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Let's Start!

The Impact Of Green Supply Chain On Sustainability: A Case Study Of Pharmaceutical Industry Peshawar, Pakistan

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The Impact Of Green Supply Chain On Sustainability: A Case Study Of Pharmaceutical Industry Peshawar, Pakistan

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Abstract

The purpose of this research was to determine how the green supply chain affects sustainability. Managers at the senior and middle levels of the pharmaceutical industry in Pakistan were the focus of this study since they were creating the company's policies and strategies. There were 86 managers in the purposive sample. An electronic self-report questionnaire created with Google Forms was utilized to collect the data required for the analysis. The research hypotheses were examined using AMOS software. The study found that the green supply chain, including its components (green manufacturing, green distribution, green purchasing, eco-design, and green reverse logistics), had an effect on sustainability. Drawing from this finding, the researcher suggests that pharmaceutical companies in Pakistanan adopt green initiatives and follow the trends toward a green supply chain approach that minimizes waste and non-renewable resource consumption. Additionally, the company should implement specific policies and procedures requiring employees to implement the green approach in their work practices.

Keywords: green supply chain, sustainability, pharmaceutical industry

INTRODUCTION

Government representatives, labor unions, and nonprofit organizations are just a few of the numerous parties that keep a careful eye on companies. Of course, this examination goes beyond the growing demand for more environmentally friendly activities among at least some client segments (Salleh & Sapengin, 2023; Alshawabkeh et al., 2022; Vachon & Klassen, 2006). Over the past ten years, manufacturing organizations have faced greater pressure to utilize eco-friendly methods and produce eco-friendly items (Zaim, 2023; Al-Nawafah et al., 2022). Manufacturing companies have acknowledged the significance of their supply chain partners in environmental management. Many manufacturing companies have turned to their suppliers and consumers to discover creative solutions to environmental problems (Feng & Tang, 2024; Aityassine et al., 2022; Al-khawaldah et al., 2022; Vachon, 2007).

The growing environmental and climate change concerns in recent years, along with the tensions resulting from social inequality and poverty issues, have made sustainable development one of the most popular topics that has drawn the attention of many academic researchers. Sustainable development was described as an investment in resources to meet

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current needs without compromising the ability of future generations to meet their own (Imperatives, 1987). Sustainability significantly influences customers' choice judgments for product characteristics when they are presented with calculated environmental effect estimates for all product design configurations (Goucher-Lambert & Cagan, 2015; Grech, 2019; Truan & Can, 2024). Strict sustainability criteria also increase the cost of planting energy crops (Smeets & Faaij, 2010; Serani, 2024; Diaz & Weber, 2020). Quality and sustainability factors affect the sensory acceptability, purchase intent, and quality perception of products that are classified as such (de Andrade Silva, Bioto, Efraim, & de Castilho Queiroz, 2017; Yen, 2018; Al Masri & Wimanda, 2024). Additionally, it was noted that sustainability disclosure (environmental, social, and governance) increased the company's worth.

Furthermore, GSCM is starting to gain traction, especially in developed countries like China and Malaysia (Laosirihongthong, Adebanjo & Choon Tan, 2013; Wang & Manopimoke, 2023). External green supply chain management (GSCM) initiatives like "green procurement" (GP) and "customer collaboration" (CC) have an effect on an organization's environmental performance (EP) (de Sousa Jabbour, Vazquez-Brust, Jabbour & Latan, 2017). The findings showed that green supply chain practices, such as green manufacturing, green information systems, customer participation, and environmental design, had positive and significant effects on business organizational performance, with the exception of green purchasing (Khan & Qianli, 2017). Manufacturing organizations that use GSCM strategies enhance their economic and environmental performance, which positively affects their total organizational performance (Green, Zelbst, Meacham, & Bhadauria, 2012; Afzal & Fatima, 2020). Furthermore, any business that uses advanced supply chain operations can improve sustainability outcomes and its overall environmental performance by using the Management of the Green Supply Chain (GSCM) (Chin, Tat & Sulaiman, 2015). A review of the theoretical literature on the impact of the green supply chain on sustainability indicates that there is a gap in the Arabic literature that links these two elements. Determining the impact of the green supply chain on sustainability was the aim of the current study.

THEORETICAL FOUNDATION

GREEN SUPPLY CHAINS

Environmental and social responsibilities have been integrated as significant advancements into the cultural underpinnings of the modern business world in recent years (Al-Quran et al., 2020). Many businesses have started identifying "greening" activities as competitive strategic approaches due to the increased interest in such obligations (Min & Kim, 2012). Green supply chain management, or GSCM, is becoming more and more popular among operations management practitioners and researchers. The growing environmental degradation, such as declining raw materials, flooded waste sites, and rising pollution levels, is the primary driver of the growing importance of Green Supply Chain Management (GSCM) (Srivastava, 2007).

