



Adoption of Green Innovation in SMEs: A Literature Review

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Abstract. SMEs as engines of macroeconomic expansion, not only contribute to social and economic progress but also have a significant negative impact on the environment. SMEs are the main source of greenhouse gas emissions in every region, but due to lack of resources as well as knowledge, they are unable to engage at the desired level. The government is focusing its efforts on developing new green strategies and learning about innovative green solutions that will help SMEs reduce their greenhouse gas emissions. This study will discuss a literature review of several research results regarding Green Innovation including the concept of Green Innovation, the adoption Green Innovation in SMEs, as well as the drivers and barriers in such adoption. The research method used is a literature review of several articles and research journals that discuss Green Innovation. The findings from this literature review are that the adoption of Green Innovation in SMEs can occur in the internal context of the organization, the external environment, and in the context of technology. The results from this study suggest managerial implication, by continually enhancing knowledge of the SMEs long-term goals and developing technology to accomplish corporate efficiency, the SMEs continue to sustain the company's innovative performance so that it continues to improve. This literature review can provide an understanding of the adoption of Green Innovation in SMEs for all parties involved, especially academics, researchers, and practitioners in the field of innovation.

Keywords: Adoption of Green Innovation · SMEs · Drivers of Green Innovation · Barriers of Green Innovation

1 Introduction

Nowadays the importance of small and medium enterprises (SMEs) is becoming more widely known. SMEs play an important role in the economic development of a country in terms of generating jobs, generating wealth and income, and reducing poverty [1]. However, SMEs as an engine of macroeconomic expansion, not only contribute to social and economic progress but also have a significant negative impact on the environment [2]. This is evidenced in a number of literature studies where it has been proven that SMEs in European countries contribute about 60% to 70% of all pollution, but the environmental consequences of SMEs in developing countries are even more dire and immeasurable [3, 4].

SMEs are a major source of greenhouse gas emissions in each region, but due to lack of resources as well as knowledge, they were unable to engage at the desired level. Therefore, governments around the world have expanded their responsibilities to limit environmental damage from waste emissions from small and medium-sized enterprises (SMEs). As a result of this growing understanding, businesses today are under great pressure to produce environmentally friendly processes or commodities as a result of greater understanding among governments around the world. The government is focusing its efforts on developing new green strategies and learning about innovative green solutions that will help SMEs reduce their greenhouse gas emissions [5]. Policymakers and experts suggest the best way to prevent pollution with green innovation [6]. Fussler and James [7] coined the term “green innovation,” which refers to changes and innovations in product processes that improve a company’s environmental performance. Several academics have emphasized the need for further research on the possible impact of green-oriented SMEs and green innovation on long-term company performance [8, 9]. While research conducted by Wong [10] green innovation has a direct and beneficial impact on the competitive advantage of green products as well as the success of new green products.

Astuti and Wahyuni [11] underlined the need to integrate green management in small and medium enterprises. Both developing and developed countries have major environmental consequences [12]. However, according to Tilley [13] the absorption and implementation of green innovation in SMEs in developing countries is still largely an untapped subject. Almost all Small and Medium Enterprises (SMEs) in Indonesia are considering how to advertise their products in order to compete sustainably since the ASEAN free market took effect in 2016. For now, natural and environmentally friendly products have become a concern [14]. This study aims to find out about the barriers to green innovation practices in SMEs, various adoptions of green innovation practices in SMEs and the drivers of green innovation practices in SMEs. The results of this study will provide important information for the management of SMEs as well as the government, helping them to compete in a dynamic business climate and achieve long-term economic success.

2 Research Methods

To better understand the adoption of Green Innovation in SMEs and their driving and inhibiting factors, a literature review of several articles and research journals that discusses Green Innovation. The articles were collected with the help of Google Scholar, Wiley, Emerald, Springer and Elsevier. The articles used as references are in the range of 2012–2022. The articles are then scanned according to the discussion that will be presented in this literature review. Discussion in this literature review will be divided into four parts, namely regarding Green Innovation, Green Innovation in SMEs, driving factors for Green Innovation in SMEs and inhibiting factors for Green Innovation in SMEs.

3 Research Finding

3.1 Adoption of Green Innovation

There are 10 articles that match the predetermined criteria to support the writing of the results of existing research studies indicate that there are several adoptions that can be done to apply Green Innovation to SMEs (Table 1).

