INDONESIAN JOURNAL OF MULTIDISCIPLINARY SCIENCE

P-ISSN: 2808-5957
E-ISSN: 2808-6724
ijoms.internationaljournallabs.com

TBL INTEGRATION ON DETERMINING SUPPLIER SELECTION CRITERIA IN BOTTLED WATER COMPANY

Aditya Asmara Nala[1*], Harianto[2], Popong Nurhayati[3]
[1]*School of Business, Institut Pertanian Bogor, Bogor, West Java, Indonesia*
[2]*Faculty of Economics and Management, Institut Pertanian Bogor, West Java, Indonesia*
[3]*School of Business, Institut Pertanian Bogor, West Java, Indonesia*
[*] *adityaasmaranala@gmail.com*

ARTICLE INFO

Published: May 26th, 2023

Keywords: *business sustainability, triple bottom line, supplier selection, supplier selection criteria*

This work is licensed under CC BY-SA 4.0

ABSTRACT

Business sustainability has become the company ambition to ensure their business existence in the long term. Companies are competing to adopt sustainability objectives in every aspect of their operations. In the context of sustainability, the term triple bottom line (TBL) is widely known as an integration of economic perspectives, environmental perspectives, and social perspectives that underlie business operations. PT ABC is a bottled water company that adopt sustainability objective since the supplier selection process. It aims to ensure that only the right suppliers which deserve to enter the company's business ecosystem. Unfortunately, supplier selection criteria at PT ABC currently only focus on economic perspective. Environmental and social perspective have not yet significantly influenced supplier selection decisions. Therefore, this study aims to determine supplier selection criteria in PT ABC based on integration of economic, environmental, and social perspective. Integration of these three perspectives is important to strengthen supplier selection decisions alignment with business sustainability objectives. Researchers reviewed 100 scientific journals which discussed supplier selection criteria from 2012 to 2023. As a result, researchers set 13 selection criteria and 20 indicators that can be used to select suppliers at PT ABC.

INTRODUCTION

Business sustainability has become an objective of business operation in many companies today. Until the 1980s, the term sustainability still focused on economic perspective, which referred to the capacity of a company to increase profits progressively (do Paço, 2009). In its development, social perspectives and environmental perspectives began to become a focus that was considered in the concept of sustainability. In 1994, John Elkington summarized these three perspectives into the term Triple Bottom Line (TBL), as an important unified framework to support the sustainability goals of an organization (Sunkari, 2015). In more popular terms, TBL is also known as the 3Ps, namely profit, planet, and people. Strengthening business sustainability objective is very important as corporate social responsibility concern among consumers, workers, and even investors is increasing (do Paço, 2009). Sudiyanti (2014) wrote that in the pursuit of profit, companies must also have a high commitment to environmental concern and social contribution to ensure the sustainability of their business. Miemczyk and Luzzini (2019) also emphasize the need of integration among economic perspectives, environmental perspectives, and social perspectives in managing business targets.

In scope of manufacturing business, company's business activities are supported by the effectiveness of supply chain elements that starts from suppliers, processing sites, distributors, to

consumers. In relation to TBL adoption, TBL integration can be applied even from the supplier selection stage, as supplier's license-to-enter mechanism in company's business ecosystem. TBL integration in supplier selection process is intended for selecting suppliers that strengthen sustainability objective of company's business.

Studies related to supplier evaluation and selection that identify supplier assessment criteria in TBL framework are evolving. Igarashi et al. (2013) identified that urgency of environmental criteria in supplier evaluation and selection activities is increasing. However, this does not yet have factual implications to determination of expenditure allocations. Decisions on expenditure allocations still depends on minimizing total costs as identified in study conducted by Azadnia et al. (2015), Shalke et al. (2018), and Ghadimi et al. (2018). Laosirihongthong et al. (2019) then emphasized the importance on connecting supply chain decisions with economic benefit analysis, environmental concern, and social contributions to ensure the realization of sustainable business performance. Lopes and Rodriguez-Lopez (2021) also emphasize the importance of environmental perspectives and social perspectives in supplier selection.

