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THE IMPACT OF GREEN SUPPLY CHAIN PRACTICES ON ENVIRONMENTAL PERFORMANCE AND CONSUMER PRESSURE: EVIDENCE FROM THE IRAQI TEXTILE SECTOR

Yousif Amer Musaa ALSARRAY

Master's Thesis

Supervisor

Asst. Prof. Dr. Gül Esin DELİPINAR

İstanbul, 2024

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The thesis TITLED THE IMPACT OF GREEN SUPPLY CHAIN PRACTICES ON ENVIRONMENT PERFORMANCE AND CONSUMER PRESSURE: EVIDENCE FROM THE IRAQI TEXTILE SECTOR prepared by YOUSIF AMER MUSAA AL-SARRAY and submitted on 24/9/2024 has been **accepted unanimously** for the degree of Master of Science in Business Administration.

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I declare that this graduation thesis was written exclusively by me and that I did not submit all or part of it in any other previous degree application. Unless otherwise indicated by reference or credit, the work presented is entirely my own work.

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ABSTRACT

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This study examines the impact of green supply chain practices on consumer pressure and environmental performance, utilizing three key indicators: eco-design, internal green management, and green purchasing. Data were collected from 402 managers in Iraq, and the analysis was conducted using PLS-SEM as the statistical method. The results reveal that all three variables—eco-design, internal green management, and green purchasing—positively affect both consumer pressure and environmental performance. Notably, eco-design and green purchasing have a significant influence on these outcomes, while internal green management shows an insignificant effect. The study offers valuable insights and practical implications for R&D managers, operational managers, environmental specialists, and policymakers.

Keywords: Green Practices, Environmental Performance, Consumer Pressure, Iraq, PLS-SEM.

ÖZET

YEŞİL TEDARİK ZİNCİRİ UYGULAMALARININ ÇEVRE PERFORMANSI VE TÜKETİCİ BASKISI ÜZERİNDEKİ ETKİSİ: IRAK TEKSTİL SEKTÖRÜNDEN KANITLAR

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Bu çalışma, yeşil tedarik zinciri uygulamalarının tüketici baskısı ve çevresel performans üzerindeki etkisini üç temel göstergeyi kullanarak inceler: eko-tasarım, dahili yeşil yönetim ve yeşil satın alma. Veriler Irak'taki 402 yöneticiden toplandı ve analiz istatistiksel yöntem olarak PLS-SEM kullanılarak yürütüldü. Sonuçlar, üç değişkenin de (eko-tasarım, dahili yeşil yönetim ve yeşil satın alma) hem tüketici baskısını hem de çevresel performansı olumlu yönde etkilediğini ortaya koymaktadır. Özellikle, eko-tasarım ve yeşil satın alma bu sonuçlar üzerinde önemli bir etkiye sahipken, dahili yeşil yönetimin önemsiz bir etkisi vardır. Çalışma, Ar-Ge yöneticileri, operasyonel yöneticiler, çevre uzmanları ve politika yapıcılar için değerli içgörüler ve pratik çıkarımlar sunmaktadır.

Anahtar Kelimeler: Yeşil Uygulamalar, Çevresel Performans, Tüketici Baskısı, Irak, PLS-SEM.

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1. INTRODUCTION

1.1 BACKGROUND

The rapid global economic growth has led to significant environmental changes, creating challenges in balancing economic and environmental objectives. This has made it increasingly difficult to achieve environmental goals. In today's trade environment, the complexity of the economy has highlighted the need for sustainable supply chain management practices (SUCMP). Consumers are now placing considerable pressure on supply chains to adopt environmentally friendly practices (Kuiti et al., 2019; Duarte & Cruz-Machado, 2015). As a result, environmentally sustainable supply chains have gained a competitive advantage over time (Kumar & Chandrakar , 2012). Consequently, one of the key strategies for organizations to meet consumer expectations and comply with government regulations is the integration of SUCMP into green supply chain management practices (GSUCMP) (Laosirihongthong et al., 2013).

Green practices refer to techniques applied throughout the production process to meet environmental regulations and improve environmental performance (Hsu & Hu , 2008). (Solér et al., 2010), define green practices as processes that manage both upstream and downstream activities, reducing their environmental impact. Many organizations have restructured their management systems, encouraged the adoption of green practices, and implemented certification plans, environmental audits, and supplier collaboration to support environmental goals (Wu et al., 2011).

Organizations further promote environmental collaboration by developing reverse supply chains, rethinking product life cycles, creating closed-loop systems, reducing greenhouse gas emissions, and producing environmentally friendly products (Jaber et al., 2013). Consequently, green supply chains have become a prominent focus at both organizational and governmental levels worldwide (Zhu et al., 2008). Organizations and governments are making efforts to minimize the environmental impact of SUCMP, from sourcing raw materials to product design, production, and waste management (Zhu et al., 2005). Numerous green practices have been adopted by organizations to positively affect the environment (Hasan, 2013).

According to (Testa & Iraldo, 2010), organizations currently embrace environmentally sustainable practice due to the increasing demand from the consumers for greener goods and services. Organizations also adopt green manufacturing technique in order to meet or abide by the government's regulations. According to (Diab et al., 2015), organizations move toward ecologically viable practices because of ecological tensions that would empower them to fulfill consumer expectations through enhancing their environmental performance (ENP) by reducing negative impacts of operations, products, and services on the environment.

Organizations are now looking for those supply chain methodologies which require minimum amount of material and providing sustainable solution by developing appropriate supply chain management strategy. (Mirhedayatian et al., 2014), commented that eco-friendly practices of an organization can enhance environmental performance by reducing the level of solid waste as well as carbon dioxide emission. Thus, the study of green practices becomes significant for enhancing organizational performance. (Sharma et al.,2017), indicate that organizations are increasingly adopting environmentally sustainable practices by integrating ecological objectives into their corporate strategies.

Green practices are considered a modern approach through which an organization can achieve profitability, increase operational effectiveness, capture more market, and improve brand image. According to (Abdullah et al. 2019), green practices are significantly related to ENP. (Singh, 2010), focuses on how green practices and Environmental Performance (ENP) are interconnected. (Younis et al., 2016), argue that organizations should balance environmental sustainability with economic benefits to respond appropriately to different pressures and challenges. As per (Srivastava, 2007), "Green practices integrate reverse logistics, green design, marketing, purchasing, logistics, production, and distribution".

According to (Park et al., 2022), green practices are products development from the stage of procurement of raw materials to product disposal. Green practices are described as comprehensive with their boundaries depending upon scholars' goals. Previous studies have been able to identify more than ten green practices; however, this study will focus on those which are mainly employed namely, green purchasing, internal green management, and eco-design.

The idea of green buying is the central issue of the current paper. It is the very first stage of the SCM, and it relies on a series of purchase practices, environmental programs, and also the commitment of the organization to ecological criteria (Carter, 2005). Green buying shows the willingness of the organization to include ecological parameters at the procurement procedure (Rao & Holt, 2005). While the selection of the proper supplier is relevant to environmental objectives, the building of alliances with suppliers who adhere to environmental standards is equally essential (Paulraj, 2011).

In addition to green purchasing, it is important to note eco-design. It refers to the process of engineering green products throughout their lifecycle. The products are designed and produced considering energy efficiency; they can be re-used or recycled after consumption (Shi & Liao, 2013). It is considered a proactive action plan through which organizations can achieve environmental performance by engineering a product to be productive with minimal environmental impact (de Sousa Jabbour et al., 2015).

Eco-design necessitates collaboration across the entire supply chain and assists organizations in managing stakeholder demands while attaining ecological efficiency (Liu et al., 2018). This methodology emphasizes the creation of products that are readily recyclable and easy to disassemble, limits the utilization of hazardous materials, and diminishes resource usage (Kusi-Sarpong et al., 2016).

The last critical driver of the implementation of sustainable practices is INEM. INEM refers to the policies and rules that a business entity sets with the aim of protecting the environment (Chan et al., 2012). Green practices are likely to be effectively implemented if there is coordination between departments and support from middle- and top-level management. In addition, INEM requires commitment from top management toward environmental concerns, explicit policy creation, and active managerial participation (Hong et al., 2018).

Apart from eco-friendly practices, Consumer pressure is also considered a major factor that influences organizations to integrate eco-friendly supply chain practices. Manufacturing and retailing companies jointly work together to reduce carbon footprint and implement eco-friendly practices in their supply chain network. Review of the related literature identifies a number of factors, such as premium pricing, brand equity, and environmental regulations, that support the implementation of green practices by organizations (Swami & Shah, 2013).

Organisations often develop green products because of consumer demand; in many ways, consumers are driving the green initiatives forward (Henriques & Sadorsky, 1999).

Consumer pressure has reshaped manufacturing philosophies and redefined supply chain structures, driving efforts to minimize waste, optimize resource use, and improve product disposal methods (Beamon, 1999).

1.2 ENVIRONMENTAL SUSTAINABILITY IN IRAQ

In 2000, the United Nations took a more active role in addressing global issues, with environmental sustainability emerging as a key concern (Sachs, 2012). (Jafrin et al., 2016) emphasized the importance of developing strategies to ensure the long-term sustainability of the environment. According to the Environmental Protection Index, Iraq scored 27.8 and ranked 169th out of 180 countries in the Environmental Performance Index (EPI), which assesses environmental performance across 24 indicators. Specifically, Iraq ranked 118th in waste management with an EPI score of 21.10, 108th in solid waste management with a score of 23.90, and 91st in recycling with a score of 15.40. In terms of carbon emissions, Iraq was ranked 91st with an EPI score of just 1.90. These rankings are further detailed in Table 1 and Figure 1.

Table 1.1: Iraq Environmental Performance**.**

Component	Rank	Epi Score
EPI	169	27.80
Waste Management	118	21.10
Solid Waste	108	23.90
Recycling	91	15.40
CO2 growth rate	164	1.90

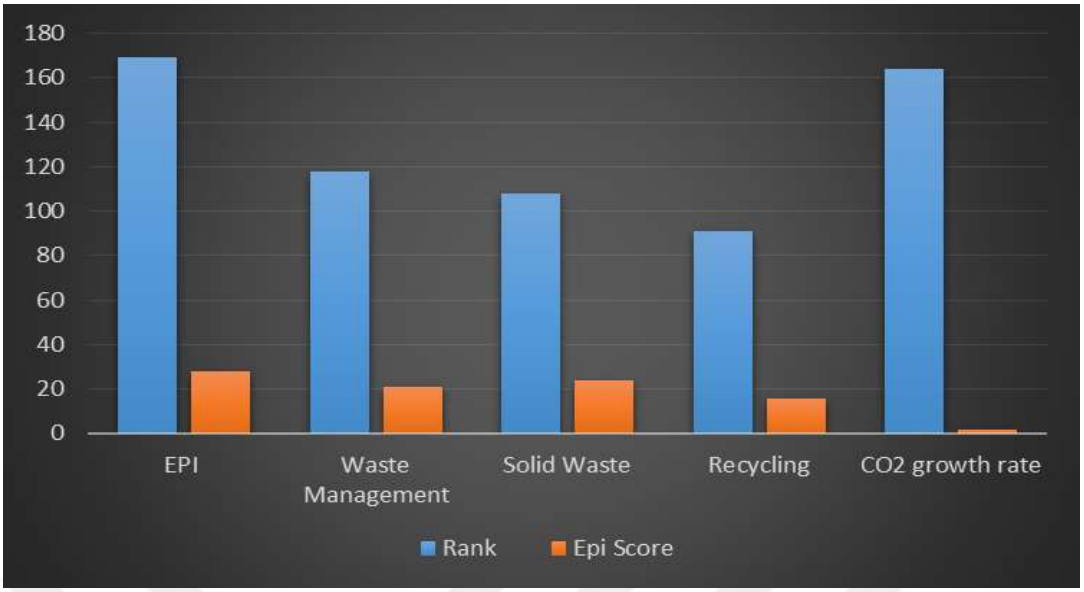

Figure 1.1: Iraq EPI Score and Rank**.**

Based on the aforementioned statistics, Iraq must develop strategies to reduce greenhouse gas emissions and promote environmental sustainability. The literature highlights that one of the primary contributors to environmental degradation is the emission of greenhouse gases. Notable emissions include methane, carbon dioxide, hydrochlorofluorocarbons, and nitrous oxide (Stern, 2008). The main sources of these emissions are human activities, particularly consumption and production. According to Stern, (2008), the accumulation of greenhouse gases in the atmosphere traps heat, leading to global warming. A report on climate change identified greenhouse gas emissions as a major driver of climate change, with households, individuals, and businesses being the primary contributors (Tol, 2009).

