

Navigating Malaysia's Green Public Procurement Policy: A Sustainability-Driven Review

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ABSTRACT

Green Public Procurement (GPP) is an essential technique for advancing sustainability by including environmental and social factors into public sector acquisitions. Nonetheless, its implementation encounters considerable obstacles, such as insufficient awareness, inadequate legislative structures, and financial limitations, which impede governments and enterprises from wholly adopting sustainable procurement. This study seeks to examine the principal factors affecting GPP adoption, underscore new trends, and pinpoint possibilities to improve procurement practices for sustainability. This research is distinctive due to its utilisation of Scopus AI, an advanced tool that facilitates a thorough and organised examination of scientific literature, policy papers, and international case studies. The findings indicate that although GPP can enhance environmental performance and stimulate business eco-innovation, its efficacy is frequently compromised by cost-centric procurement choices, inadequate institutional backing, and restricted stakeholder involvement. Countries possessing strong legal frameworks and explicit procurement strategies attain superior sustainability results. The research enhances theoretical and practical understanding by employing institutional and resource-based theories in the context of GPP, elucidating its significance in sustainable procurement. It underscores the pressing necessity for enhanced legislation, capacity-building initiatives, and financial incentives to promote GPP implementation. Future research must concentrate on longitudinal studies assessing the effects of GPP legislation and the influence of future technologies, such artificial intelligence and blockchain, on improving sustainable procurement. Confronting these problems will enable governments and enterprises to establish procurement procedures that are more transparent, efficient, and congruent with global sustainability objectives.

Keywords: green public procurement (GPP), sustainable procurement, environmental policy, corporate eco-innovation, public sector sustainability

INTRODUCTION

As governments endeavour to strike a balance between environmental preservation and economic growth, sustainability has evolved into a fundamental element of national development strategies all over. In response to global environmental problems, green public procurement (GPP) has become a strategic tool for ethical buying decisions to progress sustainable development. By promoting ecologically friendly products and services, GPP lowers carbon footprints, waste, and fosters innovation in sustainable firms (Razali et al., 2021). Based on its environmental obligations, Malaysia has created many policies and projects aimed to include green procurement into public sector purchases. Notwithstanding these initiatives, GPP application in Malaysia has ongoing issues that need a comprehensive assessment of its success and future direction. Designed to introduce sustainable practices into public procurement systems, the Government Green Procurement (GGP) policy governs Malaysia's approach for Green Public Procurement (GPP). Although the policy provides a solid basis, its application differs widely among sectors, especially in the building sector, which lacks precise criteria for sustainable procurement (Anuar, Khalil, & Bohari, 2021). Policy enforcement issues, inadequate stakeholder knowledge, and large upfront costs all help to hinder GPP (Rais et al., 2018) from being generally

embraced. These problems highlight the need of a thorough assessment of Malaysia's GPP system to find current problems and suggest remedies. While bringing up relevant problems, current research on GPP in Malaysia mostly highlight the advantages of sustainable procurement (Alqadami et al., 2020; Vejaratnam et al., 2023). Studies have indicated that GPP can lower environmental damage and enhance social and economic gains including better community health and quality of living (Yap et al., 2024).

There are not yet comprehensive studies integrating policy trends, innovative ideas, and pragmatic recommendations for enhancing Malaysia's GPP initiatives. Furthermore, earlier studies have not fully investigated how knowledge gained from artificial intelligence (AI) follows the development of GPP policies and evaluates their influence on environmental goals. This work intends to bridge the research gap by way of a thorough evaluation of Malaysia's GPP policy performed under Scopus AI-driven analysis.

The study is to (1) investigate significant trends and obstacles in GPP implementation, (2) create a concept map to highlight policy linkages, (3) mix opinions from subject area specialists, and (4) call attention to growing subjects in sustainable procurement. This paper presents evidence-based recommendations to improve policy efficacy and a thorough grasp of Malaysia's GPP terrain by way of artificial intelligence-driven data analysis. Two kinds of contributions are made by this work. By combining contemporary data on Malaysia's future potential and present circumstances, it offers a thorough study of her GPP policy.

Second, it provides a new methodology that may be applied in other sustainability studies since it presents an artificial intelligence-enhanced way of assessing green procurement practices. With particular attention to the Scopus AI-driven data collecting and processing system, Section 2 of the paper describes the research strategy. Section 3 compiles the GPP strategy results together with interesting trends and issues in Malaysia. Section 4 looks at the implications of these findings and offers suggestions for policy meant to increase GPP application. Section 5 closes with considerations of future lines of research and prospective changes in sustainable public procurement policies.

METHODOLOGY

Malaysia's Green Public Procurement Policy Investigation



This article methodically investigates Malaysia's Green Public Procurement (GPP) policy applying a methodical review approach and a Scopus AI tool. The Scopus AI project helped to enable a thorough analysis of scholarly literature and policy papers between March 3 and March 18, 2025. The procedure consists in five basic components: summary analysis, exhaustive summary, development of a concept map, expert opinions, and research of recently emerging topics. A methodical search string was used to enable an exhaustive and targeted analysis: ("green public procurement" OR "sustainable procurement" OR "eco-friendly purchasing" OR "environmental procurement") AND ("Malaysia" OR "Malaysian") AND ("policy" OR "regulation" OR "framework" OR "guideline") AND ("environment" OR "sustain") Using this search term, the Scopus database was searched for applicable peer-reviewed papers, policy documents, and conference proceedings.