PT ABC is part of the FMCG global group company that produces bottled drinking water. In relation to suppliers, PT ABC allocates no less than 400 million euros per annum of spending for suppliers. This large expenditure allocation demands high precision of supplier selection. Currently, the supplier selection instrument used at PT ABC is top-down tools which directly issued by the global group. This instrument was initiated by procurement division at global level to be applied in each country in the exact same way. Procurement division itself is a division in charge of coordinating supplier selection activities and determining spending allocations for suppliers. The existing selection instrument consists of a series of selection criteria that are translated into questionnaires that must be filled out by each division as an evaluator. In existing selection instruments, economic perspective has 79% weight, social perspective has 9% weight, and environmental perspective has 12% weight. Currently, the existing selection instrument is used by the procurement division to provide suppliers annual assessments at PT ABC. This annual assessment is termed the global evaluation result (HEG, *Hasil Evaluasi Global*).

Ideally, this annual HEG should be aligned with implications of spending allocation obtained by each supplier. Supplier with highest HEG index should obtain highest spend allocation, and vice versa. Unfortunately, in a study conducted on 12 suppliers from 4 material categories who obtained 80% of total annual expenditure allocation, no connection was found between HEG and implications of expenditure allocation obtained by each supplier (see Figure 1). Based on in-depth interviews with 4 procurement managers at PT ABC, the existing selection instrument has no implications for determining expenditure allocation due to: lack of relevance between selection criteria and business needs; selection criteria does not fully accommodate cross-divisional needs in functional relationships with suppliers; and lack of clarity of indicators measured in the selection criteria.

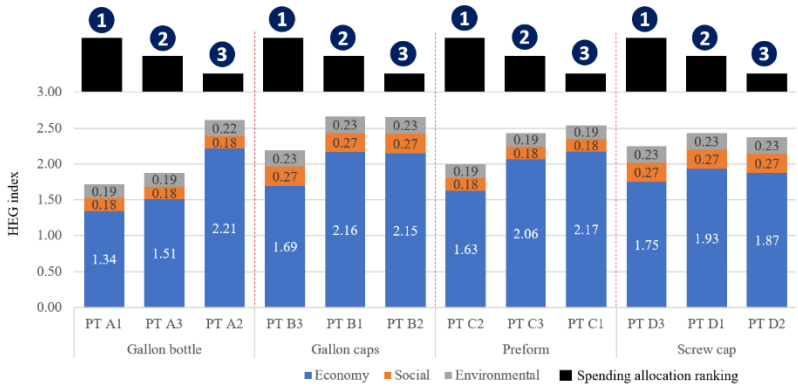

Figure 1. Comparison of HEG Against Spending Allocation

Authors identified that the determination of spending allocation for suppliers is currently based on only 4 criteria from an economic perspective, namely price, defect rate, production capacity, and maintenance compliance. In terms of price criterion, procurement division will prioritize suppliers who provide the lowest price proposal during tender process. After that, procurement division will consider the defect rates produced by these suppliers over the past year. Suppliers with the lowest defect rates will be prioritized. After the price criterion and defect rate criterion, the procurement division then consider production capacity available at each supplier. Suppliers who have the highest spare capacity will be prioritized. After considering price, defect rate, and production capacity criterion, procurement division then consider maintenance compliance for determining expenditure allocation. Suppliers who have a structured maintenance plan and discipline in maintenance implementation will be prioritized. Briefly, the sequence of application of four criteria abovementioned to supplier selection decisions and expenditure allocation is illustrated in Figure 2.

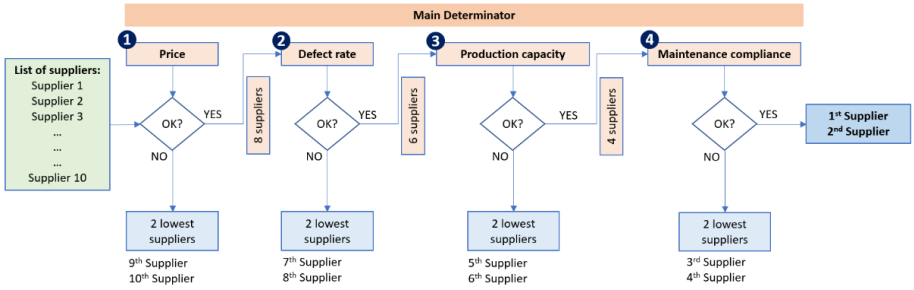

Figure 2. The Sequence of Application of Four Criteria in Supplier Selection Decisions

In fact, determination of spending allocation for suppliers only considers economic perspective and excludes environmental perspective and social perspective. In the long term, disregard of environmental perspectives and social perspectives can erode brand integrity, consumer trust, and profitability.