Climate change is having profound effects on the global environmental system. Rupa & (Saif,2023), noted that global economies are working to reduce greenhouse gas emissions, with efforts focused on limiting temperature increases to 2°C. If emissions rise by 1000 gigatons, there is a 25% chance that temperatures will exceed 2°C. If emissions reach 1440 gigatons, the likelihood of surpassing the 2°C threshold rises to 50% (Meinshausen et al., 2009). The surge in economic activities is driving temperatures up by 2°C to 4°C, leading to the extinction of 30%–40% of animal species and the submersion of significant coastal wetlands. By 2100, humanity could face severe shortages of water and food (Gupta & Palsule-Desai, 2011). In addition to greenhouse gas emissions, water waste in supply chain

activities is a key factor contributing to global warming and environmental degradation (Kumar & Chandrakar, 2012).

1.3 TEXTILE SECTOR OF IRAQ

This industry has been highly crucial for the world economy in terms of providing garments and textiles to people all over the globe. However, the textile industry can be regarded as one of the most resource-consuming and polluting sectors, which contributes immensely towards ecological decay. The notion of a Green Sustainable Supply Chain Management Process, in short GSUCMP, has recently attracted substantial attention due to an ever-increasing level of awareness related to sustainability and environmental concern in business operations. This transition indicates the importance of embedding sustainability into every stage involved in the supply chain: the procurement of the raw materials right through manufacturing to distribution (Comoglio & Botta, 2012).

Iraq’s textile industry has a long-standing history and remains a vital component of the country's economy, with the potential to drive economic growth and job creation. However, like many other nations, Iraq faces environmental and sustainability challenges within its textile sector. The industry consists of four major factories—two in Baghdad, one in Fallujah, and one in Najaf—spanning a total area of 30,000 square meters. In addition to these larger operations, there are numerous small textile firms throughout the country.

Despite the sector's presence, its economic contribution remains modest, with apparel and textile exports totaling only 0.22 million USD, while imports reach 173.65 million USD.

Iraq's top 10 exports by country are displayed in Figure 2:

Sr No	Country Name	Export Value (in Million $)	Exporter Share Percentage (%)
1	Jordan	0.12	52.63
2	Syrian Arab Republic	0.1	47.37
3	Lebanon	0	0
4	Kuwait	0	0
5	Mexico	0	0
6	Malaysia	0	0
7	Netherlands	0	0
8	Other Asia, nes	0	0
9	Oman	0	0
10	Pakistan	0	0

Figure 1.2: Iraq Top 10 Textile Exports.

The Iraq top 10 import by countries are displayed in Figure 3:

Iraq's Top 10 Textiles Imports By Countries

Sr No	Country Name	Import Value (in Million $)	Import Share Percentage (%)
1	Korea, Rep.	97.98	56.42
2	China	50.16	28.88
3	Jordan	4.11	2.37
4	Pakistan	3.91	2.25
5	Iran, Islamic Rep.	2.58	1.49
6	Australia	2.42	1.4
7	Turkey	2.36	1.36
8	India	2.11	1.21
9	Syrian Arab Republic	1.64	0.94
10	Thailand	1.42	0.82

Figure 1.3: Iraq Top 10 Textile Imports**.**

The literature highlights that the textile sector has significantly contributed to the economic and social development of the Iraqi economy, serving as a major supplier of goods (UlHassan et al., 2013; Karim & Khodarahmi, 2022). Textile enterprises operate in diverse geographic locations, each characterized by varying management styles and production capacities. According to (Ali & Anwar, 2021), the textile industry is susceptible to the "bullwhip effect," driven by insufficient green practices and fluctuations in market demand. (Coskun-Setirek & Tanrikulu, 2021), emphasize that to meet consumer pressure and demands, the textile sector must prioritize the adoption of green practices, which in turn enhances organizational performance. Ali & Anwar, (2021), further suggest that implementing such practices can make organizations more resilient and crisis-resistant.

1.4 PROBLEM STATEMENT

Scholars and researchers have extensively explored the relationship between performance and green practices (Golicic & Smith, 2013; Wong et al., 2020), revealing predominantly positive correlations. However, some studies have reported negative or insignificant associations (Sarkis et al.,2011; Geng et al., 2017), leading to ongoing research aimed at reconciling these inconsistent findings. While the nexus has been investigated across both developed and developing economies, limited attention has been directed toward Iraq (Noaman & Mohammed, 2022; Ahmed et al., 2022). In the context of Iraq, existing studies have primarily focused on identifying barriers to the adoption of green practices (Abdulnabi et al., 2022; Tumpa et al., 2019; Sajjad et al., 2015).

Regarding industry sectors, green practices have been studied in electronics (Mohammed Hassan & AlGaddah ,2022), services (Faaeq et al., 2014), construction, and manufacturing (Najy, 2021), while the textile industry has received relatively less attention. In this sector, (Ahmed et al., 2022), investigated the mediating effect of green practices on digital technology, marketing, innovation, and performance, whereas Najy (2021), examined how green practices can enhance the performance of Iraqi manufacturing firms. Despite these efforts, no research has yet explored the impact of GSUCMP on consumer pressure and environmental performance.

1.5 SIGNIFICANCE

This study examines the impact of sustainable practices and green supply chain initiatives on Iraq's textile industry. The findings aim to assist managers in developing and implementing environmentally beneficial strategies. The research contributes both theoretically and practically to the existing literature.

Theoretically, it explores the relationship between green practices and environmental performance, along with consumer pressure. Practically, it provides managers with valuable insights to better understand the role of green practices in meeting environmental standards. Based on these findings, more effective policies can be developed, helping managers align with sustainability requirements. This study seeks to offer key insights that will facilitate the transition of Iraq’s textile sector towards a more sustainable and eco-friendlier model.

1.6 ORGANIZATION OF THE STUDY

This study is divided into one to five chapters, including an introduction, a literature review, a description of the research methods, data analysis and a conclusion.

2. LITERATURE REVIEW

2.1 THEORETICAL BACKGROUND

The conceptual model of this theory is based on two theories: the natural-resource-based view and the stakeholder theory. The first theory is the natural-resource-based theory, which was given by Hart (1995). It was a modification of the resource-based theory. The stakeholder theory was given by Freeman (1994).

2.1.1 Natural Resource Based Theory

The resource-based theory has gained momentum in analyzing environmental sustainability practices and their contribution to the improvement of organizational performance. Under this theory, sources enabling firms to realize a competitive advantage are those resources and capabilities that are valuable, not so common, and more difficult to imitate. (Barney 1991; Mahoney & Pandian 1992), elaborate more on this model by identifying that resources could assume tangible and intangible assets, entailing human capital, market responsiveness, social reputation, and leadership. While physical assets can provide an advantage in competitive situations, they can easily be imitated by competing companies. Intangible assets, however, are far harder to imitate and therefore provide a sustainable competitive advantage since they result from experience accumulated over time and are not as easily accessible to competitors (Hart, 1995). Hart carries it further, with high bearing or impact on the capabilities and resources of an organization, through such factors like economic shrinkage and resource depletion. From this observation, he founded what he coined the natural-resource-based view - a model that holds that an organization can achieve competitive advantage by way of strategies pointed towards sustainable development, product stewardship, and pollution prevention.

The theory also argues that green practices positively influence environmental performance (Choi & Hwang, 2015). (Hart & Dowell,2011), contend that businesses should adopt green activities to improve their environmental performance (ENP). These practices are difficult for competitors to replicate, as they are developed through experience and specialized knowledge. Companies that engage in green practices can differentiate themselves in the marketplace, gaining competitive advantages through social approval and market legitimacy

(Molina-Azorín et al., 2009). (Wijethilake, 2017), supports this by noting that green practices enhance organizational performance by increasing productivity, capabilities, competitiveness, process and product improvement, cost efficiency, and waste reduction.

2.1.2 Stakeholder Theory

Stakeholder theory has also been utilized to examine the impact of green practices on organizational performance. Traditionally, companies focused primarily on profit-generating activities within a given period. However, as competition intensified and environmental degradation became more apparent, social responsibility emerged as a critical concern. The stakeholder theory gained prominence alongside the rising importance of corporate social responsibility. (Freeman, 1994), defined this theory as the relationship between business objectives and their influence on individuals or groups. He classified stakeholders into two categories: external and internal. External stakeholders include competitors, society, suppliers, and the government, while internal stakeholders consist of owners, managers, and employees. The theory emphasizes that organizations should operate in a manner that satisfies the needs and expectations of their stakeholders. Environmentally conscious stakeholders, in particular, expect organizations to address environmental and social challenges in addition to financial goals.

Stakeholders are especially attentive to the measures organizations take to reduce pollution. (Rivera-Camino,2007), noted that companies implement green practices to align with stakeholder expectations. Similarly, (Longoni and Cagliano,2018), emphasized that organizations adopt green practices to meet stakeholder demands. By incorporating environmentally friendly initiatives, companies can strengthen relationships with both internal and external stakeholders. Furthermore, adopting green practices enables organizations to gain a competitive edge in various ways, including enhancing their reputation, fostering long-term partnerships with suppliers and Consumers, and improving operational efficiency (Endrikat et al., 2014).

2.2 DEFINITIONS

2.2.1 GSUCMP

In 1976, two American scientists made the claim that man-made chemicals were destroying the protective ozone layer. Further support came from other scientists to say it was not only destruction occurring but was also happening at an alarming rate. In 1985, the United Nations held an international conference that they sponsored in hopes of bringing concerned parties together to find a solution to the dwindling ozone layer. This concern was echoed by the alarming fact that the World Commission on Environment and Development, or the 1987 Brundtland Report, was entitled *Our Common Future* (Magento & Luke, 2020). In the year 1996, the green supply chain concept was brought ahead by the Industrial Research Association at Michigan State University regarding environmental protection by applying the eco-friendly measures in different stages in the cycle of a product.

These would range from procurement to manufacturing and design, sales, distributions to the recycles and reusing processes. With time, companies started integrating green technologies along the supply chain in order to reduce the eco-damages with optimum utilization of energy (Sarkis et al., 2011; Kainuma & Tawara, 2006).

