BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF COMMERCE

DEPARTMENT OF ECONOMICS

AN ASSESSMENT OF THE FACTORS THAT DETERMINE THE ADOPTION OF GREEN PROCUREMENT. CASE STUDY OF ZIMBABWE PLASTIC INDUSTRY.

By

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ABSTRACT

Green procurement plays a vital role in promoting sustainable production in various industries. This study has analyzed the factors that determine the adoption of green procurement in Zimbabwe's plastic industry using a case study of 30 plastic manufacturing firms in Zimbabwe. The study adopted a pragmatic philosophy. The main objective of the study is to analyze the factors that determine the adoption of green procurement effect of using a case of Zimbabwe Plastic industry. Data collection was done by means of questionaries and interviews. The empirical results indicate a positive relationship between adoption of green procurement and management expertise. The findings also highlight the positive and significant relationship between adoption of green procurement and CSR. The same nature of relationship was established between adoption of green procurement and financial benefits. While assessing the relationship between supply chain efficiency and green procurement as an objective the study found positive relationship with cost to serve and customer satisfaction as measures of supply chain efficiency. However, established a negative relationship between green procurement and fill rate, also a negative relationship between adoption of green procurement and size of firm. The research found out that financial performance is important on adoption of green procurement and it improves supply chain efficiency. Further the research suggests that plastic firms in Zimbabwe should conduct a comprehensive analysis of the environmental impact and performance of different suppliers, materials, technologies, and processes, and choose the ones that offer the best value for money and quality.

DECLARATION

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The researcher's primary focus within this field of study has been driven by the quest for innovation, so the researcher chose to dig deep into logistics management information systems within the plastic manufacturing organizations supply chain. It has been an incredible journey to explore and work in this rapidly expanding portfolio, with its challenges and achievements in the collection of information and expertise. This research study has provided the researcher with the necessary tools to compete as a holder of Bachelor of Commerce honors Degree in this fascinating topic of Purchasing and Supply.

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APPROVAL FORM

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Submitted by LISSA MASHONGA

In a bid to partially fulfil the requirements of a Bachelor of Commerce Degree in Purchasing and Supply.

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CHAPTER 1

1.1 Introduction

The method of incorporating environmental sustainability strategies into supply chain management is known as "green procurement." It entails taking action to decrease a business's environmental effect at each stage of the supply chain, from production and distribution of the finished product to material sourcing and product design (Thomasnet, 2019). In addition to lowering waste and increasing supply chain efficiency, green procurement can help boost dependability and save costs. To cut expenses and emissions associated with transportation, a business could decide to acquire resources that are produced nearby (Edureka, 2022). In addition, by using green procurement practices, a company can reduce its exposure to both environmental and financial risk, as opposed to assuming it from its suppliers (Mar, 2020). Emphasizing life-cycle analysis, which looks at a product or service's environmental impact from raw material extraction to disposal, is a crucial component of green procurement (Meehan & Bryde 2011).

The adoption of green procurement practices has become increasingly important for organizations seeking to minimize their environmental impact and contribute to sustainability. In the context of the Zimbabwean plastic industry, understanding the key factors that influence the adoption of green procurement is crucial for enhancing industry-wide environmental performance. This study seeks to investigate the factors that determine the adoption of green procurement practices within the Zimbabwean plastic industry. By conducting a case study, the study will examine the specific drivers, barriers, and enablers that shape the industry's transition towards more sustainable procurement strategies. The plastic industry in Zimbabwe plays a pivotal role in the country's economy, providing essential materials for various sectors such as packaging, construction, and manufacturing. However, the rampant use of conventional plastics has led to detrimental environmental consequences, including pollution of land, water bodies, and air. Consequently, there is a growing urgency to transition towards sustainable practices within this industry, with green procurement being a key aspect of this transition.

1.2 Background of the study

Globally, there is a growing emphasis on the importance of managing the environment in corporate activities while meeting the demands for material commodities, utilities, and services. Developed countries began implementing green procurement (Balin & Sari, 2023). The same authors also stated that green procurement entails reverse logistics, internal environmental management, environmental cooperation with customers, and eco-design. (Anane,2020) defined green procurement as the purchasing of goods and services that have the least negative environmental impact. According to (Balin and Sari, 2023), environmental performance has become critical for customer preference, influencing transactions in most countries. One of the main causes of resource depletion and environmental damage is the plastics sector. The United Nations Environment Programme (UNEP) reports that just 9 percent of the more than 300 million tons of plastic produced year get recycled. The remainder is disposed of in landfills, the ocean, or incinerators, harming people's health, wildlife, and the environment. In addition, the plastics industry uses a lot of water and energy, and along its supply chain, it releases harmful chemicals and greenhouse gases. (UNEP, 2019).

Zimbabwe's plastic industry has encountered various environmental issues, including the accumulation of plastic waste and the need to reduce the carbon footprint of production operations (Musademba, 2023). In this context, green procurement methods have been highlighted as a potential solution to these difficulties while also improving supply chain efficiency (Maphosa & Mhembere, 2024). The greening of a supply chain is the introduction of methods that help achieve sustainability within supply chain activities. (Kumar and Chandrakar, 2021). Green supply chain management (GSCM) has numerous definitions and is a widely used term in both SCM and environmental management literature (Zhu & Sarkis, 2022). (Srivastava,2021) defines GSCM as integrating environmental thinking into SCM. This covers elements like product design, manufacturing procedures, procurement and selection of materials, customer delivery, and product end-of-life management Srivastava, (2021). Businesses are under pressure to enhance their environmental sustainability due to a multitude of causes, including declining resources and an increase in natural disasters. (Sarkis, Zhu, and Lai ,2021).

Companies like PlasTech Molding, Tool and Mold, and Evco Plastics Kipkorir & Wanyoike, among others, dominate the global plastics sector in the United States of America (2020). (Kipkori & Wanyoike,2020) state that the US plastics industry, which employs over 1.7 million people and set a record of $583.7 billion in shipments in 2020 as reported by the Society of the Plastics Industry, is one of the country's largest and fastest-growing industries. The US plastics industry is now the third largest industrial sector in the country, behind the petroleum and automotive industries and ahead of basic chemicals, according to an 11.5% increase in shipments since 2020. Green procurement practices have been implemented by companies like PlasTech Molding, Tool and Mold, and Evco Plastics as a means of improving their environmental footprint and attaining supply chain efficiency. These companies have been procuring raw materials that are located in close proximity to support the local economy and reduce transportation-related emissions. More so these companies have embarked on reducing waste by reusing and recycling materials and as a result they have attained an enhanced supply chain efficiency.

The global shift towards sustainability and environmental consciousness has placed increasing pressure on industries to adopt more eco-friendly practices, including in the area of procurement (Ahi & Searcy, 2013). Green procurement, also known as sustainable procurement, refers to the integration of environmental considerations into the purchasing and supply chain management processes (Genovese et al., 2017). This approach aims to minimize the negative environmental impacts associated with the procurement and use of goods and services. In the context of the Zimbabwean plastic industry, the importance of green procurement has gained significant attention in recent years (Muposhi & Dube, 2017). The plastic industry is a crucial component of Zimbabwe's economy, providing essential products and contributing to employment (Chipendo & Gwenzi, 2019). However, the industry's reliance on fossil-fuel-based raw materials, energy-intensive production processes, and the management of plastic waste have raised concerns about its sustainability (Moyo, 2018). The Zimbabwean plastic manufacturing industry has contributed to have significant environmental impacts, such as high energy consumption, greenhouse gas emissions, and plastic waste generation.

1.3 Statement of the problem

Plastic manufacturers in Zimbabwe have had difficulties in implementing GSCM methods. Several scholars, including (Likholo and Senelwa,2022), (Zhu, Sarkis, and Lai, 2021), (Kipkorir and Wanyoike,2020), and (Agyepong and Nhamo,2021), have reported that implementing GSCM strategies has resulted in supply chain efficiency, primarily by reducing environmental negative impact, brand image, and procurement costs, thereby increasing profitability. This has been true for the majority of plastic manufacturing enterprises in wealthy countries, but not for companies in underdeveloped countries such as Zimbabwe. Despite the adoption of green procurement practices by plastic manufacturing companies in Zimbabwe, these organizations are facing significant challenges in achieving supply chain efficiency. The Zimbabwean plastic industry plays a crucial role in the country's economy, providing essential products and contributing to employment opportunities. However, the industry's reliance on fossil-fuel-based raw materials, energy-intensive production processes, and the management of plastic waste have raised significant concerns about its environmental sustainability (Moyo, 2018; Chipendo & Gwenzi, 2019). Without effective measures to promote the adoption of green procurement, the industry's environmental footprint is likely to escalate, further exacerbating plastic pollution and its associated impacts. This study aims to examine determinants and barriers in the implementation of green procurement strategies for plastic manufacturing companies in Zimbabwe. The study also evaluates the theory and practice of green procurement in Zimbabwean plastic manufacturing companies that have used green GSCM in procurement but are still experiencing supply chain inefficiencies.

1.4 Research objectives.

The main objective of the study is on the factors that determine the adoption of green procurement strategies using a case of Zimbabwe Plastic Industry. Secondary objectives are as follows

1. To identify the drivers that motivates the adoption of green procurement in the Zimbabwean plastic industry.

2. To examine the effects of green procurement on financial performance.

3. Investigate the relationship between green procurement and supply chain efficiency in the Zimbabwean plastic industry.

