How to business environment affect green innovation in small medium enterprises: Systematic literature review

Hujjatullah Fazlurrahman[1*], *Udisubakti* Ciptomulyono[2], and *Irhamah*[3]

[1]Doctor of Management Technology, Sepuluh Nopember Institute of Technology, Digital Business, State University of Surabaya, Surabaya, Indonesia
[2]Dept. Industrial and System Engineering, Sepuluh Nopember Institute of Technology, Surabaya, Indonesia
[3]Dept. of Statistics, Sepuluh Nopember Institute of Technology, Surabaya, Indonesia

Abstract. This paper discovers the concept of green innovation in small and medium-sized enterprises (SMEs). The study deliberates on reputation of green innovation in promoting sustainable development and the need for SMEs to encirculate this practice. The paper offers an overview of the different types of green innovation and their significance in promoting environmental sustainability. It examines the challenges faced by SMEs in adopting green innovation practices, with limited resources and lack of awareness. Furthermore, the paper highlights the benefits of green innovation for SMEs, including increased competitiveness and improved brand image. The study achieves this by providing recommendations for SMEs on how to effectively instrument green innovation practices and strategies. Overall, this paper emphasizes the importance of SMEs role in promoting green innovation and sustainable development. This paper will also discuss the classification of internal and external influences of organizations in green innovation research. Internal organizational influences are classified into human resources, corporate culture, technical capabilities, organizational structure, vision, mission and objectives. The internal influence of the organization consists of political, economic, technology and regulation.

1 Introduction

Green innovation or what is often called Green Innovation is now increasingly popular, especially among small and medium businesses (SMEs) who are increasingly aware of the importance of protecting the environment. Green Innovation in SMEs relates to the development and use of environmentally friendly and sustainable technologies, green innovation is one of the business strategies that have an impact on business and the environment. Not only seeking profit but also reducing negative environmental impacts. This is the reason for the spread of green innovation in SMEs [1]. This is where the role

* Corresponding author: hujjatullahfazlurrahman@unesa.ac.id

of SMEs in efforts to reduce negative impacts on the environment and society. Green innovation is the right solution as a form of environmental and social responsibility around SME locations, this has an impact on improving business sustainability.

The process of developing green innovation is not easy, because it is faced with several obstacles and challenges. One of them is resources and funds for the development of innovations. Government support is needed in the development of green innovation in SMEs [2]. In addition, stakeholders and the community also have the same role. The government and industry need to provide incentives to SMEs that have used green innovation as a form of support for business sustainability.

This green innovation is one of the global issues in the sustainable development goals (SDGs). This program aims to improve community welfare and environmental sustainability. In this case, green innovation in SMEs can help achieve these goals by improving the quality of life of the community and reducing the negative impact of business activities on the environment.

2 Literature review

This author [1], explained that there is a European project that promotes eco-innovation called ECOLABNET. The project aims to develop and implement an innovative eco-service knowledge management system for SMEs. This service is very beneficial for SMEs because it can share knowledge, service management, and best practices with SME partners. The authors examined the implementation of the system in Navarra, Spain, and evaluated the level of effectiveness of promoting environmental innovation in SMEs. The results of this research show that this system has succeeded in transferring knowledge and collaboration among SME partners. In addition, it has contributed to the development of eco-innovation in SMEs in the area.

The role of knowledge management in the development and distribution of eco-innovative service packages for small and medium-sized businesses (SMEs) is the subject of the research presented in [2], which may be found here. The authors contend that effective knowledge management is essential for the development and delivery of eco-innovative services, which can assist small and medium-sized enterprises (SMEs) in improving their environmental performance and competitiveness. The article presents a case study of a Polish consulting company that has built a range of eco-innovative service packages for small and medium-sized enterprises (SMEs). The conclusion of the paper emphasizes the significance of knowledge management for the effective provision of eco-innovative services and makes the recommendation that additional study is required to gain a deeper comprehension of the connection between knowledge management and eco-innovation in small and medium-sized enterprises (SMEs). The purpose of this research [3] is to investigate the function of eco-management in the processes of environmental management in Latvia. The authors argue that eco-management has the potential to play a significant part in the advancement of sustainable development and the enhancement of environmental performance in Latvia, particularly within the context of the transition that the country is undergoing toward a green economy.