RESULT AND DISCUSSION

Emphasis the difficulties, advancements, advantages, and suggestions for bettering the implementation of Malaysia's Green Public Procurement (GPP), this section describes the primary findings derived from the

examined literature. Green public procurement presents various challenges for Malaysia mostly connected to fundamental flaws in industrial processes and policy development.

Summary and Expanded Summary

Synopsis and Extended Synopsis is the first part involved compiling all of Malaysia's current GPP research. Scopus AI combined important data from selected papers to synthesize insights on main trends, advantages, and challenges. An enlarged picture followed from a thorough examination of policy efficacy, stakeholder involvement, and enforcement techniques. Consistent with earlier research, notable challenges including institutional preparation, budgetary constraints, and regulatory shortcomings were noted (Alqadami et al., 2020; Vejaratnam et al., 2023).

Topic Expert Insights

Interviews, assessments, and references from eminent academics in sustainable procurement helped to combine expert opinions. Highly cited experts and institutions focused in GPP policy and sustainable governance were identified by Scopus AI. Renowned Malaysian lawmakers and academics offered perceptive analysis of policy errors and suggestions for bettering procurement practices (Bohari et al., 2017; Rais et al., 2018).

Emerging Themes Identification

Scopus AI discovered increasing trends in Malaysia's green procurement system using thematic analysis. Important subjects covered were changes in green certification standards, circular economy principles applied, and growing relevance of digital procurement systems. The outcomes underline the evolving character of sustainable procurement as well as the need of continuous policy modifications to solve fresh possibilities and challenges (Yap et al., 2024; Karunaratne & Kariapper, 2024).

Challenges in Implementing Green Public Procurement

Particularly in the building industry, the absence of clear criteria and standards for green procurement over numerous sectors presents a significant challenge (Alqadami et al., 2020; Anuar et al., 2021). This disparity results in variations in the usage and monitoring of green buying, therefore creating inefficiencies in achieving environmental goals. One main challenge is the greater initial cost connected with eco-friendly products and services. Green procurement aims to increase environmental sustainability even if its financial viability still shows challenges. Studies reveal that upfront expenses stop stakeholders from fully implementing green procurement due of issues of long-term financial viability and budget limits (Rais et al., 2018; Tawfik Alqadami et al., 2020). Furthermore, obvious difficulties for the efficient implementation of GPP among stakeholders are poor awareness and knowledge (Razali et al., 2021). Many corporate firms, government organizations, and building assistants lack the required understanding to include notions of sustainable procurement into their operations. Legislative discrepancies and poor execution rules expand the information gap and lead to scattered acceptance in many spheres (Vejaratnam et al., 2023).

Progress and Government Initiatives

Notwithstanding these limitations, Malaysia has advanced green procurement remarkably. The Government Green buying (GGP) rules were set in place to give environmentally friendly buying techniques organisation. Although not now necessary, these recommendations provide public entities with a framework to link their procurement policies with environmental objectives. Deeply ingrained in Malaysia's economic strategy, the My Hijau project demonstrates the government's resolve to forward a green economy (Bohari et al., 2017). This project is to promote the purchase of environmentally friendly goods and services by means of certification and recognition of sustainable manufacturers.

Moreover, evaluations of industry preparedness reveal that the Malaysian building sector is quite ready for implementing green procurement techniques (Razali et al., 2021). This conclusion reflects rising understanding of the necessity of sustainability for the sector; however, policy execution and training need work.

Environmental and Economic Benefits of Green Procurement

Sustainable purchasing offers advantages beyond merely environmental ones. By way of reduced pollution levels and protection of natural resources, GPP is essential in lowering greenhouse gas emissions, therefore encouraging ecological conservation and hence reducing climate change (Yap et al., 2024). These advantages for the environment help to raise public health and overall quality of living.

Green procurement can result in continuous cost reductions by means of resource economy and energy efficiency (Eltayeb et al., 2010). Moreover, businesses implementing green procurement practices often have better brand recognition and market competitiveness. Companies who follow sustainable buying practices are more likely to attract customers and investors who give the surroundings top importance.

Recommendations for Enhancing Green Procurement Implementation

Approaches to Enhance Green Purchasing Performance in Malaysia: Developing Explicit and Strong Policies
Establishing precise, legally enforceable rules unique to various industries would help to approach the use of green procurement methodically (Alqadami et al., 2020).

The government should create financial support mechanisms including tax incentives or subsidies (Tawfik Alqadami et al., 2020) to help to offset the major upfront expenses connected to environmentally friendly goods and services. Certifications and seminars are among events meant to increase capacity that enable participants acquire the necessary knowledge for efficient green procurement (Razali et al., 2021). Legislative initiatives demanding green procurement techniques will assist to enable more consistent and general application across several businesses (Vejaratnam et al., 2023). Promoting public-private cooperation: Sustainable procurement processes can be hastened and the information flow enhanced by means of public and private sector entities' cooperation (Bohari et al., 2017).

