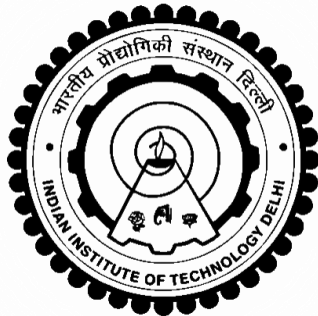


SOCIAL SUSTAINABILITY IN MULTITIER TEXTILE AND CLOTHING SUPPLY CHAIN

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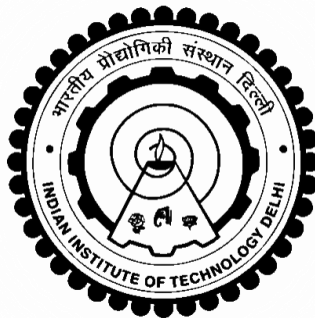
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Submitted

in fulfilment of the requirements of the degree of Doctor of Philosophy

to the



INDIAN INSTITUTE OF TECHNOLOGY DELHI

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Dedicated to my family

CERTIFICATE

This is to certify that the thesis titled '**Social Sustainability in Multitier Textile and Clothing Supply Chain**', being submitted by Mr. Mahesh Shaw to the Indian Institute of Technology Delhi for the award of the degree of Doctor of Philosophy, is a record of bonafide research work carried out by him. He has worked under our guidance and supervision and fulfilled the requirements for thesis submission, which has attained the standard required for a PhD degree at this Institute.

The results contained in this thesis have not been submitted, in part or in full, to any other university or institute for the award of any degree or diploma.

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MAHESH SHAW

ABSTRACT

Addressing social sustainability is a much-needed task for the world to achieve sustainable development goals (SDGs) by 2030. Textile and clothing supply chains employ a large workforce, especially in developing countries, and are infamous for sweatshops, low wages, discrimination, violations of human and labour rights, safety of female workers and sexual harassment. Brands are criticised for the unethical behaviours of their suppliers. Extant literature are laden with studies on environmental sustainability, and there is a lacuna in social sustainability front. Therefore, the focus of this research is fourfold. Firstly, it explores the critical barriers to adopting social sustainability in the textile and clothing supply chain; second, it explores the perceptions of multi-tier supply chain actors to these barriers; third, it deciphers micro-mechanisms that help suppliers to adopt social sustainability; and four, it proposes a simple social sustainable assessment framework.

In the first part of the research, an attempt has been made to identify the critical barriers to adopting social sustainability in the Indian textile and clothing supply chains. A modified Fuzzy-Interpretive Structural Model (Fuzzy ISM) has been proposed for analysing the contextual relationships among the barriers. Twenty barriers are shortlisted based on a review of the literature and experts' feedback. The contextual relationships among the barriers are captured in the form of linguistic ratings obtained from the experts. Using the modified fuzzy ISM method, an eight-level hierarchical model has been developed. The lack of consumer awareness, lack of consumer requirement and lack of consumer pressure are found to be important driving barriers. The other important driving barriers are the lack of strict implementation of government laws and regulations and the lack of financial support from the Government and trade bodies. The study shows that social sustainability issues can be addressed by increasing consumer awareness, coercive pressure from regulatory bodies, financial aid from government and trade bodies, and incentives to motivate top management

In the second part of the research, the perception of brands, clothing manufacturers (tier-1) and textile manufacturers (tier-2) to the barriers of social sustainability in multitier supply chains operating in India are analysed in a tier wise manner. Decision Making Trial and Evaluation Laboratory (DEMATEL) method has been used to identify prominent, cause-group and effect-group barriers and establish interrelationships among them by developing influence maps. Seven barriers related to consumers (lack of pressure from

consumers, lack of consumer awareness, and lack of consumer requirement), regulation and norms (lack of implementation of government laws and regulations, and lack of unified norms of social sustainability), and financial aspects (high implementation cost, and lack of financial assistance from government and trade bodies) are found to be common cause-group barriers for all three stages of the supply chain. On the other hand, clothing manufacturers feel that low prices offered by the buyers, and pressure of cost reduction by buyers are the important causal barriers to social sustainability while the brands perceive that competition among suppliers to reduce cost thwarts social sustainability implementation. This implies a lack of synergy and symbiotic dependence in the supply chain, which is explained through the lenses of stakeholder theory, institutional theory, and transaction cost of economics theory. Lack of top management commitment, lack of competitive pressure and lack of policy on social sustainability are omnipresent as effect-group barriers.