Green supply chain practices emerged in the 1990s as a pragmatic solution to environmental challenges, gaining significant attention by the 2000s, as supported by numerous scientific studies (Tseng et al., 2019; Fahimnia et al., 2015). The need for sustainable practices has only grown more pressing in recent years, prompting organizations to encourage eco-friendly activities, enhance cooperation between suppliers and consumers, and develop environmentally responsible products (Zahraee et al., 2018). (Hervani. 2005), explained that green practices encompass activities such as reverse logistics, green distribution, manufacturing, and procurement. Organizations are urged to consider green practices in all decision-making processes, particularly in logistics, material handling, and waste management (Fragouli & Yanksone, 2015). Srivastava et al., (2007), further elaborated those green practices should guide supply chain management, sourcing, materials acquisition, production, and product distribution, all with an emphasis on environmental responsibility.
With the increasing environmental concern, the companies are increasingly adopting those supply chain practices that are beneficial for social welfare and ecological sustainability. As (Haake & Seuring, 2009), have pointed out, it does not only reduce the ecological impact of

operation activities but also enhance the organizational efficiency. The adoption of GUSUMP has been driven by several factors such as environmental degradation, population increase, and depletion of natural resources, according to (Vanalle et al., 2017).

In conclusion, green practices can be conceptualized through the "3Rs" of waste management: recycle, reuse, and reduce. These practices encompass environmental design, packaging, distribution, management, procurement, and quality control (Green et al., 2012). Essentially, green practices begin with the procurement of raw materials, continue through the entire product lifecycle, and conclude with product disposal. Zhu & Sarkis, (2004), described green practices as starting with the purchasing phase, proceeding through development, and considering the energy consumption, pollution, distribution, reuse, and disposal of products.

(Perotti et al.,2012), extended the application of GUSUMP to transportation, distribution, reverse logistics, consumer cooperation, internal green management, design, packaging, and investment recovery. (Zhu et al.,2013), categorized green practices into consumer cooperation, internal green management, investment recovery, design, and purchasing. Wu et al. (2011), identified key elements of green practices as purchasing, eco-design, internal quality control, patents, production, and innovation.

Figure 4 provides a summary of various GUSUMP identified in the literature. Based on prior studies, this research focuses on the most frequently explored GUSUMP categories, such as eco-design, internal green management (IGM), and purchasing, as proxies for green practices (Sharma et al., 2017; Abdullah et al., 2019).

Study	GSCM activities
Bowen *et al*. (2001)	Strategic purchasing and supply, product-based green supply, corporate environmental pro-activity, greening the supply process
Buysse and Verbeke (2003)	The end-of-pipe, pollution prevention, product stewardship, sustainable development
Melnyk *et. al.* (2003)	Life cycle assessment, environmental management systems (EMSs)
Rao and Holt (2005)	Greening the inbound function, greening production, greening the outbound function
Zhu and Sarkis (2004), Zhu *et al*., (2005 & 2007)	Eco-Design, investment recovery, EMSs, collaboration with customers and suppliers
Sarkis *et al*., (2010)	Eco-Design, source reduction, EMSs
Delmas and Toffel (2008)	EMSs, government-initiated voluntary environmental programs
Sharma and Henriques (2005)	Pollution control, eco-efficiency, recirculation, eco-design, EMSs
Gonzalez-Benito and Gonzalez-Benito (2005)	Planning and organizational, operational (product related), operational (process related) and communicational activities
Vachon and Klassen (2006); Vachon (2007)	Environmental collaboration, environmental monitoring
Shang *et al*., (2010)	Green manufacturing and packaging, environmental participation, green marketing, green suppliers, green stock, and green eco-design
Green et al., 2012a	Internal environmental management, green information systems, green purchasing, cooperation with customers, eco-design, and investment recovery
Green et al., 2012b	Internal environmental management; green information systems; environmental cooperation with suppliers; environmental cooperation with customers; environmental monitoring of suppliers; environmental monitoring of customer
Wu *et al*., (2012)	Green purchasing, cooperation with customers, eco-design and investment recovery
Zhu *et al*., (2012)	External and internal activities

Figure 2.1: Summary of Green Practices Adopted from Al-Sheyadi et al. 2019.

2.2.2 Eco-Design

It includes designing of products that are ecologically viable along the whole life cycle. The approach ensures that during manufacturing and processing, the products involve the use of limited amounts of energy, and after being used, the products can be recycled or reused (Guang Shi et al., 2012). In regard to De Sousa Jabbour et al., (2015), eco-design acts as a tool for the improvement of environmental performance of an organization. Here, the key concept is design for the environment and sustainable product development. According to Abdullah et al. (2019), analyzing the ecological impacts which a product would create is essential for successful GUSUMP. In relation to this, Büyüközkan and Çifçi, (2012), also state that the ecological impact a product would cause can be determined to a great extent

during the design phase of the product itself. As further supported by Handfield et al. (2001), it is estimated that about 80% of a product's environmental impact is decided in the design phase.

Eco-design allows companies to create products that operate effectively while reducing their environmental impact. This approach is viewed as a forward-thinking strategy that fosters ecological sustainability, necessitating cooperation both within and outside the organization during the supply chain process (Kumar & Chandrakar, 2012). Incorporating environmentally conscious principles into production methodologies and products enables businesses to satisfy stakeholder expectations and enhance overall efficiency (Liu et al., 2018). The goal of this approach is to design products that make recycling and disassembly easy, reduce the use of toxic materials, and limit the amount of resources required (Zhu et al., 2008).

Choi and Lee, (2020) opine that inter-departmental cooperation, involvement of environmentally friendly processes of manufacture, and consideration of all stages of the product life cycle are necessary for successful implementation of eco-design. According to Demirci, (2014), the factors influencing an organization to implement eco-design are consumer demand, corporate image, environmental legislation, increasing costs of waste management, and public opinion. In conclusion, the Eco-design focuses on the design of products using less energy and materials while having the added benefit of being able to be recycled or reused. This product would reduce dependence on harmful materials and, subsequently, reduce waste and pollution as well (Abdullah et al., 2019).

2.2.3 Green Purchasing

The Green purchasing can be defined as procurement practices that prioritize reducing waste sources and promoting recycling without compromising environmental standards (Ha et al., 2021). It emphasizes evaluating the environmental performance of suppliers and advising them on improving their practices to offer environmentally friendly products (Santoso et al., 2022). Additionally, green purchasing helps suppliers develop sustainable capabilities (Zhang et al., 2018) and is considered part of supply chain practices aimed at encouraging product recycling and minimizing waste. In the literature, it is also referred to as green logistics, with the primary goal of reducing transportation, packaging, and production

impacts while promoting the use of environmentally friendly resources Cosimato & Troisi, (2014).

Green purchasing involves evaluating the procurement of raw materials based on their potential environmental damage (González-Benito et al., 2016). Siagian & Tarigan , (2021), noted that green purchasing supports organizations in maintaining environmental sustainability. Cosimato & Troisi, (2014), outlined several key roles of green purchasing, including:

a. Raising environmental awareness among suppliers

b. Developing systems that focus on the business environment

c. Sharing information with suppliers related to environmental conditions

d. Clarifying environmental requirements and promoting green production

e. Encouraging suppliers to contribute to environmental protection

Moreover, green purchasing reflects an organization's commitment to using sustainable raw materials, adopting environmentally friendly policies, and collaborating with suppliers to meet environmental objectives Siagian & Tarigan, (2021). Studies suggest that implementing green strategies can reduce pollution, enhance organizational reputation, and improve overall performance (Novitasari & Agustia, 2022); Kalyar et al., 2020).

Govindan et al. (2015), argue that green purchasing should be integrated into policies to minimize waste and achieve sustainability goals. Vachon & Klassen, (2006), assert that green purchasing ensures that raw materials meet green criteria such as recyclability and reusability. Shao & Ünal, (2019) explain that green purchasing focuses on environmental performance during procurement, aiming to minimize the negative environmental impact of supply chain management activities. Foo et al., (2019), add that green purchasing promotes the use of less harmful materials that can be easily reused or recycled.

2.2.4 Internal Green Management

Zhu & Sarkis et al., (2007), noticed that in practice, internal green management practices able to make a firm environmentally sustainable were dependent on support from middle to top level managers. Further, Zhu et al., (2013), has opinioned that internal green management reflected the strategic attempt of an organization at improving its ENP. Being

a core component of environmental sustainability practice, internal green management requires high commitment from top management in order to address the ecological concerns, along with well-defined and comprehensive policies and active participation of employees. It also suggests the ability of an organization to minimize and prevent the actual level of emissions generated by the business operation processes (Zhang et al., 2018). On one hand, Xu & Gursoy, (2015), believe that the company adopting environmental protection behaviour is prone to attracting consumers with environmental awareness.

2.2.5 Environment Performance

In the current study, the environmental performance is a dependent variable. According to Al-Sheyadi et al., (2019), environmental performance is the negative impacts that an organization has on the environment through the release or use of substances unsustainable in the environment. According to ISO 14001, environmental performance involves any change of the environment, whether positive or negative, resulting from human activities. The following researchers Zhu et al., (2008), it is possible to measure such area as environmental performance using metrics such as solid waste discharge, wastewater generation, air emissions, and use of toxic and hazardous substances. On the other side, an academic discussion in the literature reveals that strategies of business operation can enhance ENP by the adoption of the environmental management system, involvement of employees, and improvement of management practice (Zeng et al., 2010).

Other complementary strategies like eco-design and source reduction are considered effective practices that help an organization minimize waste and improve environmental performance (Zhu & Sarkis, 2004). Vachon, (2007), emphasizes that developing environmental partnerships with both consumers and suppliers is an effective approach to addressing environmental issues. Green et al. (2012), also point out that integrating suppliers and consumers is one of the most important ways to improve a firm's environmental performance. Also, Green et al., (2006), connect SCM policies and green purchasing practices to better environmental performance.

2.2.6 Consumer Pressure

In today's world, organizations are increasingly adopting environmentally friendly supply chain practices. Both manufacturers and retailers are collaborating to reduce carbon

emissions and implement sustainable strategies throughout their supply chains. Numerous studies have examined the factors driving organizations to embrace green initiatives. These include factors such as premium pricing, brand value, and environmental regulations (Swami & Shah,2013; Ghosh & Shah, 2015).

Furthermore, some companies adopt green practices in response to consumer pressure. Addressing this pressure often involves developing eco-friendly products. Retailers like Dell and Walmart have recognized these opportunities and tailored their offerings to meet the demands of environmentally conscious consumers. The literature on supply chains identifies consumer pressure as a key motivator for companies to pursue sustainable practices (Henriques & Sadorsky, (1999). This pressure compels firms to adapt their services and product lines to align with environmental expectations, creating new market opportunities (Paquette, (2006).

Consumer influence reshapes manufacturing philosophies and redefines supply chain structures, including operational divisions. Companies are taking steps to reduce waste generation, optimize resource use, and ensure the responsible disposal of products (Beamon, (1999).

2.3 RELATIONSHIP BETWEEN THE VARIABLES

2.3.1 Green Practices And Environmental Performance

The level to which business practice is environmentally sustainable and its consequent environmental performance have been well researched in academia. Most research findings identified the existence of a statistically significant and positive relationship between green supply chain management practices, referred to as GSUCMP, and ENP. To illustrate, Zhu et al. (2005); Zhu & Sarkis, (2004), proved that GSUCMP and ENP are positively correlated. Zhu et al. (2008), further said that implementing GSUCMP helps not only to retain the organizational relation with consumers and suppliers but also to improve their environmental performance or ENP. Green et al., (2012), have also supported the significant relationship between those variables. Besides, Diab et al., (2015), unraveled that adopting green practice significantly influences environmental performance.

