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Green Innovation in Small and Medium-Sized Enterprises (SMEs): A Qualitative Approach

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Abstract: In the face of drastic global climate change, the transition to a green economy is becoming increasingly important and it is understood as an opportunity to redesign and redefine business models, products and services, market approaches, forms of consumption, and production. Thus, this study aims to understand how small and medium-sized enterprises (SMEs) adhere to green innovation activities in the management of their business. To answer this objective, the qualitative approach (case study) was used with recourse to interview three SME owner-managers as data collection. From a content analysis, the results obtained show that green innovation is a focus of concern for managers but its operationalization has not proved easy. So two of the SMEs studied here have only implemented measures to recycle the waste produced by their daily activity, although they consider their transition to a green and sustainable business model to be important. The current macroeconomic scenarios reveal the urgent need for SMEs to change their traditional business models to a more sustainable model that involves their managers' commitment to sustainable development objectives, supported by the green and circular economy, which requires reduction, reuse, and recycling that, as has been shown, still falls far short of expectations. This means that all business stakeholders must understand the reason for adopting green innovation.

Keywords: green innovation (GI); SMEs; sustainability; entrepreneurship



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1. Introduction

Climate change is one of today's most worrying global issues, with companies being some of the biggest polluters in the world [1]. In this way, it is necessary to implement measures and practices of green innovation, in order to reduce this pollution. Currently, innovation is important due to the constant concerns for environmental protection, both from customers [2] and stakeholders [3]. Therefore, there is a need for changes in traditional business models that includes the transition to green innovation in companies. This type of innovation differs from traditional innovation, which aims to create competitive advantages by generating value for the firm, while green innovation focuses on reducing the environmental impact of processes or products.

Green innovation has various designations, such as environmental innovation, eco-innovation, and sustainable innovation, however, even with various designations, there is one main objective: to contribute to the protection of environmental sustainability [1,4]. Green innovation involves new technologies, products, services, and business models, which have a positive impact on the environment [5–7].

When it comes to small and medium-sized enterprises (SMEs), green innovation should also be a reality as, on a smaller scale, they impact the environment largely unnoticed, both regionally and nationally [5]. Consequently, due to awareness from customers, appeals from various stakeholders, and pressure from governments, this has eventually increased the responsibility of organisations, especially SMEs, to minimise their impact

of industrial activities on the environment [3]. Environmental legitimacy is an important point in explaining the relationships between institutional environments and green innovation [6]. Therefore, a firm acquires legitimacy when its environmental practices—operating methods, strategy, and outcomes—meet the objectives of all stakeholders [7].

In this regard, Arsawan et al. [8] analysed the role of environmental strategy and green innovation in SMEs, concluding that environmental strategy has significant effects on this type of green innovation for the achievement of environmental performance. The authors enumerate the benefits of innovation for SMEs, establishing that “the green innovation strategy, firms can increase productivity and focus on improving products and processes that are environmentally friendly so that they can change existing operating methods and significantly reduce their negative impact on the environment” [9] (p. 1). Ming-Horng and Chieh-Yu [9] also emphasise that innovation is the use of new technical and administrative knowledge, which the adoption of green practices can be regarded as an innovation process.

Although the impact of SMEs ends up going unnoticed, this sector of firms is one of the largest producers of industrial pollution, which has led governments and stakeholders to help these types of companies to reduce pollution and maintain economic balance. In addition, SMEs have limited resources for the growing market needs [8–14]. Therefore, SMEs are trying to implement green innovation practices but these may entail some obstacles, which Gupta and Barua [5] identified as the following: management, organisational, and human resource barriers; technological and green resource-related barriers; financial and economic barriers; weak external partnership and stakeholder engagement; lack of support from governments for green initiatives; market and customer-related barriers; and insufficient knowledge and information on green practices.

