The Impact of Sustainable Procurement on the Performance of Supply Chain Management

By

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A Dissertation report submitted to the Department of BRAC Institute of Governance and Development in partial fulfilment of the requirements for the degree of Masters in Procurement and Supply Management.

BRAC Institute of Governance and Development
BRAC University
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Declaration

It is hereby declared that

The thesis submitted is my own original work while completing degree at BRAC University.

The dissertation does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.

The dissertation does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.

I have acknowledged all main sources of help.

I would like to request the embargo of my dissertation for 06 months from the submission date due to some personal reasons.

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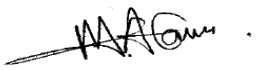

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Approval

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Ethics Statement

The dissertation titled "**The Impact of Sustainable Procurement on the Performance of Supply Chain Management"** was carried out according to the ethical code and academic standards of BRAC University**.**

In the research methodology, this study has adopted a Quantitative approach with cross-sectional interview as a way of collecting the insights of the procurement professionals and supply chain managers in different sectors such as NGOs, manufacturing, and services. The purpose, scope, and voluntary nature of the study were fully explained to all the participants of the survey. All interviewees were given informed consent before they participated. The participants were guaranteed the confidentiality and anonymity of their answers, as well as the fact that they would not be subjected to any adverse repercussions in case they decided to withdraw out of the study at any point. No personally identifiable data has been revealed or been used in a manner that would jeopardize the privacy of the participants.

The data of the survey was gathered among the organizations that have implemented sustainable procurement practices and all the participants were assured that the data would be used in academic purposes only. Special focus was given to ethical concerns during the data collection procedure, and no participant or institution in the study was hurt, either psychologically, professionally or socially.

This study has been performed under independent research and authorship of the undersigned researcher and it has been characterized by high level of honesty, objectivity and academic integrity in the research process.

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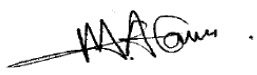

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Abstract / Executive Summary

This dissertation will discuss how sustainable procurement affects the performance of the supply chain management in Bangladesh in relation to organizations that have adopted sustainability initiatives in their procurement processes. Sustainable procurement is the process of integrating environmental, social and economic concerns in the process of making purchasing decisions in order to increase the efficiency of operations, minimize risks and create long-term sustainability within the supply chain. The research design of the current study is quantitative, with the use of a cross-sectional survey to collect the data on procurement professionals and supply chain managers working in various industries, including non-governmental organizations (NGOs), manufacturing, and services. The survey is looking into the impact of sustainable use of procurement practice on various areas of performance of the supply chain such as cost efficiency, risk reduction, and the competitiveness of the business.

The findings provided show that sustainable procurement and, more precisely, the cost management initiatives and business efficiency have a positive correlation with the supply chain performance. Specifically, the business organization, which takes the sustainability aspect into consideration in the procurement process, suggests that the organizations are more efficient in operations and have minimized the expenses. The study however also shows that there are other significant challenges such as the absence of suppliers that may satisfy the sustainability needs and heightened lively cooperation between the buyers and suppliers. These are the challenges to the ideal potential of sustainable procurement practices.

The study, based on the findings, provides possible solutions on how sustainable procurement practices can be improved that involve the establishment of more efficient relationships with the suppliers, the improvement of the capacity building process, and the implementation of sustainability measures into the performance appraisal systems. Through the issues discussed, organizations are able to use sustainable procurement to enhance the overall performance of the supply chain and gain competitive advantage in the market.

Keywords:
Sustainable Procurement, Supply Chain Performance, Bangladesh, Triple Bottom Line, Cost Management, Supplier Collaboration, Environmental Sustainability, Social Responsibility, Economic Sustainability.

Acknowledgement

First and foremost, I express my deepest gratitude to Almighty Allah for granting me the strength, patience, and determination to complete this thesis.

I would like to express my deepest gratitude to my supervisor**, Mr. Hasan Maksud Chowdhury,** Ph.D., Associate Professor, BRAC Business School, BRAC University, for his unwavering guidance and invaluable support throughout the course of this research. I am also thankful to the faculty members and administrative staff of BIGD, BRAC University for providing academic support and a conducive environment for research I am also grateful to my respondents, the procurement managers and supply chain professionals, who generously shared their insights, making this study possible.

I am very much grateful to my working supervisor Professor **Dr. Malay Kanti Mridha**, Deputy Dean and Director of the Center for Non-communicable Diseases and Nutrition, BRAC James P Grant School of Public Health, BRAC University as well as my brilliant colleagues who have been a constant source of my encouragement and support throughout this journey. I would also like to express my sincere gratitude to my office for their financial support, which has been invaluable in enabling me to complete this entire course of **Masters in Procurement and Supply Management (MPSM).**

Lastly, I would like to give a special thanks to my family and friends who have always encouraged and been very tolerant with me on this path.

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List of Acronyms

TBL: Triple Bottom Line

CSR: Corporate Social Responsibility

SP: Sustainable Procurement

IPO: Input-Process-Output

RBV: Resource-Based View

Glossary

Sustainable Procurement (SP): Procurement practices that integrate environmental, social, and economic sustainability into purchasing decisions.

- **Triple Bottom Line (TBL):** A framework that evaluates an organization's commitment to sustainability across three dimensions: people, planet, and profit.
- **Supply Chain Performance:** The overall effectiveness of a supply chain, measured by operational efficiency, cost performance, risk mitigation, and innovation capacity.

The Impact of Sustainable Procurement on the Performance of Supply Chain Management

Chapter 1: Introduction

1.1 Background of the Study

Procurement is a crucial factor in the competitiveness, efficiency and sustainability of organizational operations. With the increase and diversification of global supply chains, the conventional cost-based procurement mechanisms are now being reconsidered in the view of the sustainability requirements. Sustainable procurement (SP) can be defined as the consideration of environmental, social, and economic aspects in the procurement process that are made throughout the whole supply chain (Walker and Brammer, 2012). The modern fast shifting economic and regulatory landscape is putting a growing pressure on organizations to engage in responsible sourcing that extends beyond the short-term financial results of an organization, and is exerted by governments, investors, consumers, and civil society.

Similar to most developing economies, Bangladesh is changing its culture of procurement which is cost-driven to value creation, professional standards, and environmental responsibility. The BRAC and big manufacturing corporations and government agencies have started putting sustainability objectives in their procurement practices, but with an uneven implementation. The lack of supplier compliance, low awareness, high initial expenses, and poor monitoring tools have remained some of the challenges (Huq, Stevenson, and Zorzini, 2014). Therefore, it is of academic importance and practical need to comprehend the influence of sustainable procurement on the performance of the supply chain in the Bangladeshi context.

1.2 Problem Statement

Though sustainable procurement is being advanced as a best practice, there is limited empirical evidence on its direct effect on the performance of supply chain particularly in developing nations. Sustainability goals and operational effectiveness in organizations are usually traded off. As one such example, the introduction of environmental friendliness or ethical sourcing practices can raise the cost of procurement or make supplier coordination more difficult (Appolloni et al., 2014). In addition, suppliers in developing economies often have the technological or financial capability to meet sustainability standards leading to inconsistent application.

Most organizations in Bangladesh, especially in the development, health, and manufacturing industries are still at an infantile stage of infusing sustainability into procurement strategies. However, the existing research lacks studies on the impact of such initiatives on the efficiency of the supply chain, cost performance, reduce risks, and buyer-supplier relationships. This is the point of gap, and it signifies that there is a need to conduct systematic research in order to establish whether. sustainable procurement enhances or deteriorates the performance of a supply chain.

1.3 Research Objectives

1. To evaluate the challenges suppliers and buyers face in sustainable supply chain management.
2. To explore the influence of sustainable procurement on business efficiency.
3. To analyze the impact of sustainable procurement on supply chain performance.

1.4 Research Questions

1. What are the key challenges in implementing sustainable procurement within supply chain management?
2. How does sustainable procurement affect business efficiency and cost performance in supply chains?
3. To what extent do sustainable procurement practices impact overall supply chain performance, including efficiency, cost, risk, and resilience?
4. How can organizations strengthen supply chain performance and competitiveness through effective sustainable procurement strategies?

1.5 Significance of the Study

The present study is a contribution to the body of knowledge and management practice. Hypothetically, it will complement the limited empirical evidence to formulate sustainable procurement as a driver of performance within the supply chain in developing countries. It also places the Triple Bottom Line (TBL) framework, which is people, planet and profit, into a procurement perspective, which enables one to form a basis of a further comparative analysis.

Practically, the research will offer practical information to the procurement practitioners and policy makers on how the sustainability initiatives can be aligned with the operational and strategic goals. When it comes to such organizations as BRAC or other NGOs, it is possible to design supplier development program, procurement policies and sustainability reporting mechanisms based on the results.

1.6 Scope of the Study

The study is concerned with organizations in Bangladesh that have implemented sustainability programs in their procurement and supply chain practices, such as development organizations, government agencies, and a few of their own private business enterprises. The scope includes buyers and suppliers in the procurement activities to have a complete picture of the value chain. The paper will look at sustainable procurement in terms of environmental, social and economic aspects, which is in line with the TBL model. Nevertheless, it will not spread to larger corporate sustainability initiatives outside the procurement department.