According to Ninlawan et al. (2010), supply chain management (SCM) is the act of coordinating and managing a complex web of relationships with the goal of delivering a suitable product to the customer or end-user. According to Chin, Tat, and Sulaiman (2015), "green supply

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chain management" also refers to the integration of environmental factors into supply chain management (SCM). Green supply chain management, or GSCM, is a method that aims to optimize material and information flows along the value chain, according to Kumar et al. (2011). According to Barari, Agarwal, Zhang, Mahanty, and Tiwari (2012), Green Supply Chain Management (GSCM) is a managerial tenet that aims to preserve environmental efficiency for the intricate processes involved at every stage of the product life cycle while simultaneously generating firm profit. In order to create a sustainable supply chain, GSCM was also described as "the process of using environmentally friendly inputs and transforming these inputs into outputs that can be reclaimed and reused at the end of their life cycle" (Dube & Gawande, 2011). In order to improve the environmental performance of procedures and goods that meet environmental rules, GSCM has been identifying a proactive approach (Hsu & Hu, 2008). It has recently become a prominent organizational concept and proactive approach to controlling any environmental hazards (Diabat et al., 2013).

Green supply chain practices were found by Vachon and Klassen (2006) in two categories of environmental activities, which are environmental monitoring and environmental cooperation. "Cooperation with Customers" (CC) and "Green Purchasing" (GP) are examples of external green supply chain management practices (De Sousa Jabbour et al., 2017). Laosirihongthong et al. (2013) included green purchasing techniques, eco-design practices, reverse logistics activities, and legality and regulation. Green transportation, green distribution, and green purchasing are three more factors that are used to quantify GSC practices (Khan, Qianli & Zhang, 2018). Green manufacturing, green distribution, green logistics, and green procurement are examples of GSCM practices (Chin, Tat, & Suleiman, 2015). Both Mutingi, Mapfaira, and Monageng (2014) and Ninlawan et al. (2010) agreed with it. Five factors, such as green manufacturing, green purchasing, and green information systems, were used to gauge green supply chain operations. Eco-design, consumer collaboration, and information systems (Khan & Qianli, 2017). Thus, eco-design, eco-distribution, eco-purchasing, eco-manufacturing, and eco-reverse logistics were all aspects of supply chain green practices that were used in this study.

The methodical integration of environmental considerations into the design and development of products is known as environmental design (Tukker, Eder, Charter, Haag, Vercalsteren & Wiedmann, 2001). Green distribution practices include lowering the amount of non-renewable energy sources and ozone-depleting materials used in assembly and recycling, as well as focusing more on land during transportation (Mumbi, Karanja & Kiarie, 2021). Distribution also refers to the movement of the product from the production stage to the customer in the supply chain. According to Blome, Hollos, and Paulraj (2014), green procurement practices include the company's shifting its requirements toward greener products (like designing products for disassembly and recycling), choosing suppliers who offer environmentally friendly products in a greener way (like reducing waste and ISO certification), and cooperating with suppliers to enhance green performance (e.g., joint planning activities and supplier engagement). That is, making sure the items you buy have qualities that are good for the

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environment, including being reusable and free of dangerous parts. According to Maruthi and Rashmi (2015), green manufacturing is a system that minimizes environmental impact while simultaneously optimizing resource efficiency by integrating product and process design challenges that impact manufacturing planning and control in a way that identifies, estimates, and streams environmental waste. One type of reverse logistics that preserves the environment is called "green reverse logistics." It is a tool for planning and organizing the manufacturing process and managing end-of-life products (used and destroyed) to increase the amount of recovered goods and send them back to the manufacturer for recycling, repair, upkeep, or destruction. This comprises strategies to lessen pollution and waste products in order to preserve environmental stability and prevent its depletion.

SUSTAINABILITY

The concept of sustainability emerged from a number of conferences and studies in the 1970s and 1980s, and it was just as compelling to natural calamities and occurrences as worries about material pollution and asset depreciation (Rajput & Datta, 2020). Over the last twenty years, networks of different activators have been created, along with partnerships and specialized institutions and organizations. Additionally, a lot of money has been invested and a lot of programs have been implemented to raise awareness of sustainability (Scoones, 2007). According to a recent poll that gathered data from 18 countries in the final quarter of 2014, environmental concerns received greater attention than they did in 2012. It also showed that emerging nations were more inclined to embrace sustainable consumption practices. Several nations at the top of the list of more sustainable consumers were Brazil, South Korea, China, India, and others (de Sousa Jabbour, Vazquez-Brust, Jabbour & Latan, 2017). Sustainable development also embraces the triple consequence of its dimensions, which are represented by sustainable economic development, social development, and environmental development.

The number of investors seeking businesses that include sustainability into their best practices demonstrates the fundamental importance of sustainability in the business world. According to de Francesco and Levy (2008), these investors' actions frequently suggest an underlying anticipation that their investment performance would ultimately improve. According to Siegrist & Hartmann (2019), consumers may choose to eat more sustainably produced food as their awareness of the effects of food on the environment grows. According to Shou, Shao, Lai, Kang, and Park (2019), a focus on sustainability encourages the use of sustainable supply management (SSM) techniques.

The study's findings (Abdi, Li, & Càmara-Turull, 2020) confirmed that the degree of market value and the company's financial performance are positively correlated with the two sustainability pillars (environment and governance). According to the research, there is a significant positive correlation (Bodhanwala & Bodhanwala, 2018). Companies that implement major sustainable development strategies report increased profitability, according to the relationship between sustainability and corporate performance (return on invested capital, return on equity, return on assets, and return on equity). According to Number et al. (2019), in order to satisfy the demands of investors and other stakeholders, sustainability management that aims to

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improve financial performance should aggressively pursue relatively high levels of corporate sustainability. Yu and Zhao (2015) discovered a favorable correlation between firm value and sustainability performance. According to Eccles, Ioannou, and Serafeim (2014), sustainable businesses perform noticeably better over the long term than other businesses, particularly in terms of their stock market and accounting results. However, a sustainable development route that takes into account social, economic, and environmental challenges at the same time might improve food security, as indicated by Steindler, Graef, König, Mchau, Saidia, and Sieber (2016).