Ming-Horng and Chieh-Yu [9] also underlined that large companies tend to find it easier to implement green innovation, unlike SMEs that have insufficient resources and weaker infrastructures. Due to a lack of resources and professionals, SMEs tend to have greater difficulty in implementing green innovation [10]. In addition, studies specifically focusing on SMEs’ green innovation are still in dearth. Thus, this study aims to understand how SMEs adhere to green innovation activities in the management of their business. Therefore, the main contribution of this study is its unit of analysis (SMEs), given that most research on this topic focuses on large companies. This means that studies on SMEs are relevant, given that they are the majority of the business fabric in several economies. This study also aims to show the emergence of SMEs joining green entrepreneurship associated with a green economy and green innovation so that their environmental legitimacy is effectively recognised. This research has also several worthwhile implications for senior managers, policymakers, and governments. Our research revealed that green innovation significantly contributes to community development and environmental practices. It encourages SMEs to focus on the adoption of green innovation. However, SMEs need a change of mentality and organizational culture.

2. Literature Review

2.1. Green Innovation and Its Importance

According to Castellacci and Lie [11], green innovation or eco-innovation can be defined as the process that contributes to the creation of new products and technologies that aim to reduce environmental risks, such as pollution and the negative consequences of resource exploitation. In this sense, Karimi [12] concluded that most of the existing literature on green innovation focuses on the analysis of the benefits of implementing this type of innovation. The same authors emphasize that green innovation is an important tool for companies to increase their market share and stay alive in the long term. Green innovation can improve market position, attract customers, provide green services, and allow gaining a competitive advantage [1]. Because it brings these benefits, green innovation is on the agenda of many organisation executives as well as researchers [12].

As climate change and environmental problems have become a real concern for consumers, there has started to be pressure for companies to increase their responsibil-

ities to minimise the industrial impact of their activities on the environment [3]. With this, green innovation has been recognized as a key factor to achieve environmental sustainability [15–17]. As a matter of fact, green innovation involves new technologies, products, services, and business models that have a positive impact on the environment [5,6].

There are several ways of defining green innovation. For the OECD [17], green innovation is defined as the implementation of innovative practices that enable new ways of addressing environmental problems, both current and future, that allow for decreasing the consumption of energy and resources while promoting a sustainable economic activity. Some authors even consider that green innovation is seen as one of the main corporate assets with great potential to generate value in the market [18].

Considering the benefits of sustainability-oriented activities, many worldwide firms have initiated green activities [19]. However, many firms have scarce resources, which hamper their participation in environmental and social practices [20]. Green innovation, in comparison to environmental innovation, is more specific to organisational efforts such as green products or process innovation [21,22]. Compared to conventional innovations, despite several similar points, green innovation ultimately differs greatly in terms of purpose, complexity, research direction, and uncertainty [23,24]. Green innovation is the key to ecological initiatives and is significantly related to social and environmental practices [24].

Schumpeter's typology, which distinguishes between product innovation (new product or good) and process innovation (new production method), can be applied to the context of green innovations [25].

2.2. Green Product and Process Innovation

Green product innovation involves modifications made to improve product design, quality, and safety; it also involves reducing the impact of the entire product life cycle on the environment, such as reducing toxins in production, the efficient use of energy, and the use of biodegradable packaging [26]. Green product innovation places emphasis on reducing the impact of manufacture, use, and disposal on the environment, i.e., they are new products that in terms of one of the three types of environmental focus (materials, energy, and pollution), have a lower impact than conventional products, or ultimately make a positive contribution to the environment [14]. These products have a high level of useful life and a low level of emissions and energy consumption during the use of the product, being free of toxins and with the possibility of recycling [14].

Bansal [27] found a relationship between innovation and sustainability practices and recommended that companies should comply with their social responsibility principles in their manufacturing practices by using new technologies that are environmentally friendly [28]. The aim of social responsibility in business is to combine prosperity, social equity, and environmental preservation [29].

With regard to environment and innovation, Albort-Morant and Ribeiro-Soriano [30] argued that the firm's absorptive capacity fosters its potential to produce green innovations. The authors demonstrated that firms tend to absorb external knowledge about the negative impact of their operations on the environment (impact of pollution, waste) and combine the new knowledge with their base knowledge to facilitate the adoption of green innovation practices in their operations [31]. These practices may involve the development of new environmentally oriented products and processes related to waste reduction, recycling, pollution prevention, etc.