1.7 Limitations of the Study

The research could be subject to a number of limitations. To begin with, confidentiality and organizational policy can limit access to the correct data on procurement performance and supplier compliance. Second, survey and interview data sample size can be a constraint to the

generalizability. Third, the measurement frameworks of sustainability differ among industries and this may make comparison difficult. Lastly, the limited resources and time could limit the level of primary data gathering. In spite of these shortcomings, both quantitative and qualitative triangulation will increase validity

1.8 Conceptual Foundation

The theoretical basis of this research is based on the combination of Triple Bottom Line (TBL) and Input Process Output (IPO) model. The concept of TBL framework views sustainability as a equilibrium of economic sustainability, environmental sustainability, and social responsibility (Elkington, 1997). The IPO model in this study has been tailored to explain sustainable procurement practices as an input that is incorporated in procurement strategies by processes, i.e., sustainability-driven innovation, transparency, and accountability, which produce outputs, i.e., better supply chain performance outcomes. This theoretical congruence creates an explicit avenue of testing the hypothesized relationships empirically.

1.9 Organization of the Dissertation

The dissertation is organized into five chapters:

- **Chapter 1** introduces the background, problem statement, objectives, hypotheses, and significance of the study.
- **Chapter 2** provides a comprehensive review of existing literature on sustainable procurement and its relationship with supply chain performance.
- **Chapter 3** outlines the research methodology, including the design, sampling strategy, data collection tools, and analytical techniques.
- **Chapter 4** presents and interprets the findings of the empirical analysis.
- **Chapter 5** summarizes key conclusions and provides recommendations for practitioners and future researchers.

1.10 Conclusion

This chapter has provided the background and the rationale behind the investigation on the effects of sustainable procurement to performance of supply chain in Bangladesh. It defined the research problem, objectives, hypotheses and scope and described the theoretical foundation of the study. Through the TBL and IPO models, the study aims to reveal the potential of the sustainability consideration incorporated into the procurement functions to bolster organizational performance and resilience. The chapter that follows will conduct a review of the literature that is relevant to further contextualize and justify the research framework.

Chapter 2: Literature Review

The Impact of Sustainable Procurement on Supply Chain Performance

2.1 Introduction

Sustainable procurement has become a strategic tool in the supply chain management focusing on the incorporation of the environmental, social, and economic factors with the inclusion of cost-efficiency (UNEP, 2013; Walker and Brammer, 2009). Organizations are becoming more aware of the fact that procurement decisions have a long-term value creation impact, ethical sourcing, environmental protection, and social responsibility (Elkington, 1997; Wells et al., 2020).

This chapter is a review of the available literature on sustainable procurement with emphasis on three major areas in line with the study objectives:

1. Challenges faced by buyers and suppliers in meeting sustainable procurement criteria.
2. The influence of sustainable procurement on buyer-supplier collaboration and business relationships.
3. The impact of sustainable procurement on supply chain performance.

Furthermore, this chapter establishes the gaps in research and the rationale behind the current research, especially in the emerging market settings. The review is framed with the help of the **Input-Process-Output (IPO**) model, connecting the knowledge about literature with the conceptual framework of the study.

2.2 Theoretical Foundations of Sustainable Procurement

Several theoretical frameworks support the understanding of sustainable procurement:

- **Triple Bottom Line (TBL)** (Elkington, 1997): Advocates for balancing economic, environmental, and social performance in organizational decision-making.
- **Resource-Based View (RBV) (Barney, 1991)**: Suggests that sustainability capabilities can serve as strategic resources that are valuable, rare, and hard to imitate, providing competitive advantage.
- **Stakeholder Theory (Freeman, 1984):** Highlights the need to consider all stakeholders, including suppliers, customers, regulators, and society, in procurement decisions.
- **Institutional Theory (DiMaggio & Powell, 1983):** Explains the adoption of sustainable practices as a response to regulatory, societal, and market pressures.
- **Circular Economy Principles:** Promote product and process redesign to extend lifecycle value, minimize waste, and enhance reuse and recycling.

These frameworks collectively provide a solid theoretical basis for evaluating the processes, challenges, and outcomes of sustainable procurement practices.

2.3 Challenges in Meeting Sustainable Procurement Criteria (Input)

Implementation of sustainable procurement faces multiple challenges across buyers, suppliers, and broader supply chain systems:

Buyer-Side Challenges:

- Balancing sustainability goals with cost and operational efficiency.
- Lack of standardized sustainability metrics or benchmarks (Ageron, Gunasekaran, & Spalanzani, 2012).
- Organizational resistance and insufficient internal support (Testa & Iraldo, 2010).

Supplier-Side Challenges:

- Limited sustainability knowledge and technical expertise.
- Resource constraints, particularly in developing countries (Giunipero, Hooker, & Denslow, 2012).
- Difficulty adhering to multiple and evolving sustainability standards.

System-Wide Challenges:

- Low supply chain transparency, making monitoring and enforcement difficult.
- Complex and uncertain regulatory environments (Preuss, 2009).
- Limited external incentives for sustainability adoption.
- Challenges in quantifying long-term sustainability benefits relative to immediate costs.

These challenges underscore the importance of capacity-building, favorable policies, training, and standard frameworks to enable sustainable procurement adoption.

2.4 Effect on Buyer-Supplier Collaboration and Business Relation (Process)

The sustainable procurement practices create a stronger relationship between the suppliers and the buyers and transform the relationships between the suppliers and the buyer towards the long-term, strategic and long-term relationships:

- Sustainability, according to Carter and Rogers (2008), will lead to value co-creation, co-innovation and co-risk man
- The engagement in the social sustainability improves trust, communication, and reputation as Tate, Ellram and Kirchoff (2010) observe.
- The formation of the collaborative relationships is influenced by institutional and stakeholder pressures such as regulatory compliance and demands of the society (Freeman, 1984; DiMaggio and Powell, 1983).

Through improved collaboration, organizations can base their strategic goals, exchange information and develop sustainable products and processes together making procurement a strategic business activity.

2.5 Impact on Supply Chain Performance (Output)

Sustainable procurement positively influences various dimensions of supply chain performance:

- **Operational Efficiency:** Reduces waste, optimizes resource utilization, and ensures compliance (Zhu & Sarkis, 2004).
- **Environmental and Social Performance:** Promotes fair labor practices, reduces emissions, and ensures ethical sourcing (Seuring & Müller, 2008).
- **Risk Management and Cost Control**: Mitigates disruptions, reputational risks, and enables long-term savings (Sarkis, Zhu, & Lai, 2011).
- **Innovation and Competitive Advantage:** Supports differentiation and resilient supply chains (Pagell & Wu, 2009; Barney, 1991).

The Triple Bottom Line framework (Elkington, 1997) underpins these outcomes, emphasizing the integration of economic, environmental, and social goals in procurement strategies.

2.6 Research Gap

Although a lot has been studied on sustainable procurement, there are still a number of gaps:

1. Buyer-Supplier Collaboration: There is no research study which looks at the collaborations of collaboration. relationships are built and carry out in the sustainability programs.

2. Empirical Validation Gap: The empirical support on the direct effects of is missing. sustainable procurement on the performance of the supply chain within the context of developing. countries, one of them being Bangladesh**3. Contextual Implementation Gap:** Not many studies have focused on understanding how sustainable procurement practices as one of the input variables can be converted to output performance (output) in terms of efficiency, cost and risk reduction.

4. Context-Specific Decision Frameworks: The current frameworks do not provide actionable information to procurement managers especially when the circumstances are constrained by resources or are in the developing country.

Summary: The proposed research attempts to fill these gaps by discussing such issues as challenges, collaboration strategies, and performance results of sustainable procurement in emerging markets and offers both theoretical and practical guidance.

2.7 Sustainable Supply Chain Framework (IPO-Based)

This research paper takes the conceptual model of an Input-Process-Output (IPO) to show how sustainable procurement practices relate to the outcome of supply chain performance. The model shows that sustainability-based innovation, transparency and accountability are the mediating variables between the procurement inputs and the performance outputs. This framework is in line with the Triple Bottom Line (TBL) strategy where the environmental, social, and economic aspects are incorporated in the procurement operations to increase

