

Green supply chain management in manufacturing: A case from a developing country

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ABSTRACT

This investigation assessed the connection between GSCM and business execution, especially organizational performance. The exploration has discovered an immediate connection between green supply chain management, green purchasing, logistics, manufacturing and design, eco-design, and organizational performance. The outcomes showed that business execution develops a green production network, and the board will improve operational productivity overall. The investigation has found that the execution of the reasonable inventory network in the firm emphatically affects the financial execution of the organization and seriousness, consequently giving the organization the upper hand. This investigation also gives a unique picture of how significant the green supply chain is in playing an essential part in the hierarchical execution, and that is for the prosperity of the representatives. This paper explored advancement in what organizational performance factors affect the firms' green supply chain management practices. Data was collected through a survey questionnaire, adopted and disseminated to 152 employees working in organizations based in Karachi, Pakistan, associated with supply chain management accomplishments. Data was analyzed using Structural Equation Modeling. All four independent variables statistically correlate with green supply chain management. On the other hand, organizational performance produced a positive and significant impact. The results are significant for manufacturing organization managers in improving green supply chain management practices and achieving a competitive position in the industry.

Keywords: Green Supply Chain Management, Green Purchasing, Manufacturing, Organizational Performance, Green Practices

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Green supply chain management in manufacturing: A case from a developing country

1. Introduction

The University of the Institute of Manufacturing Research at Michigan State foresaw the chief idea of a GSCM, "Green Supply Chain Management," 1996. The stimulus on the other side of this proposition or idea was to be concerned about the environmental impact and consider the industrialized supply chain regarding resource optimization. In enhancement disputes, subsequent mechanisms are concluded from the primary preparatory fact of the unsophisticated or crude significant acquisition time of the article, so the article is by the environmental safety guiding principle amid the proposal and improvement unify, in this mode decreasing the malice affected to the world amid the consumption phase and the reimbursement phase (Rashid & Rasheed, 2023a). The green stockpile network has only recently limited the dual implications of environmental assurance and vigour shield, which is to supply the most vigorous and greenest supplies to the most remote environmentally friendly substances. The supply chain is an ever-changing topic linked, covered, and collaborated with the marketing, sales, and operations departments. Firms with a high degree of interdependence will be more likely to dominate the market and industry shortly. A company's performance can be measured in various ways, including competitiveness, economics, finance, operations, marketing, and the environment. Previous research has shown that these positively impact organizational performance (Zimon et al., 2019; Haque et al., 2021; Das et al., 2021). Firms in virtually every industry increasingly seek to ensure the sustainability of all supply chain activities. They ensure that all processes have no negative environmental impact.

By the 18th century, industry had spread all over the world. That was peak season. The emergence of new competitors compelled firms to become more efficient and quick. To get a competitive advantage, they produce more and more efficiently. Production will be far more visible than ever before. As a result, there has been an unavoidable statistical rise in manufacturing waste and defects. Companies realized it was a waste of money (Luthra et al., 2016; Rashid & Rasheed, 2023b). Production systems began to emerge in the 1940s. They were a technology that aimed to shorten lead times, boost productivity, and eliminate waste by giving users more control over the supply chain. The Toyota Production System (TPS), with its Lean Philosophy, was popular (Azfar et al., 2017).

Because lost material is an unpaid expense to the organization, Lean is primarily concerned with eliminating waste in manufacturing. More businesses exist than ever before, and their production impacts the environment. As a result, customers' and governments' expectations have grown (Azfar et al., 2017). Greater environmental sustainability has been claimed as a result of improved societal knowledge, and entire businesses have begun to consider what materials they use to manufacture items, how they are manufactured, and how to recycle worn and faulty products. The European Union has enacted extensive laws concerning consumer and industrial emissions and pollution in Europe. All of this is by a European Union action plan. It will be finished in 2020. The projects were formed for causes such as environmental well-being and enhancing European firms' competitiveness. Because many Asian firms have the benefit of having the lowest cash production costs, European firms must continue to innovate and enhance organic production (Agha et al., 2021; Masoumi et al., 2019). All available knowledge, information, and government regulations drive firms to invest in innovative techniques of producing, manufacturing, and reinforcing the supply chain.

A new use of the old phrase has evolved to make production more environmentally friendly. The word "GREEN" is used as an adjective and a verb in industrial language to respect the environment. In the last decade, supply chain management has evolved with a focus on the consumer (Zhou et al., 2019). They continue to assert that the goal is to push firms to find solutions for their organizations' internal and external aspects. In recent decades, they have gone through industrial and industrial development due to increased awareness about environmental and pollution problems. Industrialization should be prioritized. This is connected to SCM and should help to provide the groundwork for green supply chain management (Yu et al., 2014).

European corporations quickly embraced GSCM, and it is gradually gaining traction in Asia. Greening the supply chain may result in lower costs and energy use. Innovative ideas to increase supplier involvement in decision-making processes that benefit the environment Fuentes-Fuentes discovered in 2004 that greening production positively impacts the company's bottom line. In 2005, Duber-Smith outlined eleven reasons small and medium-sized firms should embrace GSCM (SME). The reasons are product differentiation, competitive advantage, and competitiveness, as well as focused marketing and resource sustainability. Pressures on the supply chain include regulatory adaptation and risk reduction, brand reputation and performance, employee morale, financial investment, and the moral imperative (Masoumi et al., 2019).