GREEN SUPPLY CHAINS AND SUSTAINABILITY

The "triple sum" of social, environmental, and economic advantages is mostly obtained through green supply chain activities, which contribute to the sustainable development of society (Eltayeb & Zailani, 2009). In addition to highlighting sustainable supply chain management practices (GSCM) as a strategic approach to attain sustainability performance, Foo et al. (2018) discovered that there is no discernible relationship between sustainability performance and supplier evaluation and selection. Customer collaboration has a negative correlation with sustainability performance, despite having a strong correlation with sustainability practices. Determining the connection between green logistics practices as a component of green supply chain performance and measures of environmental and economic sustainability is the aim of the study (Khan, Zhang, and Nathaniel, 2020). The findings showed that energy demand, renewable energy usage, and foreign direct investment flows were all positively correlated with green logistics companies. Nonetheless, research proved that there was a strong inverse correlation with carbon dioxide emissions. Renewable energy and foreign direct investment, which both enhance environmental sustainability, are driving green logistics.

The influence of Green Supply Chain Management (GSCM) on lean practices—particularly those pertaining to Kaizen and innovation management practices—on organizational sustainability was demonstrated by Singh et al. (2020). They drew attention to the detrimental effects of government regulations, innovative management, and the Kaizen Group on supply chain participants' understanding of the environment. The government policies should be reviewed to improve the impact on environmental considerations achieved based on supply chain practices oriented to reducing pollution, even though the innovation and Kaizen management strategies individually had a positive impact on the environmental supply chain. Implementing Kaizen and innovation management through the Green Supply Chain Management GSCM also greatly improves economic performance, environmental performance, and competitive performance (Metabis, A., & Al-Hawary, 2013). Jo and Kwon (2022) claim that environmental collaboration in a green supply chain setting is a key factor in helping Korean manufacturing-based SMEs develop their green innovation capabilities. Furthermore, it was found that green innovation positively affects financial success through environmental performance. It offered a theoretical framework for a comprehensive analysis of the methodical workings of green supply chains and the strategic directions they provide for the effective use of manufacturing-based GSCM Green Supply Chain Management. According to Yu, Golpîra, and Khan (2018), trade openness, FDI flows, and green energy sources are all strongly positively correlated with green logistics indices.

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They did see a negative correlation between these variables and carbon and greenhouse gas emissions, though. They also looked at renewable energy as a key component of supply chain management and green logistics, which support both economic and environmental sustainability. Using the information provided, we can formulate the study hypothesis as follows: Main hypothesis: *There is an impact of green supply chains on sustainability.*

RESEARCH METHODOLOGY

POPULATION AND SAMPLE

Information relating to sustainability is affected by the green supply chain was gathered from two Pakistani pharmaceutical businesses. Since they are in charge of creating the company's policies and plans, this study focused on middle and senior managers. Twelvey managers were chosen as a purposeful sample. They were emailed the study questionnaire and instructed to return it within a week. The surveys would be handled with extreme secrecy, it was further underlined. A total of 102 replies were received, 18 of which were excluded from the data analysis because they contained confusing or missing information. At a 71.67% response rate, 86 responses were retained for analysis.

It was discovered that of the legitimate replies, 22.1% were from females and 77.90% were from men. In terms of age, 80.62% of respondents fell into the "less than 40" category, 11.62% into the "40-less than 50" category, and 7.76% into the "50 or older" category. Furthermore, the results indicated that the majority of respondents had a high level of education, with 47.67% having earned a master's degree, 32.94% a bachelor's degree, and 19.84 a doctorate.

MEASURES

A model that incorporates sustainability as a dependent variable and the green supply chain as an independent variable has been constructed in accordance with the goals of the study. A self-report questionnaire created electronically using Google Forms was used to collect the data required for the analysis. Since experts were asked to translate all of the survey's components into Arabic and then back into English using standard reverse translation techniques, they were all first created in English. The survey comprised two sections dedicated to the primary research variables, where responses were derived using the five-point Likert scale, as well as a section to ascertain the demographic characteristics of the research sample (gender, age, and educational attainment), which were categorical variables.

Green Supply Chain: This variable was assessed using 22 items that were modified from Khanet al. (2022). The respondents' opinions about the adoption of green supply chain methods by Pakistani pharmaceutical businesses were evaluated using this scale. Six first-order constructions were used to explain the green supply chain, which is a second-order construct. Four criteria were used to measure eco-design. "For instance, a business aims to create products that can be recycled and their materials and components recovered." The five criteria "e.g., company uses recyclable boxes when distributing products in the markets" were used to quantify green distribution. Four criteria—such as "the company focuses on environmental audit procedures to assess and manage supplier relationships"—were used to measure green purchasing. Green reverse logistics was evaluated using five criteria, such as "the company

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follows a policy of selling scrap and redundant capital items," and green manufacturing was evaluated using four criteria, such as "the company emphasizes an operational strategy that minimizes waste and optimizes resource investment."