Accordingly, to strengthen business sustainability goals, PT ABC needs to develop supplier selection method based on three TBL perspectives integratively. As an improvement version of existing selection instrument, this selection method should be standardized and formulated based on selection criteria that are relevant to business needs, able to accommodate cross-divisional needs, and having clear assessment indicators to minimize ambiguity. The economic perspective, environmental perspective, and social perspective must be concrete terms that underlies determination of supplier selection criteria, which previous research mentioned have not specifically delved into. This study aims to determine what assessment criteria are needed based on TBL framework to select suppliers appropriately. Supplier selection criteria based on three TBL perspectives are expected to have factual implications for determining spending allocation to each supplier to support business sustainability.

METHOD

This research was conducted at PT ABC at RDTX Place Building, Jl. Prof. DR. Satrio No. 17, Jakarta. The data used consists of secondary data and primary data. Secondary data were obtained through a Systematic Literature Review (SLR) of 45 journals discussing supplier selection criteria topic. With regards to novelty, authors used scientific journals published from 2012 to 2023. The scientific journals were obtained through online searches in academic databases, including Elsevier (https://www.sciencedirect.com/), ProQuest (https://www.proquest.com/), and Taylor & Francis (https://www.tandfonline.com/). The keywords used for the online search are "supplier selection," "supplier selection criteria," "green criteria for supplier selection," and "green supplier selection."

Primary data were obtained through Focus Group Discussion (FGD) involving experts from PT ABC. Experts were determined purposively based on their position, work function, experience, and level of education. Experts must have an organizational function as a decision maker and have a work function with suppliers. The experts in this study were selected from a cross-divisional team that had functional relationships with suppliers for at least 5 years. The divisions involved were 5 divisions, namely procurement, quality, supply chain, research and development (R&D), and engineering. Each division was represented by 2 managers. FGD was carried out based on secondary data obtained through SLR. The FGD was aimed at sorting out criteria, reviewing its relevancies, and determining assessment indicators from these criteria. This is necessary to construct formulation of criteria that will later be used to select suppliers at PT ABC. The sequence of implementation of this study is shown in Figure 3.

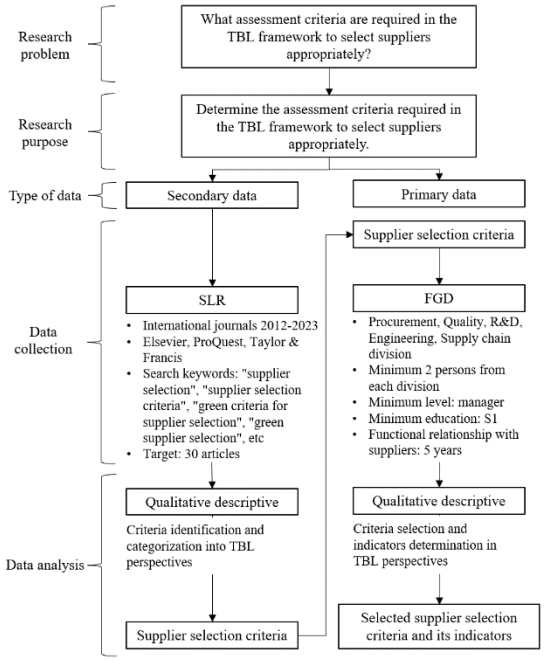

Figure 3. Sequence of Research Implementation

RESULT AND DISCUSSION

Authors collected 100 articles from online academic database. Of the 100 articles, 45 articles discussing supplier selection criteria throughout 2012 to 2023 are identified. The selection criteria discussed in those 45 articles were identified, resulting in identification of 603 selection criteria which were discussed in supplier selection topic throughout 2012 to 2023. Criteria which has similar meaning are grouped into one category. This grouping then produces 43 criteria categories. These criteria categories were then categorized into economic perspectives, environmental perspectives, or social perspectives. This categorization places 23 criteria into economic perspective, 13 criteria into environmental perspective, and 7 criteria into social perspective. The sequence of criteria categorization is illustrated in Figure 4.

