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Analyzing The Barricades to Green Supply Chain in Textile Industry of Pakistan to Attain Circular Economy Goals

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ABSTRACT The contemporary industrial revolution and CE primarily emphasize the need of a GSC for sustainability. The implementation of sustainable SC techniques in the textile sector, especially in developing nations such as Pakistan, presents significant challenges. The shift to a circular textile sector continues to encounter many obstacles. The present research identifies eight significant impediments to the application of GSC methods in Pakistan's textile sector concerning CE. This research aims to provide suggestions for enhancing innovations in Pakistan's textile sector. The government, in conjunction with corporate leaders, must comprehend the critical obstacles and formulate more effective CE initiatives. A questionnaire-based survey was conducted among specialists for data collecting. The DEMATEL approach was used to assess the extent of impact and interaction among the obstacles, facilitating the cataloging of these barricades into cause / effect categories. The researchers propose mitigation solutions that include an infrastructure plan and a platform strategy to facilitate the transformation of Pakistan's textile sector towards CE. The results will assist industrial businesses in formulating plans for the implementation of GSCs to attain long-term sustainability.

INDEX TERMS circular economy, green supply chain barriers, green supply chain, supply chain

I.INTRODUCTION

The textile industry constitutes the major manufacturing sector in Pakistan and ranks as the ninth largest exporter of textile products in Asia. It ranks as the fifth largest producer and the third largest consumer of cotton in the area. This industry comprises 46% of Pakistan's overall industrial output. The textile sector constitutes over 25% of the added industrial value, contributes 8.5% to the national GDP, and employs roughly 40% of the workforce, equating to around 19 million workers. Pakistan is recognized as the fifth largest producer of cotton in the world and possesses the third highest spinning capacity in Asia, trailing only China and India, with a

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contribution of 5% to the global spinning capacity. Notwithstanding seasonal and cyclical fluctuations, textile items have continuously constituted around 62% of national exports [1].

The global economic growth and international SC network have led to a more complex and decentralized SC system. Mitigating the adverse effects of unsustainable SC industrial practices is more challenging in today's environment. To adopt sustainable principles, global SC operations must be significantly improved. The GSC conserves natural resources and connects consumers, products, and environmental assets. The GSC directly influence the success of the monetary cycle in a CE [2]. The research [3] shows that to attain a GSC, the principles of CE must be integrated into the fundamental processes of the textile sector. CE is a comprehensive approach that mitigates the environmental impact of the SC. The industrial sector's implementation of CE theory may provide novel financial opportunities [4].

Technologies have a crucial role in achieving CE objectives [5], [6], however, in the absence of technical breakthroughs, establishing a CE that positively influences SC operations would be unfeasible. Advancements in industrial technology will enable the transition from a linear economy to a circular one. The textile industry attains a competitive edge with the use of advanced sustainable technologies [7]. Proper use of technology enhances economic performance while ensuring the long-term viability of a firm [8], [9]. Despite its substantial contributions to Pakistan's economy and jobs, the textile industry lags in the use of technology for sustainable SC processes. Ensuring the resilience of the CE requires the use of sustainable SC methodologies [10]. Consequently, companies must effectively address difficulties associated with GSCs.

A CE is emerging and is a possible explanation for resource shortages and waste management issues [11]. The textile business operates in a linear manner regarding production, distribution, and consumption, making it a significant component of the contemporary global economy [12]. The fast fashion phenomenon generates substantial waste and pollution, resulting in considerable environmental and resource challenges for the textile industry [13], [14]. The substantial ecological ramifications of the sector, including extensive water and chemical use, considerable greenhouse gas emissions, and notable waste production, have heightened governmental interest in advocating for circular processes within the textiles industry [15].

Currently, CE is regarded as a pivotal advancement in textile production and consumption systems [14], [16]. Advocating for CE principles may assist the textile sector in minimizing the use of virgin materials and decreasing pollution [16]. The shift to a circular textile industry is, nevertheless, laden with challenges [14]. Researchers have identified several obstacles to CE, including social and cultural, legal and regulatory, financial and economic, SC and infrastructural, and organizational factors.