In the third part of this research, the role of buyer-supplier collaborative relationships in facilitating the adoption of social sustainability among the suppliers is investigated. This study proposes three mediating constructs between buyer-supplier collaborative relationships and suppliers' social sustainability performance under the moderating effect of a dynamic business environment. The mediating constructs are perceived consumer social pressure, suppliers' capabilities and suppliers' sustainability culture. Smart PLS-SEM has been used to analyse the data obtained through surveys of 120 textile and clothing manufacturing companies. The results reveal that perceived consumers' social pressure, suppliers' sustainability culture, and suppliers' capabilities positively mediate the buyer-supplier collaborative relationships and suppliers' social sustainability performance, whereas the moderating effects of a dynamic business environment are not supported. However, mere buyer-supplier collaborative relationships on paper do not lead to improved social sustainability performance.

A social sustainability assessment framework has been proposed in the last part of this research. The social sustainability performance criteria and their sub-criteria are gathered through literature review and then validated by the experts. The framework consists of seven major categories or criteria and corresponding 38 sub-categories or sub-criteria. Then, the Best-Worst Method (BWM) has been applied to calculate the weightage of the main and sub-criteria. Human rights have received the maximum weightage (0.294) and community engagement the minimum (0.035). Wages and benefits, and health and safety categories received equal weightages (0.188). The weightage of working conditions,

product responsibilities, and women workers' rights are 0.125, 0.075 and 0.094, respectively. Furthermore, all sub-categories are assigned global rankings based on their relative weightage. Pareto analysis reveals that the first 18 sub-criteria contribute 80% to the social sustainability. Therefore, buyers and textile suppliers should focus on a selected set of important indicators (sub-criteria) to achieve social sustainability performance. Among the top ten indicators of social sustainability, human rights contain four (forced labour, discrimination, social security, and child labour), wages and benefits two (living wages and working time), health and safety two (fire safety and building safety), working conditions one (no verbal and physical abuse) and product responsibilities one (safety of consumers). However, women workers' rights and community engagement criteria do not have any sub-criteria within the global top ten rankings.

सारांश

2030 तक सतत विकास लक्ष्यों (एसडीजी) को प्राप्त करने के लिए दुनिया के लिए सामाजिक स्थिरता को संबोधित करना एक बहुत ही आवश्यक कार्य है। कपड़ा और परिधान सप्लाई चेन, विशेष रूप से विकासशील देशों में एक बड़े कार्यबल को रोजगार देती हैं, और यह स्वेटशॉप, कम मजदूरी, भेदभाव, मानव और श्रम अधिकारों के उल्लंघन, महिला श्रमिकों की सुरक्षा और यौन उत्पीड़न के लिए बदनाम हैं। ब्रांडों की उनके आपूर्तिकर्ताओं के अनैतिक व्यवहार के लिए आलोचना की जाती है। मौजूदा साहित्य पर्यावरणीय स्थिरता पर अध्ययनों से भरा पड़ा है और सामाजिक स्थिरता के मोर्चे पर एक खामी है। इसलिए, इस शोध का फोकस चार बिंदुओं पर आधारित है। सबसे पहले, यह कपड़ा और परिधान सप्लाई चेन में सामाजिक स्थिरता को अपनाने में महत्वपूर्ण बाधाओं की पड़ताल करता है; दूसरा, यह इन बाधाओं के लिए बहु-स्तरीय आपूर्ति श्रृंखला अभिनेताओं की धारणाओं की पड़ताल करता है; तीसरा, यह उन सूक्ष्म तंत्रों की व्याख्या करता है जो आपूर्तिकर्ताओं को सामाजिक स्थिरता अपनाने में मदद करते हैं; और चौथा, यह एक सरल सामाजिक स्थिरता मूल्यांकन ढांचे का प्रस्ताव करता है।