organizational and societal value

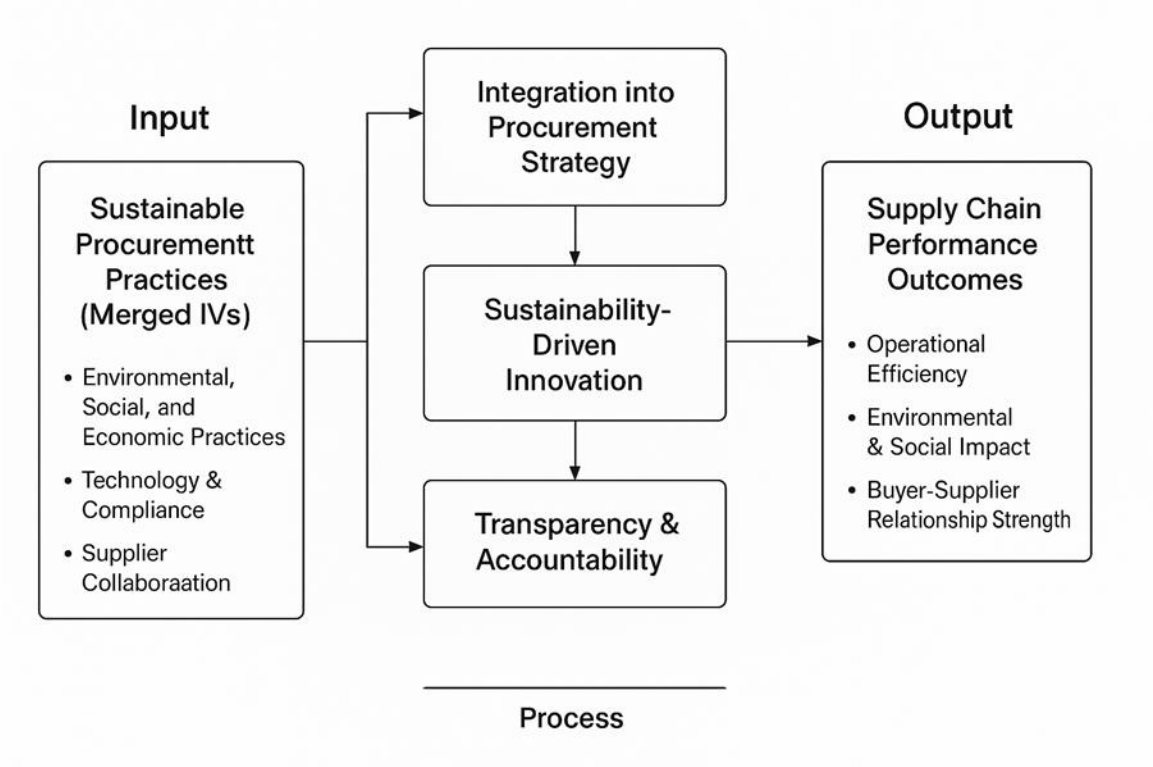

Figure 1 Conceptual Framework of Sustainable Procurement and Supply Chain Performance

As Figure 1 shows, the input section includes the sustainable procurement practices that are based on environmental, social, and economic considerations and facilitated by the adoption of technology, adherence to regulations, and collaboration with suppliers. The interaction of these inputs is achieved through procurement strategies that promote innovation based on sustainability. The process dimension: which includes integration, innovation, and transparency aspect makes the sustainable procurement efforts accountable and eases the process of translating the sustainable procurement efforts into the quantifiable performance outcomes. Output dimension represents the outcome of the performance of supply chains regarding the efficiency of its operations, environmental and social impact and enhanced buyer-supplier relations.

2.9 Conceptual Framework

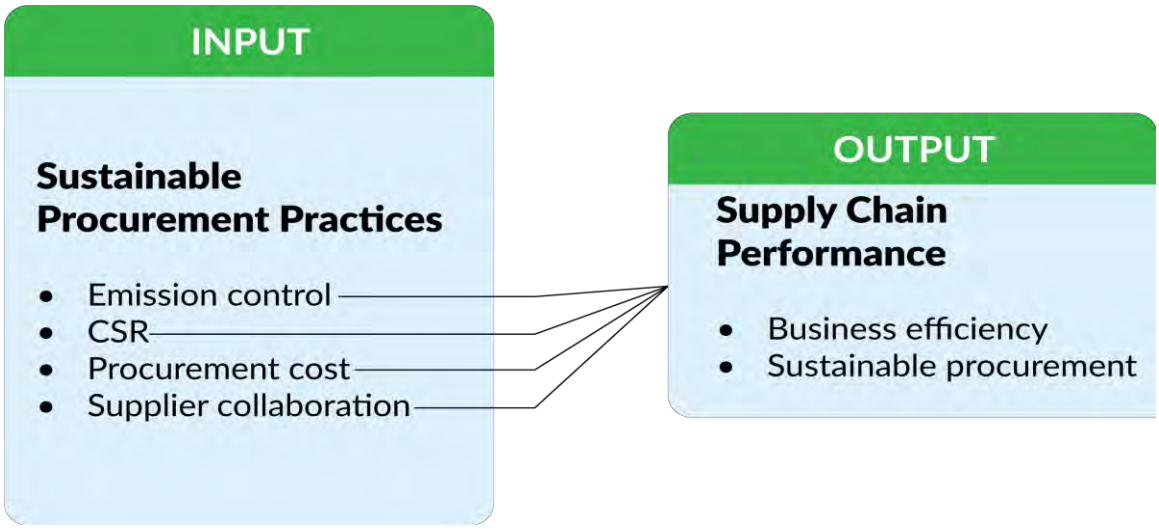

Figure 2 Conceptual Framework

The theoretical framework of this research shows the connection between the sustainable procurement practices and the performance of the supply chain management.

It will be designed in such a way that it will investigate how the different aspects of sustainable procurement could assist in improving the performance in the supply chain in terms of operation, environmental and social aspects.

The framework includes six key constructs, which are significant influencing factors in the supply chain performance:

1. **Emission Control:** This dimension deals with the practices involved in the procurement that mitigate greenhouse gas emission as well as other environmental pollution throughout the supply chain. It also includes supplier programs to install the low-carbon technologies, reduce using energy and manage the waste properly.
2. **Corporate Social Responsibility (CSR):** CSR is the social and moral obligations of the organizations to the society and stakeholders. This involves fair labor practices, community involvement, human rights and ethical sourcing in procurement.
3. **Procurement Cost:** This aspect looks at the way sustainable procurement drives cost efficiency. Some of the sustainable practices can be expensive in the short run but can result in long run savings in efficiency of resources, reduction of waste, and better performance of suppliers.
4. **Supplier Collaboration:** This aspect focuses on mutually beneficial relationships between suppliers and buyers to have common sustainability objectives. Good working relationships enhance innovation, exchange of knowledge and shareable responsibility in ensuring environmental and social standards are met.

5. **Business Efficiency:** Business efficiency is described as an enhancement in terms of operational performance e.g. productivity, reduction in lead time, and quality improvement as a result of sustainable procurement practices and supplier interaction.
6. **Sustainable Procurement:** Sustainable procurement is the first independent variable, which involves incorporation of environmental, social, and economic aspects in purchasing. It affects the other dimensions and, as a whole, affects the overall performance of the supply chain.

The conceptual framework presupposes that the sustainable procurement practices, mediated by the emission control, CSR initiatives, procurement cost control, supplier collaboration and business efficiency, have a positive impact on the performance of the supply chain. This relationship gives a basis on which empirical tests can be conducted by way of data collection and analysis.

2.10 Research Hypotheses

H1: Sustainable procurement practices have a beneficial impact on the overall supply chain performance.

H2: Supply chain efficiency is enhanced by emission control programs of sustainable procurement.

H3: CSR activities increase trust and reputation in the operations of the supply chain.

H4: Procurement cost management will help in enhancing economic sustainability and cost performance.

H5: Supplier cooperation enhances supply chain resiliency and responsiveness.

H6: Sustainable procurement practices enhance the efficiency of operations and business performance.

H7: Sustainable procurement adoption enhances mitigation of risks and stability of the entire supply chain.

H8: Supply chain competitiveness and long-term sustainability can be significantly improved by using sustainable procurement practices in an integrated manner.

Independent Variables (IVs)

1. **Environmental Sustainability Practices** – Adoption of eco-friendly materials, carbon footprint reduction, and waste management.
2. **Social Sustainability Practices** – Fair wages, labor ethics, diversity and safety of workers
3. **Economic Sustainability Practices** – Cost-efficiency, financial stability of suppliers, and profitability in the long term

4. **Regulatory Compliance & Policy Adherence** – Making sure that the company complies with the national and international standards of sustainability, procurement laws, and environmental regulations.
5. **Supplier Engagement & Collaboration** – Supplier Engagement & Collaboration Level of cooperation, mutual sustainability between buyers and suppliers
6. **Technology Adoption in Procurement** – Monitoring sustainability measures with the help of digital tools, artificial intelligence in procurement, and blockchain to ensure transparency.
7. **Sustainable Procurement: Risk Management** - Sustainability risks, such as failure to comply with the suppliers or the unavailability of resources.

Dependent Variables (DVs)

Supply Chain Performance: The performance of the supply chain is gauged on matters of operational effectiveness, cost effectiveness, risk reduction, innovation capability and buyer and supplier relationship. General outline of the Model.

Overall Structure of the Model

The conceptual framework follows an **Input–Output (IPO) logic**, where **Sustainable Procurement Practices** serve as *input variables* and **Supply Chain Performance** as the *output variable*.

1. **Input Layer**: Sustainable Procurement Practices (Independent Variables) Seven key elements of sustainability are incorporated in this layer in the process of procurement:
    - Sustainability in Environment
    - Social Sustainability Practices
    - Sustainability Practices in Economic Areas
    - Regulatory Compliance & Policy Compliance
    - Supplier Engagement & Collaboration
    - Adoption Technology in Procurement
    - Risk Management in Sustainable Procurement

2. **Output Layer:** Supply Chain Performance (Dependent Variable) The output layer will document the measurable outcomes that have been achieved due to the activities of sustainable procurement that involve:
    - Improved efficiency in operation.
    - Reduction of costs and financial sustainability.
    - Improved risk management and resiliency.
    - Improved buyer supplier relationships.
    - Increased conformity to the Triple Bottom Line (economic, social, and environmental value).