Sustainability: The nine questions used to assess this variable matched those of Alshehhi et al. (2018). Respondents' opinions of how well-informed Pakistani pharmaceutical businesses were about the needs to attain sustainability were gauged using this scale. As a first-order construct, sustainability was considered, encompassing "e.g., company develops production methods that consume less energy, and company is active in community circles by supporting charities."

RESULTS

MEASUREMENT MODEL EVALUATION

The measuring model for analyzing where the green supply chain affects sustainability was assessed using a confirmatory factor analysis (CFA). Similar studies frequently employ CFA to assess the reliability and validity of the research tool used to gather primary data (Keith, 2019). In order to determine the convergent and discriminant validity as well as the composite reliability for all first-order constructs used in the study, this method relies on the covariance matrix and the maximum likelihood approach. The outcomes of these indicators were shown in Table 1.

TABLE 1: TESTS OF VALIDITY AND RELIABILITY

Constructs	Codes	Lod.	AVE	MSV	√AVE	CR.
Eco-design	EDE1	0.741	0.581	0.399	0.758	0.852
	EDE2	0.721				
	EDE3	0.769				
	EDE4	0.809				
Green distribution	GDS1	0.711	0.618	0.492	0.783	0.890
	GDS2	0.828				
	GDS3	0.789				
	GDS4	0.748				
	GDS5	0.812				
Green purchasing	GPU1	0.727	0.602	0.358	0.764	0.861
	GPU2	0.752				
	GPU3	0.788				
	GPU4	0.801				

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Green manufacturing	GMA1	0.664	0.557	0.471	0.748	0.847
	GMA2	0.787				
	GMA3	0.764				
	GMA4	0.769				
Green reverse logistics	GRL1	0.703	0.552	0.406	0.742	0.863
	GRL2	0.724				
	GRL3	0.713				
	GRL4	0.734				
	GRL5	0.822				
Sustainability	SUS1	0.756	0.601	0.469	0.761	0.938
	SUS2	0.829				
	SUS3	0.794				
	SUS4	0.795				
	SUS5	0.709				
	SUS6	0.763				
	SUS7	0.772				
	SUS8	0.728				
	SUS9	0.829				

According to the findings in Table 1, the observable variables' associations with their latent construct, as represented by the item loadings, fell between 0.671 and 0.824. Average variance extracted (AVE) values exceeded the minimum threshold of 0.50 set for this indicator. Because the values of the indicators are higher than the minimum limitations stated by Webber et al. (2020), these results therefore validate the convergent validity of the research instrument. Additionally, the Heterotrait-Monotrait ratio of correlations (HTMT) indicated that the square root of AVE was greater than all correlation coefficients between the research constructs and that the values of AVE were superior to all values of maximum shared variance (MSV). As a result, Yusoff et al. (2020) deemed the study instrument to have discriminant validity. In terms of reliability, the McDonald's Omega coefficients that fell between 0.838 and 0.929 showed suitable levels of composite reliability because they are higher than the indicator's lowest known threshold of 0.70.

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DESCRIPTIVE ANALYSIS

Table 2 provided the search variables' means, standard deviations, and correlation coefficients. Standard deviations were utilized to quantify the dispersion of responses and the variation in perceptions, while means were employed to ascertain the trend of respondents' perceptions of the research items. Additionally, Pearson's correlation coefficients were crucial in highlighting the absence of multicollinearity in the data.

TABLE 2: DESCRIPTIVE STATISTICS AND CORRELATION

Constructs	M	SD	1	2	3	4	5	6
1. Eco-design	3.81	0.809						
2. Green distribution	3.59	0.711	0.471***					
3. Green purchasing	3.79	0.872	0.399**	0.403*				
4. Green manufacturing	3.68	0.926	0.478***	0.482***	0.423**			
5. Green reverse logistics	3.65	0.664	0.407**	0.434**	0.412*	0.439***		
6. Sustainability	3.64	0.768	0.515***	0.568***	0.548***	0.507***	0.577***	

Note: * $P< 0.05$, ** $P \leq 0.01$, *** $P \leq 0.001$.

According to Table 2's results, the relative importance levels of green supply chain constructs fell between the high and moderate ranges. Eco-design (M=3.81, SD=0.809) was ranked first at a high level, followed by green purchasing (M=3.89), which was ranked second at a high level, and green reverse logistics (M=3.65, SD=0.664), which was ranked third at a high level. At the same level of relative significance, however, green manufacturing (M=3.68, SD=0.926) was rated last, while green distribution (M=3.59, SD=0.711) was ranked fourth with a modest level. Sustainability was within the moderate relative significance range (M=3.64, SD=0.768). Additionally, while not exceeding the value (r=0.577), all correlation coefficients between the research constructs were statistically significant. According to Hair et al. (2019), correlation values below the 0.80 threshold indicate that multicollinearity is not an issue. Consequently, the constructions of the green supply chain were independent, and the multicollinearity issue had no impact on the findings of the study.

HYPOTHESES TESTING

The influence of the green supply chain aspects on the sustainability of the pharmaceutical business in Pakistan was one of the hypotheses tested in this study using AMOS software.