1.5 Research questions

1. What are the key factors that determine the adoption of green procurement?

2. What are the effects of green procurement on financial performance?

3. Is there a relationship between green procurement and supply chain efficiency?

1.6 Significance of the Study

The findings of this study can provide the Zimbabwean plastic industry with a roadmap for transitioning towards more sustainable procurement practices. By understanding the key drivers, barriers, and enablers, industry players can develop and implement effective strategies to enhance their environmental performance, which is crucial for the long-term viability of the sector. Plastic companies, suppliers, and other supply chain stakeholders can use the findings of this study to optimize their procurement processes and identify opportunities for collaboration to promote sustainable practices. This can help strengthen the industry's overall environmental performance and supply chain efficiency. The study will conclude with a framework for improving the efficiency of Zimbabwe's plastic sector in the face of current challenges. This study is important for Bindura University of Science Education since it will improve literally work and increase recent literature, which will aid other students who will be receiving new insights and the latest literature on an analysis of green buying practices have an impact on the efficiency of other businesses in numerous sectors. This investigation will also add to the recent literature. The researcher will acquire academic credit for the Bachelor of Commerce Honor's degree at Bindura University of Science Education by conducting an analysis of procurement techniques on the efficiency of the plastic manufacturing industry in Harare. The study examines how the adoption of green procurement strategies can enhance the efficiency of the plastic manufacturing sector.

1.7 Delimitations of the study

This study is on the factors that determine the adoption of green procurement in Zimbabwe's plastic industry. In this study respondents will be taken from Zimbabwe plastic organizations but only using head offices. This is because head offices make informed decisions pertaining to green manufacturing practices to adopt. Managerial employees from procurement department will be respondents of the study. This study shall be confined to a period of between 2018 up to 2024.

1.8 Chapter summary

This chapter introduced the background of the study where trends of the variables under study have been discussed. Further the chapter proffered on the problem statement and problem statement among other important aspects. The next chapter will discuss literature review related to the current study.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

A literature review is a critical examination of previous research on a topic. It summarizes the important theories, concepts, methodologies, and discoveries published in the discipline. The goal of a literature review is to uncover gaps, inconsistencies, and limitations in current knowledge and to demonstrate the necessity for additional research. This section of the literature review focuses on the factors that determine the adoption of green procurement in Zimbabwe's plastic sector. The first half will focus on a theoretical review, while the second (empirical) will analyze the issues encountered by the plastic sector around the world, as well as how green procurement techniques have affected the performance of the plastic business in other countries.

2.2 Theoretical Literature Review

2.2.1 Diffusion of Innovation theory

Diffusion of Innovation Theory, proposed by Everett Rogers in 1962, provides a framework for understanding how new ideas, technologies, or practices are communicated and adopted over time within a social system. It can provide insights into the factors that facilitate or hinder the diffusion and adoption of green procurement practices in the Zimbabwean plastic industry, such as the perceived relative advantage, compatibility, and complexity of these practices. In the context of the adoption of green procurement in the Zimbabwe Plastic Industry, this theory offers valuable insights into the process and factors influencing the uptake of environmentally friendly practices.

According to the theory, innovators and early adopters are among the first to embrace new ideas or practices. In the case of green procurement, pioneering organizations within the Zimbabwe Plastic Industry may have already begun implementing environmentally sustainable purchasing practices. Understanding their motivations and experiences can provide valuable lessons for other firms considering adoption. According to Rogers, the perceived attributes of an innovation influence its adoption rate. In the case of green procurement, attributes such as relative advantage (e.g., cost savings, improved brand reputation), compatibility with organizational values and

goals, complexity (ease of implementation), observability (visibility of benefits), and trial ability (ability to experiment on a small scale) can impact organizations' willingness to adopt these practices. Diffusion of Innovation Theory also acknowledges the presence of barriers that may hinder the adoption process. These barriers could include concerns about increased costs, lack of knowledge or expertise, resistance to change, organizational inertia, or competing priorities. Understanding and addressing these barriers is essential for promoting widespread adoption of green procurement practices within the Zimbabwe Plastic Industry. Implementing a comprehensive sustainable procurement program, which includes the use of recycled materials, the selection of environmentally friendly suppliers, and the optimization of transportation and logistics, may increase supply chain efficiency by reducing waste, lowering transportation costs, and improving supplier collaboration (Muposhi & Dube, 2017).

As a result, the Diffusion of Innovation Theory states that there are key factors that influence the rate of adoption, such as relative advantage, compatibility, complexity, trial ability, and observability (Rogers, 2003). By applying the principles of Diffusion of Innovation Theory, researchers can analyze the dynamics of adoption, identify influential factors, and develop strategies to accelerate the uptake of green procurement practices, ultimately contributing to environmental sustainability and competitive advantage within the industry.

2.2.2 Institutional theory

Institutional theory is a major perspective in organizational studies that delves into the deeper and more resilient aspects of social structure. It focuses on how structures such as schemes, rules, norms, and routines become established as authoritative guidelines for social behavior. They consist of three main elements cultural-cognitive issues, normative elements and regulative elements. This theory explains how these elements are created, diffused, adopted and adopted over time and space. The theory says organizations adopt practices to comply with external pressures or they imitate successful practices of others, but these organizations also conform to professional norms and standards.

One aspect of Institutional Theory is the influence of regulatory pressures on organizational behavior. In the case of green procurement, organizations in the Zimbabwe Plastic Industry may face increasing regulatory requirements aimed at reducing environmental impact and promoting sustainability. These regulations could include mandates to use eco-friendly materials,

implement waste reduction measures, or adhere to specific environmental standards. Firms may adopt green procurement practices to comply with these regulations and avoid penalties, demonstrating how institutional pressures shape their decisions. Institutional Theory also emphasizes the importance of normative expectations within a given industry or society. In the Zimbabwe Plastic Industry, there may be growing societal expectations for businesses to operate in an environmentally responsible manner. Consumers, investors, and other stakeholders may place value on sustainability initiatives, leading firms to adopt green procurement practices to align with these normative expectations and maintain their legitimacy in the eyes of stakeholders. Institutional pressures can manifest through industry standards, certifications, or best practices endorsed by professional associations or industry bodies. For example, organizations in the Zimbabwe Plastic Industry may seek certifications such as ISO 14001 (Environmental Management Systems) or adopt guidelines outlined by industry-specific sustainability initiatives. By conforming to these standards, firms signal their commitment to environmental stewardship and may gain competitive advantages such as improved market access or enhanced brand reputation. Institutional Theory suggests that organizations often mimic the behaviors of others perceived as successful or legitimate. In the context of green procurement, firms may observe competitors or industry leaders implementing environmentally sustainable purchasing practices and replicate these strategies to remain competitive or mitigate reputational risks. Mimetic behavior driven by institutional pressures can contribute to the diffusion of green procurement practices within the Zimbabwe Plastic Industry. Institutional Theory recognizes the importance of interorganizational networks and relationships in shaping organizational behavior. Collaborative initiatives, partnerships, or supplier networks focused on sustainability can facilitate the exchange of knowledge, resources, and best practices related to green procurement. Participating in such networks can expose firms in the Zimbabwe Plastic Industry to institutional pressures and incentives that encourage the adoption of environmentally friendly purchasing practices.

By employing Institutional Theory to assess the factors influencing the adoption of green procurement in the Zimbabwe Plastic Industry, this study can analyze how external institutional forces shape organizational strategies, practices, and decision-making processes related to sustainability. This approach provides a comprehensive understanding of the institutional context

in which firms operate and the mechanisms through which environmental concerns become institutionalized within the industry.

2.2.3 Dynamic capabilities theory

The Dynamic Capabilities theory is a theoretical framework that explains how organizations can achieve and sustain competencies to address rapidly changing environments. Dynamic capabilities refer to a firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments (Tierce et al., 1997). These capabilities allow organizations to adapt, renew, and reconfigure their resource base to match the demands of a changing market. There are three key dimensions of Dynamic Capabilities theory sensing capabilities, seizing capabilities and transforming capabilities Sensing Capabilities refers to ability to identify, shape, and seize opportunities, as well as to sense and shape threats. Seizing Capabilities refers to ability to mobilize resources to address opportunities and threats, and to make appropriate strategic decisions. Transforming Capabilities refers to ability to continuously transform and reconfigure the organization's resource base, processes, and structures to maintain competitiveness.

The Dynamic Capabilities Theory (DCT) provides a useful framework for understanding the adoption of green procurement practices by organizations. In the context of green procurement, the DCT suggests that organizations with stronger dynamic capabilities are more likely to adopt and implement sustainable procurement practices effectively. Organizations with strong sensing capabilities can identify emerging trends, regulations, and stakeholder demands for green procurement, which can motivate them to adopt such practices. Firms with strong seizing capabilities can allocate resources, develop necessary processes, and make strategic choices to implement green procurement practices effectively. Organizations with strong transforming capabilities can adapt their procurement processes, supplier relationships, and organizational structures to support the adoption and implementation of green procurement over time.

By developing and leveraging these dynamic capabilities, organizations in the Zimbabwe plastic industry can more effectively identify, seize, and transform their procurement practices to align with the growing demand for sustainable and environmentally-friendly products and services (Marini & Loury-Okoumba, 2018).For example, a plastic manufacturer in Zimbabwe with strong sensing capabilities may be able to anticipate changes in customer preferences and government

regulations towards more sustainable packaging. With strong seizing capabilities, the organization can invest in research and development to design and procure green materials, and establish partnerships with eco-friendly suppliers. The firm's transforming capabilities would then enable it to continuously adapt its procurement processes and organizational structure to support the ongoing adoption and integration of green procurement practices.

Overall, the Dynamic Capabilities Theory provides a useful lens for understanding the organization-level factors that can facilitate the adoption of green procurement in the Zimbabwe plastic industry.

2.3 Empirical Literature review

Factors that determine the adoption of green procurement practices in Plastic industry

One of the determinants are government regulations and policies mandating environmental sustainability measures have a significant impact on the adoption of green procurement practices (Pavithra et al., 2019). Stringent environmental regulations compel organizations to integrate sustainability criteria into their procurement processes to ensure compliance (Wang, 2020). For example, organizations in the Zimbabwe Plastic Industry may seek certifications such as ISO 14001 (Environmental Management Systems) or adopt guidelines outlined by industry-specific sustainability initiatives.