Organizations have developed to codify standards and regulations in order to enforce green supply chain management. The International Organization for Standardization (ISO) is the world's most prominent independent non-governmental membership organization, aiming to ensure safety, quality, and efficiency. ISO is regarded as an environmental management standard, and this standard may assist enterprises in developing an effective framework by providing them with practical tools to manage environmental obligations better and more efficiently. Companies must use ISO rules to enhance their organization's environmental performance, employee engagement, competitive advantages and finances.

Green supply chain management is gaining popularity for organizations worldwide to reduce negative environmental impacts. However, in a developing country such as Pakistan, green supply chain management is still in its early stages and has yet to be widely adopted in the automotive sector; hence, the challenges to its acceptability in a growing economy must be thoroughly investigated. The goal of this study is to examine the perspectives and issues associated with implementing green supply chain management systems in the context of the Pakistani automobile sector (Riaz, 2020; Tumpa, 2019). Pakistan, like every agricultural country, is dealing with natural pollution challenges. With the country's industrialization progressing, the difficulties associated with natural threats appear more fundamental and undermining. As global climate change occurs, there is a greater concentration of academicians and supply chain practitioners focusing on green supply chain management (GSCM). Over the last several years, GSCM has become an undeniable interest worldwide, including in Pakistan (Riaz, 2020). In Asia, Pakistan's automobile sector is regarded as one of the world's smallest yet fastest-growing. The automotive sector in Pakistan is involved in one or more lines of business, accounting for around 4% of Pakistan's GDP and employing over 1.8 million people. Pakistan has no vehicle security standards or model update strategies in place. In recent years, Suzuki has continued to sell many outdated automotive models across the country, including the Bolan and the Ravi.

1. *To determine the impact of green supply chain management on organizational performance.*
2. *To determine the relationship among the variables, independent: green purchasing, green manufacturing, ecological design, and green logistics. Dependent: Organizational Performance.*
3. *To establish new ways of implementing green supply chain management to increase organizational performance, especially in the automotive industry.*

The research will emphasize the relevance and use of GSCM, with a particular emphasis on the car industry and its production process. The do-or-die dilemma is only getting started as new companies join the market to take over, mainly from China, Changan, Korea, KIA, and the United Kingdom as MG. The rivalry will be unparalleled. However, due to competitive, legal, and societal restraints, the Pakistani car industry has begun to recognize the importance of GSCM.

1.1 Significance of the Study

Just a few international organizations currently recognize GSCM. Several global corporations, including "Nestle," "Procter & Gamble," "Ford," "General Motors," and "Nike," participate in the GSCM (Riaz, 2020). Concentrating on the Green Supply Chain Management model leads to attaining a severe position that enhances the operational presentation of the firm. Green Supply Chain

Management (GSCM) may assist firms in improving their environmental performance by lowering asset utilization and ensuring viable manufacturing. Its viability is considerably limited due to the hazards associated with working with the GSCM. In this report, I will identify and prioritize dangers in GSCM and opportunities so that the automobile industry may plan strategies and develop consequences.

2. Literature Review

2.1 Theoretical Review

Green Supply Chain Management (GSCM) refers to traditional supply chain management practices that include environmental criteria or considerations in an organization's purchasing decisions and long-term supplier relationships. The green supply chain collects waste within the industrial system to conserve energy and prevent hazardous chemicals from being discharged into the environment. The organization's supply chain operations have a disproportionate environmental impact. Learn about the skewed natural effect of green store network measures within the organization. GSCM stands for green acquisition, green assembly, green pressing, green dissemination, and green promotion. GSCM seeks to remove or reduce wastes such as energy, effluent, toxic compounds, and strong waste. Some analysts have presented theories and models to address ecological challenges. Some of these have been carried out. An "Interpretative Structural Modeling (ISM)" technique was used to identify common impacts among obstacles to the point where those obstructions are driving, which may be improved (Zimon et al., 2019). Driving boundaries regulate most restrictions, which are discrete and self-contained barriers. The GSCM-supported processes were examined by Taiwan's electrical and hardware sectors, which Original Equipment Manufacturing and Original Designing and Manufacturing dominate. The data was analyzed using a factual bundle and an essential condition model. It displays the aspects that impact coordination's expert organizations' choice of green progress. Data from a survey of Taiwanese coordinating groups was used for the demonstration. GSCM has taken a proactive approach to improving the natural presentation of cycles and objects by ecological principles (Azfar et al., 2017). This study examined approaches to ensure the consistency of examination of the factors that influence GSCM implementation and enactment.

Experts advised that more thought should be given to developing "Environmental Management (EM)" alternatives for the inventory network. This study utilized the ISM and logical progression measures to evaluate the relationship between the criteria used to identify green suppliers based on environmental performance. Pakistani Manufacturing Industries has developed an ISM-based plan for a green retail network. They uncovered essential links between empowering influences and developed a progressive paradigm for empowering agents that use ISM. An ISM-based model is familiar with model impediments to green store network practice in Pakistani manufacturing companies. They discovered that green strategic approaches are challenging to accept and implement due to several impediments. The ISM methodology was used to identify and dismantle significant barriers. The importance of GSCM and the necessary components for implementing GSCM in Pakistan's automobile sector were identified and shown. (Zimon et al., 2019). Green Supply Chain Management (GSCM) has been recognized as improving the presentation of cycles and objects using natural principles. In the Pakistani automobile industry, eleven GSCM execution restrictions have been discovered. The "Interpretive Structural Modeling (ISM)" idea was employed to identify the essential links between them—various barriers to GSCM implementation in Pakistan's automotive industry. A model was created using the ISM technique. Competitiveness and vulnerability in the market, a lack of environmental practices, cost ideas, and an unknown client (Azfar et al., 2017).