Sustainable orientation, on the other hand, is a strategic activity by nature and is based on several prerequisites that link: environmental vision and resources to be realized with environmental operations related to pollution reduction and elimination; product management; eco-design and labelling; environmental certification in accordance with standard 14001 of the International Organization for Standardization (ISO) on Environmental Management Systems, for example, and auditing and reporting [32]. A clear sustainable orientation affects firms' identity and values and leads to changes in their sustainable

actions, such as the allocation of environmental resources and the implementation of green systems and practices [33–35]. Here, environmental legitimacy is important in explaining the relationships between institutional environments and green innovation [6]. Yu et al. [7] also suggest that a firm acquires legitimacy when its environmental practices—operating methods, strategy, and outcomes—meet the objectives of all stakeholders.

Muangmee et al. [35] studied the influence of sustainability-oriented entrepreneurship on green innovation and its effect on sustainable firm performance. Thus, these authors pointed out that green entrepreneurial orientation increases corporate performance in three ways: (1) reducing the resource cost problem through process innovation, (2) obtaining benefits from being an industry pioneer in adopting green practices, and (3) increasing return on investments. The same authors also concluded that the positive impact of green entrepreneurial orientation on green innovation consequently positively influences the social, economic, and environmental performance of the organisation. Green innovation is an essential and burning topic for environmental and organizational performance [36–38].

Green entrepreneurship can be seen as the implementation of sustainability-related innovations, whose main objective is its implementation and promotion of the economy [38]. Entrepreneurship as an important concept is proposed both at the individual and firm levels [39,40]. Green innovation can facilitate the creation of green entrepreneurship and green firms. This innovation includes reducing harmful environmental effects and has been widely discussed [38,41].

In the same line of thought, Muangmee et al. [35] (p. 1), stated that “since environmental issues are becoming an integral part of business performance, policymakers and managers have started recognizing the importance of green innovation towards sustainable business performance”. According to these authors, green innovation should be adopted in concert with the Triple Bottom Line Model, and for innovation to be sustainable it should simultaneously take into account the social, economic, and environmental dimensions.

In short, green process innovation refers to improving the efficiency of production processes in order to reduce environmental impacts, which includes actions aimed at reducing material and energy consumption, thus minimising waste, by using renewable energy sources [4,26]. This type of green innovation addresses some environmental issues such as pollution prevention, waste recycling, energy saving, and eco-friendly design [42,43].

2.3. Green Innovation in SMEs

Ming-Horng and Chieh-Yu [9] contributed significantly to the literature on green innovation in SMEs, and both Etzion [43], González-Benito and González-Benito, [44] identified the main factors influencing the adoption of green innovation in these types of firms: (1) pressure from stakeholders, (2) environmental regulation, (3) the size of the company, (4) the characteristics of managers, (5) human resources, and (6) the sector of the company.

SMEs are smaller in size as compared to large companies and their impact on the environment ultimately goes unnoticed at both regional and national levels [5]. Consequently, due to awareness from customers, appeals from various stakeholders, and pressure from governments, this ultimately increases the responsibility of SMEs to minimise the impact of their industrial activities on the environment [3]. Thus, SMEs are trying to implement green innovation practices the implementation of these leads to gaining a competitive advantage over other companies [45–47]. SMEs can reduce their costs and expenditures through funds and subsidies, and thus, they are more willing to participate in social, environmental, and green activities. Incentives and subsidies provide for green activities that significantly enhance green innovation and green practices in SMEs [47].

In this sense, it is important to note that the adoption of green innovation practices by SMEs may present some obstacles. For example, Wang and Li’s research found that the adoption of green innovation in SMEs is greatly influenced by (1) the complexity, compatibility, and relative advantage of green innovation, (2) the quality of human resources, (3) organisational support, (4) government support, (5) consumer pressure, and

(6) regulatory pressure. However, environmental uncertainty has no significant effect on the adoption of green innovation [35,45].

