
Supplier Relationships in the Context of the Sustainable Development Requirements for Production Companies

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Abstract:

Purpose: The article presents the assumptions of the concept of sustainable development, with particular emphasis on the requirements for entrepreneurs. It then describes the importance of building sustainable relationships between production enterprises and their suppliers, and which methods are used to maintain these relationships. The next section combines the previously described issues and proposes the inclusion of environmental aspects resulting from suppliers' activities in the assessment and selection of contractors. Analyse methods to assess and qualify suppliers and develop a concept to build relationships with contractors based on their environmental impacts.

Design/Methodology/Approach: The methods described in the literature for assessing and qualifying suppliers and the legal requirements related to sustainability were analysed. The concept of enriching supplier assessment procedures with questions on environmental impacts was then developed.

Findings: Regulatory requirements related to sustainability impose the need to examine environmental impacts throughout the life cycle of a product as part of ESG reporting. This requires knowledge of the environmental aspects present in suppliers and contractors.

Practical Implications: The proposed approach to supplier qualification and assessment can be applied to any company. The article provides information on current legal requirements related to sustainability and provides an overview of supplier assessment methods.

Originality/Value: The inclusion of sustainability questions and the selection of suppliers also on the basis of environmental impacts influences the promotion of environmentally friendly behaviour throughout the product life cycle. It also improves the flow of information and facilitates compliance with legal requirements related to ESG reporting.

Keywords: Sustainability, ESG reporting, assessment and qualification of suppliers.

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1. Introduction

In order to take advantage of new opportunities for change in global corporations or to maintain their built position in international trade, Polish companies need to integrate ESG to a greater extent into their operations. The pioneers of ESG activities are often large multinational companies, which - following their long-term strategies or climate neutrality commitments - will place environmental, social and corporate governance requirements on other companies in their supply chains.

Also, reporting obligations will increasingly require the reporting of emissions generated by cooperators and subcontractors within a product's supply chain. Companies undertaking decarbonization of their operations or pursuing climate neutrality are responding to regulatory requirements - corporate ESG commitments are becoming more specific, verifiable and accountable.

Some companies see this process as a long-term growth opportunity and are changing their business model. At the same time, some large companies are sending more and more signals that in the coming years meeting ESG criteria may make cooperation with sub-suppliers conditional (Kąsek and Benecki, 2023). In order to achieve sustainability in the context of consumption and production, it is necessary for all actors involved in the supply chain to cooperate systematically, starting with producers and ending with consumers (<https://www.un.org.pl/>).

2. Literature Review

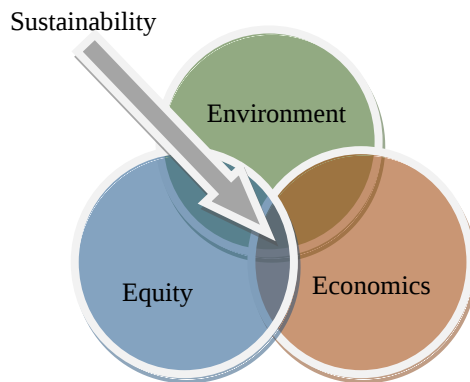
The idea of sustainability is a direct response to climate change, which can be observed over the past 200 years. The advent of the Industrial Revolution in the 18th century ushered in the massive extraction of fossil fuels and the consumption of many other natural resources. Human activities leave irreversible damage to the environment (Caradonna, 2022). The concept of sustainability talks about intergenerational justice and forward thinking. In the beginning, in the context of sustainable development, attention was mainly paid to ecology and harmony between people and nature.

Only later did the concept also begin to be identified with social equality and economic development. A breakthrough in terms of defining environmental concepts and goals was the 1992 "Earth Summit" conference in Rio de Janeiro, at the initiative of the United Nations, whose theme was "Environment and Development." The meeting put an equal sign between environmental protection and socioeconomic development as interconnected elements that should be focused on when talking about the future of humanity.

This relationship is often depicted in the form of a diagram (Figure 1), which was presented at the UN World Summit in 2005. It depicts the realities between environment, economy, social equality, that is, the three pillars on which sustainable

development should be based (Caradonna, 2022; Stanny and Czarnecki, 2011; Biernaczyk, 2024).

Figure 1. Pillars of Sustainable Development: Environment, Economy, Equity



Source: Based on Biernaczyk, 2024.