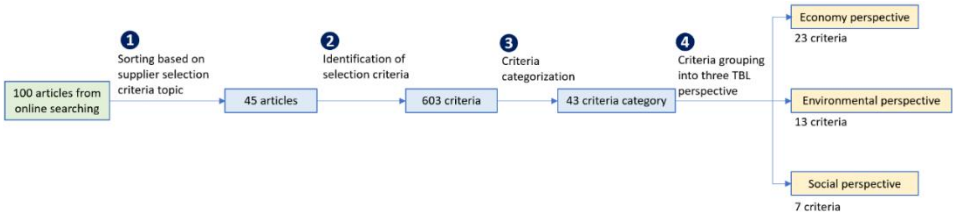

Figure 4. The Sequence of Criteria Categorization

The categorization of criteria in stage 3 (see Figure 4) is based on grouping criteria that have similar characteristics or aligned objectives. The authors summarize the definitions of each criteria category in Table 1. The establishment of this definition is used as a reference for categorization of criteria for further análysis purposes. Based on this approach, the authors identified that the

economic perspective consists of criteria categories namely: advanced knowledge and technology; after-sales service; collaboration; cost; financial capability; flexibility; in-full; on-time delivery; innovation capability; maintenance management system; management and organization; price; production facility and capacity; proximity; quality management; quality performance; relationship; reputation; responsiveness; risk management; service capability; technical capability; and cost structure transparency. The environmental perspective consists of: alternative and renewable energy; environmental awareness; clean technology; eco-friendly material; environmental cost; environmental management; green collaboration; green relationship; green reputation; green research and development; pollution control; reduce, reuse, and recycle; and environmental standard compliance. The social perspective consists of: social awareness; child labor; employee right, diversity, and equality; health and safety; social management; social training; and working environment. For subsequent simplification of the analysis, this criteria caegory is hereinafter referred to as 'criteria.'

Table 1. Definition of Criteria Categories in All Three TBL Perspectives

Perspective	Category Criteria	Definition
Economy	Advanced knowledge and technology	Supplier competencies and capabilities in technology integration and knowledge management
	After-sales service	Quality of after-sales service provided by suppliers
	Collaboration	Quality of supplier collaboration with every stakeholder in the customer in order to provide optimal business-to-business solutions
	Cost	Total cost
	Financial capability	Financial stability, debt ratio, profitability, financial reputation, long-term portfolio
	Flexibility	The ability of suppliers to be agile in adapting to accommodate customer needs.
	In-full	Supplier's ability to fulfill orders in precise quantities
	On-time delivery	Suppliers' ability to fulfill orders in a timely manner
	Innovation capability	Competency and capability of suppliers in innovation, creation of new products, and continuous improvement
	Maintenance management system	Maintenance management system for machines, utilities, and other assets

	Management and organization	Clarity and effectiveness of management and organizational governance; availability of relevant work functions
	Price	The price of the product purchased by the customer
	Production facility and capacity	Adequacy of production facilities; availability of production and storage capacity; Capability to expand production facilities, storage facilities, and increase production capacity
	Proximity	Geographical proximity between the supplier's factory and the customer's receiving point
	Quality management	Availability of quality management system
	Quality performance	Conformity of the product to established specifications or standards; defective rate; stability of product quality; availability of procedures, document control, and reliability of quality control; quality management certification
	Relationship	Availability of dedicated key account manager; quality of relationship with key account
	Reputation	Quality of supplier track record; brand image; loyalty history; credibility; customer satisfaction history; business portfolio coverage
	Responsiveness	Speed and accuracy of response; communication quality
	Risk management	Risk management and mitigation systems
	Service capability	implementation of holistic services in business relations, including: transportation support and logistics facilities; safety factor support; reporting; traceability; supply and demand governance; import dependencies
	Technical capability	Competency and capability of suppliers in mastering technical aspects, operational execution, and process optimization
	Cost structure transparency	Transparency of cost structure and pricing components

Environment	Alternative and renewable energy	Use of alternative energy and renewable energy
	Environmental awareness	Environmental awareness; environmental risk management; environmental awareness initiatives; training of environmental concern
	Clean technology	Implementation of circular management; environmentally friendly production operational practices; competency and capability of suppliers in carrying out environmentally friendly business practices
	Eco-friendly material	Use of environmentally friendly materials; production of environmentally friendly materials
	Environmental cost	Environmental cost management; continuous value chain studies in business operations
	Environmental management	Clarity and effectiveness of environmental management governance; availability of relevant work functions; management availability and implementation of sustainability strategies; readiness of resources; lifecycle assessment system; adoption of environmental principles in business operations
	Green Collaboration	Quality supplier collaboration with every stakeholder in the customer in order to provide optimal business-to-business green solutions
	Green relationship	Commitment to the relationship between suppliers and customers in green management
	Green reputation	Quality of supplier track record; brand image; loyalty history; credibility; customer satisfaction history; coverage of business portfolio in terms of sustainable business governance
	Green Research and Development	Competency and capability of suppliers in the preparation and implementation of green design, green research, and implementation
	Pollution control	Waste and pollution management
	Reduce, reuse, and recycle	Initiative, capability, and implementation of the principle of reduce, reuse, and recycle