2.11 Conclusion

The literature shows a solid theoretical and empirical support on the beneficial role of sustainable procurement on the performance of the supply chain. However, there is still the practical difficulty, particularly in the growing markets, and the lapses in integrating the implementation obstacles on the performance outcomes. In this study, I intend to address these gaps by assessing the effect of sustainable procurement on buyer-supplier collaboration and supply chain performance, and context-specific implications to practitioners and policymakers.

Chapter 3: Research Methodology

Evaluating the Impact of Sustainable Procurement on Supply Chain Performance

3.1 Introduction

In this chapter, the research methodology which will be used to study the relationship between sustainable procurement practices, buyer-supplier collaboration, and supply chain performance is described. The methodology will be effective to answer the study objectives:

1. Evaluate the challenges suppliers and buyers face in meeting sustainable procurement criteria.
2. Explore the influence of sustainable procurement on business and buyer-supplier collaboration.
3. Analyze the impact of sustainable procurement on supply chain performance.

The chapter discusses the research design, population and sampling, data collection procedures, research tools, variable operationalization, data analysis procedures and ethical issues.

3.2 Research Design

The research design used is a **quantitative study** to investigate systematically the relationship between sustainable procurement practices, collaboration, and supply chain performance. This research will involve a cross-sectional survey design where data will be collected at one point in time with the sample population comprising of procurement professionals, supply chain managers and suppliers.

The study integrates the **Input–Process–Output (IPO)** conceptual framework, linking:

- **Inputs:** Organizational and supplier challenges in implementing sustainable procurement.
- **Outputs:** Supply chain performance outcomes (operational, environmental, social, and economic).

This design allows empirical testing of hypothesized relationships derived from the literature review.

3.3 Population and Sampling

Population:

The target market is the procurement managers, supply chain professionals and suppliers working in organizations which have embraced sustainable procurement. The research targets companies in emerging market situations, where sustainable procurement is increasing yet issues are acute.

Sampling Technique:

A purposive sampling technique is utilized to choose the participants whose experience is

related to the field of sustainable procurement. This makes the respondents knowledgeable and able to give the information needed and pertinent.

Sampling Design:

The sampling design is a purposive one and is aimed at the procurement and supply chain professionals who could be directly engaged in the sustainable procurement activities. This will help in making sure that the respondents have the experience that is relevant and can give the correct information concerning the impact of sustainable procurement practices. Both the public and the private organizations that have adopted the policies of sustainability-oriented procurement will be used to select a total of 4050 respondents. The sample will consist of various industries, including NGOs, manufacturing, and service industries, to have a broad picture of the procurement outlook in Bangladesh.

Sample Size:
According to the purposive sampling method, sample size determination and considering the feasibility of the response, the study targets approximately 40–50 respondents. The exact sample will depend on organizational accessibility and willingness to participate.

3.4 Data Collection Methods

Primary Data:

- **A questionnaire** will be the primary data collection tool and it will be structured.
- The questionnaire is split into the parts that reflect the IPO framework:
    1. **Input Variables:** Buyer and supplier issues.
    2. **Output Variables:** Supply chain performance measures.

Secondary Data:

- Relevant literature, organizational documentation and sustainability documentation will be used to complement primary data to ensure context and validation.

Questionnaire Measurement:

- Perceptions of challenges, collaboration, and performance outcomes will be measured using Likert-scale items (1 = Strongly Disagree to 5 = Strongly Agree).

3.5 Operationalization of Variables

This part is operationalizing the study variables based on research objectives, questions, and hypothesis. As the study is based on the conceptual framework of the Input-Process-Output (IPO) and Triple Bottom Line (TBL) models, the variables are divided into independent (input/process) and dependent (output) variables. Variables are conceptually defined and empirically measured using validated indicators that were used in previous literature

3.5.1 The Independent Variables are the Inputs and Processes

The independent variables are the sustainable procurement practices that act as inputs and processes that have an impact on the performance outcomes in supply chains. These variables include environmental, social and economic aspects as well as governance, technology, collaboration and risk management aspects of sustainable procurement.

Table 3.1
Operationalization of Independent Variables

Variable	Dimensions / Indicators	Example Measurement Items	Key References
Environmental Sustainability Practices	Adoption of eco-friendly materials; reduction of waste and emissions; energy efficiency	Use of recyclable materials; energy-saving procurement methods; environmental certifications among suppliers	Zhu & Sarkis (2004); Seuring & Müller (2008)
Social Sustainability Practices	Ethical labor practices; fair wages; diversity and inclusion; occupational safety	Implementation of supplier codes of conduct; gender balance in supplier workforce; workplace safety compliance	Carter & Rogers (2008); Tate, Ellram, & Kirchoff (2010)
Economic Sustainability Practices	Cost-effectiveness; supplier financial stability; value creation; lifecycle cost	Long-term cost savings; supplier profitability; total cost of ownership analysis	Pagell & Wu (2009); Barney (1991)
Regulatory Compliance & Policy Adherence	Conformance with national and international procurement standards	Presence of ISO 14001 or equivalent certifications; adherence to public procurement regulations	Walker & Brammer (2012); UNEP (2013)
Supplier Engagement & Collaboration	Trust; communication; shared innovation; joint risk management	Frequency of supplier meetings; co-development of sustainability goals; open information sharing	Carter & Rogers (2008); Tate et al. (2010)
Technology Adoption in Procurement	Digital transformation; transparency through ICT; automation	Use of e-procurement platforms; digital tracking of sustainability	Ageron, Gunasekaran, & Spalanzani (2012); Walker & Brammer (2009)

		metrics; blockchain for traceability	
Risk Management in Sustainable Procurement	Identification and mitigation of supply, environmental, and ethical risks	Supplier risk assessment; crisis preparedness; diversification of sustainable sources	Sarkis, Zhu, & Lai (2011); Giunipero, Hooker, & Denslow (2012)
Environmental Sustainability Practices	Adoption of eco-friendly materials; reduction of waste and emissions; energy efficiency	Use of recyclable materials; energy-saving procurement methods; environmental certifications among suppliers	Zhu & Sarkis (2004); Seuring & Müller (2008)

Measurement Scale:

Each indicator will be measured on a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) so that the respondent will be able to give an answer in terms of the degree to which the statement corresponds to sustainable procurement practices in their organizations.

3.5.2 Dependent Variable (Output)

Dependent variable is the performance of the supply chains due to the sustainable procurement practices. Based on the TBL model, it incorporates the dimensions of operational, environmental, social, and economic performance.

Table 3.2

Operationalization of Dependent Variable

Variable	Dimensions / Indicators	Example Measurement Items	Key References
Supply Chain Performance	Operational efficiency; cost performance; social responsibility; environmental compliance; resilience	Improved on-time delivery; reduced lead time; cost savings; enhanced supplier relationships; reduced environmental footprint; improved organizational resilience	Elkington (1997); Pagell & Wu (2009); Sarkis et al. (2011)

Measurement Scale:

The responses will be captured through a five-point Likert scale to determine the perceived effect of sustainable procurement to the overall supply chain performance.

3.5.4 Measurement and Analysis Summary

- Respondents: Procurement managers, supply chain professionals, and suppliers.
- Data Type: Quantitative, collected via structured questionnaire.
- Scale: 5-point Likert (1 = Strongly Disagree to 5 = Strongly Agree).

- Analysis Tools:
    - Reliability: Cronbach's Alpha.
    - Validity: Exploratory Factor Analysis (EFA).
    - Hypothesis Testing: Correlation and Multiple Regression Analysis.
    - Software: SPSS (Statistical Package for the Social Sciences).

3.5.5 Summary

Such an operationism provides a systematic description of any variables that are used in the study. The seven independent variables, which are the inputs of the sustainable procurement and processes, are purpose of the study was to determine the combined and independent effect of these variables on the dependent. variable, performance of supply chains. This sort of structure creates uniformity to the between. the concepts and purposes of the research are theoretical, empirical studies that enhance validity and validity of the study findings

3.6 Data Analysis Techniques

Data will be analyzed by means of quantitative statistical techniques:

1. Reliability and validity testing: Internal consistency- Cronbach alpha; exploratory. factor analysis in order to test constructs.
2. Descriptive Statistics: To provide an overview of demographic data, standard, and mean scores.
3. Correlation Analysis: To test the relationships among variables (inputs, processes, and). outputs).
4. Multiple Regression Analysis: To determine the effect of challenges and sustainable. supply chain performance practices on procurement, and the mediating role. of supplier-buyer alliance.

Data will be analyzed using SPSS software.

3.7 Ethical Considerations

- **Informed Consent:** All the participants will be informed of the purpose of the study and give their consent to participate
- **Confidentiality:** The responses will be anonymized to ensure the identity of individuals and organizations
- **Voluntary Participation:** The participants can withdraw freely without any penalty.
- **Data Security:** Storing of the electronic data will be done securely and only the research team will have access to it

3.8 Summary

This chapter has described the research methodology that shall be used to investigate the effect of sustainable procurement on the performance of supply chain. Through quantitative, survey-based study, which has been conceptualized within the IPO framework, the study aims to:

- Identify the challenges faced by buyers and suppliers (input).
- Assess sustainable procurement practices and buyer-supplier collaboration (process).
- Measure the resulting supply chain performance outcomes (output).