Analyzing sustainability from the point of view of an enterprise is understood to mean that this entity takes actions aimed at achieving business goals, taking into account issues related to the environmental and social aspects of the entity. Sustainable production and consumption are the basis of a sustainable and balanced enterprise.

Modernization of production, through optimization of processes, reduction of material and energy consumption, and effective dialogue between state authorities and the enterprise, is also an important element. It is also often necessary to introduce an organizational management system, through which processes can be effectively monitored and adjusted to external conditions. The success of a company's sustainability is influenced by many factors, which can be divided as external and internal.

External factors include macroeconomic conditions, the direction of environmental policy development, support from funds dedicated to activities aimed at the protection of natural resources, the competitiveness of companies, financial investment in innovative activities and public awareness. Internal factors, on the other hand, are related to management awareness, development strategy and financial capabilities of the company (Misztal, 2019).

The sustainable development of enterprises is also strongly influenced by legal regulations, the number of which, in this regard, has recently increased. Both at the level of the European Union and at the level of national law, one can see an increasing number of legal acts aimed at reducing greenhouse gas emissions and

environmental pollution. The changes brought about by them not only apply to measures on a national scale, such as increasing the share of renewable energy sources or reducing deforestation, but also to companies, organizations and individuals. This is of great importance, as the sustainable development of each company makes an important contribution to improving the environment on a global scale. By involving every individual and company in efforts to combat climate problems, real results can be achieved. Every step towards sustainable business contributes to creating positive changes for the planet (Biernaczyk, 2024).

In the approach of business to climate and environmental issues, 2015 was a breakthrough year, with the adoption of the Paris Agreement and the UN Sustainable Development Goals. In Europe, on the other hand, the most important impetus for change was the publication of the European Green Deal with the Fit for 55 package, which sets the path for its implementation. Since then, more and more regulations have gradually emerged, making sustainability an important part of companies' strategies.

These include the SFDR regulation, which introduces new rules for sustainability-related disclosures in the financial services sector, the EU Taxonomy setting detailed rules for classifying business activities to be considered environmentally sustainable, and the CSRD Directive on sustainability reporting, published at the end of 2022. EU member states have 18 months to implement it into their national legal orders.

According to the CSRD, from 2024, the obligation to report information related to environmental, social and corporate governance (ESG) issues, including information related to climate impacts, will first cover the largest listed companies, then large companies, and from 2027 also small and medium-sized companies (Krawczyńska-Kaczmarek, 2023).

The growing role of ESG factors in the coming years will translate into the decisions of multinational companies to choose sub-suppliers. On the environmental front, this is driven, among other things, by the adoption of corporate low-carbon strategies, the need to track greenhouse gas emissions throughout the supply chain, not just a company's direct emissions, and the EU's plans to introduce carbon tariffs (Kąsek and Benecki, 2023).

3. Research Methodology

The selection of sub-suppliers is part of a company's purchasing process. The traditional definition of purchasing is a set of activities undertaken by a company to acquire products necessary for its operations. It encompasses all stages, from identifying needs, selecting suppliers, and negotiating prices, to finalizing the transaction and delivering the order. It is crucial to the achievement of a business goal, as it enables the selection of appropriate suppliers and the building of long-term relationships.

An effective procurement process ensures that products are of high quality, that customer expectations are met, as well as environmental requirements and that regulatory obligations related to sustainability are met. In the era of sustainability, companies must transform their strategies and processes, taking into account social and environmental criteria. Therefore, companies are constantly looking for solutions that will ensure the stability of supply while taking into account sustainability (Brzezinski and Rudnicka-Reichel, 2020). In general, the purchasing process consists of a number of stages, such as:

- *Identification of needs*: Determining what products or services are needed to meet the company's objectives.
- *Market research*: Analyzing available options, comparing offers from different suppliers in terms of price, quality, delivery times, etc.
- *Supplier selection*: Deciding which supplier the company will purchase from.
- *Negotiation*: Agreeing on contract terms, such as price, payment terms, delivery terms, etc.
- *Placing an order*: Formally placing an order with the selected supplier, creating purchase contracts.
- *Delivery and acceptance*: Receiving the ordered products or services and checking them against the order.
- *Payment*: Making payment for the ordered products or services according to the agreed terms.
- *Aftermath of purchase*: Evaluating cooperation with the supplier in terms of product quality, on-time delivery, customer service, potential complaints and returns, etc., (Grzybowska, 2011; Adamski, 2024).