Besides, Green et al., (2012), separately identified that practicing eco-friendly distribution strategies positively influences the ecological performance of manufacturing firms. In support, through surveying data across 215 manufacturing companies in Jordan, Abdullah et al., (2019) have found that the association between GSUCMP and ENP is significant. Jawaad and Zafar, (2020), describe that better environmental performance persuades the manufacturing organizations to use such products which reduce air emission, solid waste, effluent discharge, and toxic materials. Their study also comes up with the fact that GSUCMP has a positive impact on the environmental performance-ENP of manufacturing organizations.

For example, Wong et al., (2015), argue that GSUCMP reduces ecological harm by establishing cooperation between buyers and suppliers and different functional levels, thus helping firms trace and reduce environmental problems. In this direction, Zailani et al. (2012), showed that the adoption of GSUCMP practices, such as green packaging, design, and manufacturing, improves environmental performance. Further, Khan & Qianli, (2017), identified that companies are also greening the practice to reduce the cost of manufacturing with its respective emissions in building a positive image and credibility. Besides, Luthra et al., (2016), have pointed that an organization can maintain and improve its environmental performance up to 80% or so by adopting GSUCMP in design and operational activities effectively.

2.3.2 Internal Green Management And Environmental Performance

A number of studies have shown that the initial step towards achieving GSUCMP is the implementation of IGM (Green et al., 2012). IGM provides the basic input necessary for effective collaboration with the partner network (Yang et al., 2013). It has also been pointed out in these studies that the ability to integrate with other partners is based on sound internal green management systems (Zhao et al., 2011). Various studies have constantly identified that IGM significantly relates to ENP to show its importance in this concern. Efficient internal green management enables the current ecological information to flow among various functional departments for superior decisions pertaining to both process and product-related issues (Wong et al., 2015). The availability of prompt information enables organizations to effectively disseminate it among partners and offer feedback, thereby confirming adherence to environmental standards (Yu et al., 2019). Furthermore, this mechanism facilitates

organizations in conveying their compliance with environmental regulations to consumers (Wong et al., 2020).

De Sousa Jabbour et al., (2015), established that the four environmentally sustainable practices are immensely relevant; therefore, as much as possible support and cooperation from top management are being required for their full and proper implementation. Thus, the importance of IGM becomes very high. Further, the authors mentioned that IGM is serving as an important determinant of environmental performance. Similarly, Zhu et al. (2008), noted that such adoptions require great management support and found a positive relation between management involvement and environmental performance. Indeed, many other studies also prove that management commitment can be considered an important driving force toward environmental sustainability practices. For example, Chan et al. (2012), have inferred a significant relation of organizational performance with the internal green managerial practices, while Geng et al. (2017), have pointed to the fact that IGM is proved to positively impact the social performance of an organization.

2.3.3 Eco-Design And Environmental Performance

Eco-design refers to the process of creating environmentally friendly products throughout their lifecycle. This approach focuses on using minimal energy during production and ensures that the products can be reused or recycled after consumption (Guang Shi et al., (2012). By incorporating eco-design principles, organizations can significantly reduce waste, which in turn enhances environmental performance (Zhu & Sarkis. (2004). Eltayeb et al. (2011), identified eco-design as a green practice that positively influences intangible, economic, and environmental outcomes.

Green et al., (2012), argued that eco-design significantly contributes to environmental performance. On the opposite side, Zhu et al., (2013), expressed that eco-design minimizes environmental impact without compromising cost or functionality. More so, Zhu et al., (2008), in their study on the Chinese automobile industry, realized that eco-design plays a principal role in reducing environmental impact. On the same note, González-Benito et al., (2016), proved that eco-design reduces hazardous material usage; hence, environmental performance improved. Additionally, Zailani et al. (2012), noted that eco-design contributes to overall firm performance.

2.3.4 Green Purchasing And Environmental Performance

Literature available has been presenting a great number of studies on green purchasing, starting with the pioneering works of van der Grijp., (1998); Yildız Çankaya & Sezen, (2019), Masa'deh et al., (2017). Zhu & Sarkis (2004), underlined that green purchasing is creating the development of cooperation among organizations and their suppliers, which eventually leads to improved performance of the supply chain and overall environmental performance. Gonzalez-Benito et al., (2016), further analyzed the relationship between purchasing performance and environmentally sustainable purchasing; their findings showed a significant positive relationship. Yook et al., (2018), supported the relationship by showing that green purchasing significantly influences environmental performance (ENP). To add on, Fianko et al. in 2021, through data from 217 employees, and Yu et al., (2019), found a significant relationship between green purchasing and ENP. Indeed, works by Basana et al., (2022); Khan et al., (2023), based on data from 122 manufacturing employees and information from 386 firms correspondingly, reported significant associations of green purchasing strategies with better performance.

2.3.5 Green Practices And Consumer Pressure

Han & Huo., (2020), found that consumers are willing to pay premium prices for environmentally friendly products. Numerous studies suggest that consumers are more likely to purchase from organizations that adopt green initiatives. According to Manaktola and Jauhari., (2007), eco-design serves as a distinctive feature that differentiates products in the market. García de Leaniz & Rodríguez., (2015), further emphasized that internal green management enhances consumer satisfaction and engagement. Moreover, internal green practices foster better consumer integration. Ahmed et al., (2018), argue that these green practices not only boost consumer satisfaction but also elevate their sense of self-esteem.

2.3.6 Eco-Design And Consumer Pressure

Eco-design is a key aspect of product development that focuses on the determination of crucial environmental elements that affect the environment during a product's life cycle, ranging from the extraction of raw materials to distribution levels (Garasová, 2019). The main goal of eco-design is to reduce the negative impact brought about by these activities

during the production process (Garasová, 2019). In addition, eco-design promotes sustainability, usability, design, and ecological compatibility, creating impressive and beautiful products (Garasová, 2019). Tischner & Charter , (2017), summed up that the eco-design targets the improvement of the positive impacts and vice versa on ethical, social, environmental, and economic parameters. Numerous studies have explored the connection between eco-design and consumer behavior. (Garasová, (2019), found that consumers often consider energy labels when purchasing household appliances. Shen et al. (2014), observed that eco-design is often driven by market pressures. Walton et al., (1998), highlighted that organizations account for stakeholder pressures when developing eco-friendly products. Furthermore, Hajmohammad et al. (2021), noted that manufacturing firms increasingly focus on environmentally friendly practices in response to growing consumer demand for eco-friendly services and products. Hartmann & Germain, (2015), reported that eco-friendly features are a key consideration for consumers when purchasing such products. Li & Sarkis, (2022), emphasize that many organizations are now embedding eco-friendly elements into their product designs, which are reflected in their advertisements, labels, and packaging. Jung, (2015), highlighted FedEx's adoption of eco-friendly packaging in its technological processes. Chen et al., (2010), argue that eco-friendly products and processes contribute to a company's eco-friendly image, positively affecting performance and consumer behavior. They found that as consumer environmental concerns grow, eco-design practices increasingly drive consumer satisfaction and trust. D'Souza & Taghian , (2005), suggest that eco-design practices, once considered an internal organizational initiative, have evolved into a critical factor for companies as consumers demand greater environmental responsibility. These practices help shape an eco-friendly corporate image, ultimately influencing consumer purchasing patterns.

2.3.7 Internal Green Management And Consumer Pressure

Zhu & Sarkis, (2007), highlighted that internal green management (IGM) involves the support of mid- and senior-level managers in implementing practices that promote environmental sustainability. According to Green et al., (2012), managers within organizations play a key role in responding to pressures from both the government and consumers for eco-friendly products, processes, and services. Kim & Han, (2011), suggested that a company's IGM enhances its overall image, which positively influences consumers' willingness to engage with the firm again. Furthermore, Zhu et al., (2013), emphasized that managers' internal commitment and dedication significantly boost the company's environmental performance. This internal green management not only strengthens the company's relationship with consumers but also with suppliers. In conclusion, IGM plays a crucial role in shaping an organization's eco-friendly image, which, in turn, impacts consumer Behaviour.

2.3.8 Green Purchasing And Consumer Pressure

Waste is minimized and recycling is encouraged in the procurement process, and all environmental regulations are followed in the process of doing this (Ha et al., 2021). Several studies have determined that the consumer is becoming more conscious about the ecological issues such as global warming, greenhouse gas emissions and depletion of natural resources. These factors play an important role in the purchase decision-making process (Young et al., 2010; Schlegelmilch et al., 1996). For example, Olson, (2013), pointed out that almost 50% of consumers intended to buy a hybrid car. On the other side, Ottman, (2017), has pinpointed that buyers are highly interested in healthy, safe and environmentally viable products and services.

2.3.9 Empirical Evidences

Ahmed et al., (2023), utilized cross-sectional data to investigate the relationship between digital technology, innovation, marketing, and corporate performance. The study also examined the mediating role of green practices in this relationship. Using PLS-SEM, the analysis was conducted on data from 219 managers. The study's quantitative results revealed

a positive association between digital innovation and marketing. Furthermore, the findings confirmed that green practices serve as a mediator between these variables.

Najy, (2021), explored how the Green Supply Chain Management Practices (GSUCMP) influence the performance of Iraqi manufacturing firms. The study assessed green practices using six proxies: green logistics, manufacturing, consumer cooperation, eco-design, purchasing, and green information systems. Data was collected from 220 employees, and regression analysis was applied. The results indicated that all green practices—except green purchasing—enhanced firm performance, with green purchasing negatively impacting it. Among the predictors, green information systems emerged as the most significant.

Abdallah & Al-Ghwayeen, (2020), examined the impact of GSUCMP on business, operational, and environmental performance in Jordan. The study utilized structural equation modeling (SEM) on data from 215 employees of manufacturing firms. The results showed that supply chain management practices significantly influenced operational and environmental performance. However, the relationship between supply chain practices and business performance was negative.

Khan et al. (2023), studied the connection between operational performance and GSUCMP in Pakistan, focusing on the mediating role of technological innovation. Data from 223 manufacturing employees was analyzed using PLS-SEM. The findings demonstrated a significant association between operational performance and green practices, with technological innovation partially mediating this relationship.

Jawaad & Zafar, (2020), explored firm performance affecting green practice, where competitiveness and investment recovery act as mediators. Responses of 272 employees from textile firms were collected and analyzed using PLS-SEM. Results proved that there exists a positive relationship between firm performance and green practice, of great magnitude. Besides, competitiveness and investment recovery play a mediating role between them.

Han & Huo , (2020), studied the sustainable performance versus green practice by collecting data from 206 employees involved in the manufacturing firms. While measuring green practices, it has involved three proxies such as green consumer integration, supplier integration, and internal integration. From PLS-SEM results, it has clearly shown that there is a positive relationship significant between firm performance with green practices.

Basana et al., (2022), investigated the relationship of top management to operational performance, where considerable attention is given to the mediation role of environmentally sustainable production and purchasing. Using PLS-SEM, the data was drawn from 578 employees in the manufacturing industry. The positive relationship among top management and operational performance, as its conclusion, was claimed, the mediation role played by green production and purchasing.

For example, Dzikriansyah et al., (2023), examined the impact of environmental performance on GSUCMP within Indonesian SMEs. With PLS-SEM applied on data collected from a sample of 89 owners and managers, their findings proved that internal green management was not able to provide significant reductions in environmental impact.