	Environmental standard compliance	Compliance with environmental standards or certifications; Environmental certification
Social	Social awareness	Social consciousness; social risk management; social care initiatives; training on social concern
	Child labor	The existence of child workers
	Employee right, diversity, equality	Workers' rights, respect for diversity, and equality
	Health and safety	Implementation of occupational health and safety standards; certification of occupational safety and health; incidence rate
	Social management	Clarity and effectiveness of management governance and social responsibility; availability of relevant work functions; risk management and mitigation; stakeholder management
	Social training	Support for worker training related to social management
	Working environment	Working environment, working conditions, wage, and working hour arrangements

The economic perspective dominates discussion of supplier selection criteria throughout 2012 to 2023. Authors identified that criteria from an economic perspective were discussed in each year throughout the period of the articles studied. This criterion was discussed, among others, by Haldar et al. (2012), Kilic (2013), Ghadimi and Heavey (2014), Azizi et al. (2015), Mavi et al. (2016), Cengiz et al. (2017), Kumar et al. (2018), Taherdoost and Brard (2019), Duarte and Sousa (2020), Tavana et al. (2021), Goodarzi et al. (2022), and Debnath et al. (2023). Of the total supplier selection criteria identified, 75.25% are criteria from economic perspective, 17.28% are criteria from environmental perspective, and 7.48% are criteria from social perspective (see Figure 5).

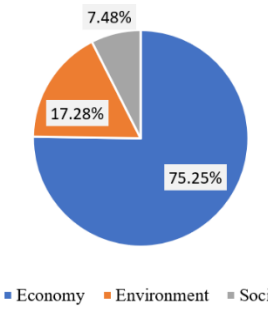

Figure 5. Perspectives Underlying Supplier Selection Criteria in 2012 – 2023

Quality performance is the criteria from an economic perspective that are most widely used for supplier selection. As much as 16.56% of the criteria discussed from an economic perspective is quality performance (see Figure 6). Authors also identified that this criterion was used in each year throughout the period of the articles studied. Quality performance are discussed, among others, by Ghorbani et al. (2012), Kilic (2013), Ghadimi and Heavey (2014), Polat and Eray (2015), Mavi et al. (2016), Jabbarova (2017), Kumar et al. (2018), Watrobski (2019), Duarte and Sousa (2020), Tavana et al. (2021), Tushar et al. (2022), and Deretarla et al. (2023).

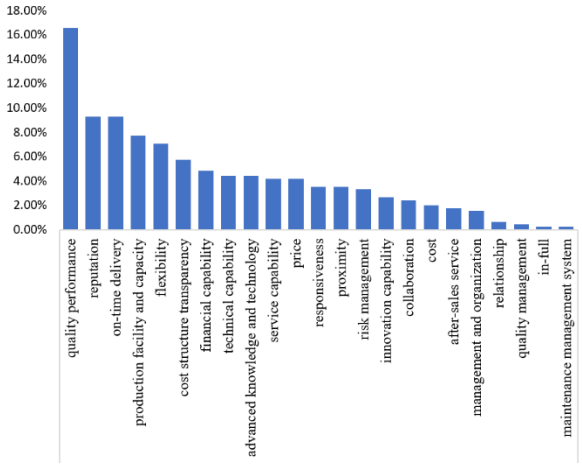

Figure 6. Supplier Selection Criteria from Economic Perspective

In terms of environmental perspective, clean technology and evironmental management are the most widely used criteria for supplier selection. As much as 26.92% of criteria discussed from environmental perspective are clean technology (13.46%) and environmental management (13.46%) (see Figure 7). Clean technology are discussed in the research conducted by Vahdani et al. (2012), Ghadimi and Heavey (2014), Scott et al. (2015), Watrobski (2019), Javad et al. (2020), Goodarzi et al. (2022), and Debnath et al. (2023). Meanwhile, environmental management are identified in the research conducted by Simic et al. (2015), Javad et al. (2020), Tavana et al. (2021), Sonar et al. (2022), and Guneri and Deveci (2023).

