SILESIAN UNIVERSITY OF TECHNOLOGY PUBLISHING HOUSE

SCIENTIFIC PAPERS OF SILESIAN UNIVERSITY OF TECHNOLOGY 2024
ORGANIZATION AND MANAGEMENT SERIES NO. 213

BUSINESS GREEN INITIATIVES AND ENVIRONMENTAL OUTCOMES: AN EMPIRICAL ANALYSIS

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Purpose: The article addresses the current and important research area of business sustainability, which is attracting the interest of both theoreticians and management practitioners. It focuses on the environmental dimension of business sustainability. The main objective of the article is to identify the relationship between activities in the environmental dimension and sustainable environmental outcomes.
Design/methodology/approach: The study covers organizations 303 operating in Poland and is based on a questionnaire. The collected data was used to build a regression model.
Findings: The results revealed statistically significant relationships between environmental outcomes and variables: value proposition, transport & distribution and suppliers & subcontractors.
Research limitations/implications: The variables were measured using subjective indicators. In addition, the research was conducted only in companies operating in Poland and the results may be typical of businesses operating in this country. Therefore, the research should be extended to other countries, and it would be particularly interesting to compare with companies operating in countries where sustainability-related indicators are highly rated. It would also be very interesting to expand the data gained through questionnaires through interviews and case studies.
Originality/value: Linking green-focused business activities to the benefits that businesses can achieve in the area of environmental outcomes as a result.
Keywords: management, sustainability, triple bottom line, environmental dimension, environmental outcomes.
Category of the paper: research paper.

1. Introduction

In the context of changes in the business environment and the growing awareness of customers, the pressure to engage in sustainable practices is increasing significantly. Thus, it is the indicators in the three basic areas of economic, social and environmental that are becoming key to ensuring competitive advantage. At the same time, in recent years,

the increasing importance of environmental concerns in the eyes of customers worldwide, their preferences for choosing eco-friendly products, and their positive attitude toward environmentally conscious companies indicate the growing significance of environmental sustainability for businesses (Eminova, 2023). This means that businesses should focus their activities more on protecting and conserving natural resources and reducing the negative impact of human activities on the environment. The actions that businesses take must also be taken from a broader perspective, not only of the businesses themselves, but of the supply chains, in cooperation with stakeholders, such as customers, suppliers, partners and sometimes competitors. However, currently, the sustainable development paradigm is complemented by the idea of a "green economy" (Mamedova, 2022). The article examines the relationship between businesses' environmental sustainability activities and their environmental outcomes.

2. Concept of sustainable development

The concept of sustainable development is based on the assumption that meeting the needs of modern societies will take place without compromising the ability to meet the needs of future generations. This means expanding the view of the results achieved from a focus on the economic to a social and environmental dimension. The concept grew out of the need to take care of people's long-term needs, because environmental management developed without meeting the requirement for constant renewal of life-sustaining resources, which inevitably leads to their depletion, the degradation of ecosystems. Sustainability at the business level means maintaining a balance between these three areas, leading to long-term stability and prosperity. In the economic area, it means that organizational resources are used efficiently taking into account the needs of diverse stakeholders ensuring sustainable economic growth. In the social area, sustainable development refers to ensuring equality, security, protection of human rights, social justice and improving the quality of life for all (the Sustainable Development Goals emphasize the need to eliminate poverty and inequality). In the environmental area, sustainable development focuses on the management of natural resources, emphasizing the need to protect non-renewable resources and ecosystems. So, on the one hand, business activities should focus on reducing the negative impact of people on the environment (minimizing footprints) and maximizing the positive one (e.g., taking care of biodiversity). Strategic decisions of businesses should aim to integrate the three perspectives. Economic action coupled with care for the environment and social responsibility means compliance with the concept of sustainable development. This requires the implementation of new solutions that will promote the reduction of energy consumption, water consumption, or the reduction of environmental pollution and the extension of the life cycle of closed-loop products.