From the point of view of the objectives of this study, the most important stages are identification of needs, analysis of available options, selection of a supplier, and evaluation of cooperation and categorization of suppliers based on past experience. The supplier selection and evaluation process is a complex decision-making issue, requiring multi-criteria evaluation of potential business partners. The supplier evaluation process is based on diverse criteria, both quantitative (measurable) and qualitative (subjective, difficult to quantify).

In order to enable comparison and analysis of data expressed in different units of measurement, it is necessary to unify the criteria in advance. Data prepared in this way form the basis for further evaluation using existing analytical methods (Serafin and Luściński, 2014). Supplier evaluation and prioritization are elements of the purchasing process in manufacturing enterprises.

During supplier selection, companies analyze order specifications and define their own requirements including technical, quality and commercial expectations of potential bids. On this basis, they identify suppliers that are able to meet the defined criteria.

Research initiated by Dickson in the 1960s led to the development of a list of 23 criteria for evaluating suppliers (Serafin and Luściński, 2014), quality, delivery, performance history, warranties and complaints, equipment and capacity, price, technical capability, financial situation, communication system, reputation and position in the industry, desire of business, management and organization, operational control, repair services, attitude, impression, packaging capability, relations with trade unions, geographical location, unpaid receivables, training aids, mutual understanding.

In the traditional approach, the supplier selection process is based on several key groups of criteria, among which price, the quality of goods offered, timeliness and completeness of deliveries, the supplier's potential and financial health, as well as its image and location come to the fore (Serafin and Luściński, 2014).

To effectively evaluate suppliers, companies often use a number of methods and tools that can be applied in a manufacturing company to optimize the process of selecting and working with suppliers. The supplier selection process can be based on rigorous, multidimensional evaluation methods that include diverse models and strategies.

The interdisciplinary nature of supply chain performance research means that researchers from the fields of economics and technical sciences use different research approaches. Qualitative methods such as brainstorming, the Delphi method or expert systems (phase I and II) dominate the initial stages of evaluation. These are primarily used to identify potential suppliers and initially verify their suitability. Quantitative methods, used in further stages of selection (phases III and IV), focus on quantification of supplier characteristics and their numerical or percentage parameterization. This makes it possible to objectively compare bids and select the optimal supplier.

Quantitative methods of supplier selection and evaluation can be grouped as follows (Burdzik, 2017):

- Multi-criteria methods, such as: AHP, SMART, weighted evaluation, matrix methods,
- Mathematical programming methods, e.g.: linear programming, goal programming, DEA,
- Statistical models, e.g.: structural equation modeling SEM, confidence intervals,
- AI models, e.g.: neural networks, Bayesian networks,
- Others: ABC, TCO, indicator method.

It should be noted that both qualitative and quantitative methods play an important role in the supplier selection process, complementing each other. Analyzing a selection of supplier evaluation methods from different groups, it can be

concluded that there is no single best way that fits every case. The choice of method depends on the size of the company, its industry, the complexity of the supply chain and available resources. It is important to choose the method that best suits the company's needs and capabilities, such as:

- *Weighted Assessment Method:* It is simple to use and allows you to take into account various evaluation criteria. However, it requires subjective evaluation of suppliers and does not take into account all factors affecting selection. Does not require specialized software or knowledge.
- *ABC method:* Allows classification of suppliers according to their importance to the company, focusing attention on the most important ones. However, it may be insufficient in a complex supply chain environment and needs to be combined with other methods. May require data analysis software, but does not require specialized knowledge.
- *AHP method:* Provides a comprehensive assessment of suppliers, considering both quantitative and qualitative criteria. It is relatively easy to understand and use.

However, evaluations are also subjective and may depend on the preferences of those involved in the decision-making process. It may require specialized software to perform hierarchical analysis, as well as some expertise in interpreting the results. Choice of method in the context of company size:

- *Small companies:* The weighted evaluation method may be suitable for small companies because of its simplicity and ease of application.
- *Medium and large companies:* The ABC or AHP method may be more suitable for larger companies that have more complex supply chains and need to consider more factors in evaluating suppliers.
- *Manufacturing companies:* The AHP method may be particularly suitable for manufacturing companies because it allows both quantitative and qualitative criteria to be considered, which is important in evaluating suppliers of components and raw materials.