The other determinant is management expertise. Managers with a strong understanding of environmental issues and the potential impact of procurement decisions are more likely to prioritize green procurement (Zhu & Geng, 2013). They can recognize the benefits of sustainable practices and effectively communicate them to the organization (Appolloni et al., 2014).

Effective managers can develop a clear strategic vision for green procurement and demonstrate a strong commitment to its implementation (Geng & Doberstein, 2008). This commitment cascades down to the rest of the organization, fostering a culture of sustainability (Bowen et al., 2001).

The other reason is cost considerations, the perceived cost-effectiveness (financial benefit) of green procurement practices plays a crucial role in adoption decisions. Research indicates that while initial investment costs may be higher for environmentally sustainable products, long-term

savings and benefits often outweigh these costs (Lu, 2018). Organizations weigh the potential financial implications of green procurement against traditional procurement practices to determine feasibility (Sundarakani, 2020).

The third reason is market demand and competitive advantage, growing consumer awareness and demand for sustainable products drive organizations to adopt green procurement practices to gain a competitive edge (Fernandes, 2023). Organizations perceive sustainability as a source of differentiation and seek to capitalize on market opportunities by offering eco-friendly products and services (Geng, 2022). Stakeholder expectations and demands exert significant influence on organizations' adoption of green procurement practices. Customers, investors, and other stakeholders increasingly prioritize environmental sustainability, prompting organizations to align their procurement strategies with these expectations (Ahi & Searcy, 2019). Proactive engagement with stakeholders and responsiveness to their sustainability concerns drive the adoption of green procurement (Papadas, 2021).

The last determinant is organizational culture and leadership commitment (management expertise) play pivotal roles in driving the adoption of green procurement. Leadership support for sustainability initiatives, coupled with a culture that values environmental responsibility, fosters a conducive environment for adopting green procurement practices (Jabbour et al., 2020). Employee awareness, training, and involvement in sustainability initiatives also contribute to successful adoption (Gimenez, 2019). A strong organizational culture that values sustainability and environmental stewardship fosters a supportive environment for adopting green procurement practices. When sustainability is deeply ingrained in the organizational values and beliefs, employees are more likely to embrace environmentally friendly initiatives. Leaders articulate a clear vision for sustainability and communicate its importance to the organization's mission and strategic objectives. By championing the adoption of green procurement practices, leaders inspire commitment and alignment among employees towards environmental goals.

(Igarashi, M., de Boer, L., & Michelsen, O,2015). The study revealed that larger firms tend to have more resources and capabilities to implement green procurement practices, compared to smaller firms. (Geng, R., Mansouri, S. A., & Aktas, E.,2017) the study highlighted the importance of management expertise and commitment in the successful implementation of green procurement practices. A study found that the adoption of green supply chain management

practices, including green procurement, can lead to improved financial performance for firms. (Zhu, Q., Sarkis, J., & Lai, K. H., 2013)

The effect of green procurement on financial performance

Financial performance is used to assess a company's overall financial health over time. It can also be used to compare similar enterprises within the same industry or to compare industries or sectors in general. The financial performance analysis analyzes the firm's financial strengths and weaknesses by correctly creating linkages between balance sheet items and profit and loss accounts (Jayaraman, 2013). The financial aspects of GGP, particularly perceptions of the financial viability of implementing GPP, play an important role in shaping the extent to which SP policies are implemented, as green procurement/socially responsible production methods are frequently perceived as being inherently more expensive than other methods. Given the tight financial limits and competing objectives confronting most public sector organizations, perceptions of the cost-effectiveness of GPP play an especially crucial role in decision making (Brian, 2016).

(Berman,2020) described performance as an employee's effective attitude toward his or her work. Furthermore, (Akerele,2013) defined organizational performance as an individual's overall impression and evaluation of the work environment, as well as a good emotional status resulting from job evaluations and workplace experiences. The overarching principle that connects these definitions is that employee performance is a product of employee satisfaction, which describes how people in an organization feel about their entire work. Several studies have identified personal qualities and environmental conditions as key elements impacting employee happiness and performance.

Various studies were undertaken in Asian economies, including the UAE. Based on this research, we conclude that businesses wishing to increase financial performance must address employee satisfaction, which in turn stimulates improved financial performance, hence enhancing total organizational performance. Dissatisfied employees, on the other hand, are more likely to have negative consequences on their mental health and financial performance, resulting in a drop in financial performance (Brent, 2015). Researchers generally agree that performance is an important variable in work organization, and it has become a prominent indicator in measuring organizational performance in numerous studies. Employee performance can also be measured

through the combination of expected behavior and task-related aspects even though performance is often determined by financial figures. In reality, performance that is based on an absolute value or relative judgment may reflect overall financial performance.

The impact of green procurement on supply chain efficiency

The impact of green procurement on supply chain efficiency can be assessed using fill rate and cost to serve which are the measures that determine supply chain efficiency. One advantageous outcome of implementing green procurement practices is the potential to decrease reliance on fossil fuels and thereby mitigate the release of greenhouse gas emissions linked to the manufacture and use of plastic materials. A study by Wang et al. found that the use of environmentally-friendly suppliers and materials, can lead to increased direct costs in the short-term. However, the researchers also noted that these upfront costs are often offset by longer-term savings, such as reduced energy usage, waste disposal fees, and regulatory compliance costs (Wang, 2021). A (Bain & Company,2022) highlighted the potential of enhancing plastic circularity, which entails reintegrating old plastic into the supply chain instead of allowing it to become garbage, as a means to achieve sustainability objectives and decarbonisation milestones. In a similar vein, (Karisalov,2021) posited that the shift towards a sustainable economy necessitates the adoption of a comprehensive approach by both corporations and governments in order to effectively tackle the issue of plastic pollution and save the natural environment. The plastic sector can increase its social responsibility and reputation, as well as ensure compliance with regulatory standards, by implementing green procurement methods. These activities include the utilization of recycled or bio-based plastics, reduction of plastic consumption, and the improvement of recycling infrastructure.

(Zhang ,2020) conducted a fifth study that investigated the influence of green procurement on the fill rate performance of plastic producers in China. A stochastic inventory model was employed to examine the trade-off between environmental benefits and operational costs across several scenarios of green procurement adoption. Research has demonstrated that the use of green procurement practices has the potential to enhance the fill rate through the reduction of demand and supply fluctuation, the improvement of supplier reliability, and the augmentation of customer happiness. Nevertheless, it is worth mentioning that the implementation of green

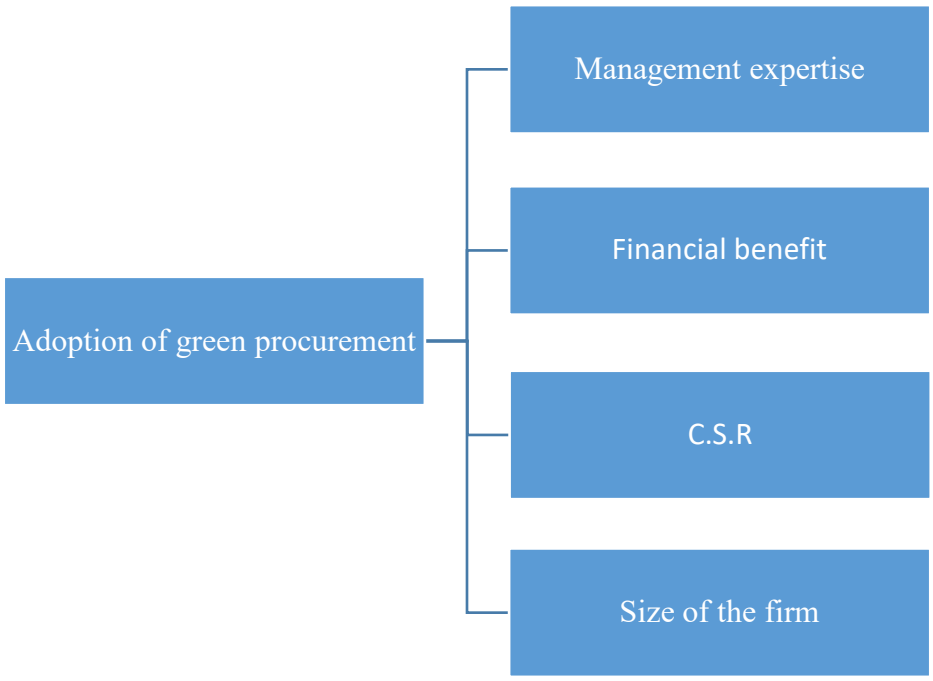
procurement practices may result in elevated operational expenses due to the necessity of adhering to stricter quality standards, longer lead times, and more frequent inspections.

Green procurement can have both positive and negative effects on cost-to-serve in the plastic industry. The benefits include less environmental effect, improved brand image, better logistics optimization, stimulating innovation in sustainable product design, increasing social responsibility, and adhering to regulatory standards. The negative repercussions include increased operating costs, lower product quality, and lower levels of customer satisfaction. As a result, it is critical for the plastic industry to strike a harmonious balance between the aforementioned aspects and create optimal techniques that may effectively achieve both economic and environmental objectives.

In conclusion, green procurement can have positive effects on cost-to-serve and fill rate in the plastic industry. The benefits include less environmental effect, improved brand image, better logistics optimization, stimulating innovation in sustainable product design, increasing social responsibility, and adhering to regulatory standards.