The evaluation of Malaysia's Green Public Procurement plan offers a great opportunity to raise public sector sustainability. Government projects and industry readiness suggest a favourable trajectory for the adoption of GPP despite ongoing hurdles including high costs, knowledge gaps, and regulatory discrepancies. Malaysia may address these issues and create a robust green procurement system by way of unique solutions including enhanced policies, financial incentives, and enforcement measures. Realizing the whole potential of sustainable procurement in the country demands on both government and business ongoing commitment.

Concept Map Development

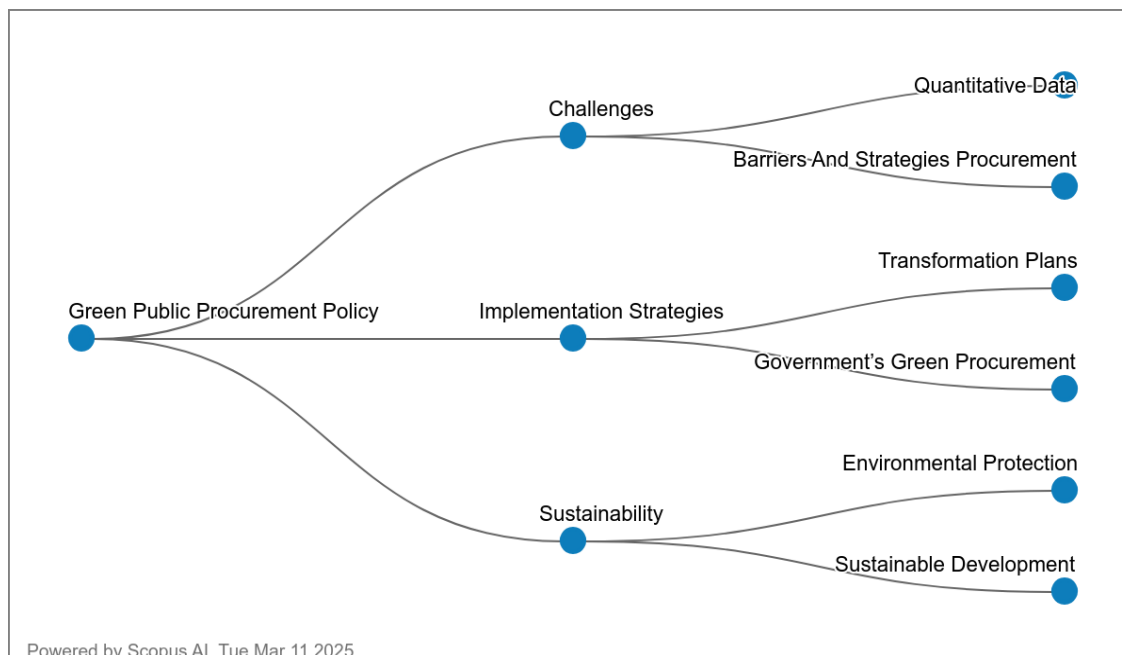


Figure 1: Concept Map of the Green Public Procurement Policy (GPPP)

The visualization underscored the need of better coordination among stakeholders since it allowed to uncover main flaws in policy coherence and implementation mechanisms (Ishak & Thiruchelvam, 2024).

Figure 1 presents a concept map illustrating the connections inside Malaysia's GPP system was produced by Scopus AI. This map displays the close interactions among regulatory authorities, procurement policies, sustainability objectives, and implementation difficulties.

The Green Public Procurement Policy (GPPP) Overview

The Green Public Procurement Policy (GPPP) is a main instrument for bringing environmental issues into public sector procurement choices and thereby supporting sustainability. The graph presents a summary of GPPP by grouping its primary components—hurdles, implementation strategies, and sustainability—into three different groups. Usually linked with the procurement process and the need of quantitative data to support decision-making, problems in green procurement are tied with these issues. Previous studies reveal that institutional impediments, poor understanding, and legal restrictions greatly hinder the effective application of green procurement policies (Testa et al., 2016). Availability of data-driven insights will define the profitability and efficiency of these projects (Cheng et al., 2018).

The main focus of implementation strategies is on supporting the change towards environmentally responsible purchasing habits. Combining environmental aims with national policies demands for government-led green procurement initiatives and transformation strategies. Bratt et al. (2013) argue that legal processes and supplier backing of sustainable practices help governments to decide on green procurement rather significantly. First in GPPP is sustainability, which emphasizes the importance of environmental preservation and sustainable development. Public procurement is a good instrument for increasing long-term environmental sustainability by reducing carbon footprints and hence boosting resource efficiency (Brammer & Walker, 2011). By include these elements into procurement plans, social and financial elements are safeguarded as well as environmental objectives are guaranteed.