A dependent factor was the asset's unwillingness to transition to GSCM. There are no government-run emotional support systems. High management's lack of responsibility and IT deployment were cited as drivers. Oppose the option of mechanical progress; scarcity is an organizational improvement, and insufficient HR qualities were found to be connecting factors. There was no boundary recognized as a free factor. Market vulnerability and competition do not engage in biological operations; cost concepts and consumer obviousness were highlighted as higher-level hurdles, with the absence of government emotional support networks indicated as the significant lower-

level hindrance. The GSCM could be deployed in Pakistan's automotive sector by eliminating these barriers.

Two factors facilitate its transition from a slow-growing global economy to a rapidly emerging one: a) its enormous asset of small-scale labour and b) its ability to mass-produce on the fly. Globalization has impacted the local retail network, posing new difficulties to global coordination, agility, adaptation, and pragmatism (Zhou et al., 2019). The globalization of industrial expansion and the geographical spread of financial development have increased the economic significance of the vehicle and coordination sectors. Critical extensions include marine transportation and compartment transit. The effects of a production network outage have an impact on both income and spending. Transportation and interchanges accelerated and grew more efficient during the 1990s. A much more extensive idea of coordination administrations has been developed in the twenty-first century, becoming a dictator, the business sector, and so on (Ali, 2019)—globalization of the arrangement. The world is rapidly reorganizing itself. The vehicle structure has a direct impact on the progress of globalization. The most important relationship between goods and monetary growth has been established. The most crucial factor is the need for merchandise transportation. The waste has been repaired all around. Regarding the population, GDP, total retail consumer merchandise exchanges, and fixed assets invested in transportation and interchanges, item multiplication is a typical test for businesses that sell a range of goods. Firms typically blend systems as components of their supply chain intelligibility, deferral, and inconsistency to overcome this problem (Yu et al., 2014).

Even though the Pakistani automobile industry began in the 1940s, it has grown significantly in the previous two decades, thanks mainly to monetary progress, which includes 100 per cent foreign direct investment in this sector. Global vehicle and component producers energize the foundation of the country's assembly and inventive task offices due to many skilled experts, lower production costs, faster planning, improvement interaction, and rising marketplaces. Most companies investigate their geographic locations while controlling product development and essential acquisition. The organization is involved in various gatherings of constructing agents, international constructing agents, Pakistani segment providers, and global segment providers, each with distinct qualities and shortcomings, with 77 per cent of the creation esteem added to the coordinated area and the remainder to the SME area. Natural pollution is an issue in Pakistan, like in every agricultural country. As the country's industrialization grows, the concerns associated with environmental hazards become more fundamental and undermining. Academics and supply chain professionals increasingly focus on green supply chain management as the world's environment changes (GSCM). In recent years, GSCM has attracted international recognition, notably in Pakistan (Riaz, 2020). Pakistan's car industry is one of Asia's most minor but fastest-expanding industries. Pakistan's car sector is tied to one or more business courses, accounting for more than 4% of Pakistan's GDP and employing more than 1.8 million people. Pakistan has no plans to adopt car safety standards or model changes. Suzuki has lately maintained a selection of classic automobile models nationwide, including the Bolan and the Ravi. Due to severe, administrative, and common pressing challenges, the Pakistani car sector has begun recognising the necessity for GSCM.

Pakistanis could only afford European and American vehicles till the 1960s. Japanese manufacturers arrived at the time. They were initially met with scepticism due to concerns about the quality and dependability of their automobiles. Regardless, Japanese firms eventually consolidated their supremacy. Their automobiles were more vital, durable, and conventional than European and American vehicles. Recently, Chinese automakers attempted to enter the Pakistani market but were turned down owing to obsolete products and a need for features and quality (Bhattacharya, 2014). Another reason for its dissatisfaction was its impotent decision about encircling accomplices. However, the situation is complicated at this time. Chinese automakers are attempting to strengthen their brands, provide advanced models, and construct new manufacturing plants. Because of trendsetting innovation and improved wellness features in the business, travel, and SUV segments, certain Chinese cars have pulled in customers and enlarged their recognition rate. This is the dawn of a new era, and local Chinese car building brokers claim it will have a position alongside Chinese manufacturers. Cost-conscious buyers recognize that it will take time for Chinese automobiles to earn the trust of customers who usually

purchase Japanese vehicles. They claim that Chinese bikes have been more successful in the Pakistani market due to their reduced prices (regardless of their low quality). However, the car sector is a different game, and acquiring a share of the industry will require considerable investment. The Auto Policy 2016–21 established new roads for Korean and Chinese gatherers and brought much money into the country. People are becoming more interested in Korean automobiles such as Hyundai (Tucson) and Kia (Sportage and Picanto), dubbed the best rivals to Japanese vehicles.

2.1.1 Green Purchasing

The scope of GSCM's practices has increased beyond green acquisition to encompass inventory chains that run from supplier, manufacturer, client, and opposing coordination, which serve to "complete the circle" as described in the store network board. Organizations should engage in cross-functional activities with other people from the production network (such as providers and consumers) in these cycles to maximize the benefits of their natural administrative measures. Furthermore, he emphasized that businesses would only thrive in the ultimate eco-stage. When the board functions as a comprehensive framework, the inventory network comprises clients, providers, and numerous entertainers (Riaz, 2020). They also proposed that the store network technique demands the integration of cross-functional and cross-organizational activities such as item planning, supplier cycles, and assessment inbound frameworks and coordination. As a consequence, three major components of internal GSCM are examined in this study: inner GSCM, GSCM with clients, and GSCM with providers. Even though we characterize internal GSCM about the auto industry in Pakistan, the numerous natural administration practices that we investigate in this investigation are more extensive in scope and cover numerous aspects of corporate ecological supportability in the manufacturing industry.