The chi-squared ratio to the degrees of freedom (Cmin/df) was 2.846, which is less than 3, as can be seen from the findings. The CFI and TLI scores, which are over the 0.90 criterion, were 0.935 and 0.958, respectively. Furthermore, the RMSEA value was 0.044, below the maximum

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threshold of 0.08 for this indication. These findings demonstrated that the model for assessing how the green supply chain's aspects affect sustainability was appropriate for the study's data and had strong construct validity (Savalei, 2021). The extracted effect coefficients used to evaluate the research hypotheses were shown in Table 3.

TABLE 3: STRUCTURAL EQUATION MODELING FOR DIRECT EFFECT

Path		Estimate	S.E.	B	t	p
Eco-design	Sustainability	0.511	0.062	0.461	8.242***	0.000
Green distribution	Sustainability	0.350	0.068	0.344	5.147**	0.008
Green purchasing	Sustainability	0.325	0.074	0.297	4.392*	0.03
Green manufacturing	Sustainability	0.453	0.071	0.428	6.380***	0.000
Green reverse logistics	Sustainability	0.402	0.077	0.372	5.220**	0.005

Note: * $P< 0.05$, ** $P \leq 0.01$, *** $P \leq 0.001$.

According to the first hypothesis (H1), eco-design has a beneficial effect on sustainability. This hypothesis was verified by the results of testing it, which were displayed in Table 3. The eco-design effect coefficients on sustainability were (β = 0.461, t = 8.242, P = 0.000). According to the second hypothesis (H2), sustainability is positively impacted by green distribution. This hypothesis was supported by the data, which indicated that the effect coefficients of green distribution on sustainability were (β = 0.344, t = 5.147, P = 0.008). Regarding the third hypothesis (H3), it was believed that sustainability was positively impacted by green shopping. The findings show that green purchasing has a positive influence on sustainability, and the effect coefficients associated with testing this hypothesis were (β = 0.297, t = 4.392, P = 0.03), indicating support for the hypothesis.

Furthermore, the fourth hypothesis (H4) took into account the fact that sustainability was positively impacted by green manufacturing. According to the findings, green manufacturing improved sustainability, and the effect coefficients for analyzing this association were (β = 0.428, t = 6.380, P = 0.000), which is regarded as evidence to support the hypothesis. According to the fifth and final hypothesis (H5), sustainability benefited from green reverse logistics. This hypothesis was supported by the effect coefficient values (β = 0.372, t = 5.220, P = 0.005).

DISCUSSION

This study discovered a relationship between sustainability and the green supply chain's components (Eco-Design, Green Distribution, Green Purchasing, Green Manufacturing, and Green Reverse Logistics). This is because green practices enable management of businesses to increase sustainability opportunities by working in ways that limit environmental degradation, such as

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reducing raw material resources, increasing pollution levels, and flooding waste sites. Additionally, supply chains are the most important part of industrial organizations because of their size relative to the rest of the organization. As a result, green practices have been incorporated into supply chain activities, leading to many practices like Eco-Design, which incorporates environmental factors into the basic design and development of the product, contributing to sustainable environmental development, and Green Distribution, which lowers energy consumption from non-renewable sources, preserving the environment. Additionally, it reduces the emissions of gases that deplete the ozone layer from distribution-related gear, including cars and other vehicles. This helps protect the environment from pollution and, consequently, the ozone layer from further harm.

While green manufacturing helps achieve sustainability through product design, green purchasing also aims to confirm that environmentally friendly materials are chosen before buying them. Examples of this include buying recyclable and reusable products or materials made from renewable and non-hazardous resources. Designing, planning, operating, and controlling the manufacturing process in a way that minimizes the use of non-renewable resources, promotes the use of renewable resources like solar and wind energy, and reduces waste flow all contribute to the sustainability of the environment and lessens its negative effects. Green Reverse Logistics also helps to promote sustainable development by gathering broken or old items and recycling or reusing them, which reduces the consumption of non-renewable resources. This promotes long-term expansion.

This study supports that of Khan et al. (2020), who discovered a favorable correlation between economic and environmental sustainability indices and green logistics operations as a component of the green supply chain's performance. Yu et al. (2018) shed light on the relationship between national economic and environmental indicators and green logistics performance, which is a component of green supply chain performance. Additionally, Eltayeb and Zailani (2009) demonstrated how green supply chain activities may be crucial to attaining the "triple bottom line" for economic, social, and environmental advantages, hence supporting society's sustainable development.

Environmental collaboration in a green supply chain setting is a significant driver of green innovation capability for Korean manufacturing-based SMEs, according to Jo & Kwon (2022). Additionally, it was shown that green innovation had a beneficial effect. Additionally, it was discovered (Cankaya & Sezen, 2018) that, with the exception of green procurement, all eight GSCM green supply chain management aspects are connected to at least one sustainability performance component. The significance of green supply chain management (GSCM) and its influence on lean practices—particularly Kaizen and innovation management practices—on organizational sustainability were demonstrated by Singh et al. (2020). GSCM approaches were emphasized by Foo et al. (2018) as tactics for attaining sustainable performance.

RECOMMENDATIONS, LIMITATIONS, AND FUTURE RESEARCH

The study discovered that sustainability was impacted by the green supply chain, which includes eco-design, eco-distribution, eco-purchasing, eco-manufacturing, and eco-reverse logistics.