The methodology ensures a rigorous, systematic approach to generate empirical evidence that addresses the research objectives and fills the gaps identified in Chapter 2.

Chapter 4: Data Analysis and Findings

4.1 Introduction

This chapter gives the empirical review of the research paper, the title of which is The Impact of Sustainable Procurement on the Performance of Supply Chain Management. It documents the sample profile, performance of the measurement scales, descriptive statistics of the core constructs and the findings of correlation and regression analysis that was done to test the research hypotheses. The data used to conduct the analysis is gathered through the 40 respondents who were working in the procurement and supply chain-related work in the companies based in Bangladesh.

The constructs that will be using the questionnaire are:

- The Emission Control Initiatives (Items 1-4) are designed to reduce the emission of carbon monoxide and other harmful gases into the atmosphere
- Corporate Social Responsibility (CSR) Practices (Items 5-8).
- Procurement Cost Management (Items 9-12).
- Supplier Collaboration (Items 13-16)
- Business Efficiency (Items 17–20)
- Sustainable Procurement: Total Impact / Supply Chain Performance (Items 21-24)

Everything was rated using a **5-point Likert scale** (1 = Strongly Disagree to 5 = Strongly Agree).

4.2 Data Screening and Response Rate

Forty responses that could be used were received and put in the data set. There were a screening of the missing values and the consistency of the codes. The Likert-scale responses were turned into numerical values (15) and the out-of-range values verified. Few spelling variations (e.g. Nutral, capitalization variations) were corrected at the time of coding.

There were no extreme outliers in construct scores and 40 cases were used in the analysis.

4.3 Profile of Respondents

4.3.1 Organization Type

Respondents were drawn from a diverse set of organizations:

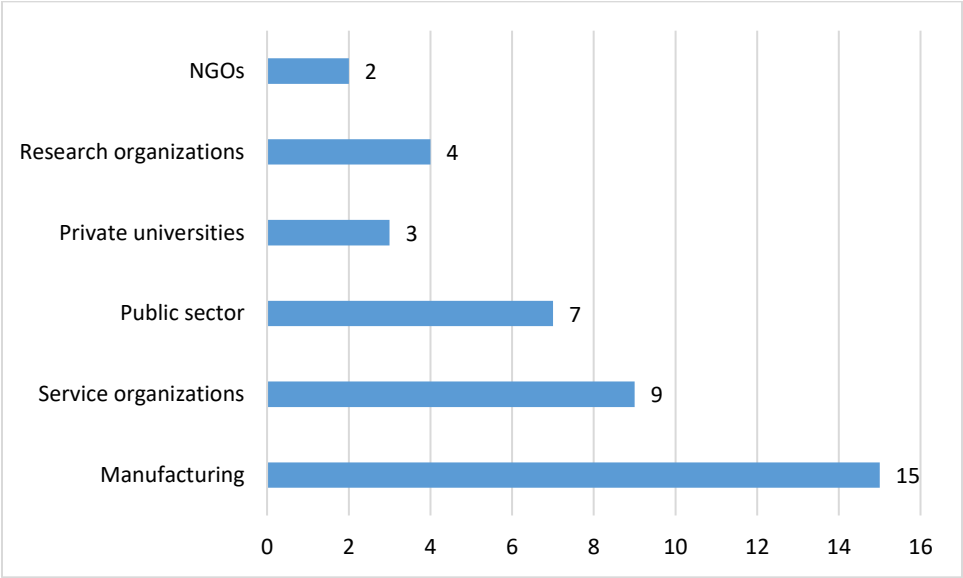

Figure 3 Organization Type

It can be seen that this distribution indicates that the sample is mostly distributed in manufacturing and service industries, and the significant presence of the public and research institutions.

4.3.2 Position

The respondents primarily worked at a mid- to senior-level position in the field of procurement and supply chain (e.g., Procurement Manager, Supply Chain Officer, senior executives at logistics, production, or procurement departments). This will make sure that the participants were exposed directly to procurement decisions and supply chain performance issues.

4.3.3 Years of Experience

The majority of respondents had substantial professional experience:

- **>10 years:** 26
- **6–10 years:** 9
- **<3 years:** 4
- **3–5 years:** 1

Therefore, 87.5 percent of the respondents (35 out of 40) had a minimum of 6 years' experience which means that the sample represents well-informed practitioner opinion.

4.3.4 Organization Size

Most respondents were from large organizations:

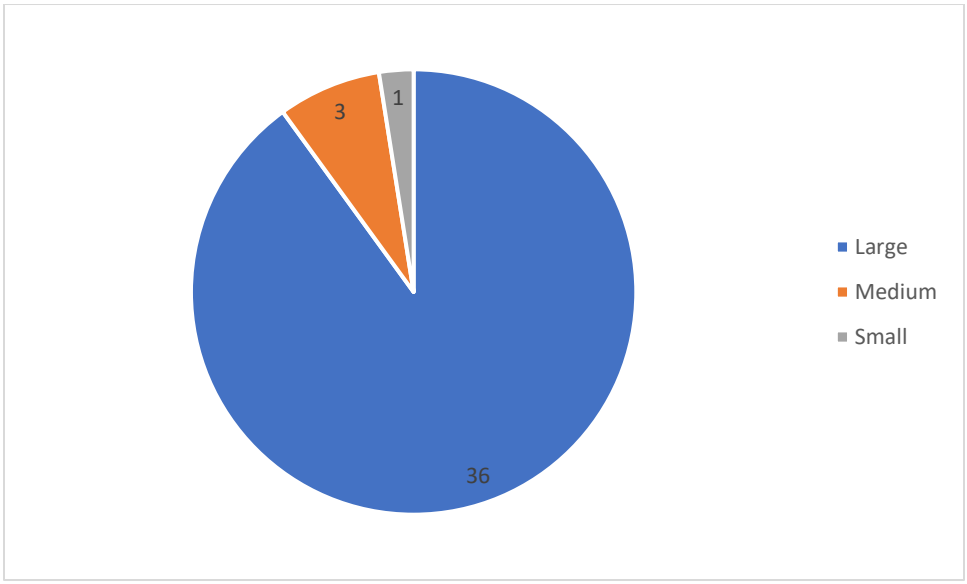

Figure 4 Organization Size

This can be seen to imply that sustainable procurement is now more common and evident within the **large organizations.**

4.3.5 Adoption of Sustainable Procurement Policies

In response to the question on whether their organization had developed formal sustainable procurement policies:

- **Yes:** 38
- **No:** 2

This shows that sustainable procurement is well known in the sample and most organizations have some type of policy or practice in existence.

4.4 Reliability Analysis

Cronbach alpha was used to test internal consistency of the multi-item constructs. Below is the summary of the results. Table 5 Reliability of Measurement Scales (Cronbachs Alpha)

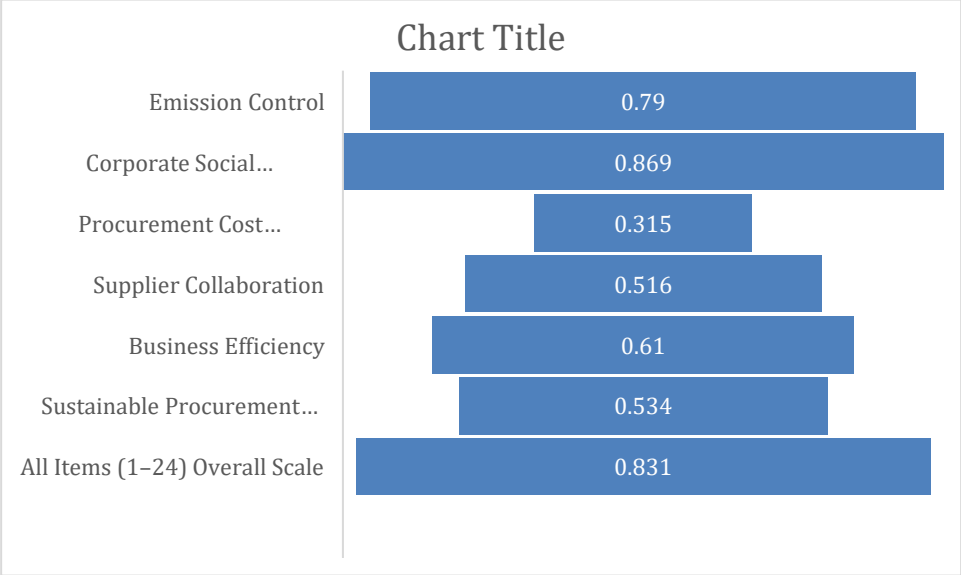

Figure 5 Reliability of Measurement Scales (Cronbach's Alpha)

Interpreting these results:

- **Emission Control** and **CSR** are reliable (α = 0.79 and 0.87), which are appropriate to be analyzed.
- **Business Efficiency** is reasonably sound (α ≈ 0.61), satisfactory to exploratory analysis.
- The alpha of **Procurement Cost Management, Supplier Collaboration, and Sustainable Procurement Impact** is lower, which means that it has a weaker internal consistency. This is probably because of the small number of items, little variance and the small sample size.
- The **overall 24 item instrument** is highly reliable (α = -0.83) indicating that, as a set, the items are consistently able to reflect the overall construct sustainable procurement and its perceived consequences.

