GreenSharia: Journal of Islamic and Business for Sustainability
E-ISSN: 3123-2175
https://journal.ekantara.com/greensharia

SUSTAINABLE SUPPLIER PERFORMANCE EVALUATION WITHIN A GREEN ISLAMIC PROCUREMENT FRAMEWORK: AN ANALYTICAL HIERARCHY PROCESS APPROACH

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Article Information
Submitted Month xx, 20xx
Revised Month xx, 20xx
Accepted Month xx, 20xx

Keywords:
Analytical Hierarchy Process, Performance Evaluation, Suppliers

How to cite (**APA 7th Style**): Last Name, First Name. (Year). Article Title. Journal Name, Volume (Number), Pages. DOI Link.

E-ISSN: 3123-2175

Published by: CV. Eureka Artha Nusantara

Abstract

This study aims to develop a sustainable supplier performance evaluation model within a Green Islamic Procurement framework by integrating environmental sustainability and Islamic ethical principles into the decision-making process. The research adopts the Analytical Hierarchy Process (AHP) as the primary method. The selection of AHP is based on its ability to structure complex multi-criteria decision problems hierarchically, incorporate both qualitative and quantitative criteria, and generate objective priority weights through systematic pairwise comparisons supported by expert judgment. The evaluation model consists of six main criteria: Flexibility and Response, Compliance with Purchase Order/Contract, Price, Product Quality, Environmentally Friendly and Sustainable Principles, and Experience and Expertise. Sustainability considerations are embedded through environmental responsibility indicators aligned with Islamic values of accountability (amanah) and public benefit (maslahah). The results indicate that Flexibility and Response (20.8%) and Compliance with PO/Contract (20.6%) are the highest priority criteria, followed by Price (18.2%), Product Quality (16.4%), Environmentally Friendly and Sustainable Principles (16.2%), and Experience and Expertise (7.7%). The final ranking shows Supplier PB2 as the main supplier (0.388), followed by Supplier PB3 (0.327) and Supplier PB1 (0.285). The findings demonstrate that AHP provides a structured and transparent decision-making framework capable of integrating sustainability considerations within Green Islamic Procurement practices, thereby supporting responsible and value-based supply chain management.

INTRODUCTION

Suppliers are a fundamental element in the supply chain, significantly impacting the procurement process for goods or services. Mistakes in selecting suppliers can disrupt a company's operations (Rodrigues et al., 2022). Suppliers play a vital role in the supply chain, and a company's performance is influenced by their presence. Therefore, supplier evaluation must be conducted carefully and accurately, as this is a strategic activity within the company (Sivanagaraju Pitchaiah et al., 2021). Furthermore, selecting the right supplier can contribute to cost reductions and service improvements, which in turn strengthens a company's competitiveness (Abuzaid et al., 2024). Competition between companies is increasingly fierce, driven by ever-increasing technological advancements and developments (Parthiban et al., 2012). Companies conduct research and development in various areas, from production planning and raw material procurement to new product design and financial analysis. Given this, a company desperately needs efficiency across multiple aspects to increase production output and profits by maximizing costs (Bali & Amin, 2017; İnan & Bağlan, 2025).

Managing suppliers can provide significant and measurable benefits to a company. A number of supporting policies and procedures are required, including those related to the supplier performance assessment process (Bajaj, 2018). Supplier performance assessment is an important tool that can be used in the post-contract phase to assess supplier effectiveness (Yadav & Sharma, 2016). There are many benefits to conducting supplier performance assessments, including ensuring that suppliers maintain their capacity and capability to supply goods, continuously monitoring performance in terms of cost, quality, and delivery, and enhancing communication between suppliers and buyers to create improvement initiatives (Chettri et al., 2020). In general, designing a supplier performance assessment model requires determining the performance measures or criteria to be used (Verdecho et al., 2010).

Selecting the right supplier or properly assessing supplier performance can speed up a company's entire production process, produce quality products, and generate profits (Saaty, 1990). Incorrectly selecting or assessing suppliers can negatively impact the entire supply chain, financial performance, and operational performance of a company (Huang, 2019). Properly selecting or assessing suppliers can significantly reduce raw material purchasing costs and improve a company's competitiveness. Suppliers are a crucial part of the supply chain, significantly impacting a company's survival. Selecting the wrong supplier can disrupt a company's operations, but selecting the right supplier can significantly reduce purchasing costs, increase market competitiveness, and increase end-user satisfaction (Luthra et al., 2017).