3. The Triple Bottom Line – Planet

Business sustainability has developed into a strategic management approach that integrates economic, social, and environmental goals (Brandon-Jones, 2015). This evolution emphasizes responsible practices, innovation, resource efficiency, and stakeholder engagement, which enhance an organization's reputation and value through corporate social responsibility. Elkington introduced the concept of evaluating a business model from three sustainability perspectives, leading to the "Triple Bottom Line" (TBL) model. The TBL framework, proposed by Elkington in 1994, includes three essential indicators: Profit, Planet, and People, offering a holistic method for assessing an organization's impact across economic, environmental, and social dimensions (Figure 1).

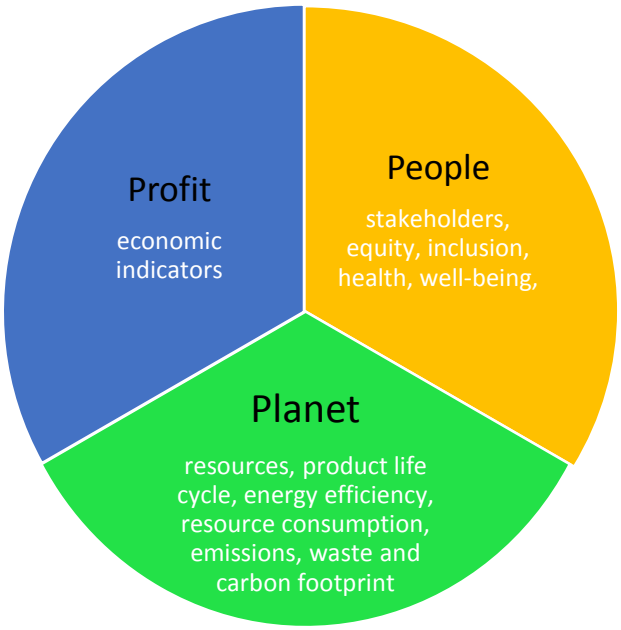

Figure 1. Triple bottom line layers.

Source: author's own work based on Elkington TBL concept.

By incorporating Elkington's Triple Bottom Line indicators, businesses can make decisions beyond immediate profits, considering the long-term impact on profit, the planet and people. The framework emphasizes the interconnectedness of economic success, environmental responsibility and social well-being (Thiago et al., 2021; Brandon-Jones, 2015). Organizations that adopt this approach are, in essence, better equipped to create value for a broader set of stakeholders, including communities and the environment, not just shareholders. Elkington's innovative model challenges traditional business practices, encouraging a shift toward increasing sustainability and corporate responsibility. As global challenges increase, the Triple Bottom Line functions as a guiding framework, leading organizations toward a more responsible and sustainable way of operating. As a development of Elington's concept, Joyce and Paquin (2016) proposed a tool for designing sustainable business models by adding two

additional layers to the classic Business Model Canvas: an environmental layer based on a life cycle perspective and a social layer incorporating a stakeholder perspective. The authors emphasized the growing pressure on organizations to actively respond to the challenges associated with implementing sustainable values.

Elkington's environmental indicator in the TBL framework focuses on the "Planet" and assesses an organization's impact on environment. Midgley and Arya (2022) described the TLBMC (Tool Triple Layer Business Model Canvas) which was used to expand concept sustainable business. Moreover the environmental dimension is the most important, social and economic are secondary, because everything depends on resources (Porrit, 2007; Bansal, 2005; Correira, 2019). The earth dimension is concentrate on product life cycle, energy efficiency, resource consumption, emissions, waste and carbon footprint (Meera, 2016). The environmental dimension is crucial to sustainable development. Effective management of environmental impact not only leads to the protection of the planet in the long term, but also results directly into an increase in competitive advantage, building a positive reputation. Elkington's Triple Bottom Line framework includes issues that collectively assess an organization's environmental impact: natural resource management and emissions and pollution reduction (Elkington, 1994). Slaper et al. (2011) give examples of indicators in this area: sulfur dioxide concentrations, nitrogen oxide concentrations, selected priority pollutants, excess nutrients, electricity consumption, fossil fuel consumption, solid waste management, hazardous waste management, land use/land cover change. Importantly, to ensure the widest possible range of positive impacts, environmental indicators should also include supply chain activities.