The aforementioned methods can serve as a support for evaluators to provide an opportunity to gather all the information needed in a given situation and get a broader view of a given supplier, e.g., from the point of view of an important contemporary factor, such as sustainability (Adamski, 2024).

4. Research Results

A sustainable supply chain involves optimizing economic processes while minimizing negative environmental impacts (Kołosowski and Józwiak, 2012). Examples of sustainability measures include, for example, applying environmental and social criteria in the selection of suppliers, risk analysis, assessment of environmental and social impacts, building lasting relationships with suppliers, open

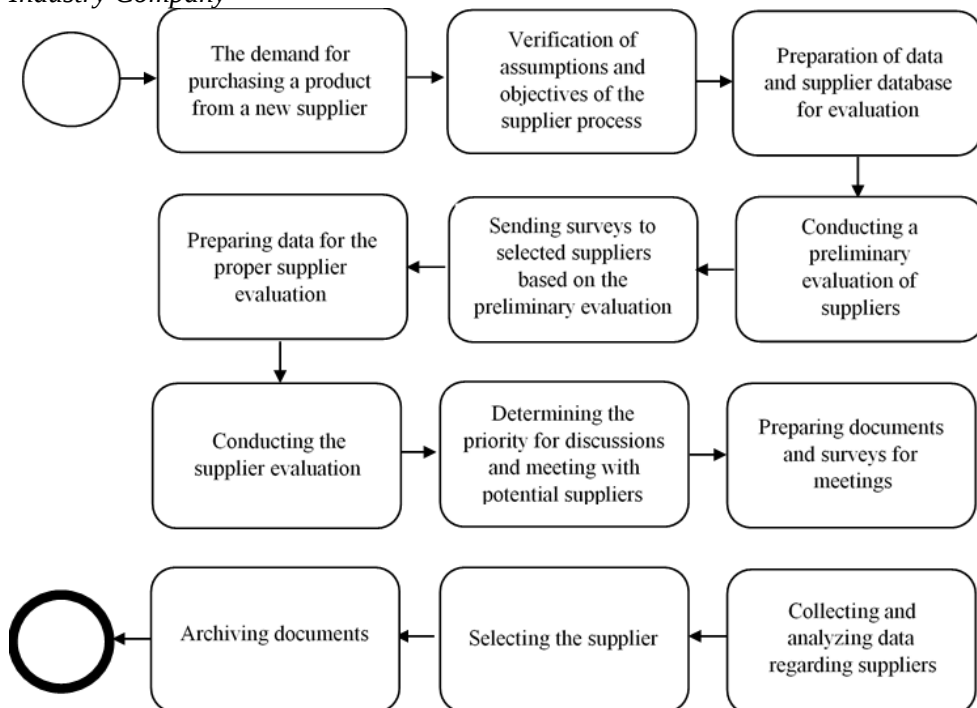
circulation of product information, setting an adequate price to expectations, transparency of operations.

Nowadays, sustainability issues are increasingly important, because according to the CSRD, from 2024 the obligation to report information related to environmental, social and governance (ESG) issues has become a reality, and by 2027 it will apply to all businesses. For this reason, the requirements for suppliers are also increasing, taking into account social and environmental aspects. Examples of environmental and social criteria in the context of supplier evaluation (Kołosowski and Józwiak, 2012) are:

- *Environmental criteria:* CO₂ emission levels, compliance with environmental standards, use of energy from renewable sources,
- *Social criteria:* safety in the workplace, fair wages, not employing minors, respect for human rights, not allowing overtime work, compliance with labor laws.

Taking into account all the above considerations, the authors of this article proposed the implementation of a new supplier evaluation process for a manufacturing company in the furniture industry (Figure 2).

Figure 2. Block Diagram of the Supplier Evaluation Process Concept in a Furniture Industry Company



Source: Adamski, 2024.

The process utilized a weighted scoring method and the ABC method to develop a four-stage Supplier Evaluation Process. The weighted scoring method involved assigning weights to specific criteria (priority, net purchase value, quantity of purchased products) and evaluating suppliers against these criteria to identify the 50 suppliers with the highest priority.

The ABC method was used for the initial classification of suppliers based on their turnover value. Table 1 presents the qualitative criteria for the second stage, where suppliers were rated on a scale of 1 to 10. The resulting weighted average score enabled the determination of which suppliers should ultimately be considered for procurement needs (Adamski, 2024).