The supplier selection process is a decision-making process that must be carried out in a structured manner. Decision-making through a structured method involves clear steps, resulting in a focused decision that finds the right solution to achieve the goal (Gardas et al., 2019; Streimikis et al., 2024). In this case, a lack of decisiveness in the decision-making process can lead to inappropriate supplier selection, which can lead to the selected supplier being less responsible in meeting demand, resulting in the risk of stockouts and longer lead times than agreed (Govindan et al., 2015). Therefore, companies with a wide range of suppliers need to utilize careful selection when selecting suppliers. To find the right supplier, a sound and structured evaluation and selection system is required (Brunelli, 2015; Yusof & Salleh, 2013). Supplier performance evaluation using the Analytical Hierarchy Process (AHP) is a systematic approach to determining the best supplier by breaking down the problem into objective levels, criteria (quality, price, delivery), sub-criteria, and supplier options (Tramarico et al., 2025). Next, each element is weighted through pairwise comparisons to assign a final numerical priority, allowing for objective decisions based on logic and systematic expert judgment (Rajiev et al., 2021).

The role in the procurement of goods and services has a very important importance, where the percentage of expenditure can reach 40%-70% of the total cost of the final product. This shows that if procurement can be optimized, it will make a significant contribution to increasing the company's profitability. A structured method that can be applied in the decision-making process involving various criteria and choices is the Analytical Hierarchy Process (AHP) method (Morssi, 2021). The Analytical Hierarchy Process (AHP) method is one of the most comprehensive systems that is considered effective in making decisions based on many criteria, because this approach allows for hierarchical problem structuring and believes that a combination of numerical and non-numerical criteria can be applied (Al-Harbi, 2001; Saaty, 2008). The Analytical Hierarchy Process (AHP) is a planned and time-saving method that is able to show the priority order of selected suppliers (Gegovska et al., 2020).

The assessment methods used by some companies produce similar total scores for each supplier. This similarity in total scores makes it impossible to directly determine the relative rankings among suppliers. Furthermore, the weighting of each criterion has not been assigned. This potentially creates risks, namely uncertainty or hesitation in supplier selection (Handfield et al., 2002; Ho et al., 2010). Given this situation, the authors identify strategic challenges faced by some companies, particularly in supplier selection procedures. Therefore, improvements are needed to the supplier evaluation method as a decision support system in the selection process to make it more effective and organized (Humphreys et al., 2003).

Traditional supplier selection has prioritized economic and operational criteria, such as price, quality, flexibility, and delivery performance, but in an increasingly globalized business environment, these criteria are no longer sufficient (Wahyudi, 2025). Companies face mounting pressure to integrate sustainability considerations, including environmental responsibility and ethical practices, into procurement decisions. The surge in research on sustainable supplier selection and procurement reflects this shift, emphasizing that procurement decisions should align with both economic goals and environmental and social impacts to achieve long-term value creation and corporate sustainability commitment (Özkan & Başlıgil, 2011).

Recent studies demonstrate that incorporating green and sustainability-oriented criteria into supplier evaluation improves firm performance and responsiveness to environmental regulations. For example, the influence of both green and traditional supplier selection criteria on purchasing firms' performance confirms that environmental considerations increasingly shape procurement decisions in supply chain management (Abuzaid et al., 2024). However, these sustainability considerations have seldom been embedded within a decision-making framework that reflects ethical values tailored to specific economic paradigms, such as Islamic economic principles. Meanwhile, broader research on Islamic ethics and sustainability highlights the importance of values such as amanah (trust) and maslahah (public benefit) in guiding responsible supply chain practices, indicating a growing academic interest in ethical and sustainable supply chain frameworks (Mudrikah, 2025).

Despite progress in sustainable supplier selection research, gaps remain. Most models integrate sustainability superficially as additional criteria rather than establishing a coherent framework linking sustainability performance with ethical procurement principles. Furthermore, current supplier evaluation practices often produce similar final scores without clear prioritization of sustainability elements, creating ambiguity and strategic risk in decision making. Structured decision-making models are needed that not only differentiate supplier performance objectively but also ensure alignment with broader corporate values of environmental stewardship and ethical procurement (Wahyudi, 2025).

