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Review

Proposal for an Eco-Innovation Concept for Small- and Medium-Sized Enterprises (SMEs)

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Abstract: Eco-innovation is an important factor not only for the competitiveness of companies in the face of the greening of markets but also as one of the primary means on the road to sustainable development. However, there is a remarkable conceptual diversity in the subject given the theoretical perspective from which eco-innovation is analyzed. Therefore, this research aims to establish an integrating concept of eco-innovation, based on elements of acceptance in the scientific literature, for its application in SMEs. To this end, 40 articles from recognized scientific databases such as ScienceDirect, Scopus and Web of Science (WoS) were reviewed, resulting in a concept that covers the economic approach, definition, dimensions and drivers of eco-innovation. It was found that the implementation of eco-innovation is dependent on the degree of formalization in each element according to the institutional context in question.

Keywords: eco-innovation; sustainable development; competitiveness; SMEs

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1. Introduction

Undoubtedly, the concept of eco-innovation or green innovation presents varied representations. It can also be associated with the political agenda and legal framework for sustainable development, which currently includes development goals (SDGs) and specific targets to be met by States. As a normative concept, green innovation operates at the cognitive level by introducing a sense to a set of facts. In this sense, eco-innovation is part of a model for an order that establishes a way of presenting reality and, as such, allows for standardizing the diversity of events in a given social field by establishing criteria based on an end or purpose.

The notion of eco-innovation or green innovation is oriented to the discernible change in products and processes to achieve a benefit additional to economic benefits, such as the "creation of shared value", which, in this case, is the solution for environmental needs from the perspective of improving the competitiveness of a company [1] (p. 82). As a general typology, it is also recognized that eco-innovation addresses the improvement of products, processes and organizational systems in a way that reduces or minimizes the negative impact of business operations on the environment [2].

For its part, with the report titled Our Common Future or Brundtland, the concept of sustainable development was defined for the first time. In 1987, this report was approved as an annex to a resolution of the General Assembly of the United Nations (UN), and, with it, the action of the UN emphasized the complementarity of economic development

and the level "of technology and social organization, natural resources and the capacity of the biosphere to absorb the effects of human activities" [3] (p. 16). Later, in 2002, the World Summit on Sustainable Development was held in Johannesburg, where two documents, the Johannesburg Declaration and the Johannesburg Plan of Action, were negotiated and adopted, expressing the agreements between States regarding the reformulation of the concept of sustainable development that remains to this day. In doing so, the notion of sustainable development transcends the boundaries of ecology and becomes a concept that addresses the diverging priorities of economic growth, social development and environmental protection [4].

According to Schiederig et al. [5], when comparing the concept of sustainable development promoted by the UN with previous notions of environmental innovation, the difference is that the former included economic, ecological and social aspects, while the latter covered only economic and environmental aspects. Also, several authors have observed that since 2005, the terms "green and eco" have been increasingly used in scientific publications on environmental innovation [5] (p. 182). A controversial aspect of environmental innovation in relation to SMEs is that it constitutes a complex practice of relationships within the context that solves disparate motivations and objectives, generally dealing with larger companies that are that have resources for access to new technologies and even for their development [6].

For their part, SMEs constitute the majority of companies in developing countries and hence, the social relevance of this group of economic activity. In this sense, the problem lies in the fact that SMEs usually have a strategic approach based on intuition and experience so, as a rule, they have not developed a professionalization of management [7]. In this way, indicators based on R + D or certification in environmental management systems are unfeasible for SMEs, and it is also precisely strategic management processes that provide rationality for the development of competencies in environmental innovation as a creation of shared value [1,8,9]. Therefore, as part of a broader research project in the context of SMEs in Colombia, this study answers the question: what would be an appropriate concept of eco-innovation as a facilitating framework for its practice in SMEs?

2. Materials and Methods

The present study deals essentially with the analysis of a concept as a symbolic set from previously established theories, adapting it to a specific group of business activities. The research field is therefore that of language and meaning. A purely qualitative approach was used based on content analysis and a systematic review of the academic literature on the subject. The referential frameworks of the analysis were institutionalism, which assumes normative concepts as the axis of social integration [10], and social constructivism, which affirms that knowledge does not imply representations in the form of reified items, responding instead to an adaptive function for the participation of people in activities that are semiotically and materially located with the consequent gradual and intersubjective adjustment of meaning [11]. With this in mind, the observational statements that derive from the analysis are made from the perspective of the functional utility of knowledge.