2.4 Conceptual framework

Figure 1: Conceptual framework



2.4 Conclusion

This chapter provided a theoretical framework that included the notions of the adoption of green procurement, supply chain efficiency, and the plastic industry. Furthermore, a thorough analysis of empirical data on the determinants and drawbacks of implementing environmentally conscious purchasing techniques across a wide range of businesses and locations was done. The literature research findings show that implementing green buying techniques has the potential to improve supply chain efficiency. This can be accomplished through a variety of techniques, including cost savings, quality enhancement, enhanced customer happiness, and environmental impact reduction. Nonetheless, the study identified various barriers and shortcomings that inhibit the adoption of environmentally friendly procurement procedures in the plastic industry. These include a lack of information and awareness, insufficient government laws and regulations, a scarcity of resources and capabilities, and insufficient involvement from important parties. The following chapter will discuss research methodology.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

The previous chapter examined the project's significance and provided an important literature evaluation. This chapter explains the study methodologies used to investigate the factors that determine the adoption of green procurement practices in Zimbabwe's plastic industry. The chapter covers many aspects of the research process, such as developing the research design, determining the target population and sampling strategy, selecting and implementing data collection methods, using data analysis tools, and considering ethical principles. The primary goal of this chapter is to explain how the study objectives and issues were effectively addressed, while also offering a rationale for the selection of relevant methodologies and procedures. This chapter will demonstrate the ways of ensuring validity and reliability of the findings

3.2 Research Approach

The study employs a research technique based on the pragmatist philosophical framework, which allows for the use of both qualitative and quantitative research methods. The qualitative element of the research will comprise conducting interviews with key players from the plastic manufacturing firms. In contrast, the quantitative element of the study would include a survey and document examination of Zimbabwe's plastic companies. This survey will use a structured questionnaire to obtain information on their green buying methods and their relationship to supply chain efficiency indicators. Inventory turnover, fill rate, and cost to service are some examples of such indicators. The collected data will be analyzed using statistical approaches, as well as content analysis. Using this research approach, the study aims to provide a comprehensive understanding of the research questions while also addressing the research objectives and hypotheses.). Using a pragmatic mentality, the study seeks to successfully blend the strengths of qualitative and quantitative data, such as complete and vivid descriptions, contextual comprehension, rigorous statistical analysis, and generalizability.

The study also took a pragmatic approach, drawing inspiration from previous studies in relevant fields such as green procurement, supply chain management, and environmental sustainability. Examples of such research include (Ahi and Searcy,2015), (Dubey,2017), and (Sarkis,2010).

3.3 Research Design

The use of a descriptive research strategy is judged appropriate for this study since it allows the researcher to explain and represent the current status of the phenomenon under investigation. The use of a descriptive research design allows the researcher to collect both quantitative and qualitative data from a variety of sources, including interviews, document reviews, and questionnaires. This study used a case study methodology to investigate the factors that determine the adoption of between green procurement in the context of plastic companies in Zimbabwe. The case study approach allows for concentrated research and a detailed understanding of the issue (Dao, 2019). The use of a case study technique allows the researcher to analyze the numerous elements that influence or impede the adoption of environmentally responsible procurement practices, as well as the challenges and benefits connected with their implementation. According to Yin (2018), a case study is a research method that involves the empirical evaluation of a contemporary phenomenon in its real setting, especially when the distinction between the phenomenon and its context is difficult to distinguish.

3.4 Target Population

The study's target population consists of plastic manufacturing enterprises in Zimbabwe. These companies manufacture a variety of plastic products, such as bottles, bags, containers, pipelines, and packaging materials. It constitutes an approximate of 31 companies.

3.5 Sample Size

The sample size for the investigation was calculated using the Rao soft calculator. The calculator is an online tool that assists researchers in determining the optimal sample size for a particular population, margin of error, confidence level, and response rate. The study's population consisted of 60 managerial employees from the 30 Zimbabwe Plastic Manufacturing companies. The margin of error was set at 5%, with a 95% confidence level and a 50% response rate.

3.6 Sampling Method

To establish a representative sample of plastic manufacturing enterprises in Zimbabwe, the study used random sampling. The population was divided into two strata: managers and executives. A simple random sampling method was used to choose sample units within each stratum. The

sample size was determined using the method described by (Yamane ,1967), with a 95% confidence level and a 5% margin of error. The aim for selecting the sampling procedure was to achieve proportionality between the sample and the population while also minimizing sampling error and bias. Furthermore, the sampling process used in this study was consistent with the research aims and overall design. The sample approach made it easier to generalize the findings to the target population. The sampling technique used in this study was similar to that used in previous studies on green procurement and supply chain efficiency, as shown by (Sarkis,2020), (Zhu,2019), and (Ageron,2014).

3.7 Research Instruments

The research instruments used in this study included questionnaires, secondary documentation, and interviews. The quantitative data was gathered from a large sample size of 60 employees from plastic manufacturers and suppliers in Zimbabwe, using questionnaires. The surveys were specifically designed to examine the factors that determine the adoption of green procurement to. In addition, the questions aimed to elicit information about the perceived benefits and challenges of green procurement. According to (Kamarudina,2021), questionnaires are an effective way to collect standardized and comparable data from a large population. Document review was employed to obtain net profit data that would be statistically analyzed to test hypotheses and address research questions.

In addition, interviews were conducted to collect qualitative data from a small number of important informants within the three organizations, including managers and executives. The interviews were conducted to research the numerous factors that drive green procurement adoption, examine approaches that can improve supply chain efficiency, and analyze the implications of green procurement for both the plastic industry and the environment. According to Karl (2019), interviews are an effective way to gather comprehensive and contextualized information from a small number of participants. This data was then examined utilizing content to elicit insights and explanations about the phenomena under investigation.

The specified instruments were chosen since they are complementary in terms of data collection. According to Adhikari (2021), questionnaires, document reviews, and interviews are complementary procedures that provide a broad and deep variety of data. Additionally, these methodologies allow for the triangulation of findings from multiple perspectives.

3.8 Data Sources.

Secondary Data.

In an attempt to answer research questions on the topic under study, the researcher employed secondary data sources. The researcher used data from financial statement to record net profit for the plastic manufacturing companies, this was done to assess the effect of green procurement on financial performance. Upon selecting data to use for this research the net profit figures for the year ended 2021 was chosen to analyze the effect of green procurement on financial performance. Data was selected in this sequence so as to minimize errors. It saves time and resources and it provided accurate results and was reliable to depend on the results because they were simple and general to interpret.

The study used secondary data because some of the data needed for analysis in the research could not be found through primary data like questionnaires or interviews. According to Sisira Kumara (2022) secondary data is a great source for gathering data because the researcher may be able to skip the stage of 'collecting data' which allows him/her to proceed quickly to the stage of data analysis. The other advantage of using this research instrument is that the data gathered showed the exact trends that are more reliable and valuable to this research.

Primary Data

A survey questionnaire was created with the goal of determining the factors that affect the adoption of green procurement among the selected firms. It used a semi-structured questionnaire making use of open ended-questions and closed –ended questionnaires. Closed-ended questionnaires were used to present the demography and open-ended questions were chosen to gather an in-depth qualitative insight into exploring the factors that determine the adoption of green procurement. The researcher also used interviews to collect in-depth information about challenges faced when implementing green procurement and approximate numbers of employees for the chosen organization. Anonymity of respondent's was assured so as to encourage respondents (Kombo and Tromp 2019).

3.9 Data Collection Procedure

A survey questionnaire was created with the goal of determining the factors that affect the adoption of green procurement among the selected firms. The questionnaire used in this study was created by relying on existing literature and then validated with the assistance of other experts in the field. In addition, a stratified random selection technique was used to choose a sample of 60 employees to assure population representation. Furthermore, the questionnaire was distributed to the selected responders by email. The participants were given two weeks to complete and submit the questionnaire. The collected data was then thoroughly examined to confirm its completeness, accuracy, and consistency. Missing or incorrect data were addressed using appropriate procedures such as mean substitution or deletion. In addition, the acquired data was analyzed using descriptive and regression analysis. Interviews were conducted with chosen procurement personnel, managers, and executives to learn more about the organizations' performance. A document review was conducted covering the years 2019-2023, with a focus on the metrics used to measure green procurement.

3.10 Data presentation and analysis methods

The data analysis approaches were classified as quantitative and qualitative. For quantitative data, regression analysis was employed to investigate the relationship and causation between the variables of interest. Using the adoption of green procurement on the Adoption of green procurement as the dependent variable while the factors where on the other side. Descriptive statistics are essential for summarizing and visualizing the data before performing any regression analysis. They help to identify the distribution, outliers, trends, and relationships among the variables. Descriptive statistics also provide information about the sample size, mean, standard deviation, range, and correlation coefficients of the data as can be seen. These statistics can help to choose the appropriate regression model and to check the assumptions and validity of the results. One author who emphasizes the importance of descriptive statistics before regression is Andy Field (2018), who asserted that one embarks on any kind of analysis they should always describe your data. This analysis was carried out using SPSS software, which can perform descriptive and regression analyses. Objective number three the research used regression analysis to test whether adoption of green procurement have an effect on supply chain efficiency.

For the qualitative data, the study employed content analysis to discover and understand the patterns that emerged. The responses were grouped accurately to create a comprehensive data set. The data was then coded into the system. This analysis was carried out using SPSS software.

3.11 Reliability and Validity

The two most significant criteria for judging research quality are reliability and validity. Reliability relates to the consistency and stability of the study outcomes, whereas validity refers to how well the research findings represent reality and may be applied to various situations (Kirk, 2021).

For quantitative data, reliability was determined by calculating the internal consistency, test-retest reliability, inter-rater reliability, and parallel form's reliability of the instruments or measures employed in the study. Validity was determined by assessing the instruments' content validity, criteria validity, construct validity, and external validity. These procedures and strategies contributed to ensuring that the quantitative data gathered was accurate, exact, and representative of the population of interest.

The use of questionnaires and interviews to triangulate qualitative data improved reliability. These measures helped to ensure that the qualitative data was reliable, believable, and verifiable. Purposive sampling, dense description, reflexivity, transferability, and negative case analysis all helped to improve validity. These tactics served to guarantee that the qualitative data was rich, authentic, and transferable to different situations.