To address these gaps, this study adopts the Analytical Hierarchy Process (AHP) as the main methodological approach given its ability to systematically structure multi-criteria decision problems, integrate both qualitative judgments and quantitative priorities, and produce objective priority weights for competing alternatives. AHP has been widely utilized in supplier selection and performance evaluation research due to these strengths (Khulud et al., 2023). In this study, sustainability dimensions are explicitly embedded within the criteria hierarchy according to Green Islamic Procurement values combining environmental responsibility with ethical conduct consistent with Islamic economic principles.

Thus, the primary aim of this research is to develop a sustainable supplier performance evaluation model within a Green Islamic Procurement framework using AHP. By integrating environmental sustainability indicators and Islamic ethical values into the supplier evaluation process, this study seeks to provide a transparent, structured, and value-based decision support model useful for both academics and practitioners seeking to strengthen sustainable procurement practices.

METHODS

This study employs a descriptive approach using mixed methods, integrating qualitative data collection and quantitative analysis (Hosseini et al., 2019; Vaidya & Kumar, 2006). The initial phase is exploratory and qualitative, aimed at identifying supplier evaluation criteria and sub-criteria through in-depth interviews and literature reviews involving four expert respondents (purchasing managers and staff) selected via purposive sampling (Bai & Sarkis, 2010; Govindan et al., 2015; Harper & Winslett, 2006).

The second phase is quantitative, where the identified criteria are analyzed using the Analytical Hierarchy Process (AHP) analysis (Alidi, 1996; Govindan et al., 2013; Vaidya & Kumar, 2006). Expert judgments are converted into numerical data through pairwise comparison questionnaires. This quantitative data is then processed using Expert Choice software to generate priority weights for the criteria, sub-criteria, and the ranking of alternative suppliers (Chai et al., 2013). Thus, this study is essentially an application of the AHP method, preceded by a preliminary study to formulate the criteria framework (Ajzen, 1991; Chakraborty et al., 2023; Taherdoost & Madanchian, 2023).

In the initial qualitative phase, the study aimed to identify and structure supplier evaluation criteria aligned with sustainability dimensions and Green Islamic Procurement principles. Data were collected through in-depth semi-structured interviews with four expert participants selected using purposive sampling (Govindan et al., 2013). The participants consisted of one purchasing manager and three senior purchasing staff members who are directly involved in supplier selection and evaluation processes. The selection criteria required participants to have at least three years of experience in procurement decision-making and direct involvement in evaluating supplier performance (Prastyantoro et al., 2024). Interview questions explored traditional operational criteria such as price, quality, flexibility, and delivery reliability, as well as sustainability-related aspects including environmentally friendly materials, compliance with environmental standards, contract adherence, and accountability consistent with Islamic ethical values. Qualitative data were analyzed using thematic content analysis involving data reduction, coding, categorization, and synthesis to generate a structured hierarchy of evaluation criteria and sub-criteria (H. Chen & Wang, 2025).

The second phase employed a quantitative approach using the Analytic Hierarchy Process (AHP) as a multi-criteria decision-making technique. The selection of AHP is based on its ability to decompose complex decision problems into hierarchical structures, convert qualitative expert judgments into quantitative priority scales, and generate objective weighting results (Saputro et al., 2023). Based on the criteria framework developed in the qualitative phase, structured pairwise comparison questionnaires were distributed to the same expert participants. Respondents assessed the relative importance of each criterion and sub-criterion using Saaty's 1–9 fundamental scale.

The AHP analysis procedure involved several systematic steps. First, the decision hierarchy was structured into three levels: the overall goal (sustainable supplier performance evaluation), evaluation criteria and sub-criteria, and supplier alternatives. Second, pairwise comparison matrices were constructed from expert responses. Third, eigenvector normalization was applied to calculate local priority weights. Fourth, the Consistency Index (CI) and Consistency Ratio (CR) were computed to evaluate the logical consistency of judgments, with a threshold of $CR \leq 0.10$ considered acceptable. Finally, global priority weights were synthesized to determine the final ranking of supplier alternatives (Wimalasena et al., 2025). All quantitative computations were processed using Expert Choice software to ensure accuracy in eigenvalue calculation, consistency testing, and priority aggregation.