Table 1. *Supplier evaluation criteria*

Criteria	Weight	Considered information	Conditions	Evaluation
Contact	0.15	- Sending confirmations; - quick response to emails; - prompt reply to requests for quotations; - addressing order shortages and/or missing invoices; - capability to send e-invoices.	Lack of confirmations, long response times for emails and offers, no response to requests, no possibility of sending e-invoices.	1
			Occasionally, lack of confirmation, lost orders, several days' wait for responses or offers, longer response times to requests, occasional sending of e-invoices to the wrong email address or duplicating invoices.	5
			Immediate confirmation each time, quick preparation of offers, fast responses (within the same business day), prompt action on comments/shortages in orders/missing invoices, invoices always issued on time and sent to the correct address.	10
Delivery costs	0.12	- Free delivery; - no shipping costs above a certain amount; - no additional courier fees; - no minimum order value; - notifications of additional transport costs.	High delivery costs and/or additional courier fees, high minimum order amount, lack of information about delivery costs.	1
			Standard courier fees for every order, low minimum order amount, occasional lack of confirmation of transport costs.	5
			Free delivery and/or no minimum order amount and/or notification of transport costs every time (request for acceptance).	10
Environmental aspects	0.29	- Possession of ISO 9001, ISO 14001, 50001, and other certifications; - submission of ESG	Lack of ISO certifications, lack of ESG reporting, significant environmental impact.	1
			Having only one ISO certification, moderate level of environmental impact from operations.	5

		reports; - level of environmental impact of operations.	Having a large number of ISO certifications, regular ESG reporting, low level of environmental impact from the company, and an eco-oriented approach.	10
Flexibility	0.09	- Complaints (process overview); - responsibility for shipment; - overall evaluation of the complaint process; - adaptability to our requests (order cancellations, implementing changes); - cost-free order cancellations.	The supplier does not adapt to requests, does not improve delivery conditions, does not offer more favorable orders, or does not enhance cooperation.	1
			A supplier with whom a better collaboration can be established, but through long negotiations and/or after a long period of time.	5
			An flexible supplier, easy to communicate with, responsive, and adaptable to requests and feedback.	10
Payment and trade terms	0.16	- Initial payment terms; - the possibility of extending payment deadlines; - (subjectively) personalized discounts.	Lack of payment terms, payment by card only, and/or no discounts or rebates for larger orders.	1
			Short payment terms (7, 14 days) for an extended period and/or no fixed discounts, irregular discounts for larger orders.	5
			Long payment terms of 30 days and/or individual discounts and rebates for larger orders.	10
Deliveries quality	0.12	- Number of complaints; - on-time deliveries; - order shortages; - accurate quantity delivery; - speed of urgent order fulfillment.	Shortages in orders, delivery of correct quantities, speed of processing urgent orders.	1
			Sporadic (rare) complaints, varying waiting times.	5
			No complaints, delays, or shortages, fast order processing.	10
Additional services and support offered by the supplier	0.08	- Additional services, training, workshops, initiatives; - additional services: e.g., assembly; - product customization (e.g., cutting to specific lengths, specific packaging).	No additional services and support.	1
			Additional services and support only upon request and/or if conditions are met and/or for an extra fee.	5
			Free additional services and support every time.	10

Source: Based on Adamski, 2024.

After the evaluation and obtaining the weighted averages for each supplier, meetings are organized with selected suppliers, during which supplier questionnaires are filled out. These questionnaires contain confirmation of the data and information obtained earlier, as well as confirmation of the supplier's possession of quality and environmental certifications, including a list of ESG reporting and the company's

environmental impact. In the final stage, the final supplier selection for collaboration is made, all documents from the supplier evaluation process are archived, and the team organizes a meeting to summarize the process (Adamski, 2024).

5. Discussion

In the present context of the globalized market, sustainable manufacturing has become a major concern for all organizations. The sustainable manufacturing system includes economic, environmental, and social sustainabilities. Green manufacturing enhances the environmental sustainability but, it also affects the economic and social sustainabilities. The compulsion to follow the environmental rules and regulation in any business activity has increased the awareness for the use of green products, recyclable materials for packaging, reduction of carbon emissions, etc.

Due to the involvement of extra costs in green manufacturing, some ignorance in the implementation of green practices may be observed. To ensure sustainable systems, the selection of suppliers based on green performance measures is very important.