3. Methodology

In this study, exploratory qualitative research (case study method) was adopted in order to achieve our research objective, related to the importance of green innovation in SMEs. Qualitative research [48] is characterized by (1) the use of direct data sources, where the researcher is the main actor in data collection; (2) the data collected are descriptive; (3) data analysis is performed using the inductive method; (4) the researcher aims at understanding the meaning of data [49–51]. The selected method was operationalised through multiple case studies, which are appropriate to investigate a phenomenon embedded in its real environment [48], as is the case of the topic under study; data were also triangulated with the reviewed literature to overcome the weak external validity that characterises this methodology. On the other hand, research participants are not mere variables, as argued by Yin [49], since the phenomenon object of research is studied where it occurs [48], providing the determination of its real meaning [50]. Already obtaining the data enables the identification of explanatory factors for the behavioural patterns of a given unit of analysis as an integrated totality [51], since “the case study deals with the processes that take place and their interrelationship” [51] (p. 113).

For Merriam [52], sample selection in qualitative research aims to obtain as much information as possible to give a grounding to the research project and create theories based on practical and theoretical criteria. A case study method is applicable for a small geographical area and a limited sample size [53]. Consequently, three SME/case studies were selected, operating in different sectors, in an inland region of Portugal. The choice of these three cases/SMEs took the following criteria into consideration: (1) previous knowledge of firms that use green innovation practices; and (2) geographical proximity and the researchers’ easy access to information. More precisely, we used a convenience sample. A convenience sample is a type of non-probability sampling method where researchers choose participants based on their easy availability and willingness to participate in the study [51]. Convenience sampling is commonly used in social science research, especially in situations where researchers need to collect data quickly, inexpensively, or where it is difficult to access the entire population.

One enterprise (SME1) belongs to the restaurant sector, SME2 to the retail sector, and SME3 is a company that produces and commercialises wines with Denomination of Controlled Origin (D.C.O). In this study, the definition of SME was adopted, according to the Commission Recommendation 2003/361/EC, 6 May 2003. Thus, the three companies studied fall into the category of micro-enterprises (less than 10 employees).

As a data collection technique, we chose to interview the three SMEs (Manager I1, Manager I2, and Manager I3), i.e., top management, including owner-managers, who were interviewed in depth. As the case study approach allows data to be gathered from a wide range of key informants, it minimizes biased data [51]. All respondents were contacted by telephone to present the aim of the study and arrange a date for the interview. These interviews were conducted face-to-face during the month of May 2022. The interview script was based on previous research on green innovation [8–10,17,36]. We also chose the owner-managers of the selected SMEs as key informants, which is justified by the arguments of Gupta and Barua [14] that they are the drivers behind the dynamic growth of the economies and those responsible for the management of this segment of SMEs. The interviews were recorded with the permission of the interviewees and transcribed in their entirety.

4. Results and Discussion

This section presents the results obtained through the content analysis of the interviews conducted. In the context of this study, the most important topics were identified in accordance with the reviewed literature, which are:

- (i) Concern for the environment and green innovation

With regard to the concern for the environment, the interviewees in the three SMEs selected for this study reported some concern, mainly with regard to recycling. I1 (SME1 Manager) refers that “everything that can be reused, we use”, while I2 refers to problems that limit actions to help decrease pollution, such as the “costs, for example, of paper bags, and plastic ones are still the cheapest”, which leads to the preference of the latter. However, I2 mentions that there is already a contribution on their part through “an amount that we have to pay to “Sociedade Ponto Verde”, due to the purchase of bags.

Taking into consideration the practice of green innovation activities, I1 indicated that, in recent times, “not much has been done related to green innovation”, something that happened due to the emergence of the COVID-19 pandemic and that ended up hindering the work that was being developed in this sense. This interviewee also mentions the increase in the use of packaging, specifically in take-aways, due to the level of demand and, therefore, “this issue is worse than it was before”. I2 admits that the company does not practice green innovation activities but “we try to make our customers aware of reducing the use of plastics”. In fact, green innovation is seen as a key factor in maintaining environmental management [54] and this type of practice is of vital importance for organizations and communities, including the SME sector.