By integrating qualitative exploration and quantitative AHP modeling, this study provides a structured and transparent approach to sustainable supplier performance evaluation within a Green Islamic Procurement framework.

RESULTS AND DISCUSSION

The determination of weights for criteria, subcriteria, and supplier alternatives was carried out using a structured pairwise comparison questionnaire based on the Analytical Hierarchy Process (AHP). Each respondent evaluated the relative importance of elements at every hierarchical level, including main criteria, subcriteria, and supplier alternatives. The judgments were quantified using Saaty's fundamental scale and subsequently aggregated using the geometric mean method to obtain a collective group assessment. This aggregation technique ensures that individual bias is minimized while preserving the proportional consistency of expert evaluations, thereby strengthening the reliability of the decision-making model.

The processed assessment data were analyzed using Expert Choice software to calculate local priorities, global weights, and consistency ratios (CR). The geometric mean values presented in the following tables represent the consolidated evaluations of all respondents at each level of the hierarchy. In addition to determining priority rankings, consistency testing was conducted to verify the logical coherence of pairwise comparisons. Only comparison matrices with CR values below the acceptable threshold of 0.1 were considered valid, ensuring that the resulting supplier rankings reflect a methodologically sound and statistically reliable evaluation process. These results provide the empirical basis for interpreting the relative importance of sustainability, operational performance, and economic criteria within the Green Islamic Procurement framework.

Table 1. Global Weight of Subcriteria and Weight of Main Criteria

Kriteria Utama/Subkriteria	Bobot
K1	**0,164**
K11	0,083
K12	0,058
K13	0,023
K2	**0,206**
K21	0,081
K22	0,047
K23	0,045
K24	0,033
K3	**0,077**
K31	0,042
K32	0,035
K4	**0,208**
K41	0,072
K42	0,078
K43	0,058
K5	**0,182**
K51	0,091
K52	0,054
K53	0,037
K6	**0,162**
K61	0,065
K62	0,042
K63	0,023
K64	0,033

The results of the identification of main criteria and sub-criteria show that there are 6 main criteria and 19 sub-criteria agreed by the respondents to be used in this study. For the main criterion of product quality (K1), the sub-criteria are conformity to the desired specifications (K11), ISO: 9001 certification (K12), and ISO: 45001 certification (K13). For the main criterion of compliance with PO/Contract (K2), the sub-criteria are on-time delivery (K21), delivery in the right quantity as needed (K22), keeping promises according to PO provisions (K23), and accurate and appropriate invoices according to PO (K24). For the main criterion of experience and expertise (K3), the sub-criteria are experienced in the field (K31) and having technical capabilities (K32). For the main criterion of flexibility and responsiveness (K4), the sub-criteria are service in the goods purchasing process (K41), handling problems regularly (K42), and assisting with procurement of goods in emergency conditions (K43). For the main price criterion (K5), the sub-criteria are competitive pricing (K51), price consistency (K52), and supplier payment terms (K53). The final main criterion is environmental friendliness and sustainability (K6), with sub-criteria being ISO: 14001 certification (K61), ISO: 50001 certification (K62), carbon footprint (K63), and waste management (K64) (Chen, 2005).

Grouping is done to facilitate respondents in conducting pairwise comparisons using the Analytical Hierarchy Process (AHP) method, and to minimize judgment errors that can lead to significant changes in priorities. If the number of elements is large, the relative priority of each element will be small, and errors can significantly change those priorities. However, if the number of elements is small and priorities are comparable, small errors will not significantly affect the order of responses, so the relative priorities remain approximately the same. For this to occur, the number of elements must be less than 10, so that the overall value of each element will be more than 10%, and therefore still relatively unaffected by an error of, for example, 1%. After determining the order of criteria and subcriteria, the authors presented the proposal to respondents for input.