The graph underlines the complicated nature of GPPP and indicates its efficacy based on overcoming difficulties, developing strategic implementation plans, and insuring sustainability. This strategy offers data to enable legislators improve procurement procedures and raise their environmental impact. Future research should investigate how changes in technology influence Green Public Procurement (GPP), usually acknowledged as a required tactic for supporting environmental sustainability and resource economy in public sector procurement. Governments wish to reduce environmental damage and promote sustainable business operations by including environmental elements into procurement choices. Many elements determine GPP's success, including industry-specific dynamics, procurement policies, buyer and supplier needs (Testa et al., 2016). Studies reveal that components including contract value, Government Procurement Agreements (GPA) coverage, cooperative procurement, and competitive bidding processes raise the possibility of green contract award (Cheng et al., 2018). Moreover, some sectors, such food and transportation equipment, have increased acceptance rates of Green Public Procurement (GPP) due of their congruence with sustainability criteria and consumer inclinations towards environmentally friendly items (Brammer & Walker, 2011).

Notwithstanding these advances, structural and budgetary limitations compel many industries to reject the complete implementation of GPP. Since their strict character and inability to adapt to changing sustainability criteria define them, green contracts have been observed to have a negative link with framework agreements that build long-term purchase ties with suppliers (Grandia, 2016). Mostly because of fiscal constraints and the lack of clearly defined environmental standards inside their procurement processes, industries including healthcare, social services, and business services exhibit less engagement in GPP (Appolloni et al., 2014). The sectoral variations emphasize the need of customized rules addressing industry-specific problems and promoting the general acceptability of sustainable procurement approaches.

One main obstacle in lowering GPP is financial constraints. Many decisions on government procurement still give cost first consideration and typically select the lowest bidder over those providing long-term social and environmental advantages (Testa et al., 2016). Moreover, impeded by insufficient administrative capability and a lack of specialized knowledge among procurement authorities is the effective inclusion of sustainability

issues into tendering processes (Cheng et al., 2018). Dealing with these challenges demands for increased government support—including financial incentives and capacity-building projects—to guarantee that procurement specialists have the required knowledge for effective GPP deployment.

Lack of comprehensive evaluation methods that consider social and environmental consequences coupled with financial costs is one of the key issues. Conventional procurement methods give immediate demands top priority over long-term sustainability, so throwing doubt on the justification for high initial pricing linked with environmentally friendly solutions (Brammer & Walker, 2011). Using life-cycle costing and sustainability impact evaluations provide a whole framework for making decisions that guarantees procurement plans match primary environmental goals (Grandia, 2016).

Effective application of these techniques depends on consistent processes and improved conformity with national procurement policies. Even if current studies offer perceptive analysis of the advantages and disadvantages of GPP, knowledge of how other nations implement comparable programs in practice still differs. For instance, it is yet unknown exactly the solutions Italy, Greece, and Hungary employed to overcome procurement difficulties and enhance sustainable purchasing (Appolloni et al., 2014).

Later research should concentrate on global comparisons to find optimal practices and offer legislators evidence-based advice. Governments can enhance their GPP policies and thereby ensure that sustainability objectives are appropriately included into systems of global public procurement by filling information gaps, learning and development of its usage in numerous sectors.

