparing the data to find answers to the research questions of any study (Calzon, 2023).

Table 1 The degree of importance of drivers for influencing in embedding environmental sustainability practices. (S=205) (Researcher, 2023)

Drivers for influencing embedding environmental sustainability practices in the apparel sector of Sri Lanka	Degree of importance
Pressure from brands and retailers	3.9
Enhancing organizational reputation	3.7
Government regulations	3.6
Reducing operational costs	3.5
Safety of the workers	3.3

5.1.1. Pressure from brands and retailers

Based on the results of the questionnaire, pressure from brands and retailers is the most significant driver with a mean value of 3.9 in embedding environmental sustainability practices in the apparel sector of Sri Lanka. Brands and retailers are the core of the apparel sector in Sri Lanka as the main economic contributor to the country's economy through exports. If the brands and retailers mainly from the USA and Europe terminate their purchases from Sri Lanka due to some reasons, the entire apparel industry would be collapsed. Therefore, whatever the brands and retailers request to adhere to or to comply with due to many reasons such as regulations of those countries, pressure from competitors, pressure from non-government organizations (NGOs), and requirements of their customer base, the apparel industry of Sri Lanka should obey. As mentioned in the literature review, most brands are very enthusiastic about environmental sustainability practices throughout their supply chains and want to drive continuously due to rapidly updating environmental sustainability-related regulations and requirements. Therefore, even if the manufacturers like or dislike it, they need to incorporate environmental sustainability practices within their organizations for the survival and sustainability of the business.

5.1.2. Enhancing organizational reputation

Enhancing organizational reputation is the second most influential driver in embedding environmental sustainability practices in the apparel sector of Sri Lanka. Many of the organizations in the apparel sector of Sri Lanka have a considerable history of being in the industry for quite some sometimes. For example, organizations such as MAS, Brandix, Hirdaramani, etc. have been operating in the industry for more than 20+ years. Therefore, those kinds of organizations need to enhance their organization reputation for the longevity of their presence in the industry. Enhancing organizational reputation will increase the business profitability as well which is an essential factor for the sustainable growth of a business (Bustos, 2021). Any major environmental sustainability-related non-compliance would create a bad organizational reputation for such highly reputed organizations in the apparel sector of Sri Lanka which will directly impact their business. Even many of the biodiversity-related environmental sustainability practices such as habitat restoration and reforestation are implemented to enhance the organizational reputation by conveying to the society and all stakeholders that those organizations are conscious of all the biotic and abiotic species in the environment. Therefore, it is not a surprise that the organization's reputation has been selected as the second most

influential driver in embedding environmental sustainability practices in the apparel sector of Sri Lanka by the respondents.

5.1.3. Government Regulations

Government regulations have become the third most influential driver out of five drivers with a mean value of 3.6 in incorporating environmental sustainability practices in the apparel sector of Sri Lanka. Huang et al. (2021) have shown that government regulations play a significant role in ensuring environmental sustainability initiatives in any industry. The government of Sri Lanka has imposed many environmental regulations about energy, water, water, air emissions, wastewater, solid waste, and chemicals in many industries including apparel, and they are thoroughly following the implementation of those regulations with different stakeholders including apparel manufacturing facilities. All these regulations are governed by the Central Environmental Authority (CEA) of Sri Lanka (Central Environmental Authority, 2022). Also, the implementation of most of these regulations and compliance with them are mandatory for the apparel sector and non-compliance may cause the shutdown of apparel factories for a long period which would directly impact the manufacturing operations at those facilities. Therefore, it is inevitable that the government regulations driver was selected as the third most influential driver in embedding environmental sustainability practices in the apparel sector of Sri Lanka by the questionnaire respondents.

5.1.4. Reducing operational costs

Reducing operational cost has been selected as the fourth most influential driver out of the chosen five drivers with a mean value of 3.5 in incorporating environmental sustainability practices in the apparel sector of Sri Lanka. Even though this driver is the second last out of the five drivers, its mean value of 3.5 shows that the overall influential power of this driver is comparatively large. Handfield et al. (2020) have figured out that the operational cost in the apparel sector mainly consists of raw material and maintenance costs. Raw material costs mainly depend on raw materials used to manufacture apparel such as fabric, accessories such as elastic and thread, dyes and auxiliaries, and packaging materials. Thus, most of the environmental sustainability practices about waste management such as fabric waste reduction through marker efficiency improvement and reduction of quality defects; fabric and other waste reusing, recycling, and upcycling and production recipe improvements to reduce the utilization of dyes and auxiliaries can be utilized to reduce the cost of raw materials. Maintenance costs consist of utilities of a particular apparel factory. If the utility cost is reduced, maintenance costs will be reduced proportionally. The main utilities of a factory are energy and water. Thus, the factories can reduce their operational cost by embedding energy and water reduction-related environmental sustainability practices Therefore, it is obvious that reducing operational costs is a salient driver that has influenced in embedding of environmental sustainability practices in the apparel sector of Sri Lanka.