Al-Sheyadi et al., (2019), investigates the data of Omani manufacturing firms regarding the linkage of ENP and green practices. The four proxies of the green practices are environmental management system, source reduction, eco-design and external environmental practices. The results from PLS-SEM show that the green practices have reduced the environmental performance considerably.Bu et al., (2020), examined the impact of ENP on greening practices in small and medium enterprise firms in China. With data obtained from 246 CEOs, using the PLS-SEM method, the authors found green practice significantly related to ENP.

On the other hand, the study of Seman et al., (2019), was about the relationship of ENP on green practices within Malaysian manufacturing firms. They tested the mediating effect of green innovation using the PLS-SEM approach based on responses from 123 employees, showing that the relations between ENP and green practices were positive and mediated by green innovation.

Rupa et al., (2023), addressed environmental performance and business performance interrelated to sustainable practices in Bangladeshi enterprises. In the case of evaluation, it has considered greenhouse gas emission, resource usage, and waste management related to environmental performance, while from a business perspective, it considers cost and profit-related indicators. The statistical analysis of the primary data presented the influence of sustainability practices on greenhouse gas emissions, resource usage, and waste management; however, the influence of sustainability practices proved negligible on profitability.

García Alcaraz et al. (2022), explored the impact that the relationship between economic and sustainability performance, through green practices, has on the Mexican maquiladora industry. In terms of green practices, measurement considered the environmental management systems, source reduction, eco-design, environmental cost savings, and external management systems. The obtained results from PLS-SEM indicate that environmental management systems, source reduction, and external management systems positively impact both economic and sustainability performance. Additionally, environmental cost savings and eco-design serve as mediating factors in this influence.

3. METHODOLOGY

3.1 RESEARCH PURPOSE

Explanatory research is a methodological approach to study something that has not been well explained up to this date. In this type of research, a hypothesis is first developed, which is later followed by the evaluation and verification of the model proposed (Cooley, 1978). In this research, we have applied explanatory research since it allows the selection of a sample in which the results can later be generalized to a larger population.

3.2 RESEARCH APPROACH

The quantitative approach emphasizes the use of numbers and statistics. This approach enables researchers to conduct complicated statistical analyses including identification of means and probabilities of events, determination of correlations among the data as well as comparisons of various sets of data. In a quantitative approach, the most typically applied techniques are questionnaires, structured observation, and experimental designs, (Hopkins, 2000). Quantitative methodology is used in this research because the raw data will come in numerical format.

3.3 RESEARCH DESIGN

In this study, a correlational research design is employed to explore the relationships between variables O'Brien & Sharkey Scott, (2012). Correlational research examines the connections between two or more variables Samuel & Okey, (2015). As this research seeks to identify associations between variables, the correlational design is well-suited to achieve these objectives.

3.4 SAMPLING TECHNIQUE

In this case, it involves identifying managers in organizations in Iraq through purposive sampling with the intention of drawing from their relevant knowledge and experience for decision-making on matters to do with environmental management and organizational effectiveness. As a matter of fact, purposive sampling is an approach through which respondents are intentionally selected to provide meaningful responses in relation to the

research objective. Although not randomized, this approach brings out relevant data within a general managerial perspective.

3.5 TARGET AUDIENCE/POPULATION

The target audience is the managers of the companies working in Iraq.

3.6 SAMPLE SIZE

Our research included a total sample size of 402 responses. The sample size was determined using Cochran's formula \[n = (Z^2 * p * q) / E^2\], where Z represents the confidence level, p is the proportion, q is 1-p, and E is the margin of error. A confidence level of 95% (Z = 1.96) and a proportion (p) of 0.5 were used, with a margin of error of 0.05. According to the formula, the recommended sample size was 384. However, to ensure greater reliability, data were collected from 402 respondents.

3.7 STATISTICAL TECHNIQUE

In this investigation, Smart PLS software was employed to conduct the analysis. The Partial Least Square-Structural Equation Modelling (PLS-SEM) approach was utilized through Smart PLS to examine the data. The PLS-SEM analysis includes two components: the measurement model and the structural model. In the measurement model, both convergent and discriminant validity are assessed. Convergent validity is evaluated using the reliability of individual items, Cronbach's alpha, composite reliability, and Average Variance Extracted (AVE). Discriminant validity is determined through the correlation matrix, cross-loadings, and the Heterotrait-Monotrait (HTMT) ratio. The structural model explores and explains the relationships among the variables under investigation.

3.8 QUESTIONNAIRE AND MEASUREMENT INSTRUMENT

The data was gathered through a questionnaire utilizing a 5-point Likert scale, where 5 indicates "strongly agree" and 1 indicates "strongly disagree." An English-language questionnaire was administered online via Google Forms. Information related to five variables-which included two dependent variables and three independent variables-was obtained. Other demographic details regarding gender, job title, organizational size, and organizational age were also provided.

In this study, the responses associated with internal green management assessment were measured by six items adapted from Khan et al., (2023). Accordingly, in this study, eco-design was measured by three items and the responses associated with analysis regarding green purchasing included four items derived from the work of Khan et al., (2023). Environmental performance was measured by using six items from Cerchione et al., (2018), whereas consumer pressure was measured using five items adapted from Zailani et al., (2012).

3.9 OBJECTIVES

The objectives of this study are as follows:

a. To evaluate the impact of eco-design on environmental performance.
b. To assess the effect of internal green management on environmental performance.
c. To examine the influence of green purchasing on environmental performance.
d. To explore the relationship between eco-design and consumer pressure.
e. To investigate the effect of internal green management on consumer pressure.
f. To analyze the influence of green purchasing on consumer pressure.

3.10 QUESTIONS

The objectives of this study are as follows:

a. To examine the impact of eco-design on environmental performance.
b. To analyze the influence of internal green management on environmental performance.
c. To assess the effect of green purchasing on environmental performance.
d. To investigate how eco-design affects consumer pressure.
e. To explore the influence of internal green management on consumer pressure.
f. To evaluate the impact of green purchasing on consumer pressure.

3.11 HYPOTHESES

Based on the above discussion the following hypotheses are tested:

a. H1: The relationship of eco-design on environmental performance is positive and significant.

b. H2: The relationship of internal green management on environmental performance is positive and significant.

c. H3: The relationship of green purchasing on environmental performance is positive and significant.

d. H4: The relationship of eco-design on consumer pressure is positive and significant.

e. H5: The relationship of internal green management on consumer pressure is positive and significant.

f. H6: The relationship of green purchasing on consumer pressure is positive and significant.

3.12 CONCEPTUAL MODEL

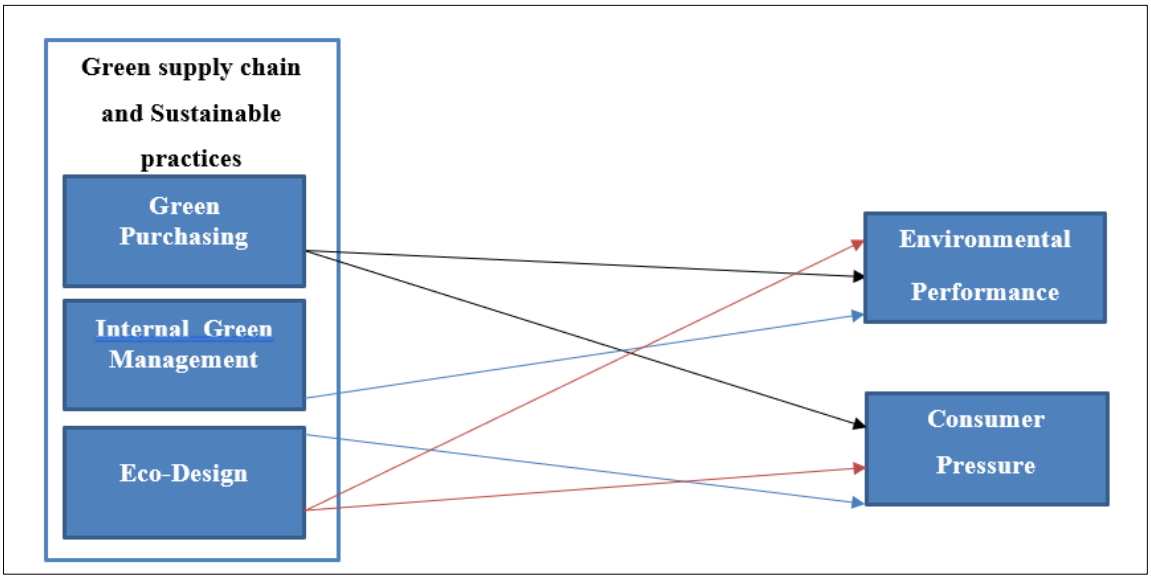

Figure 3.1: Model.

3.13 ETHICAL CONSIDERATION

The respondents' information was collected solely for the purpose of this research. Participation was entirely voluntary, and it was ensured that the data collected would be used exclusively for this study. Additionally, no personal information was requested from the respondents. Any personal details provided by the selected sample will be kept confidential to safeguard their privacy. Furthermore, no data or information gathered in this study will be shared with any other researcher without the explicit consent of the participants.

4. DATA ANALYSIS

4.1 DEMOGRAPHICS

The demographic characteristics of the respondents were analyzed using SPSS software. The data collected includes the respondents' gender, job position, number of managers, and the firm's age. Tables 2 through 5 present a detailed overview of this information.

Table 4.1: Gender**.**

	Frequency	Percent
Male	281	69.9
Female	121	30.1
Total	402	100.0

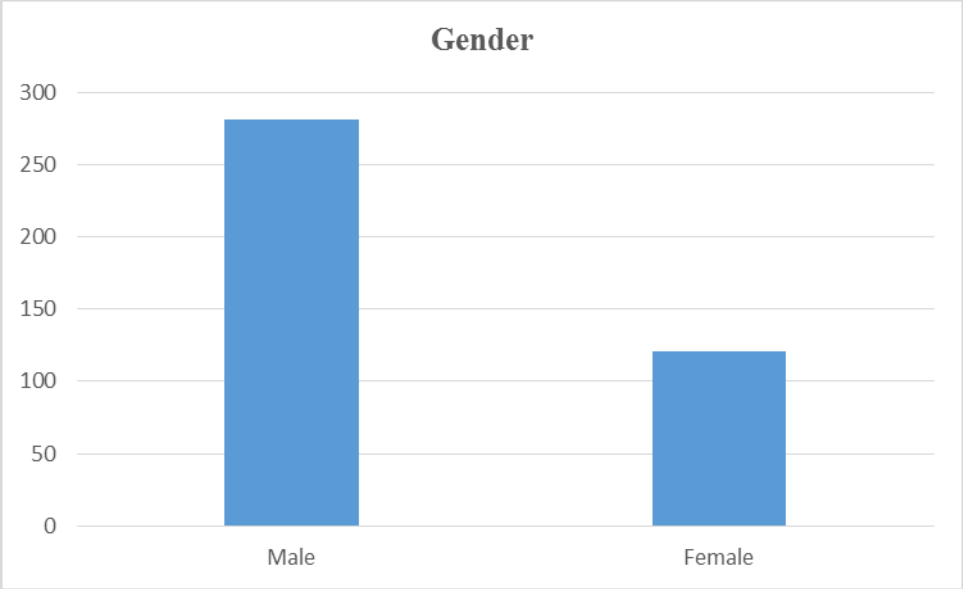

Figure 4.1: Gender.