This study [4] investigates the challenge of internationalization that is presented to small and medium-sized firms (SMEs) who specialize in eco-innovations with the

intention of increasing energy efficiency in other industries. The authors believe that small and medium-sized enterprises (SMEs) confront a unique set of obstacles due to the complicated nature of the eco-innovation value proposition. This value proposition frequently requires close collaboration and customization in order to fulfill the specific requirements of individual customers. The paper presents a case study of a Spanish small and medium-sized enterprise (SME) that has created a range of eco-innovative solutions for energy efficiency in the hospitality sector. In its conclusion, the report highlights the relevance of conducting additional research into the internationalization issues that small and medium-sized enterprises (SMEs) involved in eco-innovation face, as well as the significance of addressing these difficulties in order to advance sustainable development and safeguard the environment [5].

In order to investigate the connections between green innovation, green human resource management, green transformational leadership, and green human resource management, the author [6] suggests a mediation-modernization model. The authors contend that good green human resource management and green transformational leadership can encourage green innovation, which, in turn, can stimulate environmental performance inside firms. In this research, a quantitative study is presented that is based on a survey of employees from a variety of firms in Pakistan, and an analysis of the proposed mediation-modernization model is performed. According to the findings of the study, green human resource management and green transformational leadership have a favorable impact on green innovation, which in turn has a beneficial impact on environmental performance. In addition, the study reveals that the positive association between green human resource management and green innovation is moderated by green transformational leadership, which strengthens the influence of green human resource management on green innovation. In its conclusion, the paper highlights the importance of green human resource management, green transformational leadership, and green innovation in promoting environmental performance in organizations. Additionally, the paper suggests that future research should concentrate on the circumstantial factors that influence the association between these variables [7].

The practices of eco-innovation among small and medium-sized businesses (SMEs) in the food processing and manufacturing industries are investigated by researchers [8]. The authors contend that eco-innovation can give small and medium-sized enterprises (SMEs) a competitive advantage by increasing resource efficiency, lowering waste levels, and catering to the growing demand among consumers for ecologically sustainable products. The paper discusses a qualitative study that was conducted in Pakistan and was based on interviews with small and medium-sized businesses. The authors also identify a number of obstacles that stand in the way of the widespread implementation of eco-innovation, such as a dearth of monetary resources, a scarcity of understanding regarding eco-innovation techniques, and an aversion to change.

The author [9] explores the process by which businesses implement environmentally friendly innovations by means of the growth of environmentally friendly dynamic capabilities, as well as the shrinking importance of environmental vitality and the capacity for big data analytics. The authors contend that green dynamic capabilities can assist businesses in adjusting to changes in the surrounding environment and in adopting green innovation techniques, which can ultimately lead to increased performance and

sustainability. The paper presents a quantitative analysis that was based on a survey of companies in Malaysia.

The author [10] investigates the ways in which small and medium-sized businesses (SMEs) have adopted and are putting into practice environmentally friendly, innovative strategies. The authors contend that small and medium-sized enterprises (SMEs) have the potential to profit from green innovation methods by strengthening their environmental performance, lowering their expenses, and becoming more competitive. The paper summarizes the findings of a qualitative study that was conducted in Portugal and was based on interviews with small and medium-sized businesses. In its conclusion, the study highlights how vital it is to encourage the adoption of environmentally friendly innovations by small and medium-sized enterprises (SMEs), and it proposes that supportive policies and programs can assist in creating sustainable development and economic progress [11].

This research [12] examines the possible benefits of green innovation for small and medium-sized enterprises (SMEs) that are technology-based. These potential benefits include developing a green image, taking technological initiatives, and improving market competitiveness. This study investigates the connection between low-carbon services and the performance of businesses. According to the findings of the study, low-carbon service innovation has the potential to boost the performance of technology-based SMEs by more than 20% under specific conditions. These findings show the potential value of green innovation for companies of this sort [13].