Recent studies emphasize the significance of CE barriers in business, utilizing multi-criteria decision-making techniques [17]–[19]. This study emphasizes the comparative importance of CE footraces and outlines effective facilitation strategies. Identifying the most critical obstacles is essential; however, this alone is inadequate, as a single barrier may initiate a series of disruptions. The existing methods for distributing CE lack clarity [20]. It is crucial for governments and business leaders to comprehend the interconnections among these obstacles to identify key barriers and enhance the effectiveness of CE programs. The predominant purpose of this examination is to ascertain the major impediments to circular textile business and present recommendations for inventive textiles in Pakistan.

Consequently, addressing environmental challenges requires the incorporation of sustainable practices into the SC processes of the textile industry. Implementing sustainable SC practices in Pakistan's textile industry would address the substantial environmental challenges encountered by the sector. Technological advancements can enhance long-term profitability in the textile sector within the framework of the CE. The textile industry faces challenges related to rising product complexity and personalization [21]. The implementation of a CE strategy can provide a competitive advantage in SC management [22]. This research assesses the difficulties associated with the implementation of GSC practices in developing nations, specifically in Pakistan, through the lens of CE principles. [23] identify a significant challenge in SC operations, the imperative of achieving sustainability in industrial enterprises. The study's specific problem statement is as follows:

“Analyzing the impediments to contrivance GSC in Pakistan's textile industry to attain CE objectives.”

A. RESEARCH OBJECTIVES

1. To investigate the obstacles to implement GSC in relation to the CE in Pakistan's textile sector.
2. To comprehend the ramifications of these obstacles.
3. To categorize the obstacles from a strategic perspective.
4. To incorporate GSC practices by addressing the challenges within Pakistan's textile industry.

B. RESEARCH QUESTIONS

This study examines the following research questions, which emerge from identified gaps in the literature:

RQ-1. What major obstacles, among the numerous challenges encountered by the industry, hinder the textile sector's transition to a circular economy by creating further dysfunction?

RQ-2. What strategies can be developed for intermediation to effectively address complex, interconnected issues while simultaneously fostering innovation in Pakistan's textile sector?

RQ-3. In what way these obstacles can be categorized and prioritized from a strategic perspective?

RQ-4. What is the crucial barrier that Pakistan's textile industry must address to implement GSC practices effectively?

C. SIGNIFICANCE

The efficiency and ecological sustainability of textile production can be enhanced through the implementation of quality control and process digitalization systems [24]. They contribute to enhancing environmental sustainability through the reduction of carbon footprints. Recent years have seen a significant focus shift in the industrial sector due to the adoption of advanced technology [25]. CE solutions enhance the sustainability and effectiveness of GSC operations. Businesses can enhance flexibility, environmental performance, and production through the adoption of technological advancements [26]. Circular economy can address sustainability challenges.

D. SCOPE OF THE STUDY

The textile sector offers a viable model for achieving environmentally sustainable SC operations through the implementation of circular economy principles.

E. LIMITATIONS

This study presents a significant accumulation of sustainable business models; however, it has several limitations. Eight significant challenges have been identified in the implementation of GSC practices within Pakistan's textile sector to achieve sustainable operations. These insights may be challenged by other sectors and different nations. The findings are not generalizable. Additionally, the DEMATEL technique has certain limitations stemming from the potential for distorted expert judgments. The findings lack generalizability.

II.LITERATURE REVIEW

A. GREEN SUPPLY CHAIN (GSC)

SC techniques are regarded as activities aimed at reducing costs while enhancing revenue. This has been predominantly utilized in commercial contexts, including corporate exhibitions and financial reports. For an extended period, the term "SC" was paired with "green" to form the acronym "GSC". [27] define "GSC" as supply chain management strategies and tactics aimed at minimizing the energy and environmental impacts associated with freight distribution in transportation, waste management, packaging, and material handling. [28] defines GSC as activities necessitating ecological product management and the transmission of precise, valuable information between the point of origin and the consumption site to fulfill or exceed consumer demand. [29] define green logistics (GSC) as an organizational activity that incorporates environmental considerations into SCM to enhance the ecological performance of traders and consumers. In contrast, [30] characterize green practices as the assessment of environmental impacts from diverse distribution approaches, the drop in energy consumption during SC operations, and the management of waste disposal. GSC is defined as the production and distribution of goods in a sustainable manner, considering environmental and social factors [30].