Table 2 provides a breakdown of the audience by gender. Out of the total sample of 402 participants, 281 were male, representing 70% of the audience, while 121 were female,

accounting for the remaining 30%. This indicates that males constitute a significant majority of the audience, whereas females represent a smaller proportion.

Table 4.2: Job Position**.**

	Frequency	Percent
Low management level	96	23.9
Middle management level	215	53.5
Top management level	91	22.6
Total	402	100.0

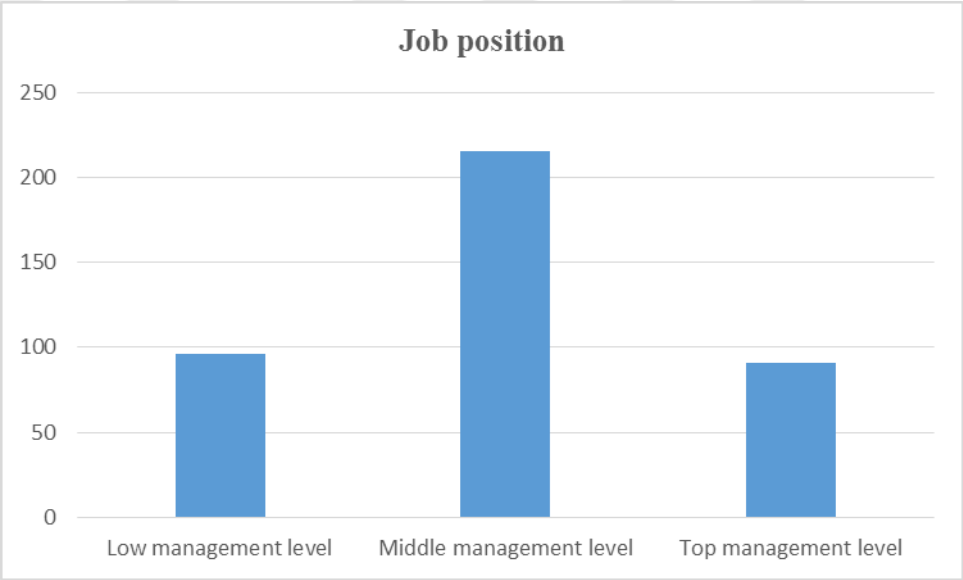

Figure 4.2: Job Position**.**

Table 4 presents the job positions of the respondents. A significant portion, 54% (215 respondents), occupy middle management roles. The remaining respondents are distributed between low management, with 96 respondents (24%), and top management, with 91 respondents (22%).

Table 4.3: No of Employees**.**

	Frequency	Percent
less than 50	31	7.7
50 less than 150	112	27.9
150 less than 250	157	39.1
250 and above	102	25.4
Total	402	100.0

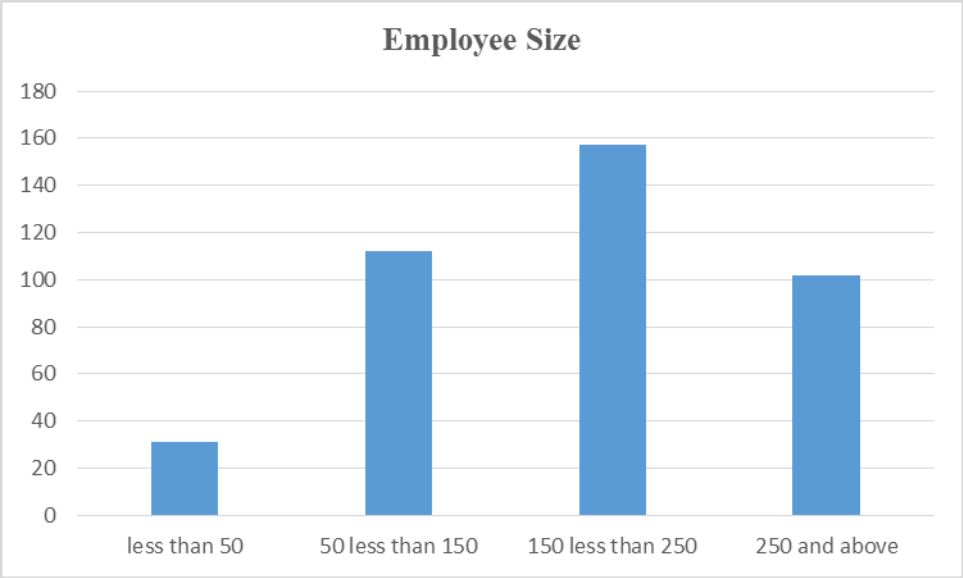

Figure 4.3: No. of Employees**.**

Table 4 presents the distribution of employees in the organizations to which the respondents are affiliated. The results indicate that 157 respondents work in firms with between 150 and 250 employees. Additionally, 112 respondents are employed in organizations with 50 to 150 employees, while 102 respondents are part of firms with over 250 employees. Lastly, 31 respondents work in organizations with fewer than 50 employees.

Table 4.4: Age of Firm**.**

	Frequency	Percent
Less than or equal to 15 years	355	88.3
More than 15 years	47	11.7
Total	402	100.0

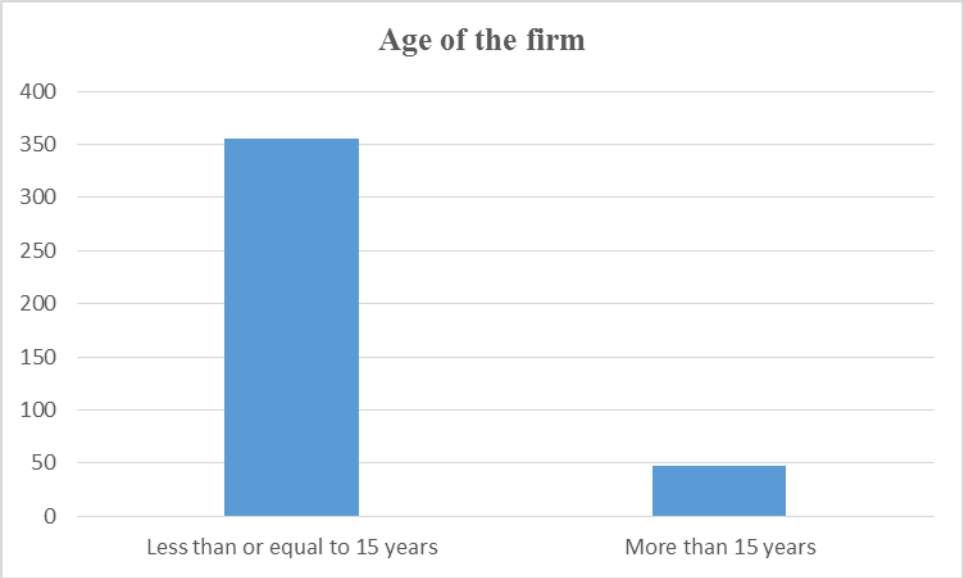

Figure 4.4: Age of Firm**.**

Table 5 presents the distribution of respondents based on the age of the firms they are associated with. The majority of respondents, 355 in total, work for firms that have been established for 15 years or less. In contrast, 47 respondents are employed by firms that have been operating for more than 15 years.

4.2 STATISTICAL ANALYSIS

In this study, the hypotheses are tested using Partial Least Squares Structural Equation Modeling (PLS-SEM) due to its ability to provide in-depth analysis of variance (Hair et al., 2019) and its suitability for handling complex models. This method assesses the reliability of the instruments through a measurement model, while hypothesis testing is performed using a structural model (Hair et al., 2019). The PLS-SEM version 4 software is employed in this research because it supports formative measurement models and enhances predictive power (Ringle et al., 2022; Ngah et al., 2023). SmartPLS, a robust multivariate analysis tool, is chosen for this study as it is particularly effective when the goal is to explain or predict a conceptual or theoretical model.

SmartPLS is ideal for working with complex conceptual models that involve numerous indicators, constructs, and associations. It is also appropriate for measuring one or more constructs formatively and for models with multiple dependent and independent variables. The first step in the analysis involves assessing the internal consistency of the questionnaire.

The PLS algorithm is applied to examine convergent and discriminant validity, and PLS bootstrapping is used to evaluate the structural model within the PLS-SEM framework.

4.3 MEASUREMENT MODEL ASSESSMENT

The model's reliability and convergent validity were evaluated using the following indicators:

a. Individual reliability
b. Cronbach's Alpha
c. Composite reliability
d. Average variance extracted (AVE).

Nunnally & Bernstein, (1994), stated that individual item reliability is confirmed when the factor loading exceeds 0.7. According to Carmines & Zeller, (1979), Cronbach's Alpha and composite reliability are considered satisfactory when their values are greater than 0.7. Furthermore, Fornell & Larcker, (1981), asserted that convergent validity, assessed through AVE, is confirmed when the construct's AVE exceeds 0.5.

To assess discriminant validity, which explores the distinctiveness of the constructs, the following criteria were applied (Hair et al., 2019).

a. Fornell-Larcker criterion
b. Cross-loading and HTMT values.

The Fornell-Larcker criterion states that the square root of the AVE for every construct should be higher than the highest correlation of the said construct with any other construct. Besides, these, in cross-diagonal values, should also be higher than off-diagonal ones. Cross-loading is also checked to make sure each item loads more heavily on its respective construct rather than on other constructs. HTMT refers to the heterotrait-monotrait ratio of correlations used to assess discriminant validity by determining the level of equivalence between latent variables. Discriminating validity is established when the HTMT ratio is below 0.90, while any value above 0.90 reveals a lack of discriminant validity (Henseler et al., (2015).

4.4 CONVERGENT VALIDITY ASSESSMENT

The reliability of the model is then analyzed based on the internal consistency of the factors by means of Cronbach's Alpha, Composite Reliability, and Average Variance Extracted (AVE). It is observed from Tables 6 to 13 that the values for both Cronbach's Alpha and Composite Reliability are greater than 0.7, indicating a manifestation of internal consistency (Alfalah et al., 2023). Further, the factor loadings have been considered for the validity of the items-that is, how the item is related to its construct. The values of the factor loadings were above the threshold value of 0.7 set by (Choudrie et al., 2018). Convergent validity was checked through the values of AVE which describe the variance explained by the items of a variable of the variable itself, as described by (Henseler et al., 2009).

Tables 6 to 10 represent the items and their respective factor loading. Table 6 is the reliability for consumer pressure items. Consumer pressure was measured by five items whose values range from 0.708 to 0.885 thus all meeting the threshold set requirement of 0.7 as seen by (Choudrie et al., 2018).

Table 4.5: Consumer pressure Reliability**.**

	CP
CP1	0.750
CP2	0.855
CP3	0.823
CP4	0.885
CP5	0.708

Table 7 presents the reliability analysis of the eco-design items. Three items were utilized to assess eco-design, with reliability values ranging from 0.834 to 0.948. All items exceed the recommended threshold of 0.7, as established by (Choudrie et al., 2018).

Table 4.6: Eco-Design Reliability**.**

	ED
ED1	0.938
ED2	0.834
ED3	0.948

Table 8 presents the reliability analysis of the environmental performance items. Four items were utilized to assess environmental performance, with reliability values ranging from 0.730 to 0.918. These values exceed the acceptable threshold of 0.7, as recommended by (Choudrie et al., 2018).