This study aims to look at the link between GSCM rehearsals and the presentation of enterprises in a developing country like Pakistan that have confirmed or intend to adopt GSCM. The test findings show that GSCM rehearsals differ from corporate execution. It indicates that businesses' efforts to understand the link between GSCM methodologies and execution tend to be fruitless. Green Supply Chain Management (GSCM) may assist firms in improving natural execution by minimizing equipment utilization and assuring long-term output. Given the dangers associated with managing green production networks, the appropriateness of GSCM is relatively low (Akhtar, 2019). In this record, they classified dangers and concentrated on the GSCM so that the company could hone in on high-risk areas and define its strategy as needed. Relationship "Green administration" is associated with item configuration, measurement plan, innovation, packaging materials, and packaging strategy (Hashmi & Mohd, 2020). The specialists looked at what the scale of the organization meant for the execution of the green inventory network used by the leaders of the Pakistani company, as well as the influence on authoritative execution. They also suggest specific strategy improvements to approve the green store network and the executive's barriers and improve the appearance of the mining business, particularly smaller ones. They observed that when assembly companies employ GSCM practices, they help improve their financial and natural performance, considerably impacting operational execution (Rashid et al., 2019).

2.1.2 Green Manufacturing

Green Manufacturing techniques are the use of socially and environmentally responsible methods to reduce the harmful effects of manufacturing and increase business productivity. Green techniques are being implemented to increase measurement efficacy. This instruction involves using green assets, which can provide an advantage by lowering item costs and boosting item quality. Green purchasing and manufacturing businesses minimize waste and improve production process efficiency. According to experts, green assembly has several advantages: Green processes and ongoing cycles reduce the terrible impacts of assembling measures on natural manageability, whilst green assembly improves organizations' operational, ecological, and financial performance (Jazairy, 2019). They are considering "GSCM" as a management mix of data and material movement all over the SC, gratifying client interest via environmentally friendly goods and administrations generated by environmentally friendly measures. GSCM is a way to incorporate natural issues into a company's operations. The

advantage and profit of being the first to embrace green practices may be gained via supply chains (Rashid et al., 2023a).

There is no way to interact with the effect. Green legislation governing the seriousness of organizations is optional to get an advantage and increase monetary or financial performance by using green practices in the retail network. Executing green and green inventory network executives may decrease waste, which increases water usage, energy, and side effects, profit from the primary benefits and enhance their output by utilizing green innovations and cycles (Rahman et al., 2019). "Green supply chain management (GSCM) is an organizational strategy that may give the company a competitive edge in terms of high product quality, high service quality, little waste, zero pollution, a better image, and a high return on investment." As one of the largest assembly industries, the automobile industry greatly impacts society and the environment. Cars provide mobility to millions and create jobs while also endangering the environment. Buyer pressure, unofficial rules, and partner requests for advantage have forced the automobile industry to evaluate its environmental and social consequences in addition to its financial position (Hashmi et al., 2021a). The pressure on the car industry to participate in green initiatives has recently increased dramatically. A recent literature review revealed the need to investigate how Green Supply Chain Management (GSCM) techniques might contribute to an organization's natural, financial, and operational success.

2.1.3 Green logistics

The use of Eurasia as a chronology was one of the issues. Land connects to compartment traffic; that break was identified. The benefit of land spans (about their expenses) will be processing plant fit; nonetheless, the port's concerns must be addressed. Alternative modes of transportation are made as undesirable as possible by rail transit. Stocks held in clearly visible coordination stockrooms may be required to play an essential part in global coordination (Rashid & Amirah, 2017). Transportation is a single motion coordinated into coordinates, which is the primary interaction of store network executives. Product market advantage has been shown to have implications in developing a company division's coordination strategy or at the organizational level. In establishing coordinating approaches, there needs to be more pilot considerations that focus on South Asia and the Middle East, providing an excellent reason for performing this contextual study. Businesses are pressured to create unique production techniques in today's brutally competitive global market (Masoumi et al., 2019; Rashid, 2016). Customer product distribution is becoming increasingly competitive. The designers anticipated that SCM's specialized board coordination might aid in cost savings and overall management—an in-depth examination of the relationship between green, agility, and preparedness. According to the research, the three-store network models have considerable limitations and various connecting and distinguishing properties. The use of renewable energy sources to improve provincial inventory chains is being carefully examined. SCM, manageability, and green coordination are the most concerning, and they have gotten adequate attention in the academic world and the main firm (Bhattacharya, 2014). Researchers are working on strategies to assist industry leaders in responding quickly.