Such findings are to be taken into account during the interpretation of the findings and the lower reliabilities are taken as a limitation of the study.

4.5 Descriptive Statistics of Core Constructs

The items in the constructs (Emission Control, CSR, Cost Management, Supplier Collaboration, Business Efficiency and Overall Impact) were averaged to create composite scores.

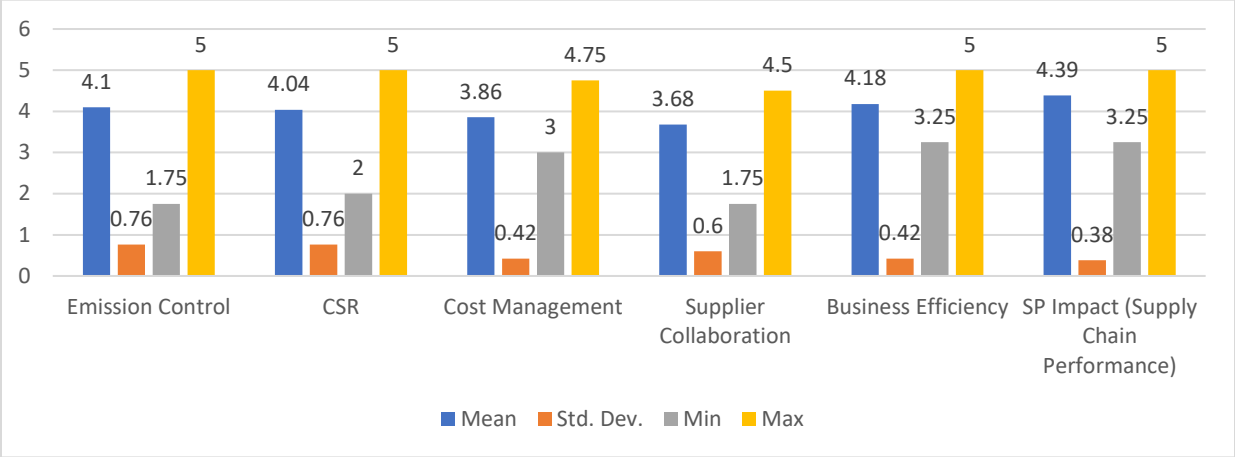

Figure 6 Descriptive Statistics of Key Constructs (N = 40)

Interpretation:

- All the mean scores **exceed 3.5,** and it means that the respondents tend to believe that in their organizations, sustainable procurement practices and their results exist.
- **The mean** of **Sustainable Procurement Impact** is the highest **(4.39),** meaning that the respondents have a strong belief in sustainable procurement as a way of enhancing the performance of supply chains, reputation, and environmental/social performance.
- Other areas such as **Business Efficiency (4.18)** and **Emission Control (4.10)** also indicate high agreement; this means that the respondents associate sustainable procurement with operational improvements and environmental performance. Supplier Collaboration:
- The construct has the lowest **mean (3.68)** of all the constructs, but this, although still positive, implies that there is a relatively greater opportunity to enhance **collaborative** mechanisms with suppliers.

4.6 Correlation Analysis

The constructs were explored with the help of Pearson correlation coefficients, with the special emphasis put on the association between sustainable procurement practices and the **perceived supply chain performance (SP Impact).**

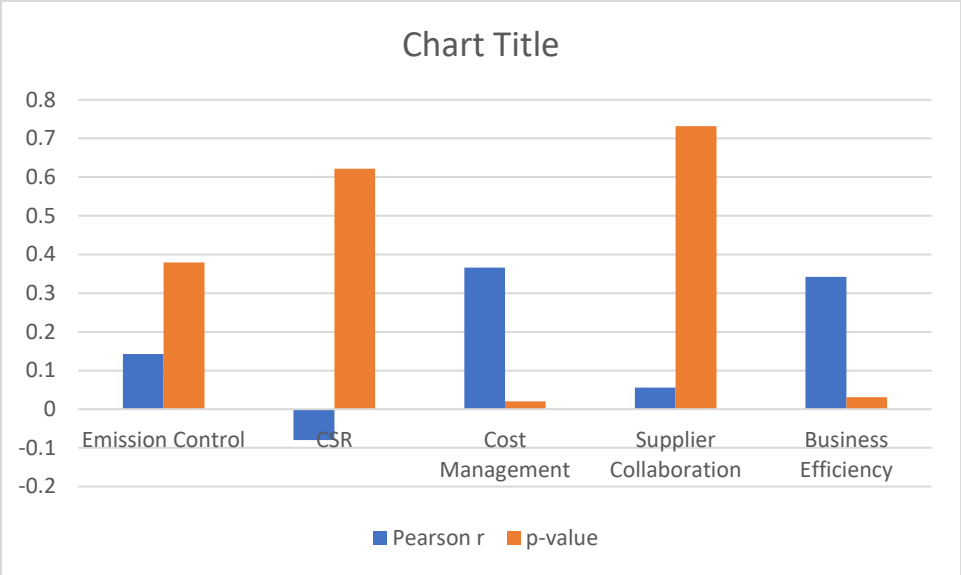

Figure 7 Correlation with Sustainable Procurement Impact (SP-Impact)

Key observations:

- **Procurement Cost Management** shows **significant (but positive)** correlation with SP-Impact ($r \approx 0.37$, $p \approx 0.02$), which implies that the quality of sustainable procurement cost management is linked to the quality of perceived performance in the supply chain.
- **Business Efficiency** also has a **positive and significant** relationship with SP-Impact ($r \approx 0.34$, $p \approx 0.03$). This implies that as sustainability is incorporated in operations, respondents feel that there is an increased overall supply chain performance.
- Emission Control and Supplier Collaboration have **positive but nonsignificant** relationships with SP-Impact.
- The only result is that, CSR has a **weak negative**, **non-significant** relationship with SP Impact in this sample, but it has a strong relationship with Supplier Collaboration ($r \approx 0.64$, $p < 0.001$), which shows that socially responsible practices are closely linked to more relational aspects in the supply chain.

Moreover, internal relationships of some predictors are strong like:

- **Cost Management and Business Efficiency** ($r \approx 0.62$, $p < 0.001$), which implies that productive cost practices are seen to have a direct positive impact on efficiency.

- **CSR and Supplier Collaboration** ($r \approx 0.64$, $p < 0.001$), which supports the perspective that CSR activities contribute to trust, involvement and collaboration between companies and suppliers.

4.7 Regression Analysis

To establish the combined impact of sustainable procurement dimensions on the perceived performance of the supply chain, a multiple linear regression was performed with:

- General; Sustainable Procurement Impact (SP-Impact; Items 2124) is the **dependent variable**.
- **Independent variables**: Emission Control, CSR, Cost Management, Supplier Collaboration, Business Efficiency.

4.7.1 Model Summary

- **R^2:** 0.191
- **Adjusted R^2:** 0.072
- **F (5, 34):** 1.606
- **p (model):** 0.185

The model accounts about **19.1% of the variance** in SP-Impact, however, the overall model is **not statistically significant** at **5 percent (p > 0.05).** This probably can be explained by the **small sample size (N = 40)** and predictor intercorrelations.

4.7.2 Coefficient Estimates

All predictors are positive and non-significant, with the exception of CSR that has a small negative coefficient:

- Emission Control: $\beta \approx 0.06$ ($p \approx 0.52$)
- **CSR: $\beta \approx -0.12$ ($p \approx 0.27$)**
- Cost Management: $\beta \approx 0.22$ ($p \approx 0.26$)
- Supplier Collaboration: $\beta \approx 0.05$ ($p \approx 0.72$)
- Business Efficiency: $\beta \approx 0.16$ ($p \approx 0.38$)

Even though the **bivariate correlations** do not reveal any statistically significant relationship when both individual predictors are entered, the results suggest that **Cost Management** and **Business Efficiency** are meaningful predictors of perceived supply chain performance. The results of the regression are however, to be treated with caution and are to be viewed as **exploratory.**

4.8 Comparison of SP Impact by Adoption of Policies

To estimate the impact of the adoption of formal sustainable procurement policy (Yes/No) on perceived performance, mean SP-Impact scores were compared:

- **Organizations without SP policy (No, n = 2):** Mean = 4.00
- **Organizations with SP policy (Yes, n = 38):** Mean ≈ 4.41

Even though formal statistical tests are not significant when there are only two cases to consider in the No group, this trend indicates that organizations that have implemented **sustainable procurement policies** are more likely to have higher results of **supply chain performance**.

4.9 Summary of Hypothesis Testing

According to the descriptive statistics, correlation, and regression analysis, the status of hypotheses can be summarized as follows (interpretation is conservative, as the N is small, and some of the values of reliability are low):

H1: Sustainable procurement practices have a beneficial impact on the overall supply chain performance.

- Status: Supported in Part. The means are high overall and SP-Impact is positively correlated with the most important dimensions, in particular, Cost Management and Business Efficiency.