Since I2 does not belong to a manufacturing company, they have some difficulty in this green innovation; however, some of their suppliers and distributors already apply more sustainable measures from production to packaging. In addition, green innovation has become an important tool for businesses to increase their market share and stay alive in the long run [54].

On the other hand, in SME3, its manager (I3) mentions that it differentiates itself from its competitors precisely by implementing green innovation practices, i.e., of a sustainable nature. Firstly, from the concern of recuperating castes in extinction in Beira Interior where, in this aspect, the company is a pioneer. “So that the choice of the castes to recover is the most correct, our company makes an analysis of the market, trying to know which are the fashions, which are the current tastes of the consumers so that, when it goes to the market, the wine with the caste in question, has the best possible feedback” (I3). This interviewee also mentions that his company was the first winery certified as integrated production in Portugal at the level of grape transformation into wine.

Integrated production reveals itself as an alternative to sustainable agriculture, which can be translated into the production of high-quality food where only natural resources and natural regulation methods are used, as a way of replacing production techniques that are harmful both to the environment and to those who consume them later. As I3 refers, “Integrated production has a holistic vision for the whole farm, and aims to ensure viable agriculture in the long term. We intend to relate green innovation to integrated production, since integrated production could become a source of innovation and differentiation for a company and, in turn, always being in tune with the preservation of the environment and the development of sustainable products”.

In light of the above, the three SMEs under analysis demonstrate environmental concerns, since they use and implement some green practices in their businesses, i.e., they use natural resources and natural regulation mechanisms, as well as favour products and processes that are not harmful to the environment. With these types of green practices, these SMEs can sensitize their consumers to this environmental concern [37], so that the quality factors are not only, in the case of wines (SME3), the taste and price.

Food safety is also a key factor in the analysed companies. For example, in the case of SME3, integrated production guarantees (with analyses carried out regularly) that the wines are free of any artificial products. This certification entails ethical principles of commercial transactions that are not visible to consumers, and the only way that consumers can perceive this certification is if it is mandatorily placed on the wine labels, which ends up raising awareness among consumers. This type of certification is considered a form of green innovation.

SME3 also preserves natural resources, as is the case of water productivity, i.e., this company collects water for dams when it rains, thus not having to use irrigation when it needs it, which would imply the use of electricity and other factors to get this water to the vineyards. Thus, integrated production also values biodiversity, which aims to protect all the plant and animal life that is found throughout the property and not just in an exclusive parcel. This is also a green innovation practice, as it creates value for its stakeholders since this holistic approach always aims for long-term sustainability [31]. In short, SMEs have concerns about the environment, so green innovation is a way of responding to those concerns [5] and improving their legitimacy with stakeholders [10].

(ii) Importance of green innovation for sustainability, application, and product difference

Green innovation, as a key factor to achieve environmental sustainability [37], is something important that makes sense to the interviewees but I1 states that “before we noticed more the reduction at this level” and “some customers already bring their bag and take their food with them”. This interviewee mentions that these small steps are fundamental to improving the situation of the planet. I2 sees innovation as a key factor for the company itself to have environmental sustainability, despite not being a producing company. For I3, for “a company to achieve certification, regular updates of the farmers’ knowledge are necessary because we are in times of constant change, which requires new techniques to be adopted depending on the situation in question.” In this sense, integrated production means that when the vines are planted, they must have a phytosanitary passport. This passport guarantees “that there is no contamination of the soil if the plants come in sick”, the interviewee adds.

These testimonies are in agreement with other authors [16,17,26], who state that green innovation is a key factor for environmental sustainability. Regarding the application of this type of innovation, I1 admits that the company, before COVID-19, applied green innovation in the take-away part. For I2, the applications go through the packaging of the products sold, which are more ecological and suitable to be reused. This corroborates with Kammerer [28], who portrays the reduction of the impact of the entire product life cycle on the environment where packaging is concerned. In addition, green innovation has a positive and direct impact on green products’ competitive advantage and new green products’ success [55].