2.1.4 Green design

According to experts, employing an ecological strategy in retail network management can minimize the environmental effect of connected items and cycles by up to 80%. Environmental planning encompasses a wide variety of principles, including the use of cleaner innovation cycles, green raw materials, and repairs. The eco-friendly design of the goods reduces their environmental impact during their useful life. Furthermore, green item design encourages item reuse, reusing, and recycling, which not only helps companies improve their natural displays but also saves money. The ecological administration centre was shifted from the association to the inventory network level. Several studies have identified the enabling forces and barriers to implementing green practices in the retail network (Zimon et al., 2019; Rashid et al., 2023b). The specialists explored the six elements influencing green development choices for coordination's specialized co-ops. An ISM-based method for greening Pakistani assembly firms' inventory networks has been clarified. They promoted the concept of a green shop network and investigated numerous factors influencing all aspects of life. Furthermore, it

familiarizes an approach to successfully accepting controlled practices in the inventory network by comprehending the components among the many improving effects that will assist in changing the shop network into a genuinely reasonable assembly. GSCM is a critical authorized method of thinking used to reduce natural risks and examine variables impacting GSCM implementation (Rashid & Rasheed, 2022). Analyzing the parts of the environmental cycle and their impact on business execution in Turkey's small and medium-sized companies According to the study, the primary motivation was to stand. It was also established that the ecological strategy and natural administration framework are strongly related to execution.

According to a survey, customers are becoming more aware of environmental issues, and government officials are adopting strict natural standards to reduce environmental impact. They uncovered and examined constraints to selecting GSCM practices among Pakistani auto part makers using the ISM methodology. Purchaser influence, government help, and the availability of green production networks have all been identified as critical drivers of GSCM's efforts. A green store network is the board execution estimation structure that uses a community dynamic technique inside the company. A fluffy ANP method was used to identify and link the causal links between authoritative responsibility, ecological planning, GSC interaction, social execution designs, and practical execution designs (Rasheed & Rashid, 2023). Specialists presented a technique for measuring green production network execution by coordinating store network cycles to evaluate the natural display of assembling supply chains. Using the Analytical Hierarchy Process (AHP), the inquiry provided an experimental investigation of GSCM practices in Pakistani micro, small, and medium Enterprises (MSMEs). The study reveals that MSMEs experience significant external pressure to adopt GSCM practices. The designers developed and tested a hypothetical model of the GSCM application's institutional drivers (Baloch & Rashid, 2022; Luthra et al., 2016). According to the statistics, GSCM techniques aid in financial implementation. Despite the natural complexities of the concept of maintainability and the ongoing debate about whether collaborations exist between the various elements of manageability, it has been argued that the question for supply chain organizations should not be whether they will genuinely be reasonable (in all components of supportability), but instead, they will use ideas. As with the triple principal concern, they are quantifying progress toward maintainability as a set goal is crucial (Zimon et al., 2019). This research focuses on SCM's natural or biological component (GSCM) as an inner and between-company board of the upstream and downstream store network. This may lessen the overall ecological effect of neighbouring and opposing streams.

There is no doubt that energy and petroleum derivatives significantly impact the global supply chain and coordination, as they are the primary drivers of environmental change, an increase in global temperature, and contamination with rising fossil fuel byproducts and ozone-depleting substances. It is the greenhouse. Sustainable economic and ecological growth requires environmentally friendly energy and biofuels in inventory network tasks. Experts believe that coordination-related activities require more energy to achieve their primary purpose. Sustainable energy sources and biofuels increase financial performance while reducing fossil fuel byproducts. In addition, petroleum products are more expensive than biofuels and other alternative energy sources. Strict government regulations and increased customer awareness put pressure on businesses to use ecologically friendly biofuels and energy in their inventory network activities. Bioenergy reduces the byproducts of fossil fuels while enhancing the firm's benefit and reputation. Businesses' key motivation for using green practices in their inventory network activities is to save money. The deployment of green store network drives will assist in minimizing the cost of packaging, components, and materials by utilizing reused, reused, and recycled items (Shaikh et al., 2020; Rasheed et al., 2023). According to specialists, green practices can grab new company sectors and be harmless to ecosystem nations. However, filthy organizations cannot exchange their things for fare harmless to the ecosystem nations such as the United States, Germany, the United Kingdom, and Poland. Undoubtedly, green store network the board exercises have been a tool for businesses to cut the cost of their products, raise output, and grow their part of the total industry (Bhattacharya, 2014; Hashmi, 2022). Corporations use green practices in their business operations to improve social performance. Personal enjoyment can be enhanced by social performance without losing natural beauty. Furthermore, social execution entails improving the organization's image and natural supportability while lowering environmental dangers.

Organizations may improve their working environment by improving item quality and delivery management by receiving GSCM training. Green shop network leaders also assist companies in improving their environmental image by minimizing fossil fuel byproducts, removing waste from the general inventory network, and promoting competent and strong teamwork. It reduces correspondence costs and facilitates reuse, reusing, and recycling with suppliers (Jazairy, 2019; Rashid et al., 2022a). A corporate assembly system linked to an "Environmental Management System (EMS)" can help organizations improve their environmental image. Internationally, the car sector is recognized as a critical growth engine for the national economy and a substantial contributor to the world economy (Yu et al., 2014). The vehicle is defined as a "structure and capacity" item with a distinct degree of technology and is positioned as a cutting-edge item. Because it employs goods from practically all assembly organizations and supports fundamental and downstream industries, this industry is accurately classified as "fabricating ventures.". The combination of innovation has resulted in the combination of hardware (sensors, actuators) that replaces the mechanical design of the apparatuses: motor slowing mechanisms, controlling, and so on; coordinated test gear, route and theatre setup; and improvement in materials and design. India, China, and Brazil are the key rising business sectors with significant domestic interest and enough local creation. Automobile manufacturers have lower EBIT margins (10.4 per cent) than industry leaders, but they have the highest stock turnover (18.2) and the best transportation execution (97 per cent) (Luthra et al., 2016; Hashmi, 2023). The industry has increased in terms of resources, materials, and effort, necessitating operational planning and execution at all levels of management. Government involvement has been a significant driving element in the evolution of the automotive industry in Brazil, China, South Korea, and the United States during the hatching, entry, and maintainability periods.