4 Discussion

Green Innovation is an innovation related to environmentally friendly products or processes. Environmentally friendly here can be interpreted by not polluting the environment, preventing resource depletion, contributing to environmental preservation, and contributing to the survival and welfare of living things. Green innovation can be defined as innovations related to products or processes, as well as technologies involved in energy saving, pollution prevention, waste recycling, green product design, and corporate environmental management [24]. According to Afshar Jahanshahi et al. [25], Green Innovation is a means to develop a new product that has fewer harmful effects on the environment, namely the product has a high shelf life, low emission levels and energy consumption during the use of the product and is free of toxins, with the possibility of recycling. Green Innovation offers a bundle of benefits for companies in terms of reducing costs, reducing risk, increasing reputation and brand value, and creating the ability to innovate [26].

According to Schiederig et al. [24] there are six important aspects in the concept of Green Innovation, namely:

Innovation Object. Objects Green Innovation can be products, processes, services, or even a method that must be able to meet the needs of its users and must be able to solve a problem.

Market Orientation. Green Innovation created must have a selling value and be able to compete in the market.

Table 1. Literature review results.

Main Element	Innovation in SMEs	References
Internal Context	Using reusable packaging Turning off electronics when not in use Using high-quality utensils Organize waste as compost	[15–17]
Technology Context	Having a website Using E-Commerce	[3, 15–20]
External Context	Collaboration with environmental groups, Support from government	[15–17, 21–23]

Environmental Aspects. Green Innovation must be able to help reduce negative impacts on the environment and help preserve nature and existing resources.

Phase. The phase referred to here is the cycle of raw materials or resources taken from nature that must be considered. The goal is to reduce resource consumption so that it does not run out, and it is recommended to use renewable resources so as not to disturb the environmental balance.

Impulse. The intended impulse is the intention to make a reduction in the use of resources and costs, or it can also be a reduction in the level of risk left in the creation of the innovation so that it can be said to be economical, effective, and efficient.

Level. In this case, the level is defined as continuous innovation, where innovation not only contributes to the improvement of environmental problems but also contributes to social and economic problems. Green Innovation must be useful in all aspects or levels in life. Contains the results of empirical research or theoretical studies written in a systematic, critical, and informative analysis.

4.1 Inhibitors Green Innovation in SMEs

In a study conducted by Huang et al. [27] revealed that there are several obstacles that can occur in efforts to adopt Green Innovation in SMEs. These include lack of courses or training in conducting Green Innovation, lack of knowledge related to environmental issues, lack of cooperation in partnerships, and lack of customer demand for environmentally friendly products. In addition, competition and market uncertainty, the complexity of the Green Innovation, and the reluctance of SMEs to implement Green Innovation are also the main obstacles. Constraints in financial capacity and lack of government support can also hinder the adoption of Green Innovation in SMEs.

Likewise, the results of research conducted by Marin et al. [28] revealed that barriers in terms of costs and lack of knowledge can hinder efforts to adopt Green Innovation in SMEs. Limited capabilities, lack of SMEs strategies in innovating, and low commitment to environmental conservation make it difficult to adopt Green Innovation at the SMEs level. In addition, the market also feels that it does not provide them with sufficient opportunities in developing Green Innovation.

4.2 Adoption of Green Innovation in the Internal Context of Organizations

In the fight against climate change, the business sector plays an important role. The availability of skilled human resources who are committed to the practice of Green Innovation is one of the success factors for the adoption of Green Innovation in SMEs [15]. Introducing the Green Innovation to people is not an easy thing, in addition to requiring qualified skills, awareness of environmental sustainability is also needed [16]. More staff should be educated on how to reduce waste, save energy, and resources, such as: changing product packaging in reusable or environmentally friendly containers, turning off lights when not in use, turning off laptops when not in use, using high-quality cooking utensils so that they are more durable, utilizing organic waste to be used as compost. Therefore, training on Green Innovation to improve quality and motivate employees about Green Innovation [17].

4.3 Adoption of Green Innovation in the Context of External Environment

Innovative SMEs are SMEs that are proactive to appear innovative in their interactions with the outside world, especially in terms of the external environment [1]. According to Jun [15], Green Innovation has not been much in demand by the general public compared to non-Green Innovation products, then external partnerships and cooperation are important factors to help promote Green Innovation by SMEs. For example, if SMEs want to produce without damaging the environment, collaboration with environmental groups is needed to find out the right steps so as not to damage nature and help promote Green Innovation by SMEs [19, 20].