The reflecting measurement paradigm was used, as well as the Fornell-Larcker criterion for discriminant validity

3.12 Regression analysis.

Using the Ordinary Least (OLS) approach the study will run regression to ascertain the nature of the relationship among the study variables that are outlined in the research framework. The model is specified below.

$$\mathrm{GP} = \beta_0 + \beta_1 \mathrm{FR} + \beta_2 \mathrm{CTS} + + \beta_3 \mathrm{CS} + \varepsilon$$

Where :

GP: Green Procurement.

FR: Fill Rate.

CTS: Cost To Serve.

CS: Customer Satisfaction.

β_0: intercept.

$\beta_1, \beta_2, \beta_3$: Structural parameter coefficients.

ε: Error

Logit regression analysis

AGP = $\beta_0 + \beta_1 ME + \beta_2 SF + \beta_3 CSR + \beta_4 FB + \varepsilon$

Where:

AGP: Adoption of Green Procurement

ME: Management Expertise

SF: Size of Firm

CSR: Corporate Social Responsibility

FB: Financial Benefit

β_0: intercept.

$\beta_1, \beta_2, \beta_3 \beta_4$: Structural parameter coefficients.

ε: Error

3.13 Ethical Considerations

The study aims to explore the factors that determine the adoption of green procurement in the plastic industry in Zimbabwe. The study will involve collecting data from managers and executive members using interviews, and observations. The study adhered to the following ethical principles:

3.13.1 Respect for autonomy

The study honored the participants' rights and dignity by informing them about the study's purpose, procedures, and advantages. The study received informed consent from all participants prior to collecting any data and allowed them to withdraw from the study at any time without penalty or pressure.

3.13.2 Beneficence

The study attempted to maximize the research's advantages while minimizing its negative effects on participants and society. The study ensured that the participants and their data were kept secure and anonymous, and that they were not subjected to any physical, psychological, social, or economic harm before, during, or after the study.

3.13.3 Justice

The study ensured that the participants were treated fairly and equitably and that they were not exploited or discriminated against them based on their age, gender, race, ethnicity, religion, or any other factor.

3.14 Conclusion

This chapter looked at the research methodology. The chapter further proffered on the research design, data collection methods among other critical aspects. The next chapter will look on results and analysis.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the findings and discussion of the study that investigated the factors that determine the adoption of environmentally conscious purchasing practices in Zimbabwe's plastics industry. Statistics, both descriptive and regression, are utilized in the process of analyzing and making sense of the information gleaned from the questionnaire survey as well as the interviews. The findings are then contrasted and compared with the previous research as well as the theoretical framework.

4.2 Response Rate

Using the Raosoft calculator, a total sample of 30 was generated. A total of 60 questionnaires were distribute to the study participants. However, 55 were filled in and returned. This translates to a response rate of 91%. This shows that the representatives from the plastic manufacturing firms actively participated or responded to the call to action. This response rate was achieved because the respondents were given enough time and follow ups were done to check the progress. This high response rate has reduced non-response bias. Fan et al. (2021), argues that a response rate of 60-80% to solve the problems associated with response rate. Table 1 below shows the study respondents for every stratum and the total response rate.

Table 1: General responses.

Employee class	*Distributed*	*Returned*	*Response rate*
Executives	*30*	*28*	*93%*
Managers	*30*	*27*	*90%*
TOTAL	*60*	*55*	*91%*

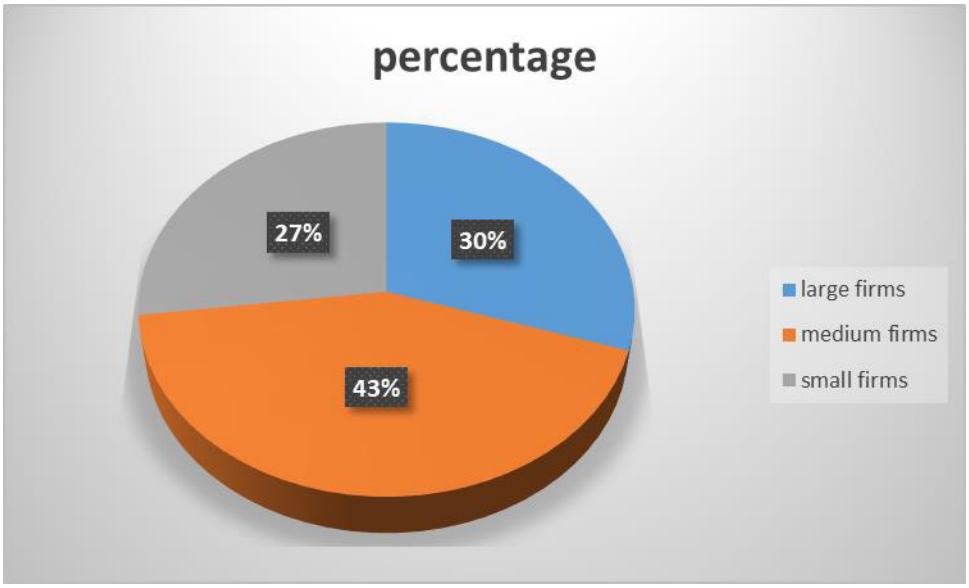
Source: Author's Calculations

The table above shows that 55 out of 60 questionnaires were filled and returned. It can therefore be concluded that the problem of response bias is ruled out as this translates to a 91% response rate. (Fosnacht,2023) argue that higher response rates above 60% are enough to make conclusions in any research.

4.3: Industry Composition

Further, sought to establish the response rate by industry composition. The results are presented on the figure 2 below.

Figure 2*: Response Rate by industry composition*

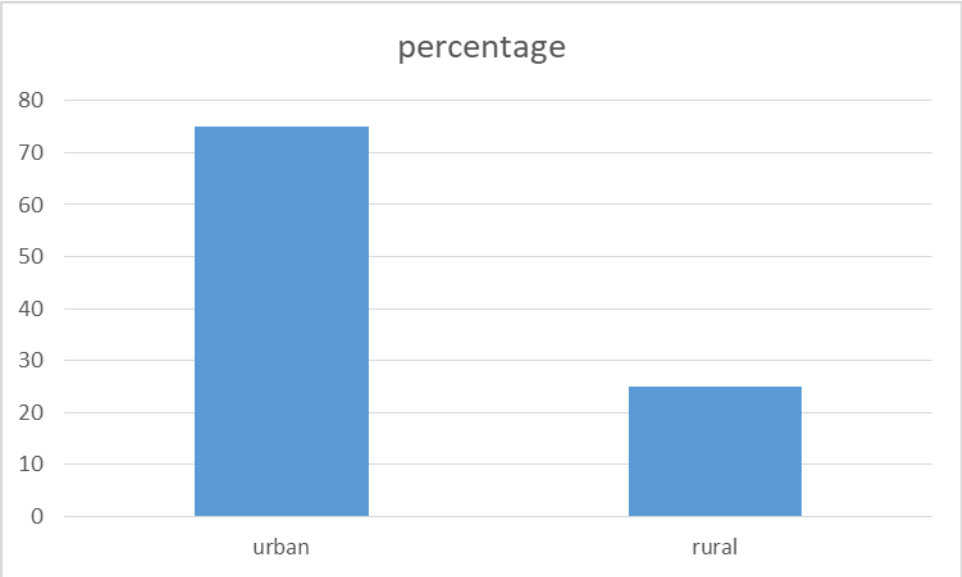


The results above are showing that the majority of the respondents were from medium sized firms with a 43% response rate, followed by large plastic manufacturing firms with a 30% response rate and a response rate of 27% from small firm's males with a response rate. However, the response rate was representative enough. Decomposing response by industry composition when collecting data for study this study is important because it this would show how size of firm affect adoption of green procurement. Large firms are bound to have latest technology than small firms this would give insights on how technology can influence the adoption of green procurement in the plastic industry. Industry composition -disaggregated data and company statistics can help assess the potential or actual impact of green procurement policies and practices on industries. Such data can also inform the design of more equitable, efficient and relevant strategies for enhancing adoption and sustainability. Such data must be collected and analyzed within the policy-making process, ideally covering several years to track changes and take corrective action.

4.4 Geographic distribution

Prior to the findings above, the researcher sought to establish the geographic distribution of the responds. The results are presented in figure.3 below.