This study evaluates the suppliers' performances based on Green Practices as follows, environmental management and pollution control, cost, quality, and flexibility using the fuzzy-extended Elimination and Choice Expressing Reality approach. This approach helps the managers to incorporate the subjective decision of the decision makers and convert it into a quantitative scale. This method is used to eliminate and outrank the poor performers. As poor performers are outranked, this approach helps to select the most suitable green suppliers as per the organization's requirement (Pravin *et al.*, 2017).

The criterion of pollution prevention emphasizes the importance of suppliers' efforts to eliminate emission sources and implement control technologies, which directly improve the quality of the natural environment. Eco-friendly packaging, such as biodegradable or recyclable materials, constitutes a crucial element of waste reduction strategies and resource consumption minimization (Ahamed *et al.*, 2023).

Evaluating green processes is also essential, focusing on the efficiency of production processes in reducing their environmental impact, including the level of air pollution emissions, the quality and volume of discharged wastewater, and procedures for handling hazardous waste disposal. Green management analysis is also key, encompassing actions related to implementing sustainable development principles in company management, marketing strategies promoting environmentally friendly products, and applied transportation methods, such as intermodal transport and CO₂ emissions assessment.

Continuous monitoring and regulatory compliance are critical as well, ensuring ongoing evaluation of the supplier's environmental impact and adherence to current legal standards (Villanueva-Ponce *et al.*, 2014).

Incorporating environmental aspects into the evaluation process has become not only a standard but also a necessity. Sources indicate that environmental risk is one of the key factors to consider when assessing suppliers in the context of Industry 4.0.

The key environmental aspects in supplier evaluation include verifying whether the supplier has implemented an environmental management system compliant, which demonstrates their commitment to minimizing environmental impact; analyzing the supplier's environmental policy, including their commitments to environmental protection and strategies for reducing negative environmental effects; monitoring emissions to air and water as well as the consumption of energy, water, and other natural resources, which allows for the assessment of the supplier's environmental performance; evaluating waste management procedures, including recycling, composting, or other recovery methods; verifying whether the supplier uses recycled materials in their products and packaging, which contributes to reducing environmental impact; and analyzing the environmental impact of transporting materials and products, including greenhouse gas emissions, where optimizing transportation routes and choosing eco-friendly transport options can significantly reduce the carbon footprint (Pandey, 2023).

6. Limitation of the Study

In the company where the method described above was implemented, the selected IT tool was used to support the process of evaluating suppliers, while consolidating the proposed criteria and adopted weights. However, at the conceptual level presented in this paper, the method of selecting and evaluating suppliers can be applied to any manufacturing company. The criteria and weights can be adapted to the priorities of a given organization.

7. Conclusions

Modern supply chains are becoming increasingly complex, prompting companies to seek ways to enhance competitiveness while minimizing risks. A key element of this approach is a detailed evaluation of suppliers, where growing environmental awareness plays an increasingly significant role.

Traditional evaluation criteria, such as costs, quality, and delivery timeliness, are now often expanded to include an analysis of suppliers' environmental impact. This process considers pollution emissions, including exhaust gases, wastewater, and methods of hazardous waste disposal generated by the supplier. The possession of environmental certificates, such as ISO 14000, which confirm the implementation of an environmental management system, is also crucial.

Assessing the efficiency of environmental management systems based on procedures, monitoring, and performance indicators is another important factor. The environmental impact throughout the product's lifecycle is a significant aspect,

considering eco-friendliness at every stage: from raw material sourcing, through production and distribution, to disposal. This also includes eco-design, where products are developed with the aim of minimizing their negative impact on the environment, for instance, through the use of biodegradable materials, energy reduction, or facilitation of recycling, as well as the analysis of recycling possibilities for supplied products (Wu, 2022).

Including environmental criteria in supplier evaluation procedures brings numerous benefits to companies, particularly those for whom production is a key area of operations. A carefully designed supplier assessment system that incorporates ecological aspects enables the creation of a more sustainable and responsible supply chain while minimizing risks and enhancing the company's competitiveness.

This approach ensures high-quality products and services, as suppliers employing responsible environmental practices often invest in modern technologies and solutions, positively influencing the quality of the materials provided and the final products.

Furthermore, collaborating with suppliers who comply with environmental standards helps avoid risks associated with regulatory sanctions, reputational damage, or supply chain disruptions caused by ecological issues on the supplier's side. Building a positive corporate image is another advantage, as consumers and business clients increasingly prefer companies that operate responsibly and sustainably. Working with environmentally responsible suppliers increases stakeholder trust while strengthening competitive advantage in the market.