Within the context of the countries that make up the European Union (EU), the topic of this article [14] is the participation of small and medium-sized businesses (SMEs) in eco-innovation activities. According to the findings of the research, small and medium-sized enterprises (SMEs) in the EU participate in activities related to environmental innovation a significantly lower percentage of the time than they do in activities related to innovation, and the level of participation in environmental innovation can range from that of innovation. The research also categorizes European Union member states into three distinct groups according to the extent to which they participate in eco-innovation and innovation-related endeavors.

A study that identifies factors affecting the environmental, financial, and social sustainability of manufacturing SMEs in Malaysia is discussed in this article [15]. The study was conducted in Malaysia. For the purpose of evaluating hypotheses and estimating the level of importance they have in terms of sustainable performance, the research makes use of a combination of structural equation modeling and artificial neural networks.

This study [16] addresses the relationship between green innovation, resource efficiency, and sustainable economic growth in developing countries, particularly in the E7 countries (China, India, Mexico, Russia, Turkey, Brazil, and India). The E7 countries are referred to as the BRIC countries. The authors examine the data from 2010 to 2021 using a technique called the Generalized Method of Moments (GMM), and they come to the conclusion that green innovation and resource efficiency both have a beneficial impact on green economic growth. They advocate for the implementation of pragmatic policies such as enhancing the creation of environmentally friendly jobs through SMEs,

supporting environmentally friendly financing methods, and fostering environmentally friendly foreign direct investment (FDI).

This research [17] illustrates the environmental issues faced by the world as a result of increasing carbon emissions, waste of energy, pollution, wastewater, and a lack of water. Small and medium-sized businesses (also known as SMEs) are responsible for a major portion of the world's pollution and need to find solutions to environmental problems. This article analyzes the ways in which initiatives for corporate social responsibility (CSR), particularly green innovation, can improve environmental performance in small and medium-sized enterprises (SMEs) in developing countries such as the Maldives and Morocco [18].

According to the findings of this study [19], social innovation can also have a beneficial effect on environmental performance. The term "social innovation" refers to the generation and application of novel ideas, principles, or practices with the goals of satisfying societal requirements and enhancing societal outcomes. This study conducts a survey of small and medium-sized enterprises (SMEs) in Semarang, Central Java, and finds that acceptance of SBMI is influenced by a variety of elements, including external factors, dynamic performance expectations, facilitating conditions, social influence, effort expectations, hedonic motivation, and internal speed considerations [20].

This study helps to understand the relationship between green entrepreneurship, innovation and financial performance in the context of Saudi small businesses. It emphasizes the importance of promoting green business self-efficacy and business orientation to promote sustainable business practices and outcomes [21]. Social and political contributions are most important in promoting sustainable product innovation, followed by reducing pollution, waste and emissions.

In addition, the study found that pollution and waste are the most influential factors in promoting sustainable process innovation, followed by anti-competitive behavior and emission reduction [22]. the impact of knowledge transfer activities on SMEs in the food sector. The KITE project facilitated knowledge transfer between universities and industry, resulting in added value and increased competitiveness for the SMEs. The financial investment in research and technology support activities led to developments in information technology and systems, supplier sourcing, and waste reduction. The university's technical and food science/safety support enabled service activity resulting in certifications, new supply routes, and increased sales for the SMEs. These findings contribute to the understanding of the importance of knowledge transfer in driving growth and competitiveness in the food sector [23]. This study involved conducting a survey among SMEs in Portugal and the UK. The survey was shared with SMEs registered with the Small Business Support Institute in both countries, and a total of 249 responses were received after removing incomplete responses [24] the understanding of the factors influencing green innovation and economic performance in small enterprises and provides insights for policymakers and organizations to support and promote green entrepreneurship in Saudi Arabia [25] eco-innovation plays a crucial role in transitioning towards a more resource-efficient economy. The eco-innovation index is an important indicator of environmental innovation, research, and development, and is one of the thematic indicators in the European Union's Resource Efficiency Scoreboard [26].

Providing insights and recommendations for the management of SMEs in reorganizing their activities and redefining their strategies based on eco-innovation.

The study suggests that future research should focus on expanding cooperation between institutions at the industry and government levels, as well as measuring other innovation indicators using individual clusters to better understand differences [26].