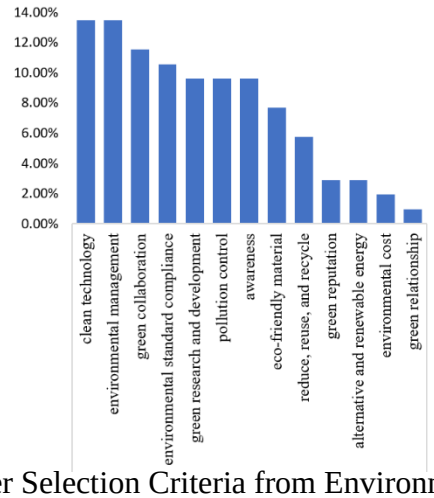

Figure 7. Supplier Selection Criteria from Environmental Perspective

With regards to social perspective, social management is criteria that are most widely used for supplier selection. As much as 31.11% of the criteria discussed from social perspective is social management criteria (see Figure 8). Social management are discussed in the research of Bilisik et al. (2012), Ghadimi and Heavey (2014), Taherdoost and Brard (2019), Marzouk and Sabbah (2021), and Goodarzi et al. (2022).

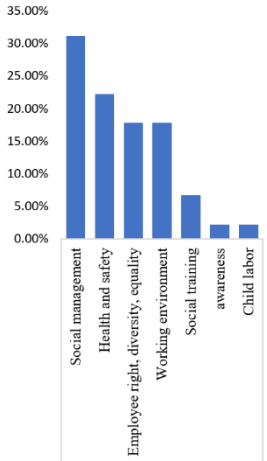

Figure 8. Supplier Selection Criteria from Social Perspective

All criteria from economic perspective, environmental perspective, and social perspective obtained then used as FGD material which involved 2 people each from procurement, quality, R&D, engineering, and supply chain division. FGD is conducted to determine which criteria will be selected to evaluate suppliers at PT ABC. All representatives of the divisions agreed on preliminary rule for determining these criteria. This preliminary rule namely: sorting criteria in each perspective will focus on criteria which identified in 50% of literature studies; disaggregated criteria must have clear assessment indicators, and; assessment indicators must have relevancy to business needs and work functions with one or more of divisions involved. Based on preliminary

rule, authors establish 13 selected criteria and 20 assessment indicators according to FGD results, as presented in Table 2.

Table 2. Supplier Selection Criteria and Its Assessment Indicators

Perspective	Criterion	Assessment Indicators
Economy	Quality Performance	Defective rate
		Downtime ratio
		Reject rate
	Reputation	Stakeholder satisfaction with supplier performance in the previous period
	On-Time Delivery	On-time delivery ratio
	Production facility and capacity	Non-negotiable equipment (NNE) ratio
		Spare capacity ratio
		Maintenance compliance
	Flexibility	Lead time order
		Term-of-payment
	Cost Structure Transparency	Clear cost structure breakdown, including raw material, overhead cost, storage, transportation, profit ratio, and final price
Environment	Clean technology	Implementation of management and circular technology
	Environmental Management	Availability of environmental management governance
		Resource availability
	Green Collaboration	Ratio of green projects carried out with customers
	Environmental Standard Compliance	ISO 14001 certification
	Green Research and Development	The existence of research and development projects of environmentally friendly technology and materials
Social	Social management	No critical and major SEDEX non-compliance
	Health and safety	ISO 45001 certification
		Implementation of K3 management

CONCLUSION

Authors identified a set of criteria from the three perspectives of TBL and indicators that will be used to select suppliers at PT ABC. These criteria underlie formulation of supplier selection

methods as an alternative to existing selection instruments which currently used at PT ABC. From economic perspective, selected criteria are quality performance, reputation, on-time delivery, production facility and capacity, flexibility, and cost structure transparency. In addition, selected criteria from environmental perspective are clean technology, environmental management, green collaboration, environmental standard compliance, and green research and development. From a social perspective, selected criteria are social management and health and safety.

Those selected criteria from the three TBL perspectives abovementioned can be used as a basis for supplier selection process at PT ABC. Due to the multi-criteria involvement of the three TBL perspectives, an appropriate selection method should be selected by considering an importance of those multi-criteria. Supplier selection activities based on multi-criteria from the three TBL perspectives are expected to deliver factual implications on determining expenditure allocation for each supplier to strengthen business sustainability.