The environment has become a primary concern of the society. Numerous organizations have acknowledged the peripheral supply chain costs associated with environmental issues including noise, pollution, and climate change. Consequently, efforts to mitigate these external factors and establish a more sustainable equilibrium among environmental, economic, and social objectives are termed as GSC. The objective of all green SC operations is to promote long-term sustainability [31]. Companies face pressure to enhance the sustainability of their supply chain services for two main reasons. The first pertains to commercial necessity, whereas the second addresses an environmental issue. Currently, most consumers prefer environmental friendly products and are acutely aware of the entire supply chain, anticipating that all activities would align with sustainability goals to enhance planetary safety and promote longevity. [32] conducted a study on the primary drivers for GSC, revealing that maintaining strong connections with stakeholders is the most significant factor, whereas building alternative networks is the least critical in the adoption of GSC by enterprises. Businesses employ supply chain management primarily to enhance their green image, rather than to prioritize environmental protection, thereby improving their public relations. Businesses often opt for straightforward strategies to safeguard their image and brand while adopting environmentally friendly messaging [32].

B. CIRCULAR ECONOMY (CE)

The CE model is a systemic strategy designed to address the harmful environmental impacts of production and consumption, vis-à-vis greenhouse gas emissions and waste generation, as a response to current environmental challenges. The CE model is constructed on various established and contemporary principles, aimed at reducing the environmental impact of economic activities, among other objectives. This article aims to define the term GSC by demonstrating the potential methods for managing sewage sludge within a circular economy framework. The closure of economic system loops is anticipated to lead toward reduced pollution, decreased consumption of natural resources, and less capital- and energy-intensive methods for acquiring and processing recycled materials, while also aligning with the Zero Waste principle [28]. Circular economy often requires the reorganization of entire industrial processes to enhance the efficiency of the overall circular economy system [33]. The CE is fundamentally a comprehensive system that promotes waste-free methods

of service delivery, production, and consumption, aiming to reduce the manipulation of energy and valuable natural resources. The objective of CE is to generate value through the efficient utilization of resources while minimizing the argumentative environmental impacts of industrial products throughout their entire life cycle, thereby facilitating material reuse.

Another important concept to consider is GSC, which serves as a prerequisite and essential element for the development of the CE. GSC incorporates the aforementioned elements and advances the principle of sustainable development [34]. The closed-loop motion of matter, referred to as green matter, constitutes a significant element of the CE concept and has potential applications in the creation of GSC. GSC encompasses a diverse array of semantic interpretations. To comprehend the impact of supply chain (SC) on residue flows within an economic system, it is essential to differentiate between eco-SC and GSC, terms that are often used interchangeably, as well as recycle SC, referred to as waste SC or reverse SC.

Eco-SC is a supply chain subsystem that emphasizes supply chain activities, particularly collection, storage, and transportation. The primary focus of eco-SC activities is waste management. Consequently, eco-SC aims to mitigate the adversative environmental impacts of commercial activities, including the reuse of waste materials [35]. Certain definitions of eco-SC focus exclusively on the movement of waste from its source to either neutralization or reuse. Conversely, reverse SC was initially perceived as the application of SC principles to waste recycling and disposal, alongside hazardous waste management. Additionally, SC activities focused on minimizing resource consumption, recycling materials, reusing products, and waste disposal were also highlighted [36].

C. GREEN SUPPLY CHAIN FROM THE VIEWPOINT OF CE

The term GSC denotes a set of supply chain management strategies focused on transportation, waste management, packaging, and material handling, aimed at minimizing the environmental and energy impacts associated with product delivery [29]. This involves the consideration of environmental issues and their integration into supply chain management [29]. The circular economy promotes waste-free services, production, and depletion to minimize the manipulation of natural resources and energy.

GSC is essential and serves as a crucial tool for the advancement of the CE. The CE model emphasizes features that facilitate resource tracking and minimize waste. The demand for supplementary raw materials in CE is minimized through the rotation of existing resources and the assessment of product performance within a closed loop [37]. Waste generation is minimized to the utmost extent. Industries are increasingly attentive to adopting circular economy doctrines to prolong resource lifespan in response to impending risks. [38] assert that Circular economy (CE) is still in its nascent phase, with the majority of enterprises prioritizing recycling above reuse principles.