Figure 3: Geographic location



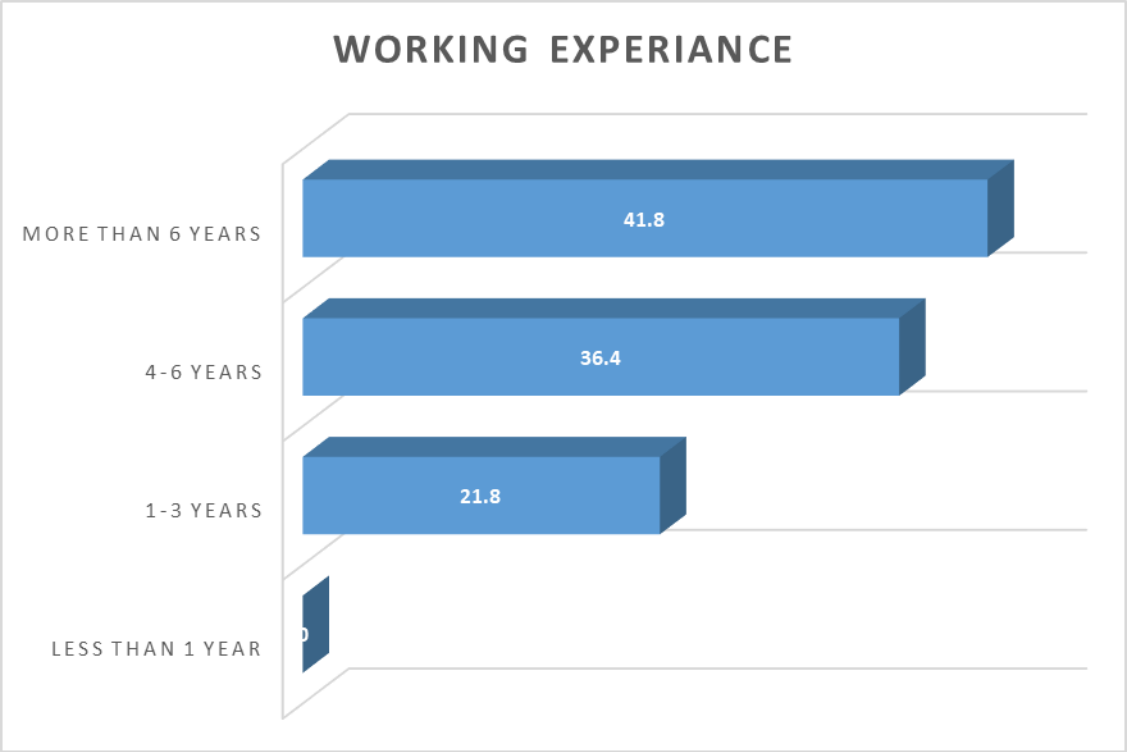
Harare and Bulawayo which are urban areas in Zimbabwe has a lot of plastic manufacturing organizations with a response rate of 75% and a smaller response from rural areas of 25%. This data show that a lot of plastic manufacturing organizations are in urban areas. Decomposing responses by geographic distribution is an important method for collecting data for this study. This is because analyzing the geographic distribution of plastic manufacturing facilities, suppliers, and consumers across Zimbabwe can help identify regional variations in environmental awareness, regulatory frameworks, and market demands for eco-friendly products. By analyzing the responses by geographic distribution, the study can identify the gaps and opportunities for improving green procurement adoption in the plastic industry, which is a major source of environmental pollution. Green procurement is a procedure to increase efficiency and decrease environmental effects for companies that collaborate with customers and suppliers (Tajabadi and Daneshvar, 2023). It involves applying green aspects of purchasing, design, manufacture, distribution, packaging, marketing, and reverse logistics of supply chains to improve their company's performance regarding environmental issues (Rooney, 2020). Green procurement plays an essential role in driving sustainability, and is often the missing link

between stakeholders, suppliers and commercial teams (Srivastava, 2020). Therefore, decomposing responses by geographical distribution can help the study to understand the needs and expectations of different stakeholders and design effective strategies for adoption of green procurement in different areas.

4.5 Working Experience

The results on work experience are presented in figure 4 below.

Figure 4: Working Experience



The results of the figure 4.4 above indicate that the majority of the respondents had more 6 years working experience. They contribute a proportion of 41.8%. This was followed by employees who had four to six years working expiring contributing a proportion of 36%. AT the bottom were those who had one year experience ad their proportion was 21.8%. From these results, it can be deduced that the respondents experienced enough to answer the questionnaire. The reason is that the higher the level of experience, the higher the level of institutional memory. It is also a measure of labor turnover to see if the organizations are able to retain their employees. The researcher therefore proceeded to analyze the regression results.

Analyzing data by working experience is important when collecting in this research. This is because working experience can affect the perception and attitude of the respondents towards the adoption of green procurement practices. Green procurement is the act of integrating environmental sustainability into purchasing decisions and processes. It can help reduce environmental risks, improve resource efficiency, and enhance competitiveness in the plastic industry. However, green procurement also involves challenges such as higher costs, lack of awareness, and resistance to change. Therefore, analyzing data by working experience can help identify the factors that influence the adoption and implementation of green procurement among different levels of in the plastic industry. It can also help evaluate the benefits and challenges of green procurement for supply chain efficiency from different perspectives and experiences. One authoritative source that supports this argument is Eureka (2021), which states that "many green initiatives improve supply chain efficiency and reduce waste, resulting in increased reliability and cost savings".

4.6 Nature of data collected

Before establishing the relationship between adoption of green procurement and the selected independent variables. Descriptive statistics are essential for summarizing and visualizing the data before performing any regression analysis. The results are presented in table 2 below.

Table 2: *model Summary*

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	24.163[a]	.341	.483

The above results show the most important part about the overall goodness of fit of the estimation model and the significance of the link between the variables. The value of Cox & Snell R squared value of .341 which is about 34.15% and notably the Nagelkerkr R squared of .483 which is about 48.3% of the variation in the dependent variable. The adoption of green procurement can be explained by financial benefits (net profit), Corporate Social Responsibility, Size of the firm and Management Expertise. Indicating that the taken variables has an impact on green procurement.

Table 3: Classification Table.

	Observed		Predicted		
			ADOPTIONOFGREENPROCUREMENT		Percentage Correct
			NO	YES	
Step 1	ADOPTIONOFGREEN PROCUREMENT	NO	7	2	77.8
		YES	3	18	85.7
	Overall Percentage				83.3

The above tables explain well how many observations of Green Procurement is correctly assigned the correct group. The model correctly predicts 7 companies who did not adopt green procurement and incorrectly predicts 2 companies who actually adopted green procurement should have not adopted and the percentage of being correct is 77.8% of the companies who did

not adopt green procurement. And incorrectly predicted 3 companies who did not adopted green procurement should have adopted and correctly predicted 18 who adopted green procurement and the model correctly worked out 85.7% of those who adopted green procurement. This gives a total of 83.3% which is reasonable.

Table 4: Logit regression results

Variables		Coeff(B)	S. E	Odd ratio Exp(B)	95% CI UPPER LOWER	P-VALUE
Constant		.611	.00	.074		<0.001
Management expertise	1			4		<0.001
	2	2.462	1.537	9.17	.577 238.445	<0.001
	3	.464	1.392	7.39	.104 24.350	<0.001
CSR	1			.895		<0.001
	2	-1.101	2.096	.599	.005 20.209	<0.001
	3	20.939	12846.468	1	.000	<0.001
	4	.505	1.347	1.4	.118 23.201	<0.001
Firm size	1			.186		<0.001
	2	-2.562	1.396	.067	.005 1.192	<0.001
	3	-1.799	1.614	.265	.007 3.911	<0.001
Financial benefit (net profit)		1.2	.000	12	1.000 1.001	

4.7 Factors that determine the adoption of green procurement in Zimbabwe Plastic Industry

Looking at the results, all the classes have a positive B accept the three which carries a negative B. so to interpret the above we divide by 1 and management 1, 2, 3 are likely to have a causal effect on green procurement as follows 2 and corresponds with so the (4, 9.17, 7.39. since all are positive, management who agree have 9.17 chances to cause the adoption of green procurement.

Moving on to cooperate social responsibility (1/.599) =1.6, 1 and 1.4 in CSR since CSR 2 have a negative it means that there is a negative relationship between cooperate responsibility 2 and green procurement this proves that it has 1.6 chance of diverting from what is expected. And all other have 1, and1.4 chance of having a positive causal effect on green procurement.

In firm size (1/.067) =16.66, (1/.265) =3.8. all the firm size are negative which means that they have a negative effect on green procurement this in tells that if we increase firm size by 1, green procurement reduced by 2,562 have the odds are indicating that they have 16.66 chance of deviating from what is expected as well as 3.8 chance of a negative impact on large firms

Lastly net profit indicates a positive relationship of 12 so net profit stand a chance of having a positive effect with 12 chances in the adoption of green procurement.

A study conducted on factors that affect the adoption of green procurement in Indonesian educational institutions, which used a quantitative method of research to understand the effects of the variables on green procurement, discovered that the dimension of corporate social responsibility (CSR), which has an average value of 3.97, indicates that the CSR dimensions are perceived positively by respondents that influence the implementation of green procurement. In another context, the Commission of the European Communities (2001) defines CSR as "the voluntary integration, by organizations, of social and environmental concerns in their commercial operations and relationships with interested parties." Companies understand how their procurement and supply chain activities impact their reputation and long-term success. In contrast, they often held responsible for promoting and protecting the environment, health, and safety rules of employees who manufacture their goods despite whether they are direct workers or work for their suppliers (Cruz & Wakolbinger, 2008). CSR has received more comprehensive research coverage in the recent past; for instance, Carroll (1991) stated that CSR includes economic, legal, ethical, and humanitarian expectation tied to companies by the society at a certain point in time. Therefore, organizations are obliged to improve their environmental performance to respond to the community's requirements.

Skilled managers can create comprehensive strategies that prioritize environmental sustainability during procurement procedures. They can include green procurement targets into the broader business plan, guaranteeing alignment with organizational goals. Management expertise is critical in driving the adoption of green procurement practices in Zimbabwe's plastic industry. It facilitates strategic planning, resource allocation, risk management, supplier engagement, employee development, measurement, reporting, and continuous improvement.

A 2012 study conducted by (Giunipero, Hooker, and Denslow) discovered that management commitment, knowledge, and skills are critical enablers of sustainable procurement strategies in

firms. The lack of administrative competence has been cited as a significant impediment to green procurement adoption. This Delphi study examined the hurdles and drivers to green procurement adoption. Tate, Ellram, L.M., and Dooley (2008) found that managerial competences such as environmental awareness, strategic planning, and change management are critical in aiding the implementation of green procurement strategies. These investigations are consistent with the conclusions of this study, which found that management expertise is an important element in the adoption of green procurement.

Implementing green procurement strategies such as procuring recycled goods or decreasing waste might result in direct cost savings. For example, adopting recycled plastics or improving packaging can reduce raw material prices, shipping costs, and waste disposal fees. It frequently entails simplifying operations and maximizing resource allocation. This can result in improved operating efficiency, reduced energy use, and cheaper manufacturing costs. For example, investing in energy-efficient equipment or applying lean manufacturing processes can lead to large financial gains. Compliance with environmental rules is critical for enterprises in the plastic industry. Green procurement strategies can assist reduce regulatory risks and potential fines for non-compliance. By adhering to environmental standards and reducing environmental impacts, companies can avoid legal liabilities and reputational damage.