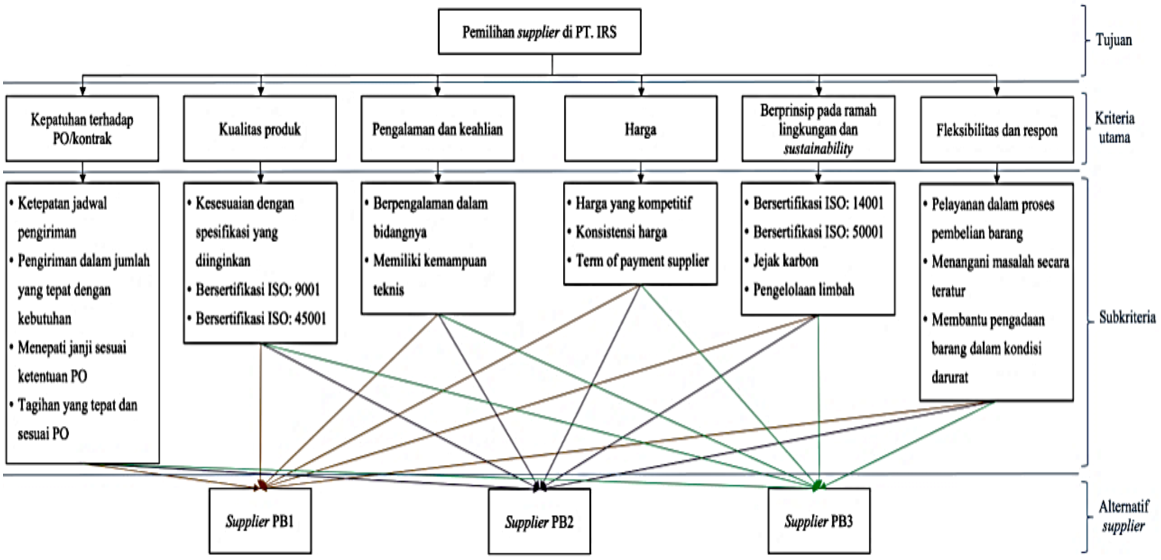

Figure 1. Supplier Selection Hierarchy Structure

The flexibility and responsiveness criterion (K4) has the highest weighting in supplier selection, namely 0.208 (20.8%), which makes it a very important criterion. The supplier's ability to adapt to changing needs, handle urgent requests, or resolve emerging issues is the aspect considered most crucial, as the company believes this can ensure the continuity of supply of goods. The second criterion is compliance with Purchase Orders (PO)/contracts (K2) with a weighting of 0.206 (20.6%). Suppliers who can fulfill the requirements in the agreed PO or contract will be the company's priority choice. Next, the price criterion (K5) is in third place with a weighting of 0.182 (18.2%). The company's assessment of the cost of products and services provided by suppliers compared to the value generated is the next consideration. The product quality criterion (K1) is in fourth place, with a weighting of 0.164 (16.4%).

This consideration relates to how well the offered product meets specified specifications, including durability, reliability, and performance. The fifth criterion relates to commitment to the environment and sustainability (K6), with a weighting of 0.162 (16.2%). Companies prefer suppliers who demonstrate a dedication to environmentally friendly practices and sustainability in their production and operational processes. The final criterion considered is experience and expertise (K3), with a weighting of 0.077 (7.7%). Companies assess suppliers' experience in the relevant industry and provide technical skills.

Subcriterion K11 (conformity to expected specifications) is the subcriterion with the highest global weight of 0.083 (8.3%) and is considered the most important subcriterion by three respondents. Subcriterion K12 (having obtained ISO: 9001 certification) with a global weight of 0.058 (5.8%) is considered the second most important subcriterion, while subcriterion K13 (having obtained ISO: 45001 certification) has a global weight of 0.023 (2.3%) and is the third most important subcriterion. Subcriterion K21, which is related to the accuracy of the delivery schedule, has the highest global weight of 0.081 (8.1%) and is considered the most important subcriterion according to the choices of three respondents. Subcriterion K22 (delivery in quantities according to needs) has a global weight of 0.047 (4.7%) and is the second most important subcriterion. Sub-criterion K23 (fulfilling commitments in accordance with the terms of the purchase order) has a global weight of 0.045 (4.5%) and is the third sub-criterion. Then, K24 (accurate and in-line invoices in accordance with the purchase order) is the final sub-criterion with a total weight of 0.033 (3.3%).