H2: Supply chain efficiency is enhanced by emission control programs of sustainable procurement.

- Status: Supported in Part. There are a high mean and positive but non-significant correlation between Emission Control and SP-Impact.

H3: CSR activities increase trust and reputation in the operations of the supply chain.

- Status: Supported (relational dimension). Supplier Collaboration ($r \approx 0.64$, $p < 0.001$) is closely related to CSR, which implies that CSR practices enhance collaboration, trust, and relationship.

H4: Procurement cost management will help in enhancing economic sustainability and cost performance.

- Status: Supported. Cost Management has a significant relationship with Business Efficiency ($r \approx 0.62$, $p \leq 0.001$) and SP-Impact ($r \approx 0.37$, $p \approx 0.02$). The hypothesis:

H5: Supplier cooperation enhances supply chain resiliency and responsiveness.

- Status: Not supported in a quantitative manner. Supplier Collaboration is moderately, but not significantly correlated with Business Efficiency and SP-Impact. Nevertheless, its positive mean shows that there is collaboration but it might require more reinforcements.

H 6: Sustainable procurement practices enhance the efficiency of operations and business performance.

- Status: Supported. Business Efficiency demonstrates high mean scores and the significant positive correlation with SP Impact (r 0.34, p 0.03).

H7: Sustainable procurement adoption enhances mitigation of risks and stability of the entire supply chain.

- Status: Supported, partially. The average SP Impact score in those organizations reporting adoption of SP policy is higher than in those with no such policies, but the sample sizes are unequal.

H8: Supply chain competitiveness and long-term sustainability can be significantly improved by using sustainable procurement practices in an integrated manner.

- Status: Supported, partially. The total 24-item scale is also reliable and constructs are positively related to SP-Impact, although the regression model is statistically unimportant.

Chapter 5: Discussion, Conclusion and Recommendations

5.1 Introduction

The chapter explains the empirical results in Chapter 4 through the research objectives, research questions, and available literature on the topic of sustainable procurement and supply chain performance. It also gives conclusions, practical recommendations to organizations working in Bangladesh and the future research directions.

5.2 Discussion of Findings

5.2.1 Sustainable Procurement and Supply Chain Performance (H1, H6, H8)

The first aim of the study was to examine how sustainable procurement affects the performance of the supply chain. The findings indicate that the respondents tend to agree or strongly agree with the idea that sustainable procurement enhances performance:

- SP Impact mean = 4.39 (on a 5-point scale)
- Business Efficiency mean = 4.18

These results show that there is a **perceived strong positive impact** of sustainable procurement on the operations performance, responsiveness and overall organizational performance. The fact that **Cost Management, Business Efficiency**, and **SP-Impact** have significant positive correlations with each other also helps to prove that incorporating sustainability in the procurement decision-making process could increase efficiency and perceived supply chain performance.

This is in line with earlier works which have associated sustainable procurement with enhanced operational performance, risk reduction, and competitive advantage (e.g., Zhu and Sarkis, 2004; Pagell and Wu, 2009; Sarkis et al., 2011). Although the regression model was not statistically significant at the 5 percent level, it could be attributed to the relatively small sample size and the presence of interdependence of the predictors as opposed to the absence of a relationship.

In general, the findings confirm **H6 and partly H1 and H8** by showing that sustainable procurement may be a source of both efficiency and strategic performance in the supply chains that are active in Bangladesh.

5.2.2 Emission Control and Environmental Performance (H2)

The construct of Emission Control has a high mean score (4.10) implying that organizations have in place a high interest in environmental issues including reduction of carbon emissions, recyclable materials and minimization of waste in their procurement activities.

But the relationship between Emission Control and SP-Impact, though significant ($r \approx 0.14$), was not significant. This can be an indication of a number of problems:

- Respondents experience the benefits of the environment but might not directly associate the same with quantifiable supply chain performance.
- Benefits like emission reduction are long-term and indirect, which is why it is more difficult to relate them to short-term performance indicators.

As such, **H2 is not fully supported**. Environmental initiatives are currently in place and they are appreciated, but the impact of them

5.2.3 CSR, Supplier Collaboration, and Relational Outcomes (H3, H5)
The research was also interested in knowing the relationship between the CSR practices and collaboration with suppliers and sustainable procurement outcomes:

- CSR mean = 4.04- the high degree of agreement that labor standards, fair wages, safety and community initiatives are part of procurement.
- Supplier Collaboration mean = 3.68 positive, but comparatively lower than others.

One of the findings is the **high and substantial correlation** between **CSR and Supplier Collaboration** ($r \approx 0.64$, $p < 0.001$). This implies that the higher levels of **social responsibility** in organizations the more they have a chance at establishing **cooperative and trustful relationships with suppliers**, which is akin to the Stakeholder Theory and other research outcomes that indicated that CSR led to the development of stronger relational capital and reputation (Carter and Rogers, 2008; Tate et al., 2010).

Supplier Collaboration however only has modest non-significant relationships with Business Efficiency and SP-Impact. This implies that even though businesses and suppliers are cooperating on sustainability, it is not yet a highly coordinated or performance-focused collaboration with the outcome being resiliency, responsiveness or flexibility. Thus:

- H3: The **H3 is supported** with respect to CSR increasing trust and cooperation.
- **H5 cannot be highly supported** by quantitative data; there is a presence of supplier collaboration but its direct performance effect remains undeveloped.

5.2.4 Procurement Cost Management and Economic Sustainability (H4)
The mean of Procurement Cost Management (3.86) is relatively high and has strong correlations with both:

- Business Efficiency ($r \approx 0.62$, $p < 0.001$)
- SP-Impact ($r \approx 0.37$, $p \approx 0.02$)

These findings confirm H4, which states that the cost management in the framework of sustainability (e.g., emphasis on the lifecycle cost, supplier stability, and total value) leads to better operational and economic performance. This justifies the Resource-Based View (RBV) that propose that competently administered sustainable procurement resources could develop into strategic resources that boost competitiveness and cost effectiveness.

5.2.5 Policy Adoption, Risk Management, and Stability (H7)

Nearly all the organizations sampled indicated that they had a form of sustainable procurement policy (38 of 40). Mean SP-Impact score is greater in the case of policy holders (4.41) than non-policy holders (4.00).

Although there is no significant statistical test that can be implemented since the number of cases of No-policy is very small, the trend can be related to **H7** since formal implementation of sustainable procurement policies may be linked with perceived better supply chain performance and, consequently, better risk management and stability.

5.3 Answers to Research Questions

RQ1: What are the key challenges in implementing sustainable procurement within supply chain management?

The present-day questionnaire involved more practices and results than direct challenges, and therefore, quantitative information on barriers is scarce. Nevertheless, the mean of Supplier Collaboration is relatively lower and some of the constructs have lower reliability implying that:

- Mechanisms of collaboration with the suppliers are in their early stages.
- Sustainability-related performance measurement, data sharing and standardization may be difficult to practice.

This is in line with the literature that cost pressures, inability to measure sustainability outcomes, and inability of suppliers to meet demands are still a barrier in developing countries.

RQ2: How does sustainable procurement affect business efficiency and cost performance in supply chains?

Findings show that:

- Business Efficiency is scored high (mean = 4.18).
- Cost Management is strongly correlated with Business Efficiency and significantly co-related with SP-Impact.

In this way, sustainable procurement is seen to enhance the operational responsiveness, delays **minimization, and economic performance in the long term**, which proves that sustainable practices may not only be cost-increasing.

RQ3: To what extent do sustainable procurement practices impact overall supply chain performance, including efficiency, cost, risk, and resilience?

The SP Impact mean (4.39) and the strong correlation with the Cost Management and Business Efficiency indicates that the respondents have a strong sense of sustainable procurement to:

- Increase efficiency and reliability.

- Added value to enhanced cost control and stability.

Although Emission Control and Supplier Collaboration did not have significant direct statistical impacts on SP-Impact, they are still significant parts of the overall sustainability strategy and may probably have an indirect impact (e.g., through reputation, compliance, and long-term resilience).

RQ4: How can organizations strengthen supply chain performance and competitiveness through effective sustainable procurement strategies?

According to the findings, the organizations can improve performance by:

- The implementation of cost management and lifecycle thinking into sustainable procurement.
- Provision of CSR programs to establish close and trusting relationships with suppliers.
- Institutionalizing sustainable procurement policies and their association with performance indicators.
- Improving business performance as a result of sustainability (e.g. less wastage, less disruptions).

The recommendations are based on these points in the following section.

5.4 Practical Recommendations

On the basis of the results and the context of Bangladesh, the following recommendations can be offered:

5.4.1: Enhance Supplier Cooperation

- Establish formal partnerships with major suppliers (shared planning, shared problem-solving, shared investment in more environmentally friendly technologies).
- Close capability gaps through the introduction of supplier training and capacity-building based on environmental and social standards.
- Utilize performance contracts with sustainability and service level metrics (lead time, quality, flexibility).

5.4.2: Combine Lifecycle Costing and Value-Based Procurement

- Go beyond lowest price requirements and add total cost of ownership, energy consumption, maintenance, disposal and risk cost.
- Apply systematic assessment tools in the selection of suppliers that consider cost, quality, risk, and sustainability factors.
- Connect procurement KPIs with economic and sustainability performance, so that sustainable decisions should be rewarded within the company.