Challenges

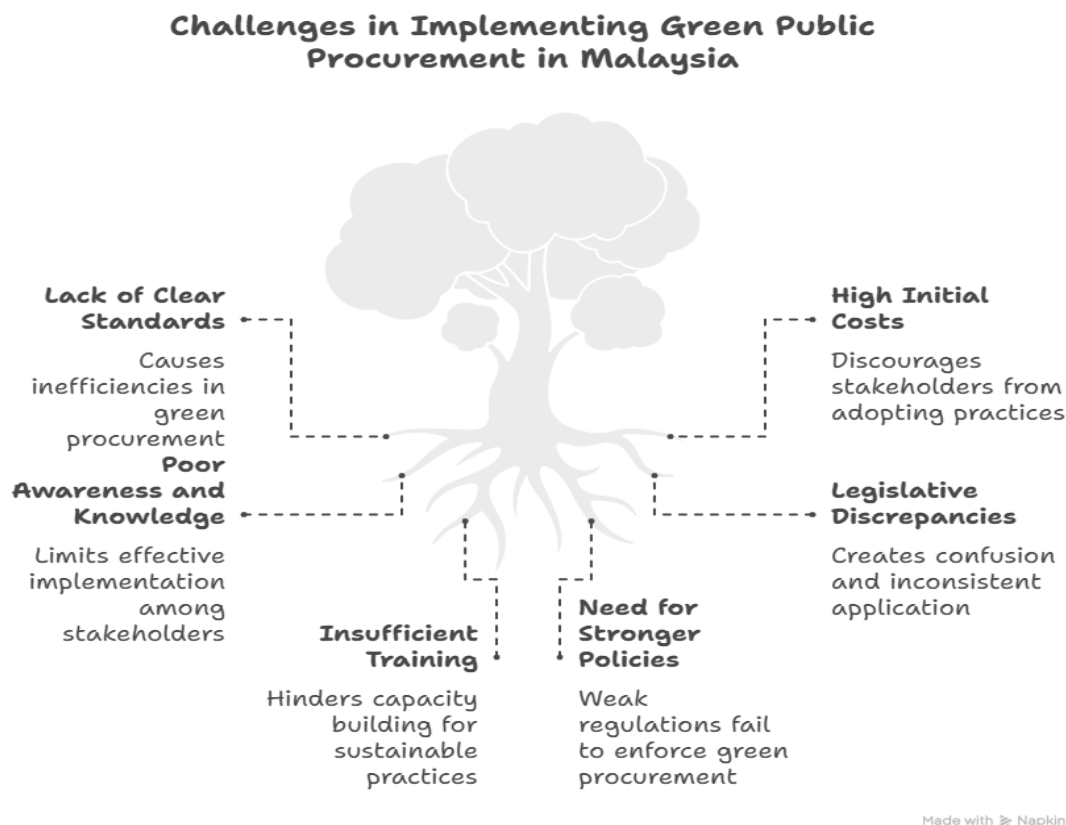


Diagram 1: Challenges in Implementation Green Public Procurement in Malaysia

Many people feel that Green Public Procurement (GPP) is essentially responsible for raising sustainability in public sector procurement. Still, its execution comes with difficulties. Research done in Malaysia and Indonesia reveal that major obstacles to the general acceptance of environmentally friendly products are related to their upfront costs (Razak et al., 2020; Setiawan et al., 2021). Moreover, even if many countries are

creating laws enabling GPP, variations in policy creation and actual execution frequently result in inefficiencies (Tan et al., 2019). Many impoverished nations find it more difficult to add sustainability into procurement decisions without mandated rules for green procurement (Hussin & Ismail, 2020). Lack of defined regulatory frameworks implies public bodies might not have the motivation or need to offer top priority in acquiring environmentally friendly solutions. There are important issues about how organizational characteristics affect the performance of Green Public Procurement (GPP) programs. Effective adoption of green procurement standards in governmental institutions apparently depends on high-level executive backing (Gupta & Arora, 2021). Many businesses still lack the required will of leadership to encourage environmentally friendly purchasing behaviour. Adoption of interdepartmental collaboration is hampered by its complexity and resistance to change from conventional procurement techniques. Public agencies' unclear policies and lack of responsibility systems compound the issue by making procurement staff unwilling to include environmental aspects into purchasing decisions.

Still one of the main challenges to GPP acceptance is budgetary constraints. Studies from Slovakia and Bulgaria reveal that public contracting agencies often suffer financial constraints, so complicating the explanation of the higher initial pricing related with green goods and services (Nováková et al., 2022; Petrov & Dimitrov, 2020). Often stressing cost, procurement choices favour the lowest bidder above an assessment of long-term economic, social, and environmental advantages (Stoilova & Markov, 2021). Moreover, many procurement managers are not aware of alternative evaluation criteria, including life-cycle cost, which could help to choose environmentally friendly solutions.

These financial and informational constraints create a loop whereby green procurement is anomalies rather than the standard. Weak legal systems and inappropriate administrative capability complicate the GPP operation even more. Many countries have policies supporting green procurement; nonetheless, their impact is restricted by the absence of legally mandated restrictions (Razak et al., 2020). Usually lacking the required institutional knowledge and qualified staff to correctly utilize Green Public Procurement (GPP), public organizations are the complexity of sustainability criteria leads to less acceptance rates and inadequate direction for procurement authorities. Many public procurement experts find it challenging to include green elements into their purchase decisions without organized training programs and ongoing knowledge-sharing efforts (Hussin & Ismail, 2020).

Notwithstanding these limitations, there are chances for development particularly in terms of market expansion, capacity building, and innovation. Studies reveal that developing nations like India could employ GPP as a stimulus for technical innovation and commercial expansion (Gupta & Arora, 2021). Meeting this demand for thorough planning including stakeholders, supporting first research projects to ensure that sustainability criteria complement market reality. Cooperation between public and private sector groups is promoted as public awareness increases, and comprehensive support systems using GPP help to balance financial sustainability with environmental aims. Future studies should look at case studies of successful GPP implementations in order to find best practices able to enhance the drafting of policies.

Implementation Strategies

Public sector procurement supports Green Public Procurement (GPP) by means of many sustainability-promoting activities. Including Environmental Performance Criteria (EPC) into procurement processes helps one to connect purchasing decisions with goals of environmental policy (Andersen et al., 2020). During contract award processes, EPC assists procurement managers in choosing vendors with strong environmental commitments—including lower carbon emissions, resource efficiency, and sustainable product designs—by means of their performance. This strategy motivates businesses to develop and implement eco-friendly industrial methods as well as promotes sustainability. Effective deployment of EPC depends on the knowledge of procurement personnel and the availability of standardized evaluation tools to provide objective assessment of environmental performance.

In some nations, green public procurement has been effectively implemented into national laws and regulatory structures. Norway has developed Green Public Procurement (GPP), a national policy (Johansen & Kristiansen, 2021) by giving ethical and environmental issues top attention through laws and government projects. The

Norwegian government has legislated green procurement as a legal obligation, therefore promoting its wide implementation in many different spheres. This legislative approach demonstrates how strong government commitment and policy execution can help to achieve methodical transformation in public procurement. The effectiveness of these initiatives depends on continuous observation and adaptation to manage changing market dynamics and new environmental issues. By adding environmental criteria into their procurement decisions, local governments greatly assist to use Green Public Procurement (GPP).