Subcriterion K31 (having experience in the field) is the most important subcriterion chosen by three respondents with a global weight of 0.042 (4.2%). Subcriterion K32 (having technical ability) with a global weight of 0.035 (3.5%) is the next most important subcriterion. Subcriterion K42 (solving problems regularly) has the highest global weight of 0.078 (7.8%) and is the most important subcriterion chosen by three respondents. Subcriterion K41 (service in the process of purchasing goods) with a global weight of 0.072 (7.2%) is the second most important subcriterion, while subcriterion K43 (assistance in procurement of goods in emergency situations) has a global weight of 0.058 (5.8%) making it the third most important subcriterion.

Based on the data processing results, subcriteria K51 (competitive pricing) ranks first with the highest global weight of 0.091 (9.1%), which is agreed by three respondents. The next position is followed by K52 (price consistency) with a weight of 0.054 (5.4%) and K53 (supplier terms of payment) of 0.037 (3.7%). Meanwhile, in other categories, K61 (ISO: 14001 certification) is the top priority with a weight of 0.065 (6.5%). The next order of importance is filled by K62 (ISO: 50001 certification) of 0.042 (4.2%), K64 (waste management) of 0.033 (3.3%), and K63 (carbon footprint) as the last subcriteria with a weight of 0.023 (2.3%).

Consistent testing of pairwise comparisons was conducted using Expert Choice to ensure the validity of the group assessments. The results of this test, which covered criteria, subcriteria, and supplier alternatives, are summarized in the table:

Table 2. Sub-criteria and Consistency Ratio of Criteria

Kriteria	Perbanding Berpasangan	Inkonsistensi
Kriteria utama	K1, K2, K3, K4, K5, K6	0,007
Subkriteria	K11, K12, K13	0,010
Subkriteria	K21, K22, K23, K24	0,020
Subkriteria	K31, K32	0,000
Subkriteria	K41, K41, K43, K45	0,006
Subkriteria	K51, K52, K53, K54	0,020
Subkriteria	K61, K62, K63, K64	0,010

Based on Table 4, the consistency ratio (CR) values for all pairwise comparisons were below the threshold of 0.1. This indicates that the group's assessment of the criteria and subcriteria met validity requirements and was deemed consistent.

Table 3. Subcriteria of Supplier Alternative Inconsistency Value

Perbanding Berpasangan	Inkonsistensi
Alternatif *supplier* terhadap K11	0,010
Alternatif *supplier* terhadap K12	0,010
Alternatif *supplier* terhadap K13	0,010
Alternatif *supplier* terhadap K21	0,010
Alternatif *supplier* terhadap K22	0,000
Alternatif *supplier* terhadap K23	0,010
Alternatif *supplier* terhadap K24	0,000
Alternatif *supplier* terhadap K31	0,000
Alternatif *supplier* terhadap K32	0,001
Alternatif *supplier* terhadap K41	0,010
Alternatif *supplier* terhadap K42	0,010
Alternatif *supplier* terhadap K43	0,010
Alternatif *supplier* terhadap K51	0,000
Alternatif *supplier* terhadap K52	0,000
Alternatif *supplier* terhadap K53	0,000
Alternatif *supplier* terhadap K61	0,000
Alternatif *supplier* terhadap K62	0,000
Alternatif *supplier* terhadap K63	0,000
Alternatif *supplier* terhadap K64	0,000

From the interview process, the company has three supplier options to meet the needs of plastic bags and rolls used as packaging materials. The three suppliers are Supplier PB1, Supplier PB2, and Supplier PB3. To evaluate supplier performance, the company uses several criteria, namely product quality, accuracy in delivery, experience in their field, service during the purchasing process, technical capabilities, the ability to assist with procurement of goods in emergencies, fulfilling agreements written in purchasing documents, making invoices on time, sending goods in quantities according to needs, handling problems regularly, and having ISO certification (9001, 14001, 45001, 50001).

To determine the main criteria and sub-criteria to be used in evaluating supplier performance in this study, the author referred to the criteria used by the company and considered these criteria based on existing reference books. In general, the criteria used in evaluating supplier performance include aspects such as quality, timeliness, flexibility, and price. After reviewing the list of criteria used by the company, the author found that several criteria had not been used as a basis for evaluating supplier performance despite their importance. The criteria not yet included in the supplier performance assessment were flexibility and price. These two criteria were then added to the author's proposed criteria.