5.4.3: Improve Reporting and Measuring Sustainability Results

- Establish clear KPIs in areas of emission reduction, waste reduction, social compliance, and resilience (e.g. reduced disruptions, better on-time delivery).
- Introduce digital solutions (e-procurement systems, dashboards) to track the supplier performance and sustainability indicators.
- Embark on embedding the sustainability measures in the routine management reporting and supplier review meetings.

5.4.4: Relational Advantage Use CSR as a Leverage

- Standardize the supplier codes of conduct (labor conditions, wages and safety) and make them a part of the contracts.
- Use suppliers in community and CSR activities so as to develop common values and commitment.
- Report sustainability performances to stakeholders in order to improve reputation, and this may further reinforce the trust between buyers and suppliers.

5.4.5: Organize Sustainable Procurement Policies

- Make sure to have sustainable procurement policies passed at senior management level and connected to the organizational strategy.
- Train procurement employees to read and implement the policies in their daily decision making.
- Manage compliance and risk by aligning policies to national and international standards (e.g., ISO 14001, national procurement regulations) to comply.

5.5 Theoretical and Managerial Implications

Regarding theory, the findings:

- Support the **Triple Bottom Line (TBL)** approach by demonstrating that perceived supply chain performance is affected by the environmental, social, and economic aspects of procurement in a joint way.
- Defend the **Resource-Based View (RBV**) by showing that the sustainable procurement capabilities (in particular, cost management and efficiency) may serve as a strategic resource.
- Strengthen **Stakeholder Theory,** emphasizing the contribution of CSR to the establishment of more significant relations with suppliers.

For managers, the study:

- Shows how sustainable procurement is not only a compliance or philanthropic practice but is associated with actual efficiency and perceived performance.
- Reiterates the necessity of shifting ad hoc activities to policy-supported sustainable procurement systems.

5.6 Limitations of the Study

- **Sample Size:** The sample size (N = 40) is quite small, which restricts the statistical power of the regression analysis and generalizability.
- **Measurement Reliability**: Alpha of some of the constructs (Cost Management, Supplier Collaboration, SP Impact) was less than desired, so they should be refined in the scale.
- **Context and Sector Coverage**: The sample consists predominantly of large organizations, and specially manufacturing and service firms; therefore, this could not be entirely representative of small business, or of less formal sectors.
- **Cross-Sectional Design**: Data were measured at one time only, which could not be used to make causal inferences and could not tell much information about dynamic changes or long-term effects.
- **Limited Challenge Items**: The questionnaire lacked specific questions on particular barriers to sustainable procurement and this limited the possibility of quantifying challenges directly.

5.7: Future Research recommendations

Future studies could:

1. **Enhance Sample Size and Sector Diversity.**
    - Add more small and medium business and diversify (e.g., agriculture, logistics, healthcare).
2. **Improve and Develop Measurement Scales.**
    - Create more resilient multi-item measures of cost management, collaboration, risk management and supply chain resilience.
    - Add specific points in the challenges and barriers to implementation.
3. **Apply Longitudinal or Mixed Methods Designs.**
    - Monitor organizations longitudinally in order to learn how sustainable procurement initiatives change and influence performance.
    - Integrate quantitative surveys with interviews or case studies in order to gain a more in-depth insight into the implementation process of policies.
4. **Associate Perceptions with Objective Performance Data.**
    - Use real performance measures (e.g., lead times, cost savings, frequency of disruption, emission data) where feasible to supplement the perception-based measures.

5.8 Conclusion

This dissertation aimed at assessing how **sustainable procurement affects** the **performance of the supply chain management** in Bangladesh. The results indicate that sustainable procurement practices, especially **cost management and business efficiency** are closely linked with the perceived supply chain performance. **CSR initiatives** play a major role in improving the **collaboration of suppliers**, and emission control as well as adoption of the policy play a positive role though indirectly in performance outcomes.

Despite partial support of some of the relationships and limitations of the analysis posed by the sample size and measurement scale, the evidence is that sustainable procurement is a significant strategic tool that organizations aiming to enhance **efficiency, reputation, and long-term competitiveness** in their supply chains can use.

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Appendix

Individual Questionnaire

Questionnaire on the Impact of Sustainable Procurement on Supply Chain Performance

This questionnaire aims to collect data for academic research on how sustainable procurement practices influence supply chain performance in Bangladesh. All responses will remain confidential and will be used only for research purposes.

Please indicate your level of agreement with each statement using the following scale:
1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

Section A: Respondent Profile

1. Organization type: ☐ NGO ☐ Manufacturing ☐ Public Sector ☐ Service ☐ Other

2. Your position: ☐ Procurement Manager ☐ Supply Chain Officer ☐ Supplier ☐ Other

3. Years of experience in procurement/supply chain: ☐ <3 ☐ 3–5 ☐ 6–10 ☐ >10

4. Size of organization: ☐ Small ☐ Medium ☐ Large

5. Has your organization adopted sustainable procurement policies? ☐ Yes ☐ No

Section B: Emission Control Initiatives

1. Our organization considers carbon emission reduction in procurement decisions.
2. Suppliers are required to follow environmental standards (e.g., ISO 14001).
3. Energy-efficient and recyclable materials are prioritized in purchasing.
4. Procurement policies include waste reduction and green sourcing targets.

Section C: Corporate Social Responsibility (CSR) Practices

5. Supplier selection includes assessment of labor and ethical standards.
6. Procurement supports fair wages and safe working conditions.
7. Our organization engages suppliers in community or CSR initiatives.
8. We report social sustainability outcomes linked to procurement.

Section D: Procurement Cost Management

9. Procurement focuses on total value and lifecycle cost as opposed to lowest price
10. Sustainable procurement has reduced overall operating expenses.
11. The Procurement practices ensure the financial stability of suppliers.
12. Cost management strategies are associated with long-term economic performance.

Section E: Supplier Collaboration

13. In the case of our organization, we collaborate with the suppliers to achieve sustainability objectives.

14. Our organization shared Information and data with suppliers freely.
15. Our organization conducted Joint training or capacity-building programs with suppliers.
16. Supplier relations are enhanced through mutual trust and transparency.

Section F: Business Efficiency.

17. Sustainable procurement has improved responsiveness of supply chain.
18. Sustainability integration has led to higher operational efficiency.
19. Procurement practices have minimized delays or disruptions.
20. Sustainability helps in improved organizational performance.

Section G: Sustainable Procurement (Overall Impact)

21. Sustainable procurement improves the reputation and competitiveness of the company.
22. It is used to control risk and ensures stability of long-time supply.
23. Sustainable procurement is a positive contribution to the environmental and social outcomes.
24. Overall, sustainable procurement enhances the performance of the supply chain.

Consent Form

Participant Consent Form

Research Title: The Impact of Sustainable Procurement on the Performance of Supply Chain Management

Researcher: Md. Monjurul Alom
Masters in Procurement and Supply Management (MPSM)
BRAC Institute of Governance and Development (BIGD), BRAC University

Purpose of the Study:

The purpose of the study will be to determine the impact of sustainable procurement practices on the supply chain performance in respect to such areas as emission control, corporate social responsibility (CSR), procurement cost, supplier collaboration, and business efficiency. Your involvement will assist in offering meaningful information on how procurement strategies that are focused on sustainability can enhance the business performance and environmental responsibility.

Participant Involvement:

You are invited to join this research through a brief questionnaire. It will be a questionnaire that will last around 10-15 minutes. Participation is voluntary and you can withdraw yourself at any time without any negative consequences

Confidentiality: All data collected will be kept strictly confidential and used only for academic purposes. No personal identifiers (such as your name, organization, or contact details) will appear in the research report. Data will be analyzed in aggregate form only.

Risks and Benefits:

Risks: We do not anticipate any risk of physical or emotional harm if you participate in this research

Benefits: There is no direct benefit for taking part in this research, In the long-term research findings will contribute to the understanding of sustainable procurement and its effects on supply chain performance, potentially benefiting future organizational practices and policy formulation.

Voluntary Participation:

Participation in this research is voluntary. You have the right to know about the procedures, risks, and benefits of the survey. Even if you decide to take part in the study, you can change your mind later and can leave the interview at any time. Even you have the right not to answer any specific question. No matter what decision you make, there will be no problems for you

Data Usage: The data collected will be securely stored and may be used for academic publications or presentations, with complete anonymity preserved.

Contact Information: If you have any questions or concerns about this study, please contact with:

Md. Monjurul Alom
Email: monjurul.alom@bracu.ac.bd
Master's in Procurement and Supply Management
BRAC University

If you have any questions regarding your rights and participation as a research participant, please contact with the

Academic Supervisor:

Md. Hasan Maksud Chowdhury
Associate professor
BRAC Institute of Governance and Development (BIGD), BRAC University

Participant Declaration: I have read and understood the information given above. I voluntarily agree to participate in this research study. I understand that my participation is confidential which cannot be disclosed to anyone and I may withdraw at any time without giving a reason.

Participant's Name: _____

Signature: _____

Date: _____

Researcher's Signature: _____