(Bowen,2017) investigated the impact of specific purchasing environmental policies along the supply chain on firm financial performance, as well as the influence of tourists' green procurement purchasing behavior, as measured by long-term orientation, green procurement perceived risk, and cost-green procurement quality inference, on this relationship. Previous research has largely ignored the importance of tourists' green procurement purchasing behaviors as major elements influencing the performance consequences of adopting environmental policies. Our sample focuses on the tourism industry and includes data from 122 enterprises over a seven-year period, resulting in an unbalanced panel of 479 observations. We use random-effects generalized least squares regressions to test the claimed correlations. There is no favorable association between green procurement and financial performance in our analysis. We find that the positive relationship only holds when the moderating effects of tourists' green procurement purchasing behavior are added. By using panel data, this research contributes to the literature on green procurement tourism because it offers an insight on the nature of the

relationship between environmental practices and financial performance over a long period of time. Moreover, it highlights under which conditions tourists enable firms to accrue financial benefits from the adoption of environmental practices.

Various studies have been undertaken in Asian economies, including the UAE. Based on this research, we conclude that organizations looking to increase financial performance must address employee satisfaction, which in turn serves to stimulate improved financial performance, hence enhancing total organizational performance. Dissatisfied employees, on the other hand, are more likely to suffer unfavorable consequences on their mental health and financial performance, resulting in a reduction in financial performance (Brent, 2015).

4.8 The impact of green procurement on supply chain efficiency

Descriptive statistics are essential for summarizing and visualizing the data before performing any regression analysis. They help to identify the distribution, outliers, trends, and relationships among the variables. Descriptive statistics also provide information about the sample size, mean, standard deviation, range, and correlation coefficients of the data as can be seen. These statistics can help to choose the appropriate regression model and to check the assumptions and validity of the results. One author who emphasizes the importance of descriptive statistics before regression is Andy Field (2018), who asserted that one embarks on any kind of analysis they should always describe your data. The results result is presented in table 5 below.

Table 5: Data attributes

	GREEN PROCUREMENT	COSTTOSERVE	CUSTOMER SATISFACTION	FILLRATE
Mean	1.727273	4.272727	4.181818	4.327273
Median	2.000000	5.000000	5.000000	5.000000
Maximum	2.000000	5.000000	5.000000	5.000000
Minimum	1.000000	1.000000	1.000000	1.000000
Std. Dev.	0.449467	1.145919	1.233647	1.139437
Skewness	-1.020621	-1.442385	-1.305597	-1.727771
Kurtosis	2.041667	3.956903	3.477489	5.028019
Jarque-Bera	11.65328	21.16942	16.14785	36.78959
Probability	0.002948	0.000025	0.000312	0.000000
Sum	95.00000	235.0000	230.0000	238.0000
Sum Sq. Dev.	10.90909	70.90909	82.18182	70.10909
Observations	55	55	55	55

The figure above shows that the collected had no outliers. This is because there are no outlier observations as cane be seen in the table. One of the assumptions of linear regression is that the error terms are normally distributed and have constant variance. Outlier observations are those that deviate significantly from the general pattern of the data, and they can have a large influence

on the estimated regression coefficients and the goodness-of-fit of the model. Therefore, it is important to avoid or remove outliers from the data before performing regression analysis, as they can distort the results and lead to erroneous conclusions. According to (Cook,1977), an outlier is an observation whose response does not follow the model assumed for the rest of the data.

4.9 Regression Results

To establish the relationship of the study variables, the study utilized OLS regression. The results are presented in table 6 below. For robustness of results, the analysis of the results was done using E-views.

Table 6*: Regression Results*

Dependent Variable: GP				
Method: Least Squares				
Date: 06/10/24 Time: 10:08				
Sample: 1 55				
Included observations: 55				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.428040	0.114615	3.734603	0.0005
COSTTOSERVE	0.085805	0.120984	2.709225	0.4814
CUSTOMERSATISFACTION	0.393318	0.101878	3.860691	0.0003
FILLRATE	-0.164578	0.098161	-2.676621	0.0997
R-squared	0.807502	Mean dependent var		1.727273
Adjusted R-squared	0.796179	S.D. dependent var		0.449467
S.E. of regression	0.202919	Akaike info criterion		-0.282075
Sum squared resid	2.099978	Schwarz criterion		-0.136087
Log likelihood	11.75705	Hannan-Quinn criter.		-0.225620
F-statistic	71.31261	Durbin-Watson stat		2.157087
Prob(F-statistic)	0.000000			

R2	0.807502
Adj R2	0.796179
DW	2.157087
F Stat=	71.31261
Prob F Stat	0.000000

A higher R2 of 0.807502 implies that about 80.75% the relationship between green procurement and supply chain efficiency in Zimbabwe's plastic industry is explained by the selected supply chain efficiency indicators (explanatory variables) while the remaining 19.25% is explained by other indicators that are embedded in the error term. The adjusted R2 shows that about 79, 61% of the relationship between green procurement and supply chain efficiency in Zimbabwe's plastic industry explained by the model and the other indicators justifies the remaining 20.39%. The high adjusted R2 value indicates the high explanatory supremacy of the model. The likelihood of spurious regression is further ruled out since the Durbin Watson statistic is greater than the R2 and that its value is closer to 2 than 0 and 4. Its value is 2.151415 ruling out the probability of autocorrelation and model misspecification. Also, another cardinal rule in OLS regression is that the F-statistic must be greater than five and this rule therefore is satisfied since F-statistic is 71.31261 well above the minimum threshold value. All the selected indicators were significant in explaining the subject matter. However, their coefficient sighs were different with customer satisfaction and cost to serve all carrying positive signs. The other variable fill rate had negative coefficients. Below is the discussion of the above regression results.

The results in table 6 above established a positive relationship between green procurement and cost to serve. This is shown by a positive coefficient of 0.085805, a t statistic value of 2. 709225which is above 2 and a probability value of 0.4814. These statistics denote that the variable is significant in explaining the specified model. Here a unit investment in green procurement would lead to a 9% increase in cost to serve.

Cost-to-serve includes all the expenses associated with fulfilling a customer's order, such as transportation, warehousing, packaging, inventory, labor, and customer service. It can vary significantly depending on the type, size, location, and frequency of the order, as well as the

customer's expectations and requirements. Reducing cost-to-serve can improve profitability, customer satisfaction, and competitiveness. One way to reduce cost-to-serve is to adopt green procurement practices. By choosing suppliers that have lower environmental impacts, businesses can achieve several benefits that can lower their costs and increase their efficiency.

One of the possible explanations by the World Economic Forum (2020) is that green procurement reduces transportation costs. The source asserts that by sourcing locally or regionally, businesses can reduce the distance and time required to transport goods, which can lower fuel consumption, emissions, and logistics costs. It further submits that green procurement reduces packaging costs by choosing products that have less or reusable packaging, which businesses can reduce the amount of waste they generate and dispose of, which can lower disposal fees and environmental taxes. More importantly the same source ascribes this phenomenon to the depressing impact of green procurement on inventory costs. By choosing products that have longer shelf life or lower obsolescence risk, businesses can reduce the amount of inventory they need to hold and manage, which can lower storage costs and inventory losses.

Green procurement can also reduce labor costs (Zhu, 2017). By choosing products that are easier to handle, store, and use, businesses can reduce the amount of labor they need to perform these tasks, which can lower labor costs and improve productivity. Also, it can be explained by reduced customer service costs. By choosing products that have higher quality, reliability, and performance, businesses can reduce the amount of customer complaints, returns, and warranty claims they need to deal with, which can lower customer service costs and improve customer loyalty.

The results in table 6 above established a positive relationship between green procurement and customer satisfaction. This is shown by a positive coefficient of 0.0393318, a t statistic value of 3.860691 which is above 2 and a probability value of 0.0056. These statistics denote that the variable is significant in explaining the specified model. A percentage change in green procurement investment would increase customer satisfaction by almost 39, 3%.

One of the possible explanations for a positive relationship between green procurement and customer satisfaction is that green procurement can enhance the reputation and image of the organization. Customers may perceive the organization as more socially responsible, ethical, and trustworthy, and thus have a higher level of satisfaction and loyalty. Customers may also

appreciate the environmental benefits of green procurement, such as reduced waste, emissions, and resource consumption, and feel good about supporting a greener business.

Another possible explanation by Mwangi (2020) for a positive relationship between green procurement and customer satisfaction is that green procurement can improve the quality and performance of the products and services. Green products and services may have higher standards of durability, reliability, safety, and functionality than their conventional counterparts. They may also offer additional features or benefits that appeal to customers, such as health benefits, cost savings, or aesthetic appeal. Customers may be more satisfied with green products and services that meet or exceed their expectations and needs.

The results in table 6 above established a negative relationship between green procurement and fill rate in Zimbabwe's plastic industry. This is shown by a negative coefficient of -0.0164578, a t statistic value of -2.676621 which is above 2 and a probability value of 0.0997. These statistics denote that the variable is significant in explaining the specified model. Here an improvement in green procurement will result in a reduction in fill rate by 2%.

Green procurement can have many benefits for businesses, such as cost savings, improved reputation, and compliance with environmental regulations. However, green procurement can also have some drawbacks, especially in terms of fill rate. Fill rate refers to the percentage of customer orders that a business successfully fulfills from available inventory. It measures how well a company meets customer demand promptly. The time it takes to complete a process or a task, from start to finish. In the plastic industry, fill rate can affect the lead time, and profitability of the operations.

4.10 Conclusion

The chapter has presented the results, the next chapter will proffer the study summary and policy recommendations

CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The major objective of this study was to determine the factors that affect the adoption of green procurement in Zimbabwe Plastic Industry. Prior to the research findings, the study will the proffer on the conclusion and study summary.

5.2 Summary of findings

The major objective of this study was to determine the factors that affect the adoption of green procurement in Zimbabwe. This was a case study of Zimbabwe Plastic Industry. To determine the factors that affect adoption, the study employed a quantitative research method. Logit regression model to determine the factors that affect adoption of green procurement and effect on financial performance. To assess the relationship between green procurement and supply chain performance the study employed linear regression.