Research on CE is increasing, as noted by [23], [39]. GSC requires environmentally sustainable, economically viable, and socially acceptable approaches. To mitigate the environmental impact of these operations, the supply chain flow must align with corporate objectives and fulfill customer requirements [27]. Digital practices enhance sustainability through the utilization of renewable energy, the development of technological solutions, and the reduction of carbon footprints, benefiting all stakeholders [40]. The textile industry must implement GSC techniques to protect the environment, necessitating the removal of any barriers. Identifying and assessing GSC obstacles is essential for implementing the CE in the textile sector.

D. BARRIERS TO GSC IN THE FRAMEWORK OF CE

The implementation of GSC in the CE of the textile sector presents significant challenges. Consequently, identifying and examining these obstacles is essential. The report will assist employers in comprehending the challenges associated with implementing greener SC within the context of CE. To protect the environment, the textile sector must implement GSC techniques, necessitating the removal of any existing barriers. The challenges faced by the textile industry have been examined. In the current business environment of the CE, the industry must shape technology to attain GSC goals. Performance evaluations should be appropriately balanced.

[41] assert that the textile sector is committed to advancing sustainability and achieving competitive advantage through the implementation of green practices. Numerous studies [42]–[44] examine the challenges associated with the adoption of GSC across different industrial sectors. [45] identified several challenges associated with the application of GSC approaches

regarding environmental sustainability. Several academic studies indicate that the general public exerts a limited influence on the advancement of sustainable practices. Other scholars have indicated that insufficient eco-literacy, knowledge gaps, lack of expertise, and inadequate ecological management may hinder the implementation of GSC. The obstacles render the implementation of GSC approaches highly challenging. Consequently, it is essential to identify and analyze these impediments using a strategic approach. Table I presents a summary of the critical challenges associated with GSC.

TABLE 1

LIST OF GREEN SUPPLY CHAIN BARRIERS (GSCB)

Code	Barriers	Description	References
GSCB-1	Sub-optimal Return on Investment	The investment rate is a critical factor for the textile industry regarding profitability. The industry and enterprises perceive a low return on investment in the implementation of GSC with CE principles.	[46]–[48]
GSCB-2	Inadequate Government Support and Policies for GSC	Government support for the promotion and adoption of circular economy practices in logistics remains limited in developing nations. However, this is currently undergoing gradual change.	[44], [49]–[51]
GSCB-3	Insufficient Support from Top Management for GSC	Top management in industries primarily prioritizes profits, often neglecting support for environmentally friendly practices that require financial investment, particularly when implemented through CE initiatives.	[40], [49], [50], [52], [53]

Code	Barriers	Description	References
GSCB-4	Change Resistance from Employee	Employees in organizations typically exhibit resistance to change, particularly when it comes to the implementation of new techniques in CE practices and the adoption of innovative tools for GSC activities.	[40], [54]
GSCB-5	Insufficient engagement with renewable energy resources	Enterprises continue to utilize renewable energy resources due to their availability, which impedes environmentally friendly practices.	[40], [55]
GSCB-6	Insufficient strategies for IT systems and advanced technologies.	SC activities within enterprises and the manufacturing industry exhibit limited utilization of advanced IT technologies such as AI, Big Data and RFID.	[50], [56]
GSCB-7	Complex process design for reusing and recycling	The execution of green practices within CE perspective is impeded by the complexity of reuse and recycling design processes.	[38], [57], [58]
GSCB-8	Inadequate sustainable packaging	The nonexistence of environmental friendly materials for packaging significantly impedes sustainable practices in the industry.	[55], [57]

III.RESEARCH METHODOLOGY

A. CONCEPTUAL FRAMEWORK

The DEMATEL approach, or "decision-making trial and evaluation laboratory," was employed to analyze the stimulus and interrelation amid eight identified obstacles. This would facilitate the categorization of

obstacles into cause and effect classifications. A sensitivity analysis was conducted by experts to validate the findings.