Other studies have also revealed that the drivers Green Innovation include government policies [3, 7, 15, 18]. Doran and Ryan [23] suggest regulatory or regulatory pressures can encourage SMEs intention to adopt Green Innovation. If the government makes policies or rules regarding Green Innovation in order to declare a movement for environmental conservation and environmentally friendly products, inevitably SMEs are forced to comply with existing rules and regulations regarding the adoption of Green Innovation to support the government movement, so that enforcement of these rules can improve the level of adoption of Green Innovation in SMEs. In addition, government support in the form of financial incentives, business loans and subsidies from the government for the development of Green Innovation can encourage SMEs to adopt Green Innovation. With the support from the government, it is believed that it can increase the number of SMEs to adopt Green Innovation because it is no longer considered an expensive thing.

4.4 Adoption of Green Innovation in the Context of Technology

The use of technology in green business is one solution that can be used to improve resource efficiency, such as the number of people, number of goods, number of locations, management, and use of resources, such as the use of technology using teleconference for discussions and meetings. For business interests to reduce environmental impact [21]. Due to the emergence of business websites, the use of the Internet for commerce has grown rapidly. Information requests can be made, orders can be placed and completed, products can be delivered, and services can be provided. The local economy will benefit from the digitalization of marketing for SMEs. With continuous technological changes, it is likely to have an effect on things such as material efficiency, energy efficiency, performance improvement and product quality improvement, as well as minimizing the waste generated [15, 17]. In addition, SMEs can change the way they are recruited. Employee documents such as offer letters, CVs, and letters of recommendation can be submitted online, eliminating the need for printing. It can also be used with current employee health insurance or car contracts, as well as other salary and benefit information. Therefore, SMEs consider Green Innovation as their business strategy and assess that technological advances combined with Green Innovation will help SMEs efficiency in processing raw materials to the waste generated [16, 29].

4.5 Drivers of Green Innovation in SMEs

But in the end the success of a SMEs in adopting Green Innovation depends on how consumers respond to it because consumers will build perceptions about the Green Innovation based on their evaluation of the functional side of the product [30]. In a study conducted by Jun et al. [15], Green Innovation can be used as a market share “catcher” for SMEs because over time, the number of consumers of Green Innovation will continue to increase. The initial market segments that can be targeted by SMEs are for example groups of nature lovers or people who care about the environment, who consider that Green Innovation are a necessity. In addition, Green Innovation can also improve the reputation of SMEs and gain a competitive advantage over their non-Green Innovation.

5 Implication

Results from this study suggest the following managerial implications: Strategies involving the creation of environmentally friendly products, the use of environmentally friendly packaging, and the use of recyclable items should be maintained by SMEs actors. In addition, it's crucial that businesses never compromise on quality or stop innovating. By continually enhancing knowledge of the firm's long-term goals and developing technology to accomplish corporate efficiency, business actors continue to sustain the company's innovative performance so that it continues to improve. The government should do more to raise the profile of environmentally conscious SMEs because these businesses have less of an adverse effect on the planet when they employ green innovation strategies; furthermore, nature has already provided everything that is useful and valuable to society.

6 Conclusion

SMEs are the main source of greenhouse gas emissions in every region, but due to lack of resources as well as knowledge, they are unable to engage at the desired level. The government is focusing its efforts on developing new green strategies and learning about innovative green solutions that will help SMEs reduce their greenhouse gas emissions. Green Innovation is an innovation related to environmentally friendly products or processes that do not pollute the environment, prevent resource depletion, contribute to environmental preservation, and contribute to the survival and welfare of living things. Green Innovation offers companies a bundle of benefits in terms of reducing costs, reducing risk, enhancing reputation and brand value, and creating the ability to innovate. Lack of knowledge related to environmental issues, lack of cooperation in partnerships, and lack of customer demand for environmentally friendly products, as well as competition and market uncertainty can hinder the adoption of Green Innovation in SMEs. Several academics have emphasized the need for further research on the possible impact of SMEs that have an orientation in Green Innovation on long-term company performance.

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