4. Environmental initiatives and environmental outcomes

The growing awareness of sustainability is leading to a search for factors that influence sustainable performance also broken down into three basic areas: economic, social and environmental. The subject of many scientific studies is the relationship between the environmental activities of businesses and their sustainable environmental performance (i.e. Gimenez et al., 2012; Albertini, 2013; Madsen, Ulhøi, 2016; Latan et al., 2018; Trumpp et al., 2017; Wagner, 2015; Solovida et al., 2021; Petrović-Ranđelović et al., 2023; Walecka-Jankowska et al., 2023a, 2023b). This research considers how different environmental strategies and practices affect the environmental performance of businesses. Gimenez et al. (2021) point out that organizations strive for sustainable use of organizational resources by applying internal environmental programs, thus minimizing resource consumption and at the same time negative environmental impact. Also within the supply chain, which is key to achieving sustainable performance (not just in the environmental area) (Gimenez et al., 2012). Businesses are also

monitoring the life cycle of products, so they can make changes that not only address the production and distribution phase, but also the use phase. In addition, businesses are increasingly seeking environmental certifications (e.g., ISO 14001) that focus on reducing, for example, emissions and other pollutants (Hörisch et al., 2015; Solovida et al., 2021). What positively influences the achievement of environmental performance (So et al., 2017). Gotschol et al., (2014) point to the positive impact of environmental management on environmental performance, emphasizing that the impact is greater if businesses reinvest profits from environmental activities in further initiatives in this area. Other studies indicate a link between emission reductions and environmental performance, despite the fact that this involves increased costs (Dangelico, Pontrandolfo, 2015; Robaina et al., 2020). Walecka-Jankowska et al. (2023a, 2023b) indicate a link between the implementation of environmental innovations and environmental performance. Research described by Juma et al. (2021) analyzes the positive impact of supply chain management on environmental performance. Moreover, the research indicates a positive relationship between environmental performance and business economic value creation (Petrović-Ranđelović et al., 2023). Thus, as the cited studies indicate, there is a positive correlation between the pro-environmental activities of businesses and their environmental performance. The implementation of pro-environmental measures can significantly improve sustainable performance contributing to greater sustainability of the business in the long term, but also, as Roy et al. (2021) indicate, to a higher evaluation of the business by investors.

5. Research methodology

The primary aim of the paper is to investigate the relationship between organizational activities in environmental dimension and environmental outcomes. The broader study, an excerpt of which is included in the article, examined results along three dimensions: economic, environmental and social. Measurement of environmental outcomes included among others: environmental value proposition, customer participation in various phases of the process, product utilization distribution, environmental benefits, key resources and activities, and environmental impact.

In order to verify the relationships, a survey was conducted, for which the author's questionnaire was used (5-point Likert Scale was adapted). The study was conducted using a questionnaire that was intended to be appropriate for any organization regardless of size, activity profile, or affiliation to a branch of the economy. Employees with a broad view of the organizations surveyed (each respondent represented a different organization) were asked to complete the survey. The survey was conducted at the end of 2022, targeting companies operating in Poland, and resulted in 303 correct responses. The respondent profiles are: presented in Table 1.

Table 1.
Respondents by size of organization surveyed

Enterprise size (number of employees)	
Micro (less than 10)	133
Small enterprises (10-49)	83
Medium (50-249)	60
Large (over 250)	27

Source: authors' own work.

In order to examine the relation between activities in environmental dimension (Joyce, Paquin, 2016) and environmental outcomes (Zgrzywa-Ziemak, 2019), the following key variables were defined (Figure 2). The reliability measured by Cronbach's alpha coefficient of all variables was higher than 0.88, which means a high level of reliability of measurement scales (information about the number of items forming each variable is provided at the top of each variable).