B. NATURE OF THE STUDY

This investigation employed a quantitative strategy to gather primary data. Individuals from Pakistan's textile manufacturing sector were selected. All identified obstacles were conveyed to the relevant managers in the procurement, sales and marketing, supply chain, import and export, and packaging divisions within the textile sector. The individuals were adequately prepared and knowledgeable regarding their firms' strategies. The responders were deemed qualified to provide the requisite information. Experts in the Pakistani textile industry examined the interrelated impact of various challenges. Experts employed assessment scales to articulate their perspectives on the direct causal relationships among variables.

C. SAMPLING TECHNIQUE

This study employed a non-probability / convenient sampling method. Participants who consented to share their responses were chosen. The survey questionnaire was developed to effectively communicate the research objective to participants. It provided detailed guidelines and ensured that all data would be used exclusively for academic purposes. Employees from the procurement, sales and marketing, supply chain, import and export, and packaging departments of various textile manufacturers in Pakistan submitted the data. Several textile companies have issued apologies concerning their participation in this survey due to their policies.

D. INSTRUMENTATION

A scale ranging from 0 to 4 was employed. “0” denotes "no influence," “1” represents "low influence," “2” indicates "medium influence," “3” signifies "high influence," and “4” reflects "very high influence". Experts rated the impact of two standards using a numerical scale from 0 to 4. The average matrix of direct relations was established through the aggregation of expert opinions.

E. DATA COLLECTION METHOD

This investigation utilized a questionnaire survey as the primary data collection method. Email survey forms were distributed to various textile industries. The web-based survey utilized a direct electronic data input

system for the answer recordings. Prospective responders received a link to an online survey.

F. DEMOGRAPHIC ANALYSIS

The target audience comprised managerial personnel from diverse departments within textile firms, including people from procurement, sales and marketing, supply chain, import and export, and packaging. The academicians were subject-matter experts, and the specialists from the industry possessed a minimum of fifteen years of experience in the textile sector. The sample was selected based on volunteer participation and viewer convenience.

G. STATISTICAL TECHNIQUE FOR DATA ANALYSIS

The decision making trial and evaluation laboratory (DEMATEL) method was employed to analyze the data. This tool is usually utilized to ascertain the direct impact of two criteria on one another. A sensitivity analysis was conducted by specialists to validate the findings.

IV.RESULTS AND DISCUSSION

A. DEMATEL TECHNIQUE

The DEMATEL approach identifies and correlates essential elements. The reliability of outcomes derived from DEMATEL is evaluated through sensitivity analysis. The research conducted by [59] can be employed to discern the facilitators and barriers to CE. [22] employed DEMATEL to categorize block chain dynamics into cause / effect groups. [60] employed DEMATEL technique to establish a framework for probing waste management concerns. Figure 1 illustrates the phases of the DEMATEL approach.

STEP 1: “DEVELOPMENT OF AVERAGE DIRECT-RELATIONSHIP MATRIX”

Experts from Pakistani Textile industry analyzed the presented matrix, articulating their views on the interrelated effects of various challenges. The experts provided insights on the direct influence of relationships among factors utilizing assessment gauges.