Municipalities—as main consumers of products and services—can promote sustainable consumption and production by means of ecologically conscious procurement policies (Martínez & Delgado, 2022). Studies indicate that application of municipal level green standards reduces costs, improves efficiency, and enhances social and environmental effects. First priority local governments who provide eco-labeled office equipment and energy-efficient infrastructure projects serve to promote long-term sustainability and concurrently reduce running expenses. Usually, public support, government dedication, and resource availability determine the degree of Green Public Procurement (GPP) of localities.

Although GPP has numerous advantages, some problems compromise its suitable use. Studies reveal that main obstacles include poor understanding and training, inconsistent policy goals, and inadequate national initiatives to encourage green procurement (Kumar et al., 2023; Petrović & Ivanov, 2022). Many times, grappling with comprehending environmental needs and life-cycle costing techniques, procurement professionals generate inconsistent implementation of sustainable standards. Moreover, introducing GPP into daily operations depends on fostering an organizational culture that accords ethics, professionalism, and sustainability first importance. Countries that invest in knowledge-sharing initiatives, capacity-building projects, and standardized training for procurement specialists typically have high degrees of compliance and improved results for the surroundings. Still, there are challenges to GPP's acceptability including administrative inefficiencies, budgetary constraints, and questions over probable supplier bias. When making procurement decisions, many government organizations give the lowest price criterion top attention; so, often, less sustainable, less priced items and services are adopted (Hansen & Larsen, 2021). Legal uncertainty and questions about supplier exclusion could also deter procurement agencies from enforcing rigorous environmental criteria.

Dealing with these difficulties calls for a methodical approach considering legal clarity in procurement procedures, administrative competence, and financial feasibility. Governments should provide incentive programs like tax breaks or subsidies to support green procurement and protect fair competition among suppliers. Expanding GPP as a key procurement approach depends on enhancing institutional frameworks, promoting openness, and motivating public-commercial sector cooperation.

Sustainability

Reducing the environmental effect of purchased products and services makes green public procurement (GPP) extremely important in bringing sustainability concepts into public procurement practices. Green Public Procurement (GPP) is a key instrument for policy development since it drives governments to give environmentally sustainable goods, services, and suppliers top priority, therefore including sustainability into the decision-making process (Smith et al., 2021). Especially those concerning responsible consumption and production (SDG 12) and climate action (SDG 13), this approach meets the Sustainable Development Goals (SDGs) embraced by the United Nations. Still, various regulatory frameworks, budgetary restrictions, and administrative difficulties keep GPP from being used in many other sectors from being realised in spite of its potential.

A significant gap in GPP implementation is defined by insufficient policies addressing the Triple Bottom Line (TBL) of sustainability—environmental, social, and economic dimensions—defines (Adebayo & Yusuf, 2020). Studies carried out in Nigeria reveal that contemporary procurement practices give cost-efficiency first priority, therefore neglecting social and environmental aspects. Clear sustainability indicators are crucial in a well-ordered GPP system to make sure procurement choices support social welfare, long-term environmental stability, and economic resilience. Many Sub-Saharan African nations lack robust enforcement mechanisms, which limits GPP program capacity to fulfil sustainability targets. Including life cycle analysis (LCA) into

purchase choices is what defines sustainable procurement. From the purchase of raw materials to disposal, LCA assesses the total lifecycle environmental effect of goods and services (Eze et al., 2021). Studies reveal that public procurement—especially in underdeveloped nations—does not apply Life Cycle Assessment. Lack of comprehensive life-cycle costing methods results in public businesses often prioritizing immediate cost reductions above long-term sustainability benefits, therefore affecting procurement decisions that might finally have more financial or environmental impact. By evaluating and lowering the total environmental impact of procurement decisions, improving Life Cycle Assessments (LCA) application in Green Public Procurement (GPP) will considerably enhance sustainable procurement practices.

In the European Union (EU), where green procurement policies are included into comprehensive environmental and economic systems (Müller & Richter, 2022), the financial repercussions of Green Public Procurement (GPP) have been thoroughly investigated. Studies reveal that GPP enhances sustainability, drives innovation, enables businesses obeying environmental rules to embrace green technologies, and increases market competitiveness among others. Many underdeveloped countries find it difficult to balance financial sustainability with environmental goals. Restricted financial resources frequently cause governments to give cost-effectiveness top priority over social and environmental advantages, therefore hindering the general acceptance of green buying techniques.

The requirement of strategic sustainability approaches and innovative ideas is underlined by many difficulties still preventing GPP from being properly implemented despite present rules and regulations (N Nguyen & Patel, 2023). Many nations exhibit institutional inertia, poor knowledge, and opposition to change in procurement methods. By means of capacity-building projects, encouragement of multi-stakeholder cooperation, and government incentives to support sustainable procurement decisions, overcoming these issues could help. By means of strengthening legislative frameworks, enhancing openness in procurement procedures, and encouraging public-private partnerships, sustainability may be further included into government procurement policies thereby guaranteeing continuing environmental, social, and financial gains.