CEOs' inadequate use of the retail network presents challenges for automakers seeking a competitive advantage, particularly in growing markets such as Pakistan (Azfar et al., 2017). As a result, in a fast-growing economic sector with particular characteristics, it is vital to analyze the different components of automotive supply chains. The dialogues in this collection are intended to highlight the complexities and nuances of automotive supply networks in this one-of-a-kind circumstance and emerging global automotive trends and their implications for Pakistan.

2.1.5 Global Challenges to GSCM

"The top five global supply chain challenges are visibility, cost containment, risk management, expanding customer demands, and globalization." It is worth noting that auto supply chains routinely trail other supply chains (such as retail and medications) in these five principles, highlighting the need and possibility for significant improvements. Increase their efficiency and reactivity (Hashmi et al., 2020a; Luthra et al., 2016). Increased interest over the last decade has put unexpected pressure on current Indian automakers and auto parts manufacturers to quickly embrace global principles and practices, as well as present or renew inventory network measures, which stance challenges in the innovation arrangement and deal with change gradually without affecting the business brand image (Riaz, 2020; Hashmi et al., 2021b). Vehicle supply chains in India must cope with features that differ from those in developed countries. A preference for small and two-wheeled vehicles, a lack of client deception, particularly in provincial business sectors, bundling confusion due to phonetic and social variety, quality issues due to a scarcity of assets, a large number of divided providers impeding viable collaboration, complex expenses and charges, a lack of framework (rough terrain traffic), and a staggered dissemination framework that influences item costs are just a few examples (Rashid et al., 2022b). The start-to-finish inventory network mix is the most difficult, followed by executive interior coordination and commodity and part dispersion (Akhtar, 2019; Rashid et al., 2020). The car sector, a significant supporter of fare and development, is vulnerable to frequent swings in raw material cost, client demand for item quality, prompt delivery, and raw material source. International organizations entering Pakistan confront extra challenges, such as socioeconomic diversity and cost, salary, and asset allocation disparities. For example, KIA has customized the Picanto for the Pakistani market by lowering motor manufacturing costs (to promote environmental friendliness), raising spare component costs, etc. Only half of the workforce is regarded as excellent, with a 40% wear-down rate. Some five-star auto component manufacturers nurture talent, such as Bosch Ltd., which has a Bosch Professional

Center (BVC) (India) to train employees in quality, security, and critical thinking tactics. According to the research, the following are the primary techniques for solving SCM challenges in the Pakistani automobile industry: Increased interest in IT and cycle optimization (38%), integration of providers and merchants (31%), and internal foundation strengthening (8%). OEMs are revisiting coordination's specialized organizations in unit collecting, organization, planning, and inventory management.

H1: There is a significant impact of Green Manufacturing on Organizational Performance

H2: There is a significant impact of Green Logistics on Organizational Performance

H3: There is a significant impact of Green Purchasing on Organizational Performance

H4: There is a significant impact of Eco-Design on Organizational Performance

3. Research Method

Research philosophy takes many forms, including positivism, realism, interpretivism, objectivism, subjectivism, and pragmatism (Rashid et al., 2021). The world is viewed as external and objective, the observer's independence, a value-free approach to science, an emphasis on facts, causes, and fundamental laws, phenomena are reduced to their most basic components, hypothesis and concept testing must be active, and extensive samples are required (Kakar et al., 2023; Rashid, 2019). Because this is quantitative research, the data will be in numerical form, and the assessment will require a full descriptive description and actual statistics. The most appropriate sort of positivism for this activity is being in a scenario and then doing a critical evaluation of the literature. This study is positivist since quantitative facts and hypotheses support philosophical results while identifying just one system that can be scientifically established, logically demonstrated, or quantitatively demonstrated.

There are two research approaches: inductive and deductive investigation (Zimon et al., 2019). The inductive technique starts with observations or literature and then proposes a theory as a conclusion that has yet to be experimentally tested (Hashmi et al., 2020b). As a result of its observational nature, inductive research does not begin with a theory or hypothesis. Theories and literature are the starting points for the deductive process. Ideas or hypotheses based on theory or literature are generated and empirically tested using the survey approach. As a result, the deductive method involves deducing conclusions from premises or assumptions (Luthra et al., 2016). Because this project is based on a conceptual framework with independent and dependent variables and the relationship between them is illustrated in the literature, a theory was developed and tested by collecting respondent responses, and the conclusion was drawn from experimentally tested hypotheses. As a result, it is classified as a deductive and quantitative approach in nature.

The research design is a logical, systematic technique for connecting experimental data to research objectives and assisting in forming conclusions. This project is based on descriptive and quantitative research since it integrates data obtained through questionnaires, and this descriptive study proceeds to test hypotheses.

3.1 Sampling Design

The total population of Karachi is around 16.1 million (Wikipedia, 2023). This survey's sample size represents the answers from the local population. There are time and financial constraints for research; the most essential issue is the accuracy of the search results. With such a broad demographic and psychological audience identified, achieving general rather than ideal and precise results is possible. In research, a population is a group of people or things with similar features or attributes. Data is obtained from a population sample because accessing all of them is difficult and time-consuming. The sample size is the proportion of population components evaluated because they share the same characteristics as the study population (Khan et al., 2023; Zimon et al., 2019). The sample size for this study is 152, which was calculated using the "Raosoft Calculator" with a 95% confidence level and a

5% margin of error.