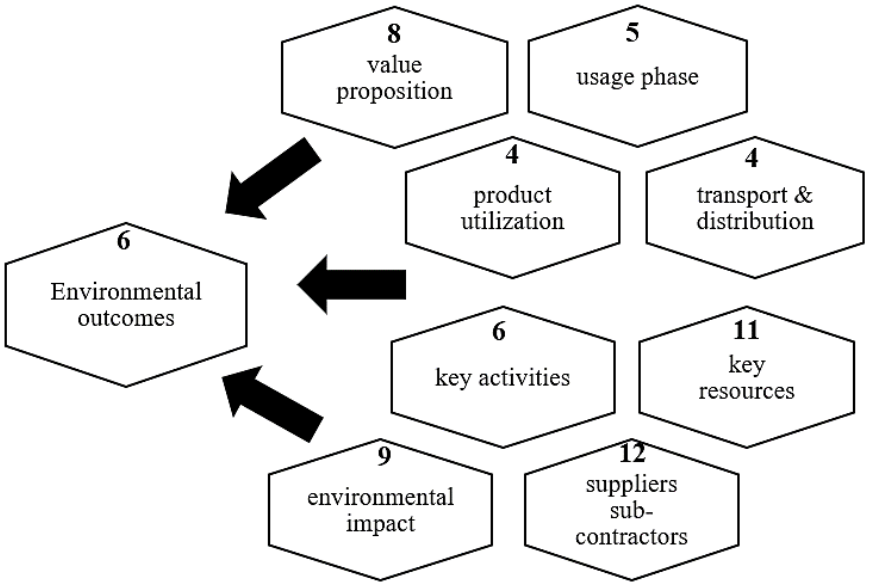

Figure 2. Variables.

Source: author's own work.

Variables forming the environmental dimension:

- Usage phase – Evaluates the extent to which the business involves customers in product design and whether the products/services offered support customers in saving resources (water, energy), repairability and extended use, and implements the concept of product sharing.
- Value proposition – assesses the extent to which the business contributes to safety, sustainable use of resources (renewable and non-renewable), development of technologies that reduce environmental risks, reduction of energy intensity and waste production, raising environmental awareness, and generating revenue from waste processing.

- Transport & distribution - assesses the extent to which the business takes environmental aspects into account in various areas of the business, such as business travel, transportation of goods to customers, distribution of goods, and use of packaging.
- Product utilization - assesses the extent to which the business implements product disposal measures, such as full recyclability, biodegradability, life extension through parts replacement and the use of reusable packaging.
- Key resources - assesses the extent to which key resources used by the business, such as agricultural crops, animal husbandry, natural resources, rare earth metals, the environment, infrastructure, and various chemicals and pharmaceuticals, affect the environment, including the carbon footprint.
- Key activities - assesses the extent to which key business activities, such as internal and external logistics, production processes, marketing and sales, after-sales service and support activities, affect the environment.
- Suppliers and subcontractors - assesses which aspects are important for the business when working with suppliers and subcontractors, such as the ability to recycle and repair components, generate by-products, extend product life cycle, industrial symbiosis, participate in the green supply chain, and shorten the supply chain.
- Environmental impact - assesses the extent to which the business affects the environment in terms of CO2 and other greenhouse gas emissions, production of biodegradable and non-biodegradable waste, production of industrial and other wastewater, and use of natural resources (renewable and non-renewable) and water consumption.

To verify the hypotheses describing the relationship between activities in environmental dimension and environmental outcomes, statistical analyzes were carried out. First, a correlation analysis was conducted using Pearson's coefficient (all correlations are significant at the 0.01 level – bilateral) - presented in Table 2.

Table 2.
Pearson's correlation

	Environmental outcomes	**Usage phase**	**Value proposition**	**Transport & distribution**	**Product utilization**	**Key resources**	**Key activities**	**Suppliers and subcontractors**	**Environmental impact**
Pearson's correlation	1	0,401**	0,488**	0,482**	0,220**	0,227**	0,249**	0,284**	0,193**
Relevance (bilateral)		0,001	0,001	0,001	0,001	0,001	0,001	0,001	0,001
N	303	303	303	303	303	303	303	303	303

Source: authors' own work.

The correlation analysis shows significant relations between all activities in environmental dimension and environmental outcomes. It should be noted that the is at a rather similar level and oscillates between 0.193 and 0.488, the highest correlation (0,49 and 0,482) is between environmental outcomes and two variables: value proposition and product distribution.

Since the analysis of pairwise correlations revealed strong associations, it was decided to perform stepwise regressions and model was obtained: F (8,294) = 14,981; p < 0,001.