Topic Experts

Particularly in Malaysia, green public procurement (GPP) is a major instrument for introducing sustainability into public procurement systems; expert subject matter notes and analysis also help to accomplish this. Ishak and Thiruchelvam's (2023) research underscores the increasing relevance of sustainable innovations in public sector procurement, therefore stressing the need of include environmental and social value factors in procurement decision-making. These concepts are progressively acknowledged as essential to fit public procurement policies with Malaysia's Sustainable Development Goals (SDGs). A thorough adoption is challenging since some procurement policies still give cost first importance over long-term environmental advantages.

Real social, financial, and environmental benefits offered by GPP policies demand a comprehensive awareness of sustainable procurement technology. Mostly, institutional support and policy coherence help to avoid the implementation of sustainable procurement policies. Ishak et al. (2023) contend that although Malaysia has improved in integrating sustainability aspects in public bids, the lack of a clear framework for assessing green procurement performance causes considerable challenges. Regularly finding it challenging to incorporate life-cycle costing (LCC) and environmental performance criteria (EPC) into procurement assessments, public agencies therefore limit their capacity to make fully informed sustainable procurement decisions. Dealing with this difference demands for regulations ensuring the intentional integration of sustainability components into procurement at all levels of government and initiatives for capacity-building.

Green Public Procurement (GPP) may be used successfully only if social value is included into building industry decisions in Malaysia. Alias (2023) stresses the significance of adding social sustainability elements into public sector projects including ethical labour standards, community welfare, and fair resource distribution. Given its significant contribution to carbon emissions and environmental damage, the building industry obviously has an obligation to back projects for sustainable procurement. Often the sector opposes change since conventional procurement processes that offer rapid cost reductions give more importance than long-term environmental advantages. Aligning the sector with Malaysia's primary sustainability objectives calls for

supporting ethical procurement practices, green building standards, and sustainable materials.

Notwithstanding these limitations, sustainable procurement systems show enormous potential for environmental conservation as well as financial development. Inspired vendors to innovate and meet rigorous environmental criteria, Thiruchelvam (2023) shows that carefully carried out green procurement regulations can increase market competitiveness. This change benefits public institutions by so promoting an increasing green economy that generates new economic possibilities by reducing long-term waste management costs and resource inefficiencies. If they are to accurately evaluate green procurement recommendations, procurement experts must have great technical knowledge and tools. Moreover, cooperation across government agencies, companies, and academic institutions can help to efficiently deploy procurement strategies with an eye towards sustainability.

The GPP and sustainability link in Malaysia is influenced by legislative advancements, institutional preparation, and industry involvement. Studies by Ishak, Thiruchelvam, and Alias offer perceptive analysis of the prospects and challenges of sustainable procurement, systematic policy execution, improved administrative capacity, and a movement towards long-term sustainability planning in procurement decisions. Still much needed is a change towards long-term sustainability planning in procurement decisions. Essential first stages towards fulfilling GPP's complete potential in Malaysia are strengthening regulatory structures, increasing environmental and social consciousness, and motivating innovation in sustainable procurement methods. Green procurement systems must always be improving under research and policy development so that sustainability remains a fundamental component of public sector procurement plans.

Themes

Academic discussions have sometimes concentrated on the challenges and possibilities connected to the application of Green Public Procurement (GPP), therefore stressing the general knowledge of GPP's ability to foster sustainability in numerous spheres. Studies demonstrate that although GPP regulations strive to encourage environmentally responsible procurement, their execution is generally impeded by financial restrictions, poor enforcement systems, and a lack of technical expertise among procurement experts (Ishak & Thiruchelvam, 2023). Absence of standardized green criteria and the predominance of traditional procurement methods giving cost reduction above long-term sustainability benefits top priority explain the irregular application of Green Public Procurement (GPP) concepts in public administration, healthcare, and construction (Alias, 2023). Still, legislation changes, programs for capacity-building, and more stakeholder involvement help to address issues (Thiruchelvam, 2023). Governments will be able to assist GPP to be more efficient and enable a better change to sustainable public procurement approaches by tackling these problems.

Green Public Procurement and Corporate Innovation (Consistent Theme)

In sustainability studies, the intersection of Green Public Procurement with business innovation is a recurrent issue. Studies reveal that GPP regulations promote eco-innovation, which drives companies to create ecologically friendly products and approaches to fulfil procurement standards (Ishak et al., 2023). This change to sustainability enhances not only more general environmental goals such resource efficiency and the reduction of carbon footprints (Thiruchelvam, 2023) but also a company's economic benefit as Clearly expressed legislative frameworks, incentives for the creation of environmentally friendly products, and rigorous monitoring systems (Alias, 2023) determine the efficacy of GPP in fostering enterprise innovation. Green criteria included into procurement policies and financial or non-financial incentives provided by governments serve to promote a culture of sustainable innovation, therefore facilitating the general acceptance of environmentally friendly products and solutions.

Sustainability Metrics in Green Public Procurement (Rising Theme)

Circular economy concepts, carbon footprint analysis, and life-cycle assessments (LCA) are now under more and more relevance in procurement evaluations even if cost efficiency has long dominated procurement performance assessments (Ishak et al., 2023). Designing consistent measuring systems appropriate for numerous procurement scenarios while ensuring practicality and feasibility presents a difficulty (Alias, 2023).