This inquiry adopts the convenience sampling strategy as a sample methodology. This non-probability research method enables the researcher to acquire data from a demographic segment through sufficient sampling. There are two sorts of sampling procedures. The first is known as probability sampling, whereas the second is known as non-probability sampling. All items in the population have the exact selection probabilities in a probability sampling technique. One of the prerequisites for probability sampling is the sample frame, which lists every element in the population. Because collecting a sample frame for a large population like the one utilized in the study is complex, non-probability sampling was employed for this analysis. Data was gathered through a survey. To obtain data for this study, individuals working in various supply chain departments across several organizations were given a questionnaire. The information was obtained from both primary and secondary sources.

4. Data Analysis

The SPSS (Statistical Package for Social Sciences) version 25.0 was utilized as a statistical software for this study, with the research findings tested using Reliability, Regression, and Correlation analysis. Survey research was conducted using inductive and research-based approaches as the primary research method. Various data-gathering options took place, including primary and secondary sources. The survey was adopted and distributed to 160 employees working in different Karachi-based and related supply chain management organizations. SPSS was used to analyze and identify the data collection and its meaningful information. After coding the data and identifying the missing variables, the following analytical techniques were used to achieve the purpose of the study. These analytical techniques are described in the next section.

The reliability of the configuration used in this study was measured using Cronbach's alpha. This test is suitable for measuring the internal consistency of equipment. It also reduces dataset bias and error. Response uniformity is also tested by reliability analysis. Standardized coefficients in the range of 0.60 to 0.70 are considered acceptable, while standardized coefficients above 0.8 are considered good. Descriptive analysis provides a summary of the data set. The descriptive analysis report reports the mean, median, central tendency range, variance, and standard deviation. This study uses descriptive analysis to report the mean and standard deviation. Correlation analysis measures the strength and degree of association between two variables. Karl Pearson commonly explains the relationship between two variables. Pearson's R-value range is ± 1 . In addition, (+1) is considered the most vital positive relationship and (-1) is considered the most substantial negative relationship, while zero indicates that it is irrelevant (Khan et al., 2022a; 2022b).

4.1 Regression Analysis

Regression analysis is used to measure relationships between variables. It also helps researchers know if a relationship exists between two or more variables. It also shows the strength, structure, and shape of the relationship. The difference between correlation and regression analysis is that the first determines the correlation or association between two variables. At the same time, it explains how the independent variable is numerically related to the dependent variable. Correlation shows a linear relationship between two variables, while regression provides an optimal line fit and estimates the effect of one variable on the other. Cronbach's alpha is used to evaluate the model's dependability.

Cronbach's alpha, which was calculated using general feeding data, was determined to be $\alpha = .920$, indicating credible data. There are a total of 30 questions that respondents in various categories asked, which make up overall credibility. The data is trustworthy enough for additional statistical analysis because the aggregate Cronbach's alpha is more than 0.6. Using Cronbach's alpha, the dependability of each independent variable was also examined. This likewise displays a value that is almost 0.8.

Green buying has a Cronbach's alpha factor of $\alpha = .761$. Using Cronbach's alpha, the dependability of each independent variable was also examined. This likewise displays a value that is extremely close to 0.8. Green logistics, Cronbach's alpha is $\alpha = .790$. Because production significantly impacts the organization's overall performance. Cronbach's alpha test for green manufacturing is $\alpha = .870$, it is the most crucial variable. The reliability test for ecological or green design is $\alpha = .813$, which is dependable above .7. The output of the alpha coefficient for the lone Eco design independent variable for organizational performance is good.

The predictors (GP, GL, GM, and ED) had Beta and Sig values $< P 0.05$. It is discovered that eco-friendly purchasing ($\beta = .094$), eco-friendly logistics ($\beta = .094$), eco-friendly manufacturing ($\beta = .512$), and eco-friendly design ($\beta = .160$) have the most significant impact on organizational performance. The created model clarifies how GSCM affects organizational performance. Regression was first used in SPSS to confirm the variation between organizational performance and green purchasing. The correlation between the dependent and independent variables is depicted in the graph by the value of R, which is 0.615. Green buying and organizational performance. Since the R-value is measured using a scale, the range must be "(-1 to +1)". The R-value in this instance is 0.615, a positive number. There is a strong link between the two factors. R² (R Squared) displays the total variance of the dependents. It should be between 0 and 1, which equals 37 or 37%. So, in layperson's terms, we can state that 37% of the organizational performance elements also impact GSCM. Because it is the coefficient of determination, the R (Adjusted), a modification of the coefficient of determination, is always less than the coefficient of determination. The real value on the graph above is .37 when adjusted. When examining sig. Alternatively, the fictitious P-value is .00, which is lower than .05. We reject the null hypotheses and accept the alternative hypothesis statements if the significant value is less than .05.

The second theory was created to investigate the variability between two variables. The graphical representation of organizational performance and green logistics displays a volatility correlation with a proportional R-value of .652. They have an entirely positive relationship because the value of R must fall between "(-1.0 | R | + 1.0)". The R Square value is 0.426, or a 42% difference in variability. For them as well, the reliability of adjustment R is .422 varies greatly. The p-value substantially impacts whether or not the hypothesis is accepted. Moreover, the rule is to accept the alternative and reject the null hypothesis if the value of P is less than .05. The P value for this linear regression is 0.00. We can reject the null hypothesis and accept the alternatives because it is less than .05.