5.1.5. Safety of the Workers

The safety of the workers is the final driver out of all five drivers influenced by incorporating environmental sustainability practices in the apparel sector of Sri Lanka with a considerable mean value of 3.3. As per the findings of Rae and Provan (2019), if organizations failed to ensure the safety of their employees, they would be unable to persuade their stakeholders that they were doing sufficient to ensure safety, which would impede their ability to pursue their core business. Therefore, organizations in all sectors including apparel need to ensure the safety of their workers for the sustainability of their businesses. The safety of workers in the apparel sector mainly depends on health and safety practices, practiced at work as well as out of the workers at the factory premises. Therefore, it is vital to minimize the safety risks of employees at production activities by providing necessary personal protective equipment, and guidance as well as ensuring that they use safe chemicals in the manufacturing processes. Thus, embedding environmental sustainability practices such as chemical compliance guidelines like Zero Discharge of Hazardous Chemicals Manufactured Restricted Substance List (ZDHC MRSL) and Zero Discharge of Hazardous Chemicals Technical Industry Guidance (ZDHC TIG) when onboarding and utilizing chemicals respectively will ensure the safety of workers at the production stages. In non-production activities, incorporating environmental sustainability practices like drinking water and wastewater treatment and testing to ensure water quality; testing of noise, light levels, carbon dioxide levels, and dust levels to ensure safe living conditions at the factory and environmental community engagement projects such as tree planting to ensure the mental safety conditions of workers can succour to ensure the safety of the workers throughout their stay at respective apparel manufacturing facilities. Therefore, it is certain the safety of the workers is a key driver that has influenced in embedding of environmental sustainability practices in the apparel sector of Sri Lanka.

5.2. Qualitative Analysis

All drivers mentioned by the interviewees in the semi-structured interviews are the same set of drivers that have been extracted through the literature survey and put into the questionnaire for the quantitative analysis namely reducing

operational costs, enhancing organizational reputation, pressure from brands and retailers, safety of the workers, and government regulations.

As an open-ended question asked in the semi-structured interviews, no other influential drivers apart from the above-mentioned five drivers were mentioned by any of the interviewees.

Table 2 Key drivers that influence the apparel sector organizations to embed environmental sustainability practices (n=30) (Researcher, 2023)

Key driver that influenced the apparel sector organizations to embed environmental sustainability practices	Total number of interviewees mentioned (n=30)
Pressure from brands and retailers	97%
Enhancing organizational reputation	93%
Government regulations	90%
Reducing operational costs	86%
Safety of the workers	80%

As per the above results in Table 2, the pressure from brands and retailers is the most significant driver. Like the outcome of questionnaire responses, enhancing organizational reputation, government regulations, reducing operational costs, and safety of workers is the order of other drivers which are closely followed by the most significant driver. It should be acknowledged that the key drivers for some apparel sector organizations may be all these drivers or a combination of some of these drivers.

In this research, 97 percent of interviewees (29 out of 30) believed that pressure from brands and retailers was the primary driver influencing in embedding of environmental sustainability practices in the apparel sector of Sri Lanka. One of the respondents remarked:

"For example, if all our chemicals are not achieved ZDHC MRSL compliance, the majority of USA brands will terminate all our orders which would shut down the factory".

Above is just one example of how serious brands and retailers are considering the level of environmental compliance they need to maintain within their supply chains. USA brands, but this is also the same scenario applicable to UK and European brands as well. The biggest retailer in the UK, Marks and Spencer has already announced its goal of being "Net Zero" by 2040 (Marks and Spencer, 2021). To achieve this, M&S wants their supply chain to achieve net zero by 2040 which they have already announced within their supply chain (Marks and Spencer, 2021). As per one of the interviewees, this is a very critical objective that apparel facilities in Sri Lanka should achieve to retain M&S business in Sri Lanka since M&S is one of the top brands that manufacture their products in Sri Lanka. Like this, another environmental commitment from one of the other main brands in Sri Lanka, PVH Corp, which possess brands such as Calvin Klein and Tommy Hilfiger to have 80% of their Tier 1 and Tier 2 supplier facilities using the Higg FEM by 2025 (PVH, 2022) has pressurized the suppliers to implement Higg FEM tool for almost all their facilities. Thus, the pressure due to these sorts of commitments from brands and retailers has become the most influential driver in embedding environmental sustainability practices in the apparel sector of Sri Lanka.

As per the interviewees, enhancing organizational reputation has become the second most influential factor in embedding environmental sustainability practices in the apparel sector of Sri Lanka with a percentage of 93% (28 out of 30 interviewees). One of the interviewees suggested a more accurate description of this point:

"Our organization is more than 30 years old, and we have a reputation locally as well as globally to be the pioneer of implementing environmental sustainability practices within our facilities. We aim to enhance this reputation which is a key marketing factor as well in our business development by embedding more and more environmental sustainability practices within our facilities as well as our sub-contractors and suppliers throughout the value chain".