This model seem to fit the data well and the regression equations can be written as follows:

$$Y = b_0 + b_1 \times X_1 + b_2 \times X_2 + b_3 \times X_3 + b_4 \times X_4 + b_5 \times X_5 + b_6 \times X_6 + b_7 \times X_7 + b_8 \times X_8$$

where:

Y – environmental outcomes,

X_1 – Usage phase,

X_2 – Value proposition,

X_3 – Tr ansport & distribution,

X_4 – Product utilization,

X_5 – Environmental benefits,

X_6 – Key resources,

X_7 – Key activities,

X_8 – Suppliers and subcontractors,

X_9 – Environmental impact.

$$\textbf{Environmental Outcomes} = 2{,}202 + 0{,}139 \times X_2 + 0{,}127 \times X_3 + 0{,}030 \times X_7$$

where:

X_2 – Value proposition,

X_3 – Transport & distribution,

X_7 – Suppliers and subcontractors.

Analysis of the collected data revealed statistically significant relationships between environmental performance and the value proposition, transport & distribution, and cooperation with suppliers and subcontractors (presented in Figure 3).

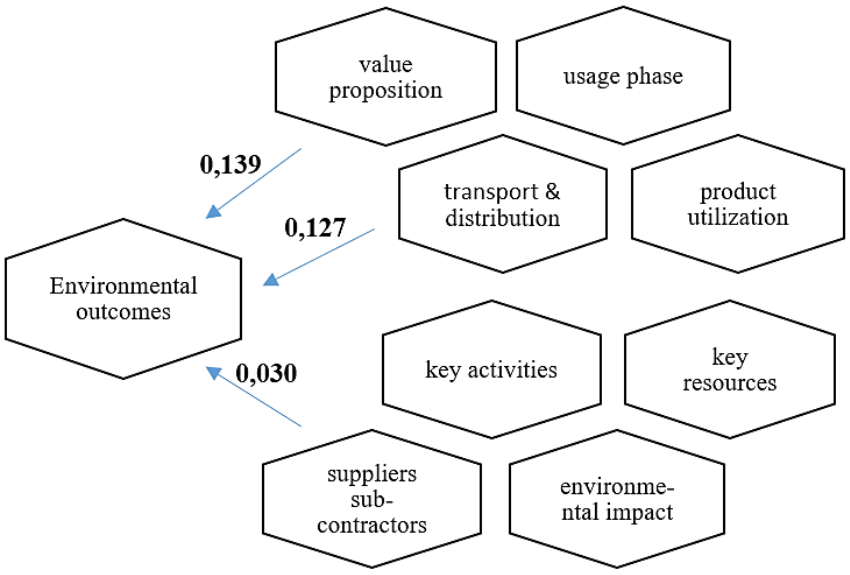

Figure 3. Relationship between results and environmental variables.

Source: author's own work.

6. Conclusions

Analysis of the statistical results obtained indicates that the following factors are most strongly related to environmental performance: value proposition, transportation & distribution, and suppliers & contractors. An increase in the value of these variables mean that the environmental performance of businesses is higher. This means that organizations should focus their efforts on making sustainability a differentiator in the products/services they offer. A manifestation of this could be a focus on improving safety, use of renewable and non-renewable resources, on technologies that reduce environmental risks, reduce energy intensity and waste production, but also on raising environmental awareness among employees, customers, partners. What's more, integrating environmental sustainability should also address environmental aspects in different areas of operations - deliveries, transportation to the customer, business travel and how they are packaged. Higher environmental outcomes require cooperation throughout the supply chain - assessing the recyclability and reparability of supplied components, generating by-products, extending product life cycles, shortening the chain and taking care of environmental indicators. Thus, organizations should focus on these very elements if they want to improve their sustainable environmental outcomes.

There are several limitations that should be taken into account when interpreting the results. The variables were studied using subjective assessment. In addition, the research was conducted in businesses operating in Poland and the results may be typical of businesses operating in this country. Thus, the research should be extended to other countries, especially interpreting seems a comparison to businesses operating in countries where indicators related to sustainability are rated highly. It would also be very interesting to expand the data gained through questionnaires through interviews and case studies.

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