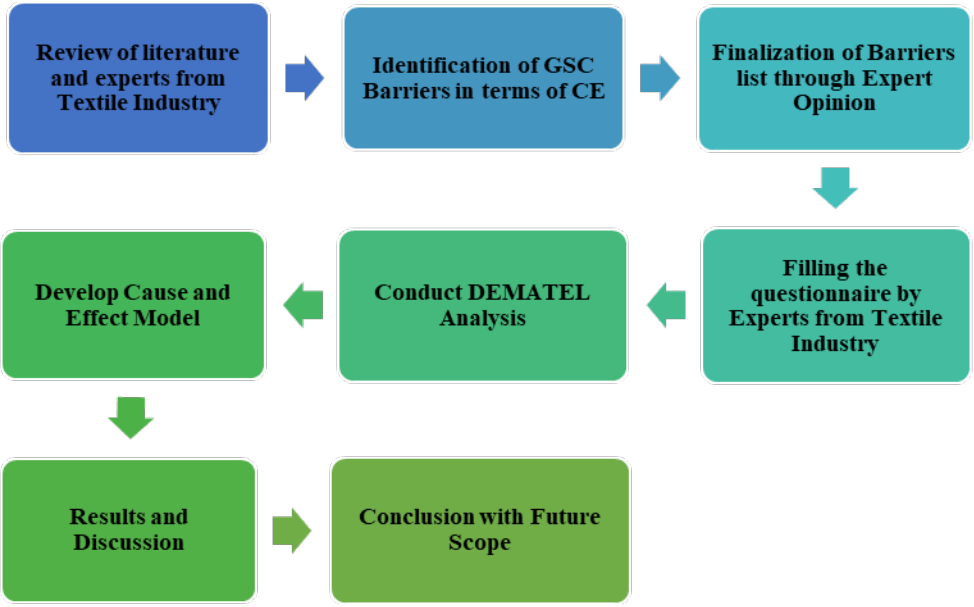

FIGURE 1. Research model

STEP 2: "NORMALIZING THE AVERAGE DIRECT-RELATION MATRIX (X) AND DEVELOPMENT OF TOTAL RELATIONSHIP MATRIX"

The subsequent stage involves normalizing the values resulting from the initial table. The researchers normalized the preliminary direct relation matrix "D" through the following process:

$D = m \times A$

Total relationship matrix was computed following normalization. The normalized initial direct-relation matrix D, referred to as Dm, represents the consequence of length m or the product promulgated after m – 1 intermediary through its m-indirect influence. Table II presents the total relationship matrix containing D and R values.

TABLE 2

TOTAL RELATIONSHIP MATRIX WITH D AND R

Barrier Code	GSCB-1	GSCB-2	GSCB-3	GSCB-4	GSCB-5	GSCB-6	GSCB-7	GSCB-8	D
GSCB-1	0.166	0.202	0.272	0.320	0.266	0.167	0.181	0.151	3.347
GSCB-2	0.169	0.155	0.199	0.277	0.243	0.180	0.190	0.167	2.962
GSCB-3	0.269	0.284	0.231	0.288	0.324	0.222	0.211	0.203	3.984

Barrier Code	GSCB-1	GSCB-2	GSCB-3	GSCB-4	GSCB-5	GSCB-6	GSCB-7	GSCB-8	D
GSCB-4	0.255	0.237	0.207	0.205	0.225	0.158	0.198	0.143	3.114
GSCB-5	0.179	0.212	0.229	0.277	0.169	0.157	0.172	0.142	3.085
GSCB-6	0.222	0.317	0.311	0.367	0.299	0.173	0.236	0.234	3.966
GSCB-7	0.216	0.225	0.245	0.297	0.209	0.193	0.155	0.152	3.322
GSCB-8	0.212	0.281	0.301	0.354	0.264	0.244	0.226	0.147	3.777
R	3.080	3.334	3.770	4.253	3.534	2.745	2.941	2.448	-

STEP 3: PRODUCING THE CAUSE-AND-EFFECT VALUES FROM THE TOTAL RELATION MATRIX

D + R and D – R values, derived from the DEMATEL approach, are presented in Table 3. Negative values of D-R are apportioned to “effect group”, while positive values of D-R are labelled as “cause group”. The disinterest of top management emerged as the most significant barrier, exhibiting the highest score of D+R at 7.739 regarding the adoption of GSC practices in the circular economy for Pakistan's textile industry (GSCB-3). Consequently, it represents the most significant obstacle. The reluctance to adopt GSC practices through CE (GSCB-4), the absence of strategies for information and advanced technologies such as AI, Big Data and RFID (GSCB-6), and the deficiency of strategies for utilizing renewable energy resources in the implementation of GSC practices (GSCB-5) rank as the 2nd, 3rd and 4th challenges, respectively. This study's findings will contribute to the development of a framework for analyzing hitches and assessing their interconnections. Figure 2 illustrates graphical relationships among the barricades within the cause / effect framework for this study.