REFERENCE

Azadnia, A. H., Saman, M. Z. M., & Wong, K. Y. (2015). Sustainable supplier selection and order lot-sizing: An integrated multi-objective decision-making process. In *International Journal of Production Research* (Vol. 53, Issue 2). https://doi.org/10.1080/00207543.2014.935827

Bilişik, M. E., Çağlar, N., & Bilişik, Ö. N. A. (2012). A comparative performance analyze model and supplier positioning in performance maps for supplier selection and evaluation. *Procedia - Social and Behavioral Sciences*, *58*. https://doi.org/10.1016/j.sbspro.2012.09.1128

Debnath, B., Bari, A. B. M. M., Haq, Md. M., de Jesus Pacheco, D. A., & Khan, M. A. (2023). An integrated stepwise weight assessment ratio analysis and weighted aggregated sum product assessment framework for sustainable supplier selection in the healthcare supply chains. *Supply Chain Analytics*, *1*. https://doi.org/10.1016/j.sca.2022.100001

Deretarla, Ö., Erdebilli, B., & Gündoğan, M. (2023). An integrated Analytic Hierarchy Process and Complex Proportional Assessment for vendor selection in supply chain management. *Decision Analytics Journal*, *6*. https://doi.org/10.1016/j.dajour.2022.100155

do Paço, A. M. F. (2009). Adam Werbach, strategy for sustainability. A business manifesto. *International Review on Public and Nonprofit Marketing*, *6*(2), 187–188. https://doi.org/10.1007/s12208-009-0039-4

Duarte, B. M., & Sousa, S. D. (2020). Supplier pre-qualification method for the Portuguese construction industry. *Procedia Manufacturing*, *51*. https://doi.org/10.1016/j.promfg.2020.10.237

Ghadimi, P., Ghassemi Toosi, F., & Heavey, C. (2018). A multi-agent systems approach for sustainable supplier selection and order allocation in a partnership supply chain. *European Journal of Operational Research*, *269*(1). https://doi.org/10.1016/j.ejor.2017.07.014

Ghadimi, P., & Heavey, C. (2014). Sustainable supplier selection in medical device industry: Toward sustainable manufacturing. *Procedia CIRP*, *15*. https://doi.org/10.1016/j.procir.2014.06.096

Ghorbani, M., Bahrami, M., & Arabzad, S. M. (2012). An integrated model for supplier selection and order allocation; Using Shannon Entropy, SWOT and linear programming. *Procedia - Social and Behavioral Sciences*, *41*. https://doi.org/10.1016/j.sbspro.2012.04.064

Goodarzi, F., Abdollahzadeh, V., & Zeinalnezhad, M. (2022). An integrated multi-criteria decision-making and multi-objective optimization framework for green supplier evaluation and optimal order allocation under uncertainty. *Decision Analytics Journal*, *4*. https://doi.org/10.1016/j.dajour.2022.100087

Güneri, B., & Deveci, M. (2023). Evaluation of supplier selection in the defense industry using q-rung orthopair fuzzy set based EDAS approach. *Expert Systems with Applications*, *222*, 119846.

Igarashi, M., de Boer, L., & Fet, A. M. (2013). What is required for greener supplier selection? A literature review and conceptual model development. *Journal of Purchasing and Supply Management*, *19*(4), 247–263. https://doi.org/10.1016/j.pursup.2013.06.001

Jabbarova, A. I. (2017). Application of Z-number concept to supplier selection problem. *Procedia Computer Science*, *120*, 473–477. https://doi.org/10.1016/j.procs.2017.11.266

Javad, M. O. M., Darvishi, M., & Javad, A. O. M. (2020). Green supplier selection for the steel industry using BWM and fuzzy TOPSIS: A case study of Khouzestan steel company. *Sustainable Futures*, *2*, 100012. https://doi.org/10.1016/j.sftr.2020.100012

Kilic, H. S. (2013). An integrated approach for supplier selection in multi-item/multi-supplier environment. *Applied Mathematical Modelling*, *37*(14–15), 7752–7763. https://doi.org/10.1016/j.apm.2013.03.010

Kumar, S., Kumar, S., & Barman, A. G. (2018). Supplier selection using fuzzy TOPSIS multi criteria model for a small scale steel manufacturing unit. *Procedia Computer Science*, *133*, 905–912. https://doi.org/10.1016/j.procs.2018.07.097