The justification for this study starts from the principle of collective acceptance typical of institutionalism and is assumed at the context level in the form of the following mutual conditional statement [10]: x is F in context C $\leftrightarrow$ if group G in context C has an attitude A[F] on x. Along with this, the design moves away from the attributes of deductive logic in the sense of reviewing all data possibilities, or all those available, considering a selection or intentional sample of 40 scientific articles on the subject. The relevance of the information and collective acceptance was considered with the hierarchy of sources by including articles from publications with high scientific recognition, in turn with a significant number of citations (+50), selected from the ScienceDirect, Scopus and Web of Science (WoS) databases (Appendix A). In this way, the design can be seen methodologically in the line of reflective pragmatism [11]. The underlying inductive reasoning is that the generally accepted concept of eco-innovation is also applicable to SME practice.

Considering eco-innovation as a normative notion, and given the unlimited nature of conceptual frameworks, within the referential framework of institutionalism, the notion of constitutive rules proposed by Searle [12,13] was also taken into account. According to this theory, normative concepts (Y) establish the link between constituent entities (X) and the relevance of the concept in a context (C). According to Hindriks [10], the syntax of constitutive rules can be posed at the following two levels: (1) X counts as Y in C and (2) Y is for Z. The first level of analysis refers to the realization of a concept (Y) using its constituent entities (X), which in this case is eco-innovation. Context (C) is a reference to the specific social and institutional field for the realization of the concept. The second level of analysis, i.e., Y is for Z, refers to the practical purpose of the concept.

For the development of a concept of eco-innovation, according to the perspective of the constitutive rules, the following topics were established, taking into account previous knowledge on the subject: (1) definition; (2) dimensions; (3) economic approach; and (4) drivers. While the first two topics in themselves satisfy the conceptual approach, it was felt that both the economic approach and the drivers would bring an important dynamic extension to the elements of the context (C) and the practical purpose of eco-innovation (Z). Additionally, the topics established constituted the criteria for the information search in both Spanish and English. Along with them, the terms eco-innovation and green innovation were used interchangeably (definition + eco-innovation OR green innovation; dimensions . . . ; economic approach . . . ; drivers . . .). Figure 1 shows the analysis process that was performed.

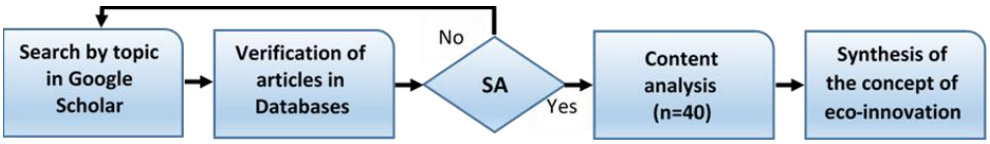

Figure 1. Flowchart showing the bibliographic analysis. SA = selection of articles according to their relevance (decision). Source: The authors' own elaboration.

The content analysis followed a simplified procedure considering only a moment or interpretative level. This was possible since, as raw data, the sources of information were scientific articles that already had a synthesis and categorical structure according to the established topics. The analysis, therefore, used the following steps: (1) the bibliographic references were reviewed, identifying the elements of interest in the text as observational statements in each predefined category; (2) statements were selected according to interest for their presentation as examples or judgments of authority in the argumentation; and (3) synthetic definitions or explanations for the summarized statements in the argumentation were formulated. The frequency of appearance of different elements or statements was not considered relevant, nor was it necessary to encode or distribute the data in matrices, taking into account the disposition of the information, the objectives of this study, and the particularities of the design used for the qualitative approach. Table 1 shows the categories that guided the content analysis.

Table 1. Predefined categories for the content analysis.

Topics	Descriptive Categories	
Definition	Object of eco-innovation Minimization of environmental impact Market orientation Sustainability	Functional description
Dimensions	Perspectives of eco-innovation Typology of dimensions	
Economic approach	Theoretical positions of sustainability Economic trend in eco-innovation	
Drivers	Perspectives on drivers Typology of drivers of eco-innovation	

Note: The authors' own elaboration.

3. An Integrating Concept of Eco-Innovation

Using the bibliographic analysis, it was possible to verify that there has been an increase in the relevance of the topic of eco-innovation in the academic field, with articles that began to be published in the last decade of the last century and an escalation in publications since 2007 [14]. Similarly, it could be seen that the term environmental innovation has now been replaced with eco-innovation, which was the most used term in the last six years [2].

3.1. Definition of Eco-Innovation

Eco-innovation has generally been accepted as the main way to achieve sustainable development in business practice based on the following four fundamental aspects of its definition [2]: (1) the object of innovation, referring to the various components of the company; (2) minimization of environmental impact, with the control of resource consumption, polluting emissions and waste; (3) market orientation, being based on competitiveness, taking into account the stakeholders; and (4) sustainability, as the economic and social purpose of the company is also affirmed.