The study focuses on Thai SMEs and may not be generalizable to other contexts. Future research could explore the impact of intellectual capital on open sustainability innovation in different industries or countries. Additionally, the study could consider the inclusion of human capital in the intellectual capital construct and further investigate the consistency of open sustainability innovation with sustainable development goals [27]. The literature on eco-innovation has identified key drivers of eco-innovation at the macro, meso, and micro levels [28]. These drivers include the importance of connecting various sources of knowledge, such as universities and suppliers, in supporting environmentally friendly business efforts. Customer demand is also a critical driver, as more environmentally sensitive customers raise their expectations for the environmental quality of goods and services. Additionally, financial performance has been found to be positively correlated with environmental innovation activities [29].

3 Methods

Since the development of data mining tools, the process known as systematic literature review (SLR) has seen a surge in popularity. Following the completion of a search strategy and the use of bibliometric analysis (BA), the SLR researches the inclusion of data collection. For the purpose of this study, "Biblioshiny" is a bibliometric instrument that is used for the examination of science mapping. The author then uses the string " sustainability innovation" OR "sustainable innovation" OR "environment innovation" OR "environmental innovation" OR "green innovation" OR "eco-innovation" AND "SME" OR "SMEs" OR "small and medium-sized" OR "small-medium businesses.". We found 512 document to generate the data.

4 Result and discussion

In Fig. 1 analysis of Biblioshiny, there are various groupings that can be used to understand and evaluate research results. One of them is a thematic map that consists of four quadrants, namely Niche Themes, Emerging or Declining Themes, Motor Themes, and Basic Themes.

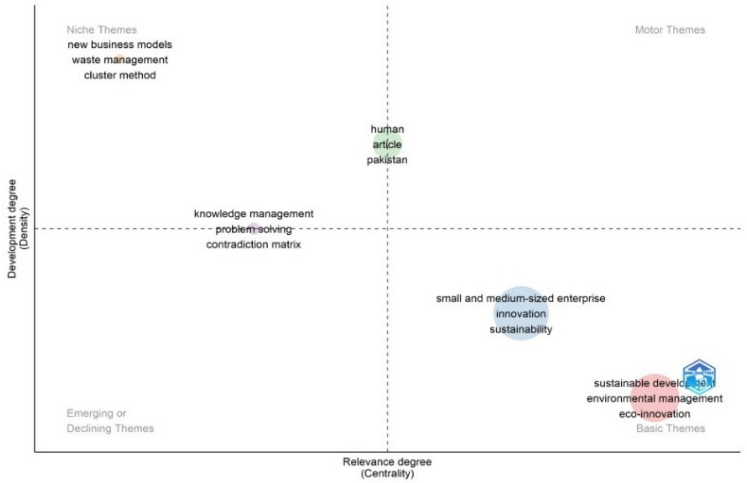

Fig. 1. Bibliometric thematic map.

In the Basic Themes section, there are two groups that are relevant to the paper title "Green Innovation in SME", namely groups that discuss Small and Medium-Sized Enterprise Innovation Sustainability and Sustainable Environmental Management Eco-Innovation. However, even though both are in the same quadrant, their positions are different and have different focuses.

The Small and Medium-Sized Enterprise Innovation Sustainability group tends to focus on things related to technology and trends, as well as things that are rising or falling. Meanwhile, the Sustainable Environmental Management Eco Innovation group tends to focus more on the basic things that form the basis of research.

Even though both have almost the same size and are widely discussed by others, it is still important to understand the difference in focus between the two in the context of green innovation in SMEs.