शोध के पहले भाग में, भारतीय कपड़ा और परिधान आपूर्ति श्रृंखलाओं में सामाजिक स्थिरता को अपनाने में महत्वपूर्ण बाधाओं की पहचान करने का प्रयास किया गया है। बाधाओं के बीच प्रासंगिक संबंधों का विश्लेषण करने के लिए एक संशोधित फजी-व्याख्यात्मक संरचनात्मक मॉडल (फजी आईएसएम) प्रस्तावित किया गया है। साहित्य और विशेषज्ञों की प्रतिक्रिया की समीक्षा के आधार पर बीस बाधाओं को शॉर्टलिस्ट किया गया है। बाधाओं के बीच प्रासंगिक संबंधों को विशेषज्ञों से प्राप्त भाषाई रेटिंग के रूप में कैप्चर किया गया है। संशोधित फजी आईएसएम पद्धति का उपयोग करके, एक आठ-स्तरीय पदानुक्रमित मॉडल विकसित किया गया है। उपभोक्ता जागरूकता की कमी, उपभोक्ता आवश्यकता की कमी और उपभोक्ता दबाव की कमी महत्वपूर्ण ड्राइविंग बाधाएं पाई गई हैं। अन्य महत्वपूर्ण ड्राइविंग बाधाएं सरकारी कानूनों और विनियमों के सख्त कार्यान्वयन की कमी और सरकार और व्यापार निकायों से वित्तीय सहायता की कमी हैं। अध्ययन से पता चलता है कि सामाजिक स्थिरता के मुद्दों को उपभोक्ता जागरूकता बढ़ाने, नियामक निकायों से दबाव डालने, सरकार और व्यापार निकायों से वित्तीय सहायता और शीर्ष प्रबंधन को प्रेरित करने के लिए प्रोत्साहन देकर संबोधित किया जा सकता है।

शोध के दूसरे भाग में, भारत में संचालित बहुस्तरीय आपूर्ति श्रृंखलाओं में सामाजिक स्थिरता की बाधाओं के प्रति ब्रांडों, वस्त्र निर्माताओं (टियर-1) और कपड़ा निर्माताओं (टियर-2) की धारणा का स्तरवार तरीके से विश्लेषण किया गया है। निर्णय लेने परीक्षण और मूल्यांकन प्रयोगशाला (डीमैटेल) पद्धति का उपयोग प्रमुख, कारण-समूह और प्रभाव-समूह बाधाओं की पहचान करने और प्रभाव मानचित्र विकसित करके उनके बीच

अंतर्संबंध स्थापित करने के लिए किया गया है। आपूर्ति श्रृंखला के सभी तीन चरणों के लिए उपभोक्ताओं से संबंधित सात बाधाएं (उपभोक्ताओं की ओर से दबाव की कमी, उपभोक्ता जागरूकता की कमी और उपभोक्ता आवश्यकता की कमी), विनियमन और मानदंड (सरकारी कानूनों और नियमों के कार्यान्वयन की कमी, और सामाजिक स्थिरता के एकीकृत मानदंडों की कमी), और वित्तीय पहलू (उच्च कार्यान्वयन लागत, और सरकार और व्यापार निकायों से वित्तीय सहायता की कमी) सामान्य कारण-समूह बाधाएं पाई गई हैं। दूसरी ओर, वस्त्र निर्माताओं को लगता है कि खरीदारों द्वारा दी जाने वाली कम कीमतें और खरीदारों द्वारा लागत में कमी का दबाव सामाजिक स्थिरता के लिए महत्वपूर्ण कारणात्मक बाधाएँ हैं, जबकि ब्रांड मानते हैं कि लागत कम करने के लिए आपूर्तिकर्ताओं के बीच प्रतिस्पर्धा सामाजिक स्थिरता कार्यान्वयन को बाधित करती है। इसका तात्पर्य आपूर्ति श्रृंखला में तालमेल और सहजीवी निर्भरता की कमी है, जिसे हितधारक सिद्धांत, संस्थागत सिद्धांत और अर्थशास्त्र के लेनदेन लागत सिद्धांत के लेंस के माध्यम से समझाया गया है। शीर्ष प्रबंधन प्रतिबद्धता की कमी, प्रतिस्पर्धी दबाव की कमी और सामाजिक स्थिरता पर नीति की कमी प्रभाव-समूह बाधाओं के रूप में सर्वव्यापी हैं।