Table 4.7: Environmental Performance Reliability**.**

	EI
EP1	0.730
EP2	0.918
EP3	0.875
EP4	0.863
EP5	0.822

Table 9: Reliability analysis for green purchasing items; the measurement of green purchasing used four different items. The reliability for the items ranged between 0.730 and 0.880. According to (Choudrie et al., 2018), the recommended threshold is above 0.7, the items are reliable.

Table 4.8: Green Purchasing Reliability**.**

	GP
GP1	0.850
GP2	0.751
GP3	0.847
GP4	0.880

Table 10: Reliability check for the internal green management items It can be analysed from the above table that all the below six items fall in the range of 0.741 to 0.896, which falls

within the excellent region of internal consistency and above the threshold value of 0.7, as identified by (Choudrie et al., 2018).

Table 4.9: Internal green Management Reliability**.**

	IGM
IGM1	0.795
IGM2	0.883
IGM3	0.860
IGM4	0.896
IGM5	0.859
IGM6	0.741

Table 11 shows the Cronbach's Alpha of the variables, which is >0.7 for all the variables. The figures stand at: Consumer Pressure is 0.812, while Eco-design is 0.896, Environmental Performance is 0.898, Green Purchasing is 0.778, and Internal green Management stands at 0.927. All the figures above show that indeed the above variables are reliable.

Table 4.10: Cronbach Alpha**.**

	Cronbach's alpha
CP	0.812
ED	0.896
EP	0.898
GP	0.778
IGM	0.927

Table 12 presents the composite reliability values for the variables. The results indicate that all variables meet the established criterion, with values equal to or exceeding 0.7. Specifically, consumer pressure has a value of 0.849, eco-design stands at 0.959, environmental performance at 0.909, green purchasing at 0.928, and internal green management at 0.907. Therefore, all values successfully fulfill the required threshold.

Table 4.11: Composite Reliability.

	Composite reliability
CP	0.849
ED	0.959
EP	0.909
GP	0.928
IGM	0.907

Table 13 presents the Average Variance Extracted (AVE) values for all variables, demonstrating that each meets the required threshold of 0.5 or higher. Specifically, consumer pressure has an AVE of 0.584, eco-design has 0.824, environmental performance has 0.712, green purchasing has 0.530, and internal green management has 0.612. As such, all variables successfully satisfy the AVE criteria.

Table 4.12: AVE**.**

	AVE
CP	0.584
ED	0.824
EP	0.712
GP	0.530
IGM	0.612

4.5 DISCRIMINANT VALIDITY ASSESSMENT

The discriminant validity was confirmed through the analysis of the Fornell–Larcker criterion, cross-loadings, and HTMT values. Table 14 presents the Fornell–Larcker criterion, where the bolded values represent the square root of the AVE. These values are higher than the corresponding correlation values, as required. Furthermore, the diagonal values are greater than the off-diagonal values, demonstrating that the discriminant validity criterion has been met.

Table 4.13: Fornell–Larcker Criterion**.**

	CD	ED	EI	GP	IGM
CD	**0.764**				
ED	0.294	**0.908**			
EP	0.598	0.111	**0.844**		
GP	0.314	0.108	0.258	**0.728**	
IGM	0.134	0.499	0.095	0.180	**0.783**

Table 15 presents the cross-loading results, which indicate that all the items associated with each variable are properly loaded onto their respective constructs, with factor loadings exceeding 0.7.

Table 4.14: Cross Loadings**.**

	CP	ED	EP	GP	IGM
CP1	**0.750**	0.230	0.747	0.237	-0.049
CP2	**0.855**	-0.330	0.431	0.210	-0.124
CP3	**0.823**	-0.217	0.603	0.185	-0.133
CP4	**0.885**	-0.275	0.405	0.248	-0.106
CP5	**0.708**	-0.199	0.320	0.325	-0.087
ED1	-0.291	**0.938**	-0.101	0.061	0.426
ED2	-0.172	**0.834**	-0.053	0.165	0.569
ED3	-0.304	**0.948**	-0.128	0.101	0.429
EP1	0.388	-0.007	**0.730**	0.199	-0.023
EP2	0.502	-0.099	**0.918**	0.203	-0.090
EP3	0.576	-0.167	**0.875**	0.192	-0.112
EP4	0.532	-0.093	**0.863**	0.238	-0.039
EP5	0.502	-0.081	**0.822**	0.250	-0.116
GP1	-0.152	0.510	-0.047	**0.850**	0.327
GP2	0.228	0.198	0.147	**0.751**	0.171
GP3	0.182	0.110	0.189	**0.847**	0.172
GP4	0.248	0.196	0.239	**0.880**	0.235
IGM1	-0.068	0.276	-0.075	0.205	0.795
IGM2	-0.062	0.465	-0.060	0.176	**0.883**
IGM3	-0.086	0.516	-0.031	0.146	**0.860**
IGM4	-0.108	0.479	-0.048	0.163	**0.896**
IGM5	0.017	0.398	0.037	0.216	**0.859**
IGM6	0.052	0.275	0.048	0.155	**0.741**

Lastly, discriminant validity was confirmed through the HTMT values. Table 16 presents the HTMT results, which demonstrate that none of the values exceed 0.9, indicating that the criteria for discriminant validity have been met.

Table 4.15: HTMT**.**

	CP	ED	EI	GP	IEM
CP					
ED	0.306				
EP	0.772	0.120			
GP	0.339	0.399	0.238		
IGM	0.104	0.544	0.063	0.391	

It would then be followed by the structural model, which would validate the relationships among the variables. The most important procedure that would be carried out in this respect is that the revised R-square value, path coefficients denoted as β, and its associated significance level would be considered. PLS-SEM estimates path coefficients through bootstrapping that presents the path coefficients with their respective significance levels and adjusted R^2 values. The adjusted R-square statistic expresses the extent at which the variation in the independent variables is predictive of the dependent variable; the strength of this relationship can be defined as weak, moderate, or strong (Sarstedt et al., 2017).

Table 17 presents the adjusted R^2 thus showing the three independent variables collectively explain 20.3% of the variation in the dependent variable-as Consumer Pressure. The independent variables account for about 28.7% variation in the variation of the surrogate dependent variable, Environmental Performance.

Table 4.16: R-Square Values**.**

	R-square	R-square adjusted
CP	0.209	0.203
EP	0.334	0.287

4.6 STRUCTURAL MODEL ASSESSMENT

The model was evaluated using the PLS-SEM technique with SmartPLS 4 software. The PLS-SEM approach utilizes bootstrapping to obtain path coefficients and significance levels. Figure 10 illustrates the regression model, and the corresponding results are presented in Table 18. The table displays the regression coefficients based on the mean sample, while the significance value indicates the significance level. Out of the six hypotheses tested, two were

rejected due to their lack of explanatory power, as their significance levels exceeded the 0.1 threshold.

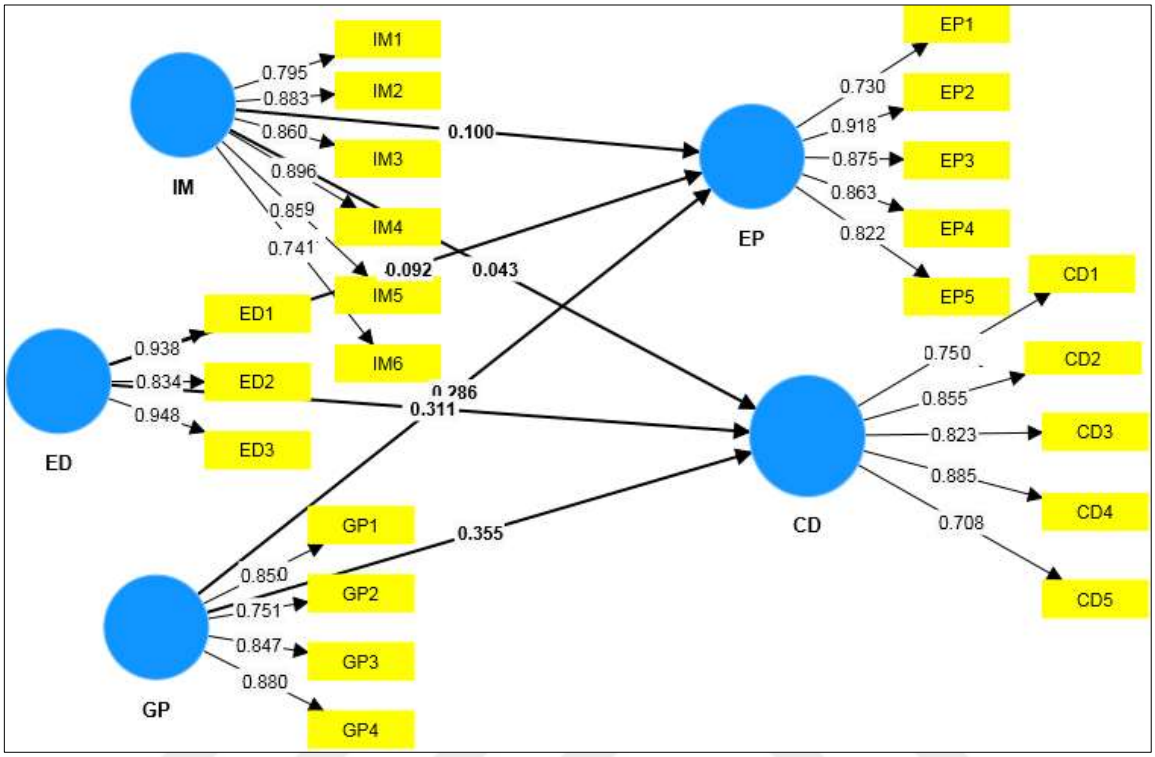

Figure 4.5: PLS-SEM Model (Extracted from Software).

Table 4.17: Path Analysis**.**

	Original sample	Sample mean	Standard deviation	T statistics	P values
ED -> CP	0.311	0.316	0.049	6.370	0.000
ED -> EP	0.092	0.103	0.047	1.938	0.053
GP -> CP	0.355	0.354	0.048	7.463	0.000
GP -> EP	0.286	0.286	0.051	5.583	0.000
IGM -> CP	0.043	0.014	0.116	0.370	0.712
IGM -> EP	0.100	0.064	0.119	0.839	0.402

The first hypothesis examines the relationship between eco-design and consumer pressure. Table 18 demonstrates a positive and significant association between these variables, with an original sample value of 0.311 and a P-value of 0.000, which is below the 0.1 threshold for significance. This indicates that a 1% increase in eco-design corresponds to a 0.311 unit increase in consumer pressure.

The second hypothesis explores the link between eco-design and environmental performance. According to Table 18, there is a positive and significant association, as evidenced by the original sample value of 0.092 and a P-value of 0.053, also below the 0.1 threshold. This suggests that a 1% increase in eco-design results in a 0.092 unit rise in environmental performance.

The third hypothesis investigates the connection between green purchasing and consumer pressure. Table 18 reveals a positive and significant association, with an original sample value of 0.355 and a P-value of 0.000. This signifies that a 1% increase in green purchasing leads to a 0.355 unit increase in consumer pressure.

The fourth hypothesis assesses the relationship between green purchasing and environmental performance. Table 18 shows a positive and significant association, with an original sample value of 0.286 and a P-value of 0.000. This indicates that a 1% increase in green purchasing leads to a 0.286-unit improvement in environmental performance.

The fifth hypothesis examines the relationship between internal green management and consumer pressure. Although the association is positive, Table 18 shows it to be insignificant, with an original sample value of 0.043 and a P-value of 0.712, which exceeds the 0.1 threshold for significance. This implies that a 1% increase in internal green management leads to only a 0.043 unit rise in consumer pressure, but the result is not statistically significant.