Management expertise, size of the firm, CSR and financial benefits are the factors that were used as determinates of adoption. For the sake of these study supply chain efficiency was measured using fill rate, cost to serve and customer satisfaction. Questioners were used to collect data about size of the firm and net profit. This data was then used to run regression analysis.

The study summarizes that green procurement adoption can be determined by many factors such as management expertise, financial benefit and corporate social responsibility in Zimbabwe's plastic industry. However, the study found a negative relationship between size of the firm and adoption of green procurement. Three of the selected green procurement determinants were significant in explaining specifies of the regression model.

5.3 Conclusions

This study explored the factors that determine the adoption of green procurement in Zimbabwe's plastic industry. The study used questionnaires and interviews to collect data from plastic firms in Zimbabwe. The data was analyzed using descriptive statistics and regression analysis. The study found the following results:

The study established a positive relationship between adoption of green procurement and the variable management expertise. This means that the more the firms have managers with strategic vision and committed it becomes easy to adopt green procurement with their strategic planning.

Further there was a negative relationship between adoption of green procurement and firm size. This means that the larger the firm, the more time it takes in decision making and they might consider the initial cost as prohibitive. Whilst smaller firms have no adequate resources to enhance adoption of green procurement.

Additionally, the study found a positive relationship between adoption of green procurement and CSR. This means that the more the firms are social considerate, the more they adopt green procurement. Mores, there was a positive impact on financial performance and adoption of green procurement. This means that the more the firms adopted green procurement, the higher their financial performance was. The study also measures the effect of green procurement adoption and supply chain efficiency. Supply chain efficiency was measured using Fill rate, cost to serve and customer satisfaction. The results were as follows positive relation between cost to serve, and customer satisfaction and a negative relationship with fill rate. This can then be said that there is both positive and negative impacts on supply chain efficiency.

5.4 Recommendations

There was a positive relationship between adoption of green procurement and its determinants variables, which are management expertise, financial benefits and CSR and. However, a negative relationship between green procurement adoption and firm size. Having found out that these are the most important determinants the study recommendations are as follows.

The study recommends that plastic manufacturing organization should embed green procurement considerations into the company's budgeting and financial forecasting processes. this ensures that sustainability initiatives are planned and funded as part of the organizations overall financial strategy. The management provide a good working environment for employees so as to enhance their efficiency and performance. The management should show a high level of commitment to employee objectives, while the employees will also show a high level of commitment to the organization. The management should provide rewards and recognitions for the best performing

employees to motivate them because this would intern increase their financial performance measured using net profit.

The study recommends that plastic manufacturing organizations should enhance the green procurement capabilities of managers by providing specialized training in sustainable practices, environmental regulations and green procurement strategies. Create and implement well-defined green procurement policies. Ensure that these polices are aligned with the organizations sustainability goals and are communicated effectively to all employees.

Use qualitative research methods such as interviews and focus groups to acquire a better understanding of the organizational dynamics, culture, and decision-making processes that influence green procurement adoption in companies of various sizes. Compare the efficiency of green procurement programs among enterprises of varying sizes. This could include evaluating environmental performance metrics, cost savings, supplier relationships, and stakeholder views to better understand how firm size affects sustainability initiatives.

There was a positive relationship between green procurement and cost to serve. This means that the more the firms adopted green procurement, the lower their cost to serve was. Cost to serve is the total cost of delivering a product or service to a customer, including production, transportation, warehousing, distribution and customer service costs.

Plastic firms in Zimbabwe should consider implement a strategic sourcing approach that evaluates suppliers not only on price, quality, and delivery, but also on environmental performance, such as carbon footprint, waste management, and resource efficiency. This can help identify the best value for money suppliers that can meet both the economic and environmental objectives of the plastic manufacturers.

Plastic firms in Zimbabwe should collaborate with green suppliers to improve their capabilities and performance, such as providing technical assistance, sharing best practices, and co-investing in green technologies. This can help reduce the risks and uncertainties associated with green procurement, as well as create long-term partnerships that can lower the costs and increase the benefits of green sourcing.

Plastic firms in Zimbabwe should adopt a circular economy model that minimizes waste and maximizes resource utilization in the plastic industry. This can involve designing products that

are durable, reusable, and recyclable; using recycled or biodegradable materials; reducing packaging and transportation; and recovering and reusing waste materials. This can help reduce the environmental impact and the cost to serve of plastic products, as well as create new revenue streams and competitive advantages for the plastic manufacturers.

There was a positive relationship between green procurement and customer satisfaction. This means that the more the firms adopted green procurement, the higher their customer satisfaction was. Customer satisfaction is the degree to which customers are satisfied with a product or service, based on their expectations and experiences. Here are some recommendations based on the findings.

Plastic firms should negotiate with suppliers: Plastic manufacturers can leverage their bargaining power and long-term relationships with suppliers to negotiate lower prices and better terms for eco-friendly materials. They can also collaborate with suppliers to share best practices, reduce waste, and improve efficiency.

Plastic firms should consider optimizing logistics: Plastic manufacturers can optimize their logistics processes to reduce the environmental impact and cost of transportation and storage. They can use modes of transport that have lower emissions, such as rail or sea, instead of road or air. They can also consolidate shipments, use reusable containers, and locate warehouses closer to customers.

There was a negative relationship between green procurement and fill rate. This means that the more the firms adopted green procurement, the lower their fill rate was. Fill rate is the percentage of customer orders that are fulfilled without any stock-outs or backorders. The study recommends the following.

Use recycled or biodegradable plastics. By using recycled or biodegradable plastics, businesses can reduce their dependence on virgin materials, which are often scarce, expensive, and subject to price fluctuations. This can help them avoid supply chain disruptions and maintain a consistent fill rate. Moreover, recycled or biodegradable plastics can lower the environmental impact of plastic production and disposal, which can enhance the business's image and attract more customers.

Implement lean manufacturing principles. Lean manufacturing is a set of practices that aim to eliminate waste, optimize processes, and increase quality and efficiency. By applying lean principles to plastic production, businesses can reduce their inventory levels, minimize defects and rework, and shorten lead times. This can improve their fill rate by ensuring that they have the right amount of inventory to meet customer demand, without overstocking or understocking.

Collaborate with green suppliers and customers. Green procurement is not only about what businesses buy, but also who they buy from and sell to. By collaborating with green suppliers and customers, businesses can create a more sustainable and resilient supply chain. For example, they can source from suppliers who have environmental certifications, use renewable energy, or offer take-back programs. They can also sell to customers who have green preferences, offer incentives for eco-friendly packaging or delivery options, or provide feedback on how to improve their products or services. This can increase their fill rate by strengthening their relationships with their partners, reducing risks and uncertainties, and creating more value for all stakeholders. Such stakeholders would entail Procurement Regulatory Authority of Zimbabwe and Environmental Management Agency among others.

5.4 Implications for future study/research

This research concentrated on the factors that determine the adoption of green procurement in the plastic industry in Zimbabwe. The selected indicators (explanatory variables) were management expertise, financial benefit, CSR and size of the firm.

Future researchers can concentrate on their industries other than the plastic and that they can add other indicators like rules and regulations and awareness

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APPENDICES

Appendix 1

Dear Sir/Madam,

I am a student at Bindura University of Science Education, pursuing a Bachelor's Degree in Purchasing and Supply Chain. I am conducting research on the topic titled AN ASSESSMENT OF THE FACTORS THAT DETERMINE THE ADOPTION OF GREEN PROCUREMENT IN ZIMBABWE'S PLASTIC INDUSTRY. The aim of this research is to examine how management expertise, CSR, Size of the firm and financial benefit affect the adoption of green procurement practices, also how does green procurement affect supply chain efficiency.

As part of this research, I have designed a questionnaire that seeks to collect data from the managers and executives of plastic companies in Zimbabwe. The questionnaire consists of both closed and open-ended questions that cover various aspects of green procurement strategies and their impact on supply chain efficiency.

I kindly request your permission and cooperation to administer this questionnaire to the relevant staff members in your organization. The questionnaire will take approximately 10 minutes to complete and the responses will be treated with utmost confidentiality and anonymity. The data collected will be used solely for academic purposes and will not be disclosed to any third party without your consent.

I appreciate your time and support for this research. If you have any questions or concerns, please do not hesitate to contact me at the email address or phone number provided below.

Thank you very much.

Yours sincerely

QUESTIONNAIRE

GENERAL INFORMATION

SECTION A

1. Which company do you work for?

……

2. What size is your organization?

a) Large

b) Medium

C) Small

3 How long have you been working for this manufacturing firm.

a) Less than 1 year

b) 1-3 years

c) 4-6 years

d) More than 6 years

4. Which part of Zimbabwe is your plastic manufacturing company located?

Area	Response
Urban	
Rural	

SECTION B

5. Did you adopt green procurement?

YES	
NO	

6. What is your financial performance?

Net Profit	$

7. To what extent is your organization aware of green procurement practices and its potential benefits?

a) Very familiar

b) Somewhat familiar

c) Not very familiar

d) Not familiar at all

8. Do you agree that the adoption of green procurement is determined by the following factors?

	Strongly Agree	*Agree*	*Neutral*	*Disagree*	*Strongly Disagree*
Management Expertise					
Financial Benefits					
Corporate Social Responsibility					
Size of Firm					

9. Do you agree that adoption of green procurement has an effect on the following supply chain efficiency measures?

	Strongly Agree	*Agree*	*Neutral*	*Disagree*	*Strongly Disagree*
Cost to serve					
Customer satisfaction					
Fill rate					

10. What are the main benefits of green procurement for your company? (Select all that apply)

_____

_____

11. What are the main challenges or barriers of green procurement for your company? (Select all that apply)

_____

_____

12. How do you overcome or address these challenges or barriers? (Please explain)

_____

_____

_____

_____

_____

_____

_____

_____

13. Do you have any suggestions or recommendations on how to improve green procurement and supply chain efficiency in your company? (Please explain)