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Based on this finding, the researcher advises pharmaceutical companies in Pakistan to adopt green initiatives and follow the trend of implementing a green supply chain approach that lowers waste and non-renewable resource consumption. Additionally, the researcher suggests establishing specific laws and regulations within the company that require employees to implement the green approach in their work practices. We also suggest periodic monitoring within the company to make sure that everyone is following the company's green initiatives laws and regulations.

The study concentrated on how the green supply chain affected sustainability; however, a different study may examine how the green supply chain affected corporate image, firm competitiveness, or organizational effectiveness. Eco-design, green distribution, green purchasing, green manufacturing, and green reverse logistics are the dimensions of the green supply chain that are examined in this study. Another study may include "Cooperation with Customers" (CC), as well as laws and regulations, or it may address environmental monitoring and cooperation. The variable of sustainability as a whole was addressed in the study. Another study could focus on the economic, social, environmental, and governance dimensions of sustainability, or it could focus on just one of them. For example, one study might focus on pharmaceutical companies, while another might focus on auto factories.

REFERENCES

Abdi, Y., Li, X., & Càmara-Turull, X. (2020). Impact of Sustainability on Firm Value and Financial Performance in the Air Transport Industry. *Sustainability, 12*(23), 9957.

Afzal, I., & Fatima, N. (2020). Bridging the Electricity Demand-Supply Gap in Pakistan: The Role of Circular Debt and Transmission Losses. *Journal of Energy and Environmental Policy Options*, *3*(2), 50-55.

Aityassine, F., Aldiabat, B., Al-rjoub, S., Aldaihani, F., Al-Shorman, H., & Al-Hawary, S. (2021). The mediating effect of just in time on the relationship between green supply chain management practices and performance in the manufacturing companies. *Uncertain Supply Chain Management*, *9*(4), 1081-1090.

Al Masri, R., & Wimanda, E. (2024). The Role of Green Supply Chain Management in Corporate Sustainability Performance. *Journal of Energy and Environmental Policy Options*, *7*(2), 1-9.

Al- Quran, A. Z., Alhalalmeh, M. I., Eldahamsheh, M. M., Mohammad, A. A., Hijjawi, G. S., Almomani, H. M., & Al- Hawary, S. I. (2020). Determinants of the Green Purchase Intention in Jordan: The Moderating Effect of Environmental Concern. *International Journal of Supply Chain Management, 9*(5), 366-371.

Al-khawaldah, R., Al-zoubi, W., Alshaer, S., Almarshad, M., ALShalabi, F., Altahrawi, M., & Al-hawary, S. (2022). Green supply chain management and competitive advantage: The mediating role of organizational ambidexterity. *Uncertain Supply Chain Management*, *10*(3), 961-972.

Policy Journal of Social Science Review
ISSN (Online): 3006-4635
ISSN (Print): 3006-4627
https://journalofsocialsciencereview.com/index.php/PJSSR
Vol. 3 No. 1 (2025)

Alshawabkeh, R., AL-Awamleh, H., Alkhawaldeh, M., Kanaan, R., Al-Hawary, S., Mohammad, A., & Alkhawalda, R. (2022). The mediating role of supply chain management on the relationship between big data and supply chain performance using SCOR model. *Uncertain Supply Chain Management*, *10*(3), 729-736.

Alshehhi, A., Nobanee, H., &Khare, N. (2018). The impact of sustainability practices on corporate financial performance: Literature trends and future research potential. *Sustainability*, *10*(2), 494.

Barari, S., Agarwal, G., Zhang, W.J., Mahanty, B., & Tiwari, M. K. (2012). A decision framework for the analysis of green supply chain contracts: An evolutionary game approach. *Expert systems with applications, 39*(3), 2965-2976.

Blome, C., Hollos, D., & Paulraj, A. (2014). Green procurement and green supplier development: antecedents and effects on supplier performance. *International Journal of Production Research, 52*(1), 32-49.

Bodhanwala, S., & Bodhanwala, R. (2018). Does corporate sustainability impact firm profitability? Evidence from India. *Management Decision, 56*(8), 1734-1747.

Chin, T. A., Tat, H. H., & Sulaiman, Z. (2015). Green Supply Chain Management, Environmental Collaboration and Sustainability Performance. *In Proceedings of the 12th Global Conference on Sustainable Manufacturing*, (Vol. 26, pp. 317-322). Procedia CIRP.

de Andrade Silva, A. R., Bioto, A. S., Efraim, P., & de Castilho Queiroz, G. (2017). Impact of sustainability labeling in the perception of sensory quality and purchase intention of chocolate consumers. *Journal of Cleaner Production, 141*, 11-21.

de Francesco, A. J., & Levy, D. (2008). The impact of sustainability on the investment environment. *Journal of European Real Estate Research, 1*(1), 72-87.

de Sousa Jabbour, A. B. L., Vazquez-Brust, D., Jabbour, C. J. C., & Latan, H. (2017). Green supply chain practices and environmental performance in Brazil: Survey, case studies, and implications for B2B. *Industrial Marketing Management, 66*, 13-28.

Diabat, A., Khodaverdi, R., & Olfat, L. (2013). An exploration of green supply chain practices and performances in an automotive industry. *The International Journal of Advanced Manufacturing Technology, 68*, 949-961.