Table 4. Subcriteria of Supplier Weight

Kriteria Utama/ Subkriteria	Bobot	Supplier PB1	Supplier PB2	Supplier PB3
K1	**0,164**			
K11	0,083	0,014	0,030	0,038
K12	0,058	0,030	0,009	0,019
K13	0,023	0,008	0,004	0,012
Jumlah bobot K1		**0,051**	**0,044**	**0,069**
K2	**0,206**			
K21	0,081	0,021	0,043	0,017
K22	0,047	0,016	0,016	0,016
K23	0,045	0,021	0,017	0,008
K24	0,033	0,011	0,011	0,011
Jumlah bobot K2		**0,069**	**0,086**	**0,051**
K3	**0,077**			
K31	0,042	0,014	0,014	0,014
K32	0,035	0,004	0,022	0,009
Jumlah bobot K3		**0,018**	**0,036**	**0,023**
K4	**0,208**			
K41	0,072	0,012	0,033	0,026
K42	0,078	0,013	0,036	0,029
K43	0,058	0,006	0,038	0,014
Jumlah bobot K4		**0,031**	**0,108**	**0,069**
K5	**0,182**			
K51	0,091	0,030	0,030	0,030
K52	0,054	0,018	0,018	0,018
K53	0,037	0,012	0,012	0,012
Jumlah bobot K5		**0,061**	**0,061**	**0,061**
K6	**0,162**			
K61	0,065	0,022	0,022	0,022
K62	0,042	0,014	0,014	0,014
K63	0,023	0,008	0,008	0,008
K64	0,033	0,011	0,011	0,011
Jumlah bobot K6		**0,054**	**0,054**	**0,054**
Jumlah bobot		**0,285**	**0,388**	**0,327**

Based on the data in the table, all Consistency Ratio (CR) values for comparing supplier alternatives against sub-criteria are below 0.1. This demonstrates that the group assessments given at the alternative level have met the consistency criteria.

The next step after determining local priorities and testing consistency is to calculate the total priority as the basis for decision-making. This calculation is performed by multiplying the local alternative weights against the sub-criteria by the global weights for each sub-criteria, as presented in the following table:

Based on the table, supplier PB2 received the highest weighting of 0.388, ranking first. Supplier PB3 came in second with a weighting of 0.327, followed by supplier PB1 in third with a weighting of 0.285. These results indicate that supplier PB2 is the best partner, best meeting the company's criteria for plastic bag and roll procurement. Therefore, supplier PB2 is the top priority, while suppliers PB3 and PB1 are the second and third alternatives, respectively.

The analysis shows that flexibility and responsiveness are the most crucial criteria, with a weighting of 0.208, followed by compliance with purchase orders/contracts (0.206), price (0.182), product quality (0.164), environmental friendliness (0.162), and experience and expertise (0.077). Based on the AHP method, Supplier PB2 was determined as the best vendor for plastic bags and rolls with the highest weight of 0.388, followed by Supplier PB3 (0.327) and Supplier PB1 (0.285).

This study presents a measurable framework for companies in balancing performance and sustainability to strengthen long-term relationships and supply quality.

In addition, the company also implements sustainability and environmental principles, which are part of its supplier policies, as outlined in its supplier policy document. In the document, the company stated that it expects suppliers to commit to sourcing and maintaining competitive goods and services while ensuring that those goods and services are sourced from resources that do not harm human rights, safety, or the environment. This principle can be implemented through green procurement, which is part of the green supply chain.

In this context, green procurement adheres to the principles of sustainability and the environment, selecting suppliers committed to the environment and raw materials that do not negatively impact the environment. The company already has several criteria related to green procurement principles, namely suppliers who are ISO 14001 and ISO 50001 certified. The goal is to ensure that supplier performance evaluations pay more attention to sustainability and environmental principles. Therefore, the author believes a specific set of criteria related to this is necessary. Additional criteria established are the principles of environmental friendliness and sustainability, carbon footprint, and waste management. Furthermore, the author grouped the criteria by considering the relationships between them to determine the main criteria and sub-criteria.