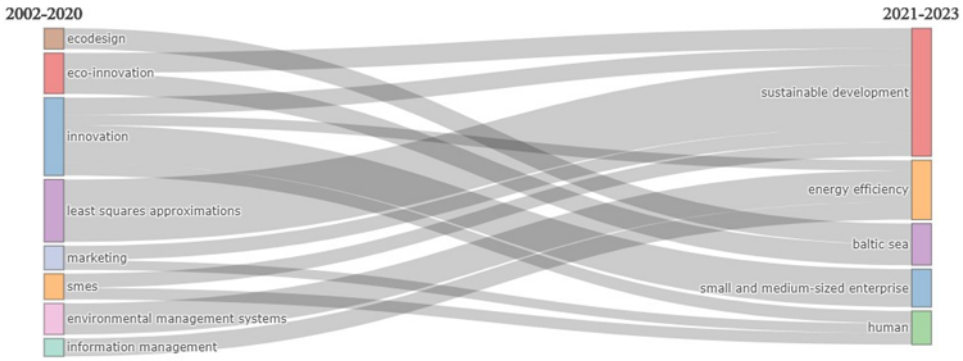

Fig. 2. Bibliometric thematic evolution

In Fig. 2 it can be seen that Thematic Evolution is divided into 2 time slice periods, namely the first time slice with the 2002-2020 period, initially, there were 8 Discussion

Topics which over time as seen in the second time slice in 2021-2023, the topics was split and conical again with fragments of other discussion topics to become 5 clusters.

If you pay attention, in the 2002-2020 period the topic of discussion was eco-innovation transformed into the baltic sea with a total of 2 papers in the 2021-2023 period which shows that there has been a change in the focus of the discussion from the main topics discussed, namely eco-innovation become baltic sea. they help in understanding the changing focus of trends over time

Then next, if you look closely, at the topic of discussion regarding innovation in the 2002-2020 period which is divided into 4 parts, namely 28 papers that discuss sustainable development, 1 paper that discusses energy efficiency, with 47 papers that discuss small and medium-sized enterprise and 8 papers that discuss human. This shows that there has been a development in terms of research, where researchers are trying to understand and identify more deeply sustainable development, energy efficiency, small and medium-sized enterprises, and humans by using the basic or main topic of innovation.

Table 1. Internal factors of green innovation

No	Classification	Total variable	Percentages
1	Human resource	20	19.8%
2	Corporate culture	11	10.89%
3	Technological capabilities	35	34.65%
4	Organizational structure	22	21.78%
5	Vision, mission, and objective	13	12.87%

Table 1 explains that green innovation is influenced by internal factors and external factors. In internal factors, there are 5 classifications consisting of human resources, corporate culture, technological capabilities, organizational culture and vision, mission and objective. In the classification of human resources, there are 20 variables with a percentage of 19.8% of 100% and variables dominated by green human resource management and transformational leadership. Then in corporate culture, there are 11 variables with a percentage of 10.89% of 100% and corporate social responsibility as the variable that dominates this classification. Furthermore, technological capabilities have a variable number of 35 variables with a percentage of 34.65% and variable frequencies that often appear, namely corporate dynamic capability, and green absorptive capacity. Organizational structure has a number of variables as many as 22 variables with a percentage of 21.78% where the organizational support variable is the dominating variable in this classification. The last one is vision, mission and objective has 13 variables with a percentage of 12.87% which are dominated by knowledge management variables.

In this classification, the highest number of variables is found in the classification of technological capabilities, which amounts to 35 variables or 34.65%.

Table 2. External factors of green innovation

No	Classification	Total variable	Percentages
1	Political	8	17.7%
2	Economic	22	48.88%
3	Technology	3	6.66%
4	Regulation	7	15.5%
5	Natural	22	11.11%

Table 2. In external factors, there are 5 classifications, namely political, economic, technology, regulation, and natural. In the political classification, there are 8 variables with a percentage of 17.7% of 100%. The for economics, there are 22 variables with 48.88%. Then technology has a variable number of 3 with a percentage of 6.66%. Regulation with the number of variables is 7 variables with 15.5%. And the last one is natural which has a total variable of 5 with 11.11%. The economic classification is the classification with the highest number of variables among other classifications, amounting to 22 variables or 48.88%.

5 Conclusion

Based on the results of the analysis conducted on thematic maps and thematic evolution, we can draw the conclusion that these two analytical tools can help provide a comprehensive view of trends and patterns in research results, and can help us understand the focus and developments that occur on the topic of discussion from time to time. Thematic Map on Biblioshiny can help us to group related topics of discussion and provide information about how much the topic of discussion is covered in the research literature. Besides that, Thematic Evolution on Biblioshiny helps us understand changes in focus and shifts in topic of discussion from time to time, so that we can evaluate the success of research and sustainable research strategies.

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