Diaz, A., & Weber, O. (2020). Balancing Investor Rights and Sustainable Development in International Investment Arbitration. *Journal of Energy and Environmental Policy Options*, *3*(4), 118-126.

Dube, A. S. & Gawande, R. R. (2011). Green Supply Chain management–A literature review. *International Journal of Computer Applications, 975*, 8887.

Policy Journal of Social Science Review
ISSN (Online): 3006-4635
ISSN (Print): 3006-4627
https://journalofsocialsciencereview.com/index.php/PJSSR
Vol. 3 No. 1 (2025)

Eccles, R. G., Ioannou, I., & Serafeim, G. (2014). The Impact of Corporate Sustainability on Organizational Processes and Performance. *Management science, 60*(11), 2835-2857.

Eltayeb, T., & Zailani, S. (2009). Going Green Through Green Supply Chain Initiatives Towards Environmental Sustainability. *Operations and Supply Chain Management, 2*(2), 93-110.

Feng, J., & Tang, Y. (2024). Supply Chain Dynamics and Challenges in E-Commerce Live Broadcasting. *Journal of Policy Options*, *7*(4), 30-37.

Foo, P. Y., Lee, V. H., Tan, G. W. H., & Ooi, K. B. (2018). A gateway to realising sustainability performance via green supply chain management practices: A PLS–ANN approach. *Expert Systems with Applications, 107*, 1-14.

Goucher-Lambert, K., & Cagan, J. (2015). The Impact of Sustainability on Consumer Preference Judgments of Product Attributes. *Journal of Mechanical Design, 137*(8), 081401.

Grech, G. (2019). Career Development as a Bridge Between Project-Based Structures and Effective HRM Practices. *Journal of Policy Options*, *2*(4).

Green, K. W., Zelbst, P. J., Meacham, J., & Bhadauria, V. S. (2012). Green supply chain management practices: impact on performance. *Supply Chain Management: An International Journal, 17*(3), 290-305.

Hair, J.F., Page, M., & Brunsveld, N. (2019). *The essentials of business research methods* (4th ed.). Routledge, London. Hsu, C. W., & Hu, A. H. (2008). Green supply chain management in the electronic industry. *International Journal of Environmental Science & Technology, 5*(2), 205-216.

Imperatives, S. (1987). Report of the World Commission on Environment and Development: Our common future. Accessed Feb, 10, 1-300.

Jo, D., & Kwon, C. (2022). Structure of Green Supply Chain Management for Sustainability of Small and Medium Enterprises. *Sustainability, 14*(1), 50.

Keith, T. (2019). *Multiple regression and beyond: an introduction to multiple regression and structural equation modeling.* (3rd edition). Routledge, New York.

Khan, M. T., Idrees, M. D., Rauf, M., Sami, A., Ansari, A., & Jamil, A. (2022). Green Supply Chain Management Practices' Impact on Operational Performance with the Mediation of Technological Innovation. *Sustainability, 14*(6), 3362.

Khan, S. A. R., & Qianli, D. (2017). Impact of green supply chain management practices on firms' performance: an empirical study from the perspective of Pakistan. *Environmental Science and Pollution Research, 24*, 16829-16844.

Policy Journal of Social Science Review
ISSN (Online): 3006-4635
ISSN (Print): 3006-4627
https://journalofsocialsciencereview.com/index.php/PJSSR
Vol. 3 No. 1 (2025)

Khan, S. A. R., Qianli, D. & Zhang, Y., (2018). The Impact of Green Supply Chain Practices in Business Performance: Evidence from Pakistani FMCG Firms. *Journal of Advanced Manufacturing Systems, 17*(02), 67-275.

Khan, S. A. R., Zhang, Y., & Nathaniel, S. (2020). Green supply chain performance and environmental sustainability: A panel study. *LogForum, 16*(1), 141-159.

Kumar, S., Teichman, S., & Timpernagel, T. (2011). A green supply chain is a requirement for profitability. *International Journal of Production Research, 50*(5), 1278-1296.

Laosirihongthong, T., Adebanjo, D., & Choon Tan, K. (2013). Green supply chain management practices and performance. *Industrial Management & Data Systems, 113*(8), 1088-1109.

Maruthi, G. D., & Rashmi, R. (2015). Green Manufacturing: It's Tools and Techniques that can be implemented in Manufacturing Sectors. *Materials Today: Proceedings, 2*(4-5), 3350-3355.

Metabis, A., & Al-Hawary, S. I. (2013). The Impact of Internal Marketing Practices on Services Quality of Commercial Banks in Jordan. *International Journal of Services and Operations Management*, *15*(3), 313–337.

Min, H., & Kim, I. (2012). Green supply chain research: past, present, and future. *Logistics Research, 4*(1).

Mumbi, K. M., Karanja, N. P., & Kiarie, M. D. (2021). Green packaging, green distribution and competitive advantage in the horticultural sector in kenya. *International Journal of Social Sciences Management and Entrepreneurship (IJSSME), 4*(2), 93-111.

Mutingi, M., Mapfaira, H., & Monageng, R. (2014). Developing performance management systems for the green supply chain. *Journal of Remanufacturing, 4*(6), 1-20.