The sixth hypothesis explores the link between internal green management and environmental performance. While Table 18 indicates a positive relationship, the association is insignificant, with an original sample value of 0.100 and a P-value of 0.402, which is above the 0.1 significance level. This suggests that a 1% increase in internal green management leads to a 0.100-unit improvement in environmental performance, but the result is not statistically significant.

4.7 DISCUSSION

As a result, the hypothesis that links eco-design and consumer power is positive, and the P value of 0.000 reported in the table is less than 0.1. Similarly, Abdullah et al., (2019) argue that consumers prefer products that are safe for the environment and don't cause harm to them. The study indicates that consumers are most likely to buy products made from friendly

environmental materials and have been forcing industries to adopt eco-friendly designs (Fernando, (2017).

The hypothesized association between eco-design and environmental performance is also supported as evidenced by a P value of 0.053 which is less than 0.1. This result is also supported by (Abdullah et al., 2019). The result indicates that eco-design is core in ensuring environmental sustainability. Büyüközkan & Çifçi , (2012), note that different dimensions of ecological performance of a product are determined at the design stage. Handfield et al., (2002), further note that about 80% of the environmental impacts of a product is determined at this stage.

Because of this, the P-value is 0.000 which is less than 0.1, hence the null hypothesis linking green purchasing to consumer's pressure is rejected. These findings are further supported by works such as those by Young et al. (2010), and Banytė et al. (2010), who state that the modern consumer is ever conscious of the environmental disaster characterized by global pollution and destruction of natural resources. This awareness has eventually curbed consumer behavior, where increasingly a marked shift towards ecocentric consumption has been undertaken. While Groening & Zhu, (2019), add that buyers actually seek out environmentally sustainable products, Gupta & Ogden, (2009), added that such a trend has positive implications for the societies in which consumers reside.

The hypothesis between green purchasing and environmental performance is also accepted since the table reports a p-value of 0.000, again below 0.1. Dagher & Itani , (2014), support the findings when they claim it is the environmental concerns predominantly stimulate buyers to switch from usual consumption to green consumption. Their earlier study also reported that consumers choose green products because it is one of the methods of improving environmental conditions. Vermillion & Peart , (2010), highlighted the green consumption is not only environmentally friendly but also has several direct benefits to the buyers. The researchers further observed that when consumers feel that green purchasing helps in environmental sustainability, it has a chance of changing a conventional product for an ecologically friendly product.

This relation links a relationship between internal green management and consumer pressure that, although positive, holds a P value greater than 0.1 and is thus statistically insignificant

enough to reject the hypothesized statement. Besides, Maier & Dost , (2018), opined that high competition and consumer pressures force the managers to develop sustainable products. However, Jayaraman et al., (2023), also pointed out that the ability and skill of internal green management is highly responsible for successfully developing environmentally sustainable products. Further, Du et al., (2018), also pointed out that the pressures exerted by consumers encourage the vendors to adopt green products to result in increased environmental performance.

Furthermore, consumers possess the capability to exert influence on suppliers regarding the utilization and advancement of environmentally sustainable resources (Tate et al., 2011). This consumer influence subsequently motivates internal green management to advocate for eco-friendly product offerings (Chu et al., 2019), and to uphold their corporate image. Additionally, Bask et al., (2018), contend that consumer pressure serves as a significant catalyst for green innovation and production initiatives. The proposition linking internal green management practices with environmental performance is rejected because the P observed was greater than 0.1. In agreement with this study's result, Susanty et al., (2017), observed that internal green management practices are not always influencing environmental performance. Using a related argument, Melnyk et al., (2003), suggested that certified procedures, outside the context of firm environmental strategies, have limited ecological outcomes. However, the positive relationship among these variables can be attributed to the fact that companies are adopting sustainable production processes and policies that emphasize achieving environmental objectives such as minimizing carbon footprint and energy preservation. Additionally, companies are reorganizing their operations structures to meet the environmental objectives.

5. CONCLUSION

This study investigates the impact of green supply chain management (SCM) practices on consumer pressure and environmental performance. The green SCM practices are evaluated using three key indicators: eco-design, internal green management, and green purchasing. Data was collected from Iraqi employees, and Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed as the analytical tool. The sample consists of 402 employees, and data was gathered using a five-point Likert scale questionnaire. Internal green management was assessed with six items from Khan et al. (2023), eco-design was measured with three items also sourced from Khan et al. (2023), and green purchasing was evaluated with four items from the same source. Environmental performance was assessed with six items from (Abdallah & Al-Ghwayeen, (2020), and consumer pressure was measured with four items from (Zailani et al., 2012).

The findings indicate that all variables—eco-design, internal green management, and green purchasing—positively influence consumer pressure. Similarly, these three practices positively affect environmental performance. Furthermore, green purchasing and eco-design have a significant impact on both consumer pressure and environmental performance, whereas internal green management demonstrates an insignificant effect on these outcomes. This study contributes both theoretically and practically to the literature, reinforcing previous findings that green SCM practices influence consumer pressure and environmental performance. Additionally, it highlights the broader environmental implications of integrating green SCM practices.

5.1 PRACTICAL IMPLICATIONS

The study gives practical implications to environmentalists, businesses, and marketers. These findings showed that ec-design significantly influences environmental performance as well as consumer pressure, thus providing a yardstick for the practitioner or operational manager. Operational managers need to drive their teams with adequacy to realize the consumer demand for the design of eco-friendly products in an aim to balance aesthetics with environmental consideration. Training programs contribute to acquiring the capability for green product design by the managers and engineers, hence the research and development team make appropriate decisions on organic shape and green product design. The

establishment and adherence to the environmental policies in the design process were also established in this study. These results put forward that eco-design is crucially linked to a reduction of ecological damages and, therefore, can be an important organizational issue.

Other strategies include eco-designs during the stages of product development. Companies that will develop eco-friendly product designs will be better positioned in the market and with an added advantage in reputation against those companies that do not take part in the designing of eco-friendly products. Production of green products therefore gives the organisation an added advantage where they are perceived to be reliable and efficient producers. The managers need to keenly scrutinize the role of eco-design in improving the level of environmental performance. In the view of Hiti and Singh, the environmental strategy of any company is directly related to product design quality and effectiveness hence strengthening eco-friendly product impacts on environmental consequences is important. This becomes effective when proper SCM practices are developed towards the firm's goals over environmental performance. Eco-design will also contribute to opening new market avenues that enable companies to keep themselves competitive.

This can be achieved by firm's green product design and manufacturing process, along with collaboration and communication with suppliers concerning eco-product design. Based on the results obtained in the study, all firms are recommended to use environmental criteria for supplier selection. If a company is committed to environmental sustainability, then its suppliers should demonstrate good environmental performance. Managers are encouraged to survey and impact their suppliers to develop sustainability practices that will reduce the chance of negative environmental impacts and protect the firm's brand.

It should be in a position to communicate and share that knowledge within its various departments on collaborative continuous improvement and sustainability. The study suggests that environmentalists, businessmen, and marketers encourage green consumption behavior of consumers through positive rewards and reinforcement of environmental friendly consumer behavior. It is found that consumers are more willing to buy green products when they realize their contributions to environmental protection. As ecocentric purchasing was found to be an important determinant in the present study, the government too should initiate some positive steps in this direction. Awareness of the origin and severity of environmental problems has to be created among the public, particularly at the higher

learning level. In addition, based on the conclusions made by Ellen et al., (1994), the organizations promoting environmentally friendly behavior should be offering positive incentives for consumers so that they can keep on purchasing sustainable products as the supply of environmentally friendly goods goes up. Protection of the environment is a governmental duty, and as such, there should be policies encouraging sustainability.

Apart from that, the curriculum should be revised to add courses on ecological problems and courses on ecological conservation. Managers should align their public relations strategies with their internal green management practices to ensure green outcomes are achieved. Companies should communicate their green initiatives to stakeholders through various channels, including social media and press releases. Governments should incentivize firms to adopt green practices by offering financial incentives, such as tax breaks and rebates. These incentives would encourage companies to implement green initiatives and motivate lagging organizations to follow suit. In addition, quasi-governmental agencies, such as the EPA, should collaborate with local governments to develop green legislation, which would support the creation of sustainable business models and promote long-term growth.

The research underscores the importance of internal green management in achieving sustainability performance, offering practical implications for managers and policymakers. Governments should establish strict regulations requiring companies to produce environmentally friendly products and strategies. At the same time, consumers should be encouraged to purchase green products, creating new market opportunities for organizations to expand in the green sector. Marketers and businesses need to be aware of how to respond to the increasing demand for environmentally friendly products. Moreover, organizations should comply with ISO certification standards, as this builds trust with clients. Managers are also encouraged to promote green behavior among their staff, as employees are consumers too.

5.2 LIMITATIONS AND FUTURE DIRECTIONS

While this research offers valuable contributions to both scholars and practitioners, it has some limitations that present opportunities for future investigation. First, the framework of this study does not account for the moderating or mediating effects of any variables, despite their potential influence on the model. Future research could enhance the understanding of this model by incorporating moderating variables such as institutional pressures, culture, and

strategic or operational orientation. Similarly, mediating factors like peer engagement could also be considered.

Moreover, this study faces generalizability challenges, as the data was collected solely from Iraq. Future studies should broaden the scope by including data from diverse industries and countries to enhance the validity and reliability of the findings. Comparative research between developing and developed nations could further enrich the analysis. Additionally, this study only examines the impact of IGM on the environment and consumer pressure. Future research should explore the role of external green supply chain management (SCM) practices in influencing both environmental outcomes and consumer pressure.

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APPENDIX

The below statements are need to be rated on five point Likert scale where 1 is strongly disagree, 2 is disagree, 3 is natural, 4 is agree and 5 is strongly agree.

Internal green management

IG1: The senior managers of our organisation are committed to green supply chain management.
IG2: The mid-level managers of our organisation support green supply chain management.
IG3: My organisation has total quality environmental management.
IG4: My organisation has environmental compliance and auditing programmes.
IG5: My organisation has ISO 14001 certification.
IG6: My organisation has environmental management systems.

Green purchasing

GP1: My organisation offers eco-labelling of products.
GP2: My organisation has cooperation with suppliers for environmental objectives.
GP3: My organisation has an environmental audit for suppliers' internal green management.
GP4: My organisation has a second-tier supplier environmentally friendly practice evaluation.

Environmental performance

EP1: Significant reduction in solid wastes
EP2: Significant decrease of consumption for hazardous/harmful/toxic materials
EP3: Significant decrease of frequency for environment accidents
EP4: Significant reduction of air emission
EP5: Significant reduction of effluent wastes
EP6: Significant reduction of waste emission

Consumer pressure

CD1. My firm’s major consumers frequently require my firm to adopt green supply chain initiatives.
CD2. My firm’s major consumers would withhold their contracts if my firm did not meet their environmental performance requirements.
CD3. My firm’s major consumers have a clear policy statement regarding its commitment to the environment.
CD4. My firm receives requirements from consumer associations to be more environmentally conscious firm.
CD5. My firm’s major consumers frequently encourage my firm to adopt green supply chain initiatives.

Demographics

Gender

- Male
- Female

Job position

- Top management level
- Middle management level
- Low management level

Number of managers

- Less than 50
- 50 less than 150
- 150 less than 250
- 250 and above

Age of the firm

- Less than or equal to 15 years
- More than 15 years 100