Sustainable development, as a growing priority in business strategy, attracts customers and distinguishes the company from competitors. Suppliers who invest in green technologies and innovative solutions also contribute to technological advancements and more efficient processes throughout the supply chain, supporting the implementation of advanced and cost-effective solutions.

Economic benefits from adopting eco-friendly practices include reduced energy and resource consumption, which lowers production costs, minimized waste generation, which reduces disposal expenses, and optimized logistics processes, where more efficient transportation methods lead to further savings (Fuka *et al.*, 2016).

References:

- Adamski, B. 2024. The importance of supplier evaluation in a manufacturing company. Master's thesis. Poznan University of Technology, Poland (in Polish).
Ahamed, M., Khan, N., Sudha, M., Sushma, M. 2023. A study of consumer awareness for green marketing. *REST Journal on Banking, Accounting and Business*, 2(3), 62-69.
Biernaczyk, A. 2024. Analysis of selected requirements of the European Green Deal in the context of sustainable development of manufacturing enterprises. Master's thesis.

- Poznan University of Technology, Poland, (in Polish).
- Brzeziński, J., Rudnicka-Reichel, A. 2020. Sustainability-focused B2B procurement process. University of Lodz, Poland. Retrieved from: <https://dspace.uni.lodz.pl/handle/11089/32923>.
- Burdzik, R. 2017. Parametric weighted evaluation of suppliers (PWOD). Scientific Papers of Warsaw University of Technology, part 1 - Basic assumptions of the method.
- Caradonna, J.L. 2022. Sustainability: A history. Oxford University Press.
- Fuka, J., Bednářová, D., Martinek, O. 2016. Supplier evaluation system in the management of quality. In: Proceedings of the International Scientific Conference INPROFORUM.
- Grzybowska, K. 2011. Purchase strategies. Poznan University of Technology Publishing House, Poland.
- Kąsek, L., Benecki, R. 2023. Mark yourself or perish: ESG criteria in the supply chains of Polish companies. Low environmental awareness of SME companies may harm their competitiveness (in Polish). In: Kłopotowska, A., Strzelczak, M. (Eds.), Shared responsibility: The role of environmental management. Responsible Business Forum, Warsaw.
- Kołosowski, A., Jóźwiak, A. 2012. Sustainable supply chain. Military Logistics Systems, 38. Military University of Technology, Warsaw.
- Krawczyńska-Kaczmarek, M. 2023. Increasing emphasis on ESG in companies: Awareness of climate-environmental challenges in companies is insufficient. MeetingPlaner.pl.
- Misztal, A. 2019. Corporate sustainability and the degree of socioeconomic development. Studies and Papers, College of Management and Finance, 174, 33-45.
- Pandey, D. 2023. Embracing sustainable fashion: A path towards a greener wardrobe. Retrieved from: <https://medium.com/@divisha.pandey1233/embracing-sustainable-fashion-a-path-towards-a-greener-wardrobe-32392dd06dd1>.
- Pravin, K., Rajesh, S., Anurika, V. 2017. Suppliers' green performance evaluation using fuzzy extended ELECTRE approach. Clean Technologies and Environmental Policy, 19(3), 809-821. <https://doi.org/10.1007/S10098-016-1268-Y>.
- Serafin, R., Luściński, S. 2014. Dynamic supplier assessment using an adaptive supply risk assessment system. In Proceedings of the Conference: Innovations in Management and Production Engineering (IZIP).
- Stanny, M., Czarnecki, A. 2011. Sustainable development of rural areas of the Green Lungs of Poland region: An attempt at empirical analysis. Institute of Rural and Agricultural Development. Polish Academy of Sciences, Warsaw.
- UNIC Warsaw. 2024. Sustainable development goals. At: <https://www.un.org.pl/>.
- Villanueva-Ponce, R., Romero-González, J., Alor-Hernández, G. 2014. Supplier selection in a manufacturing environment. Proceedings of Springer, Cham, 233-252. https://doi.org/10.1007/978-3-319-04951-9_11.
- Wu, Ch.H. 2022. An empirical study on selection, evaluation, and management strategies of green suppliers in manufacturing enterprises. Journal of Organizational and End User Computing, 34(1), 1-18. <https://doi.org/10.4018/joeuc.307568>.