TABLE III

CAUSE AND EFFECT VALUES

Barriers	D	R	D+R	Ranking	D-R	Cause / Effect
GSCB-1	3.347	3.080	6.427	5	0.267	Cause
GSCB-2	2.962	3.334	6.296	6	-0.372	Effect
GSCB-3	3.984	3.770	7.754	1	0.214	Cause
GSCB-4	3.114	4.253	7.367	2	-1.139	Effect
GSCB-5	3.085	3.534	6.619	4	-0.449	Effect
GSCB-6	3.966	2.745	6.711	3	1.221	Cause
GSCB-7	3.322	2.941	6.263	7	0.381	Cause
GSCB-8	3.777	2.448	6.225	8	1.329	Cause

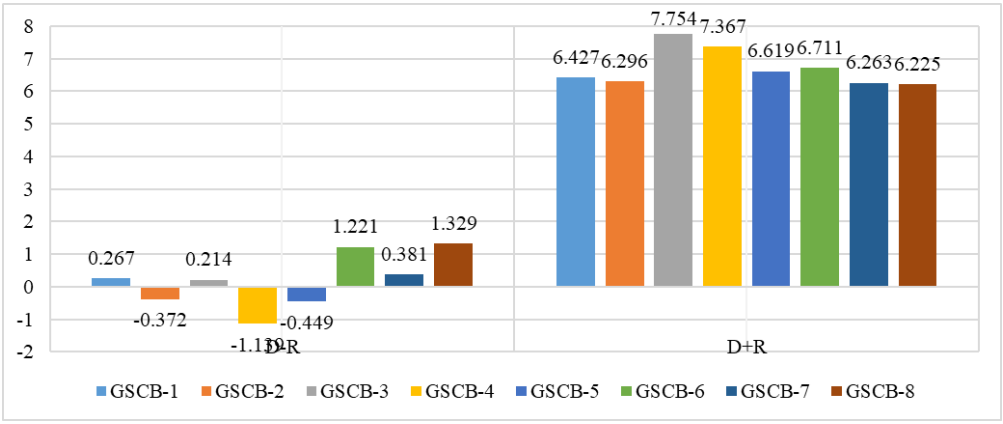

FIGURE 2. Graphical Representation - Cause-and-Effect Barriers

V.CONCLUSION

The global textile industry is acknowledged as a fundamental economic foundation. GSC is essential for the sustainable future of the textile industry. Pakistan's textile industry is actively working to adopt green and sustainable SC processes to remain competitive in international markets; however, it faces several challenges. This study focuses on the challenges that GSC encounters in the CE context. Through literature analysis and interviews with industry leaders, eight significant barriers to GSC have been identified. The DEAMTEL approach is employed to rank these obstacles. Barriers can be categorized into two types: causes and effects. Cause category barriers may influence other obstacles within the effect category. Consequently, management must initiate efforts to address the primary critical obstacle, specifically the cause category. The primary barrier to implementing GSC operations is the lack of interest from top-level management in the concept. Additionally, employees in the textile sector exhibit resistance to the adoption of newer, more sustainable SC procedures. Consequently, enhancing awareness of GSC and emerging global issues is essential through various orientation programs, lectures, seminars, and related activities.

A. IMPLICATIONS

The study's conclusions will significantly impact senior management within the textile industry and legislators. The GSC barrier's rankings can be utilized to contextualize various practices, legislation, emerging technologies, and systems within the textile sector. Evaluating the issues

within the textile industry's SC sector is beneficial for internal benchmarking from a strategic perspective. This would facilitate the simplification of informed decision-making for both management and government entities. The industry ought to advocate for CE and its role in achieving environmental objectives. Textile leaders should allocate sufficient resources to effectively implement circular economy practices and attain sustainable objectives. Pakistan's textile sector should incorporate various CE components. This will enhance the methodologies employed for sustained value creation.

B. FUTURE RESEARCH DIRECTIONS

This study, while demonstrating significant progress in the research of sustainable business strategies, has notable limitations. Eight critical barriers have been identified in Pakistan's textile sector that hinder the sustainable operations of the global supply chain. The findings cannot be generalized; however, they may be applicable across various industries and countries. The study could be broadened to encompass additional countries and industries for enhanced validation through the application of diverse MCDM methodologies. Pragmatic facts and various studies across diverse contexts can be employed to further substantiate the study.

CONFLICT OF INTEREST

The authors of the manuscript have no financial or non-financial conflict of interest in the subject matter or materials discussed in this manuscript.

DATA AVALIABILITY STATEMENT

The data associated with this study will be provided by the corresponding author upon request.

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No funding has been received for this research.

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