इस शोध के तीसरे भाग में, आपूर्तिकर्ताओं के बीच सामाजिक स्थिरता को अपनाने में सहायता करने में क्रेता-आपूर्तिकर्ता सहयोगात्मक संबंधों की भूमिका की जांच की गई है। यह अध्ययन एक गतिशील कारोबारी माहौल के मध्यस्थ प्रभाव के तहत क्रेता-आपूर्तिकर्ता सहयोगात्मक संबंधों और आपूर्तिकर्ताओं के सामाजिक स्थिरता प्रदर्शन के बीच तीन मध्यस्थ संरचनाओं का प्रस्ताव करता है। मध्यस्थ संरचनाएं कथित उपभोक्ता सामाजिक दबाव, आपूर्तिकर्ताओं की क्षमताएं और आपूर्तिकर्ताओं की स्थिरता संस्कृति हैं। 120 कपड़ा और परिधान निर्माण कंपनियों के सर्वेक्षणों के माध्यम से प्राप्त आंकड़ों का विश्लेषण करने के लिए स्मार्ट पीएलएस-एसईएम का उपयोग किया गया है। परिणाम बताते हैं कि कथित उपभोक्ताओं का सामाजिक दबाव, आपूर्तिकर्ताओं की स्थिरता संस्कृति और आपूर्तिकर्ताओं की क्षमताएं क्रेता-आपूर्तिकर्ता सहयोगात्मक संबंधों और आपूर्तिकर्ताओं के सामाजिक स्थिरता प्रदर्शन में सकारात्मक रूप से मध्यस्थता करती हैं, जबकि गतिशील कारोबारी माहौल के संयमित प्रभावों का समर्थन नहीं किया जाता है। हालाँकि, कागज़ पर केवल खरीदार-आपूर्तिकर्ता सहयोगात्मक संबंध सामाजिक स्थिरता प्रदर्शन बेहतर दिशा की ओर नहीं ले जाते हैं।

इस शोध के अंतिम भाग में एक सामाजिक स्थिरता मूल्यांकन रूपरेखा प्रस्तावित की गई है। सामाजिक स्थिरता प्रदर्शन मानदंड और उनके उप-मानदंड साहित्य समीक्षा के माध्यम से एकत्र किए जाते हैं और फिर विशेषज्ञों द्वारा मान्य किए जाते हैं। रूपरेखा में सात प्रमुख श्रेणियां या मानदंड और संबंधित 38 उप-श्रेणियाँ या उप-मानदंड शामिल हैं। फिर, मुख्य और उप-मानदंडों के भार की गणना करने के लिए सर्वश्रेष्ठ-सबसे खराब विधि (BWM) लागू की गई है। मानवाधिकारों को अधिकतम भार (0.294) और सामुदायिक जुड़ाव को न्यूनतम (0.035) प्राप्त हुआ है। मजदूरी और लाभ, और स्वास्थ्य और सुरक्षा श्रेणियों को समान भार (0.188) प्राप्त हुआ। काम करने की स्थिति, उत्पाद जिम्मेदारियों और महिला श्रमिकों के अधिकारों का भार क्रमशः 0.125, 0.075

और 0.094 है। इसके अलावा, सभी उप-श्रेणियों को उनके सापेक्ष भार के आधार पर वैश्विक रैंकिंग दी गई है। पेरेटो विश्लेषण से पता चलता है कि पहले 18 उप-मानदंड सामाजिक स्थिरता में 80% योगदान देते हैं। इसलिए, खरीदारों और कपड़ा आपूर्तिकर्ताओं को सामाजिक स्थिरता प्रदर्शन को प्राप्त करने के लिए महत्वपूर्ण संकेतकों (उप-मानदंड) के एक चयनित सेट पर ध्यान केंद्रित करना चाहिए। सामाजिक स्थिरता के शीर्ष दस संकेतकों में, मानवाधिकारों में चार (जबरन श्रम, भेदभाव, सामाजिक सुरक्षा और बाल श्रम), मजदूरी और लाभ दो (जीवनयापन मजदूरी और काम करने का समय), स्वास्थ्य और सुरक्षा दो (अग्नि सुरक्षा और भवन सुरक्षा), काम करने की स्थिति एक (मौखिक और शारीरिक दुर्व्यवहार नहीं) और उत्पाद जिम्मेदारी एक (उपभोक्ताओं की सुरक्षा) शामिल हैं। हालांकि, महिला श्रमिकों के अधिकार और सामुदायिक जुड़ाव मानदंड में वैश्विक शीर्ष दस रैंकिंग के भीतर कोई उप-मानदंड नहीं है।

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