On the other hand, green innovation products are different from conventional products. For I1, this portrays the advantages of opting for more sustainable products, such as glass bottles. An important point for I2 is the fact that these products are no longer so expensive, since “although it was a green product, it had a higher cost, because the packaging fulfilled all the requirements. At this moment, there is not much of that difference anymore”. According to Dangelico and Pujari [17], these products have a reduced impact on manufacturing, use, and disposal on the environment, and have a lower impact compared to others, contributing positively to the environment. The interviewees’ statements are in agreement with these authors.

Interviewee I3 also shows how the concept of green innovation is present in his company. Taking into account that integrated production is an agricultural system for the production of “high quality food with a view to long-term viable agriculture”, it is possible to conclude that this system is a form of green innovation since it is a type of certification that preserves natural resources such as water. Here, there will be no waste of water. As I3 refers, “there will be water retention, which will enter our property, whether by run-off from other properties or by rain, which is always better. So, channelling water into dams is always better than using water that has been transported there, for example, an irrigation system where electricity would have to be used”. So, this SME is trying to implement green innovation practices to gain a competitive advantage over other companies [46,47].

(iii) Sustainable guidelines and strategies

In the guidelines that are followed by the SMEs studied here, I1 mentions the care in recycling and the maximum use of products and I2 and I3 also mention concern with

electrical energy. These guidelines are based on the environmental vision of resources, for environmental operations that relate to the elimination of pollution, which is in agreement with Paulraj [33] and Yu et al. [10]. The strategies followed go through separating all products for I1. For I2, they do not have “a strategy by which they are governed, but there is a concern about the environmental impact”, and this is in agreement with Hellström [26] who portrays the actions for reducing material consumption in order to minimize waste and reduce environmental impacts. In addition, green processes and green products not only attenuate negative environmental impacts but also facilitate businesses in the reduction of waste and cost, resulting in increased financial and social performance [56].

According to Takalo et al. [57] and Kam-Sing et al. [58], green innovation is an important tool for businesses to increase their market share and stay alive in the long term as it can improve market position, attract customers, provide green services, and enable them to gain a competitive advantage. Thus, according to I3, “the first certified winery in integrated production in Portugal was in our company. So my company gains a competitive advantage by being a pioneer in varietal recovery. With this certification, our company provides green services because its products are more free of artificial products than other wines which do not have this certification”. This idea is also mentioned by Schamzzuzoha et al. [32].

Muangmee et al. [35] analysed the influence of sustainability-oriented entrepreneurship on green innovation and its effect on firms’ sustainable performance. In the three cases studied here, it is concluded that green entrepreneurial orientation enhances a firm’s performance in three ways: (1) reducing the resource cost problem through process innovation, (2) obtaining benefits in the sector where they operate by adopting green practices, and (3) increasing the return on their investments. In this sense, this study concludes that the positive impact of green entrepreneurial orientation on green innovation has a positive influence on the social, economic, and environmental performance of companies. As can be seen in SME3, this company also seeks to make the consumer aware of this environmental issue, so that the quality factors perceived by the consumer are not only taste and price, in this case in wines but also have other complementary criteria, such as food safety. Therefore, it is a wine that is freer of artificial products than other wines that do not have this certification and, in this case, there are also ethical principles of commercial transactions here which are not visible but are related to the quality of the environment [4].

(iv) Pressures/obstacles of green innovation

Some of the SMEs studied felt pressure or obstacles with regard to innovation. I1 mentions that it is something inherent to the person him/herself, while I2 mentions the taxes imposed by the State, which are compulsory (in the case of plastic bags) and also mentions that there could be another way of helping the environmental impact. I3 mentions that the certification process is sometimes lengthy and complex. With this, there is no connection with what authors Walker et al. [3] and Gupta and Barua [14] investigated about the obstacles experienced by SMEs when implementing green innovation. Therefore, SMEs in general, face several obstacles in the implementation of green innovation due to a lack of resources. However, the existing literature has suggested several solutions/strategies to overcome these obstacles/barriers. According to Weng et al. [59] and Kiss et al. [60], policies designed by the State regarding the adoption of green innovation might be more beneficial.