The findings of this study demonstrate that flexibility and responsiveness emerged as the highest priority criterion in supplier evaluation, followed closely by compliance with purchase orders and price considerations. This result is consistent with recent sustainable supply chain research published in Sustainability, which emphasizes that supplier agility and adaptive capacity are critical determinants of operational resilience in green procurement systems (H. Chen & Wang, 2025; Karakoç et al., 2023). These studies argue that environmental integration does not eliminate operational priorities; rather, it complements them. The present research confirms this argument by empirically showing that sustainability-oriented procurement still prioritizes responsiveness to ensure supply continuity.

Furthermore, the relatively high weight assigned to competitive pricing and product conformity reflects the persistence of economic rationality within sustainable procurement decisions. This finding aligns with (Abuzaid et al., 2024), who conclude that combining traditional and green supplier selection criteria improves overall firm performance rather than substituting cost with environmental variables. Similarly, a bibliometric review in Logistics (Khulud et al., 2023) highlights that most recent MCDM-based supplier evaluations adopt an integrated triple-bottom-line approach. The present findings reinforce this integrated model, where environmental sustainability (0.162) holds strategic significance without overriding economic feasibility.

Regarding environmental subcriteria, ISO 14001 certification received higher weighting than carbon footprint measurement, suggesting that formal environmental management systems remain a dominant institutional signal in supplier evaluation. This pattern is consistent with recent green supplier selection models using AHP and hybrid approaches, which often employ ISO certification as a measurable proxy for sustainability performance (H. Chen & Wang, 2025; Wimalasena et al., 2025). Scientifically, this indicates that while carbon accountability is recognized, its quantitative integration into procurement decisions remains limited. This gap suggests an area for methodological refinement in future sustainability assessments.

Finally, the novelty of this study lies in embedding these measurable sustainability indicators within a Green Islamic Procurement framework. While prior studies focus primarily on environmental efficiency and regulatory compliance, they rarely integrate ethical-religious governance into supplier evaluation models. By positioning sustainability within an Islamic stewardship and ethical sourcing paradigm, this research extends the sustainable supplier selection literature beyond technocratic environmental metrics. Thus, it responds to recent calls for culturally embedded sustainability frameworks and contributes to the development of value-based Islamic economic governance in procurement decision-making.

CONCLUSION

Based on the analysis and discussion presented, this study produced several key conclusions. The use of the Analytical Hierarchy Process (AHP) method has proven effective in providing an objective framework for evaluating and precisely determining plastic bag and roll suppliers. Through this method, the priority order of the main criteria was successfully identified, namely: Flexibility and Response (20.8%), Compliance with PO/Contract (20.6%), Price (18.2%), Product Quality (16.4%), Environmentally Friendly and Sustainable Principles (16.2%), and Experience and Expertise (7.7%). The final weighting results determined Supplier PB2 as the main supplier with the highest score (0.388), followed by Supplier PB3 (0.327) as the second alternative, and Supplier PB1 (0.285) as the third alternative.

ACKNOWLEDGMENTS

The authors would like to express their sincere gratitude to all parties who have supported the completion of this research. We extend our deepest appreciation to Sekolah Tinggi Ilmu Syariah Ekonomi (STIES) Alifa Pringsewu for the academic environment and support that made this work possible. We are also grateful to the suppliers and industry partners who provided the essential data and insights for this evaluation.

Our thanks go to the experts who participated in the survey for the Analytical Hierarchy Process (AHP) pairwise comparisons. Your valuable judgments were crucial in building a consistent and reliable model. We also wish to acknowledge our colleagues for their constructive discussions and feedback. Finally, we thank the anonymous reviewers for their time and insightful suggestions to improve this manuscript.

AUTHOR CONTRIBUTION STATEMENT

This article is the result of collaboration between both authors. Author 1, who also acts as the corresponding author*, spearheaded the conceptual design of the research, developed the methodology, and carried out the formal analysis—including AHP modeling and calculations. He/She was also responsible for the investigation process, data curation, drafting of the initial manuscript, and project administration.

Author 2 provided supervision and guidance throughout the research process, validated the findings and analytical model, and supplied the necessary resources. His/Her main contributions lie in the editing and thorough review of the manuscript, as well as the visual presentation of the data and results.

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