The effectiveness of the organization is impacted by green manufacturing at GSCM. The third regression is used to test this hypothesis, and the findings are displayed in the preceding. Since a value is less than -1.0 and R equals .770, this is a positive value for the correlation. These two factors have a high correlation. Organizational performance is dependent on green manufacturing in GSCM, as indicated by the coefficient of determination, which is .593 or a percentage of 59%.

Additionally, if we notice the P or Sig, the regression value rejects the null hypothesis and accepts the alternative hypothesis with a P value of .00—less than or equal to 0.05. According to the fourth and final scenario, the organization's performance is impacted by GSCM's eco-design components. The values are as follows when we get to the ANOVA & Model Summary: R = 0.685, or nearly +1. As a result, the link between the independent and dependent variables is favourable and significant. The 100% overall variation of organizational performance variability is represented by the (R Square) coefficient of determination at a percentage value of 46%. Green Design, an independent variable in the GSCM, varies by 46%. Keep in mind that the P number must be below .05. This hypothesis accepts the alternatives while rejecting the null hypothesis. The real value of this independent variable is Sig / P = .00, which is less than .05 in value.

In the preceding displays the values for the output results. Since there are no defaulters listed in the participant list, the first heading for validity is 152. Zero numbers are still needed because everything has been filled in. The related Mean values were Eco-Design/Green Design (3.8860), Green Logistics (3.7752), Green Purchasing (3.6897), and Organizational Performance (3.8860). (3.9638).

The demonstrates that Information Sharing with a has the highest Skewness ($SK = -0.795$) and the lowest Skewness (Mean = 3.68, SD = 0.86) (-0.286). The highest and lowest kurtosis values are ($KT = -0.893$ and ($KT = -.167$, respectively). Since all of the constructs used in this study fall within the range of 1.5, they all satisfy the conditions for Uni variant normalcy (Khan et al., 2021).

5. Conclusion, Discussion, Implications, Limitations and Recommendations

5.1 Conclusion

According to statistical analysis of survey data, significant correlations exist between GSCM and organizational performance (G-Variables; Green et al.). The P-value for it is 0.000. This is done in order to ensure that there is a positive correlation between the variables, which should be less than 0.05. These outcomes highlight crucial strategic choices to raise the company's performance and give it a competitive edge. The company should take into account GSCM as a source of competitiveness. The findings demonstrate that GSCM positively affects organizational performance and is statistically substantially correlated with it (P value = 0.000).

5.2 Discussion

Understanding the effect of the green supply chain on the organization's overall performance was the primary goal of this study. This study focuses on the green supply chain's sub-variants, GP, GL, GM, and ED/GD vs OP. Although there are other elements in the green supply chain, this study primarily focuses on these four. According to the research model, the four hypotheses comprise the study's key findings. Green logistics, manufacturing, purchasing, and design greatly enhance organizational performance. The model's summary shows that the green supply chain is crucial to Karachi's automobile industry's regulatory performance. The green supply chain has a positive impact on overall organizational performance. These four, GP, GL, GM, and ED/GD, are strong against OP. The model's significance is 0.00, or less than 0.5, which shows that the study model and its influence are significant and acceptable. Both fitted and normalized R-values are displayed in the general model analysis. This study adds to both the theoretical and practical realms. Theoretically, it illustrates the connection between how GSCM variables affect an organization's performance. The report clarifies the significance of green chains for corporate performance, employee benefits, and, most crucially, gaining a competitive edge in the marketplace.

5.3 Implications

According to the survey, adopting GSCM methods will take the Pakistani car sector to the next level, according to the thoughts of 152 respondents. It takes time, especially in the city of light, even though it is becoming increasingly well-known worldwide thanks to the emergence of large corporations. The complete marketplace. This encourages healthy competition amongst them, and ultimately, the GSCM exercise is crucial in helping to produce the king. As a significant change in production, adopting GSCM methods necessitates adequate funding and must have some restricting requirements that regulators must address or modify. It is crucial to distinguish between parties that value the barriers and those that do not while discussing the obstacles to convergence with GSCMP. This is crucial because it helps us see why some people, but not all, value this barrier highly. The next step is to analyze the groups that evaluated the barrier as significant and create effective methods to help overcome it. The biggest impediment to divergence was identified as a financial one. SMEs lack enough financial resources, making this financial issue more significant.

5.4 Limitations

This research has several restrictions. The first restriction resulted from a finite time, population ease, and length. At the PhD level, the thorough study can be explored further. Only four of the green supply chain management's parts are included in this study; other GSCM components that can significantly affect one another may be the subject of future research. Similar to how organizational

performance is a dependent variable, this will assist in identifying the element that has the most significant impact on the dependent variable. The population that took part in this survey investigation was the second limitation. The study can only generalize some of Karachi's industries. This study is only concerned with Karachi's automobile industry.

5.5 Recommendations

Based on the findings, senior management of the business must view the GSCM as a weapon for competitiveness in the market and concentrate on promoting and putting into action green supply chain initiatives for the efficiency of the departments. Establishing a thorough monitoring mechanism for green supply chain management is also crucial. Future studies could examine more industrial sectors that could be integrated into Pakistan, such as the textile or construction industries. A focus on expanding the body of currently known information and improving performance among the organizations impacted by green practices. To the level of SMEs in operations, it is crucial to investigate and define the consciousness of green supply chain management.

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