Ninlawan, C., Seksan, P., Tossapol, K., & Pilada, W. (2010, March). The Implementation of Green Supply Chain Management Practices in Electronics Industry. *In Proceedings of the International Multi Conference of Engineers and Computer Scientists IMECS*, (Vol. 3, pp. 1-6). Hong Kong, China.

Nuber, C., Velte, P., & Hörisch, J. (2019). The curvilinear and time-lagging impact of sustainability performance on financial performance: Evidence from Germany. *Corporate Social Responsibility and Environmental Management, 27*(1), 1– 12.

Rajput, S. P., & Datta, S. (2020). Sustainable and green manufacturing–A narrative literature review. *Materials today: Proceedings, 26*(2), 2515-2520.

Policy Journal of Social Science Review
ISSN (Online): 3006-4635
ISSN (Print): 3006-4627
https://journalofsocialsciencereview.com/index.php/PJSSR
Vol. 3 No. 1 (2025)

Salleh, I., & Sapengin, F. (2023). Exploring the impact of technological capability on inter-firm relationships in Malaysian manufacturing supply chains. *Journal of Policy Options*, *6*(4), 40-48.

Savalei, V. (2021). Improving Fit Indices in Structural Equation Modeling with Categorical Data. *Multivariate Behavioral Research, 56*(3), 390-407.

Schindler, J., Graef, F., König, H. J., Mchau, D., Saidia, P., & Sieber, S. (2016). Sustainability impact assessment to improve food security of smallholders in Tanzania. *Environmental Impact Assessment Review, 60*, 52- 63.

Scoones, I. (2007). Sustainability. *Development in practice, 17*(4-5), 589-596.

Serani, C. (2024). Dynamics of Money Demand and Supply in the US Economy. *Journal of Business and Economic Options*, *7*(2), 20-26.

Shou, Y., Shao, J., Lai, K. H., Kang, M., & Park, Y. (2019). The impact of sustainability and operations orientations on sustainable supply management and the triple bottom line. *Journal of Cleaner Production, 240*, 118280.

Siegrist, M., & Hartmann, C. (2019). Impact of sustainability perception on consumption of organic meat and meat substitutes. *Appetite, 132*, 196-202.

Singh, J., Singh, H., & Kumar, A. (2020). Impact of lean practices on organizational sustainability through green supply chain management–an empirical investigation. *International Journal of Lean Six Sigma, 11*(6), 1035-1068.

Smeets, E. M., & Faaij, A. P. (2010). The impact of sustainability criteria on the costs and potentials of bioenergy production– Applied for case studies in Brazil and Ukraine. *Biomass and Bioenergy, 34*, 319- 333.

Srivastava, S. K. (2007). Green supply-chain management: a state-of-the-art literature review. *International journal of management reviews, 9*(1), 53-80.

Tukker, A., Eder, P., Charter, M., Haag, E., Vercalsteren, A., & Wiedmann, T. (2001). Eco-design: The State of Implementation in Europe Conclusions of a State of the Art Study for IPTS. *The Journal of Sustainable Product Design, 1*, 147-161.

Turan, F., & Can, S. (2024). Innovation as a Driver of Growth in the Context of Circular Economy and Green Management. *Journal of Policy Options*, *7*(4), 1-13.

Vachon, S. (2007). Green supply chain practices and the selection of environmental technologies. *International Journal of Production Research, 45*(18-19), 4357-4379.

Policy Journal of Social Science Review
ISSN (Online): 3006-4635
ISSN (Print): 3006-4627
https://journalofsocialsciencereview.com/index.php/PJSSR
Vol. 3 No. 1 (2025)

Vachon, S., & Klassen, R.D. (2006). Extending green practices across the supply chain: The impact of upstream and downstream integration. *International Journal of Operations & Production Management, 26*(7), 795-821.

Wang, Z., & Manopimoke, P. (2023). Exploring the Interplay Between Supply Chain Dynamics and Organizational Culture in Green Practices Adoption: A Study of Thailand's Hospitality Sector. *Journal of Energy and Environmental Policy Options*, *6*(4), 21-32.

Webber, T. A., Critchfield, E. A., & Soble, J. R. (2020). Convergent, discriminant, and concurrent validity of nonmemory- based performance validity tests. *Assessment, 27*(7), 1399-1415.

Yen, W. (2018). Exploring the Nexus Between Mobile Communication and Traffic Fatalities: A Global Perspective. *Journal of Business and Economic Options*, *1*(2), 60-64.

Yu, M., & Zhao, R. (2015). Sustainability and firm valuation: an international investigation. *International Journal of Accounting and Information Management, 23*(3), 289-307.

Yu, Z., Golpîra, H., & Khan, S. A. R. (2018). The Relationship between Green Supply Chain Performance, Energy Demand, Economic Growth and Environmental Sustainability: An Empirical Evidence from Developed Countries. *LogForum, 14*(4), 479-494.

Yusoff, A.S.M., Peng, F.S., Razak, F.Z.A., &Mustafa, W.A. (2020). Discriminant Validity Assessment of Religious Teacher Acceptance: The Use of HTMT Criterion. *Journal of Physics: Conference Series, 1529*(4), 042045.

Zaim, O. (2023). Green supply chain practices and their role in enhancing cost efficiency and competitiveness. *Journal of Policy Options*, *6*(1), 23-27.