Laosirihongthong, T., Samaranayake, P., & Nagalingam, S. (2019). A holistic approach to supplier evaluation and order allocation towards sustainable procurement. *Benchmarking: An International Journal*, *26*(8), 2543–2573. https://doi.org/10.1108/BIJ-11-2018-0360

Lopes, A. P., & Rodriguez-Lopez, N. (2021). A decision support tool for supplier evaluation and selection. *Sustainability*, *13*(22), 12387. https://doi.org/10.3390/su132212387

Marzouk, M., & Sabbah, M. (2021). AHP-TOPSIS social sustainability approach for selecting supplier in construction supply chain. *Cleaner Environmental Systems*, *2*, 100034. https://doi.org/10.1016/j.cesys.2021.100034

Mavi, R. K., Goh, M., & Mavi, N. K. (2016). Supplier selection with Shannon Entropy and Fuzzy TOPSIS in the context of supply chain risk management. *Procedia - Social and Behavioral Sciences*, *235*, 216–225. https://doi.org/10.1016/j.sbspro.2016.11.017

Miemczyk, J., & Luzzini, D. (2019). Achieving triple bottom line sustainability in supply chains. *International Journal of Operations & Production Management*, *39*(2), 238–259. https://doi.org/10.1108/IJOPM-06-2017-0334

Polat, G., & Eray, E. (2015). An integrated approach using AHP-ER to supplier selection in railway projects. *Procedia Engineering*, *123*, 415–422. https://doi.org/10.1016/j.proeng.2015.10.068

Scott, J., Ho, W., Dey, P. K., & Talluri, S. (2015). A decision support system for supplier selection and order allocation in stochastic, multi-stakeholder and multi-criteria environments. *International Journal of Production Economics*, *166*, 226–237. https://doi.org/10.1016/j.ijpe.2014.11.008

Shalke, P. N., Paydar, M. M., & Hajiaghaei-Keshteli, M. (2018). Sustainable supplier selection and order allocation through quantity discounts. *International Journal of Management Science and Engineering Management*, *13*(1), 20–32. https://doi.org/10.1080/17509653.2016.1269246

Simić, D., Svirčević, V., & Simić, S. (2015). A hybrid evolutionary model for supplier assessment and selection in inbound logistics. *Journal of Applied Logic*, *13*(2), 138–147. https://doi.org/10.1016/j.jal.2014.11.007

Sonar, H., Gunasekaran, A., Agrawal, S., & Roy, M. (2022). Role of lean, agile, resilient, green, and sustainable paradigm in supplier selection. *Cleaner Logistics and Supply Chain*, *4*, 100059. https://doi.org/10.1016/j.clscn.2022.100059

Sudiyanti. (2014). Book Review: Business sustainability: Essentials for business. *Journal of Indonesian Economy and Business*, *29*(2). https://doi.org/10.22146/jieb.17335

Sunkari, P. A. (2015). *Using the triple bottom line to select sustainable suppliers for a major oil and gas company* [Thesis]. University of Arkansas.

Taherdoost, H., & Brard, A. (2019). Analyzing the process of supplier selection criteria and methods. *Procedia Manufacturing*, *32*, 1024–1034. https://doi.org/10.1016/j.promfg.2019.02.317

Tavana, M., Shaabani, A., Di Caprio, D., & Amiri, M. (2021). An integrated and comprehensive fuzzy multicriteria model for supplier selection in digital supply chains. *Sustainable Operations and Computers*, *2*, 149–169. https://doi.org/10.1016/j.susoc.2021.07.008

Tushar, Z. N., Bari, A. B. M. M., & Khan, M. A. (2022). Circular supplier selection in the construction industry: A sustainability perspective for the emerging economies. *Sustainable Manufacturing and Service Economics*, *1*, 100005. https://doi.org/10.1016/j.smse.2022.100005

Vahdani, B., Iranmanesh, S. H., Mousavi, S. M., & Abdollahzade, M. (2012). A locally linear neuro-fuzzy model for supplier selection in cosmetics industry. *Applied Mathematical Modelling*, *36*(10), 4714–4727. https://doi.org/10.1016/j.apm.2011.12.006

Wątróbski, J., Jankowski, J., Ziemba, P., Karczmarczyk, A., & Zioło, M. (2019). Generalised framework for multi-criteria method selection. *Omega*, *86*, 107–124. https://doi.org/10.1016/j.omega.2018.07.004