This clearly shows how the organizational reputation has become a key driver in incorporating environmental sustainability practices. It has deep roots throughout its value chain beyond its facilities due to the objective of

enhancing the organization's reputation locally as well as globally as the pioneer apparel organization in embedding environmental sustainability practices. Another interviewee has been mentioned below.

"Our organization is a heritage apparel organization which is one of the first apparel organizations started in Sri Lanka. We have a great global reputation due to our quality and on-time delivery. However, we have understood that environmental sustainability is the future, and our reputation will be vandalized if we do not embed environmental sustainability practices within our facilities. Therefore, most of our environmental sustainability practices about emissions, water, and chemical segments are done to enhance the reputation of our organization."

Thus, it is obvious that organizational reputation has become a very influential driver in embedding environmental sustainability practices in the apparel sector of Sri Lanka.

Government regulations have become the third most influential driver in embedding environmental sustainability practices in the apparel sector of Sri Lanka with 90% (27 out of 30 interviewees). The below quote extracted from one of the interviewees elaborates on the influence of this driver.

"Our cost of food serving 4000+ employees twice a day was very low when we used polythene lunch sheets from the beginning of this factory up to 2019. But when the government banned single-use plastics including polythene lunch sheets in 2019, we had to go for a more costly process of providing biodegradable lunch sheets to serve meals for the employees irrespective of our budgeting targets."

The above response indicates that government regulations have become a key driver where apparel factories must incorporate some environmental sustainability practices irrespective of other factors. Another statement mentioned that they had to modify their wastewater treatment facilities and boiler stack due to the stringent government regulations imposed by the government in 2019 on flue gas emissions (stack emission) and in 2022 on wastewater treatment and discharge. Therefore, it is unequivocal that government regulations have influenced many apparel sector organizations in Sri Lanka to incorporate environmental sustainability factors within their facilities.

Reducing operational costs has become the fourth most influential factor with a percentage of 86 (26 out of 30) in embedding environmental sustainability practices in the apparel sector of Sri Lanka. Out of them, the below quote seems to be a perfect example to validate the influence of this driver.

"When we were looking at cost-cutting initiatives to be implemented at the factory to reduce the operational cost, one of the key inputs we received from our board of directors was to reduce the energy cost. Therefore, we have implemented several initiatives to reduce energy costs based on the return on investments of those initiatives. Some of those initiatives are installing solar energy to cover 60% of the total energy used by the facility, converting 100% of conventional lighting to LEDs, and converting all clutch motor sewing machines to servo motor sewing machines. Within two years, these initiatives have helped us to reduce the factory operational cost by 5%". Similar responses were received for several other projects done on water and chemical reductions to reduce operational costs of facilities which have succeeded. Thus, it is certain that reducing operational costs is a key driver in embedding environmental sustainability practices in the apparel sector of Sri Lanka.

Finally, the safety of workers has become another key driver with a percentage of 80% (24 out of 30 interviewees). As per one of the interviewees, they have implemented ZDHC MRSL as a standard when onboarding chemicals not only due to brand/retailer requirements but also thinking about the safety of the workers. Another interviewee mentioned that they have installed proper air handling units to chillers to maintain low levels of carbon dioxide within the production premises to ensure the safety of workers which can be affected due to high levels of carbon dioxide. Based on these responses, indicate that the safety of workers is a key driver that has influenced in embedding of environmental sustainability practices in the apparel sector of Sri Lanka.

6. Conclusion

Based on results derived from both qualitative and quantitative analysis, it was found that all the above-mentioned drivers were pertinent to the apparel industry of Sri Lanka, with pressure from brands and retailers being the most influential and the safety of workers being the least. Also, it is evident that other than the above-mentioned drivers, none of the respondents who participated in semi-structured interviews mentioned any other driver.

7. Recommendations

This research has revealed several future research opportunities and recommendations as follows:

- It would be beneficial to investigate the differences between small and medium-sized organizations (factories with fewer than 250 employees), and large organizations (factories with more than 250 employees) in capitalizing on the discussed drivers in embedding environmental sustainability practices in the apparel sector of Sri Lanka.
- Further research is recommended to understand the statistical correlations between the influential powers of different drivers and how they interconnect in various types of apparel manufacturing facilities in Sri Lanka (dyeing, washing, printing, cut & sew, etc.) in incorporating environmental sustainability practices.
- It is recommended that apparel organizations in Sri Lanka should consider these drivers in creating their environmental sustainability strategies and business plans.
- Given that this research is a study that is largely exploratory, the results reported here are only provisional and have limited generalizability. Therefore, further research with more elaborate and well-articulated designs is required to further investigate the drivers in embedding environmental sustainability practices in the apparel sector of Sri Lanka.

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare no conflict of interest.

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