Recent studies suggest that cooperation among governmental agencies, academic institutions, and industry stakeholders can improve these indicators, therefore guaranteeing that GPP decisions are based on detailed sustainability assessments rather than fleeting economic considerations (Thiruchelvam, 2023).

Digital Transformation in Public Procurement (Rising Theme)

A significant development in public procurement is the digital revolution. Green Public Procurement (GPP) is progressively including digital technologies and artificial intelligence (AI), therefore pointing a new path in discussions on sustainable procurement. Using e-procurement technology, blockchain for supply chain openness, and AI-driven data analysis (Ishak & Thiruchelvam, 2023) is helping green procurement processes to become accountable and efficient. Real-time data enables procurement managers to monitor supplier compliance with sustainability requirements, spot greenwashing tactics, and enhance procurement decisions by means of which these technologies help (Alias, 2023). While digital transformation offers chances for increased efficiency, issues including cybersecurity concerns, opposition to technology change, and major implementation costs have to be minimized if public sector procurement is to be smoothly adopted (Thiruchelvam, 2023).

Ethical and Social Considerations in GPP (Novel Theme)

Integration of social and ethical sustainability elements into procurement strategies is a developing but always more important issue for GPP study. While environmental sustainability is a core concern, modern debate underlines the need of including fair employment standards, human rights safeguards, and social value creation into public procurement processes (Alias, 2023). GPP rules in Malaysia increasingly rely on social impact components, which drives procurement officials to give companies displaying ethical business practices first priority so promoting workforce diversity (Ishak & Thiruchelvam, 2023). This shift highlights a broad perspective of sustainability that transcends environmental concerns since the building of long-lasting sustainable development depends equally on social fairness and economic inclusion (Thiruchelvam, 2023).

The concepts emerging from Green Public Procurement underline the dynamic development of sustainable procurement practices. Recurring themes include the challenges of GPP implementation and their relevance in business innovation attract attention to ongoing issues needing regular legislative improvement and major industry participation. Simultaneously, sustainability programs and digital transformation draw attention to the requirement of sophisticated processes and technological integration to raise procurement efficiency. The emphasis on ethical and social issues indicates a shift towards a more whole knowledge of sustainability, therefore ensuring that GPP policies guarantee social justice as well as environmental well-being. Dealing with these issues and realizing the full prospects of Green Public Procurement will rely on future cooperation among governments, commercial businesses, and research institutes.

CONCLUSION

This article underlines the evolving dynamics of Green Public Procurement (GPP) and their relevance in enhancing sustainability inside public sector procurement. Important findings reveal that although GPP is a useful instrument for promoting environmental stewardship, its application is frequently impeded by financial restrictions, insufficient understanding, and resistance to change. Growing relevance of GPP in establishing sustainable procurement strategies is shown by its power to drive business innovation, support sustainable product creation, and include ethical and social considerations. Furthermore, innovative concepts such as digital transformation and sustainability assessments draw attention to the growing complexity of procurement rules, therefore stressing the requirement of open data-driven decision-making.

This study increases knowledge of sustainable procurement by addressing the confluence of environmental policies, corporate ingenuity, and social responsibility. Sustainability refers to ethical, financial, and environmental as well as other aspects. The results align with institutional theory since they illustrate how regulatory surroundings and outside elements affect organizational behaviour on the acceptance of sustainable practices. The study supports the resource-based view (RBV) paradigm by demonstrating that businesses implementing green procurement strategies could generate a competitive edge by means of environmental

innovation and resource economy. This report will notably be very valuable to policy makers, procurement managers, and industry actors. Enhancing GPP policies demands for a clear legislative framework, stronger training programs, and financial incentives to help with more general use.

Block chain technology and artificial intelligence-enhanced procurement systems boost openness and responsibility together with other digital advances, therefore lowering the dangers of green washing and inefficiencies. Moreover, adding social sustainability criteria into GPP rules—such as fair employment practices and community development projects—will help to give a more all-encompassing and equitable way of sustainable procurement. Still, this study has restrictions even if it has merits. One important limitation is the emphasis on particular sectors and geographical areas, therefore restricting the usefulness of outcomes in many environments. Furthermore, obtaining real-time procurement data restricts the capacity for long-term longitudinal studies on the evolution of GPP policies over time. The study also depends on current material, which although beneficial could not fairly depict the most recent advancements in industry or regulatory changes.

Future research should incorporate comparative studies of other nations and sectors to evaluate how various regulatory systems affect GPP performance. Moreover, long-term studies might offer significant fresh angles on the continuous advantages and challenges associated to GPP acceptance. Future research should examine how recently invented technologies—such as artificial intelligence and large data analytics—might influence environmentally friendly buying behaviour. Empirical studies assessing the social, environmental, and financial impacts of GPP policies promptly are needed by legislators and businesses wishing to apply more sustainable procurement practices. Encouragement of ethical business practices, innovation, and environmental sustainability rely on green public procurement—an absolutely essential instrument. Authorities and corporate leaders have to overcome present challenges, utilize technical advancements, and develop a comprehensive strategy including social, economic, and environmental issues if they are to completely fulfil their potential. Long-term sustainable development objectives so could find support in public procurement.

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