Environmental legitimacy is seen as an important factor for the interviewees: it is something important for all sectors, and is a topic that should be addressed as it is a matter of mindset from I1’s perspective. Furthermore, it is something to improve people, products, and even the world, and everyone should be concerned about this matter—“it’s up to each of us to have these concerns and it’s up to the common sense of each of us to be able to improve our planet”—according to I2 and I3. Thus, throughout the interviews, it is understood that the three SMEs analysed currently follow green innovation activities, which leads to the conclusion, according to Yu et al. [10], that SMEs are now beginning to achieve environmental legitimacy since their practices are now beginning to be recognised.

In addition, our findings are related to Awan et al. [61], who revealed that green innovation helps firms in practising and adopting environmental and community practices.

5. Conclusions and Implications

This study aimed to understand the perception of green innovation in SMEs in a Portuguese inland region. The results of this study indicate that green innovation is seen as a factor of importance for the three companies studied here, although two of them do not currently practice green innovation activities. However, all the SMEs studied showed their concern for the environment through actions already implemented, such as recycling, reuse of products, certification, and integrated production.

This study has direct implications for the role of green innovation in the SME context. The results obtained can enrich the literature on innovation, entrepreneurship, and management strategy, broadening its perspective on SMEs that implement green innovation practices.

In this context, it is argued that SMEs have understood the importance of adhering to green innovation since the current climate of uncertainty demands that new business models be adopted by managers. These businesses have to progress in a sustainable and green way, as the ecological footprint has not and will not end. This means that SMEs can be the bridge to a green and circular economy, considering that they represent the majority of the business fabric worldwide that consumers are increasingly demanding in relation to sustainability, so their maximum satisfaction is to have access to green and ecological products and services. On the other hand, SME managers should stimulate their employees to recognise the importance of green innovation, which these are the pillars of green transformation.

As implications for practice, it is important to refer to the limitations that SMEs are subject to for access to green innovation, specifically, access to funding, the involvement of skills, insertion in networks of knowledge, access to information, and excessive bureaucracy. Thus, it is crucial to provide SMEs with the means to become green as a way to increase their competitiveness in disruptive environments, which require rapid adaptation. In addition, green innovation can bring positive effects to the SMEs involved but it is necessary to choose the appropriate partners and practices for the realization of these innovations.

On the other hand, the managerial commitment regarding greening SMEs was confirmed in this study, which shows that if the top management of SMEs is committed enough to the goals of green innovation, then it can be achieved.

In sum, green innovation is a concept that refers to the application of technologies, processes, and practices aimed at reducing environmental impact and promoting sustainable development. SMEs have an important role to play in promoting green innovation as they account for a large share of global economic output and have a significant impact on the environment. SMEs can benefit from the traditional business model and implement green practices and technologies to become more sustainable. This includes implementing renewable energy sources, using recyclable materials, optimising production processes, and adopting responsible environmental management practices. In addition, green innovation can help SMEs stand out in the market, attract new customers, and increase their competitiveness. Green innovation can also be encouraged by public policies and promotion programmes, which provide financial resources and training for SMEs seeking to implement green solutions. SMEs need external support, such as government incentives and public finance to perform eco-activities. Government subsidies and public support are very crucial for SMEs' sustainable development and green communities. In addition, SMEs can form partnerships and collaborate with other companies, universities, and organisations to share knowledge and green solutions.

This research has a few limitations that would be beneficial for future researchers to address. For example, the small sample size, so as a future line of research, a quantitative study that establishes a causal relationship between the profile of SME managers and adherence to innovation is suggested. However, the use of a small sample (three SMEs), is

a reflection of convenience sampling, which suggests the utility of a future replication of this study with a larger sample, so that the results can be generalized and obtain greater internal validity. In a convenience sample, researchers choose individuals who are readily available, accessible, and willing to participate. This may include selecting participants who are nearby, who are already in a particular location (such as a shopping mall or a college campus), or who have a particular characteristic that makes them easy to recruit (such as social media users). While this type of sampling method can be useful in certain situations, it may not accurately represent the broader population and may introduce bias to the study results. Finally, a systematic literature review on this relevant topic of green innovation in the SME context, through a bibliometric analysis, is also suggested.

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