In correspondence with the above, there is great diversity in the definitions of eco-innovation that present subtle differences depending on the degree of environmental commitment that has been assumed institutionally. A typical example is the following definition of eco-innovation given by the European Commission in 2007 within the "Competitiveness and Innovation Framework Programme" and used as a reference by many authors including Peyravi and Jakubavicius [15] (p. 4): "Any form of innovation as significant and demonstrable progress towards the goal of sustainable development, through the reduction of impacts on the environment or achieving a more efficient and responsible use of natural resources, including energy".

This definition underlines two essential aspects of the concept of eco-innovation, that is, it frames it in the general practice of innovation and, in addition, defines its orientation in reducing environmental impacts. The aforementioned definition also establishes the aspect of motivation for eco-innovation, which, in this case, would be the political agenda of sustainable development. According to Schiederig et al. [5] (p. 181), in relation to this last aspect of motivation, other international bodies such as the Organization for Economic Collaboration and Development (OECD) point out that only the effect of reducing environmental impact is important when defining eco-innovation as follows: "The creation or implementation of new, or significantly improved, products (goods and services), processes, marketing methods, organizational structures, and institutional arrangements that, intentionally or unintentionally, lead to plausible improvements in environmental performance compared to the corresponding alternatives".

The OECD definition states that the motivation can be different from the environmental one, for example, a reduction in costs for waste management. In the same way, emphasis is placed on the previous definition of an improvement related to the possible alternatives. According to Schiederig et al. [5], this is an essential aspect since a comparison with intra- and inter-organizational alternatives is necessary and, therefore, can only be defined relatively and temporally, which is an important precision measurement for the practice of SMEs given their characteristics. Another aspect of the OECD definition relevant to SMEs is that eco-innovation can be technological or not, as is the case with organizational structure or marketing.

The purpose of the analysis on this topic is to understand the defining characteristics of eco-innovation. Table 2 shows other groups of definitions that had general acceptance within the literature analyzed, depending on whether the emphasis was on market orientation or on the implementation and results of eco-innovation. To be sure, many other definitions of eco-innovation could be cited. However, the above fully addresses the objective of this study and the purpose of defining eco-innovation in a way appropriate to the practice of SMEs.

Table 2. Groups of relevant definitions of eco-innovation.

Emphasis	Definition of Eco-Innovation	Authors
Market orientation	Process for developing products, processes or services that provide value to the customer and the company and significantly reduce environmental impact	Fussler and James [16]
	Any innovation capable of attracting green income to the market	Andersen [17]
Instrumentation and results	Process where sustainability considerations are integrated into the company's systems from the generation of ideas to R + D and commercialization	Clark and Charter [18]
	Innovations for products, processes, practices and systems that benefit the natural environment and thus contribute to environmental sustainability	Oltra and Saint Jean [19]
	Using organizational practices with the aim of developing environmentally friendly products and processes, improving efficiency in the use of resources and reducing environmental impacts	Singh et al. [20]
	Innovation that serves to reduce anthropogenic loads on the environment, clean up the damage caused or diagnose environmental problems	Hemmelskamp [21]
	Innovation of hardware or software related to products or processes, which intervene in energy saving, pollution prevention, waste recycling or environmental management	Chen et al. [22]
	Services, products and processes that do not damage or reduce the degradation of an ecological environment but enhance the value of natural resources	Ahmed et al. [23]

Note: The authors' own elaboration.

In correspondence with the above, the proposed definition of eco-innovation must assume, as constituent entities (X), innovation with explicit objects including products, processes or organizational methods, which significantly improve environmental performance in relation to possible alternatives (Y). In this case, the context specific to eco-innovation (C) includes the markets and what this implies regarding the contribution of value for customers and the company, as well as the institutional framework in relation to the political program of sustainable development. The ultimate purpose (Z) of eco-innovation, considering that the market and sustainability are not incompatible and that the latter can be achieved within commercial dynamics, is to achieve the necessary competitiveness between companies, including SMEs, which would always be something of a relative and temporary nature. In this way, eco-innovation is defined by the following statement:

> The process for innovation of products, processes or organizational methods that, by providing market value, significantly improve environmental performance compared to possible alternatives, thus improving competitiveness within a specific social and institutional context.

Therefore, the definition is a pragmatic position, where the motivation for eco-innovation does not have to be environmental performance, although it is a necessity to be called such, as could be the case, for example, of selling competitive products in the world market. On the other hand, social performance is treated from the relationships that occur in the

specific social and institutional context. In general, it is also in this way that the interrelation between eco-innovation, the political agenda and the objectives of sustainable development promoted by the international community is assumed.

3.2. Dimensions of Eco-Innovation

In the dimensions of eco-innovation, there is also diversity in the approaches that obey the theoretical perspective and purpose of the previous studies. In this sense, there are relevant works by Hellström [24], on Schumpeter's theory of organizational change associated with innovation, and that by Andersen [17], on the perspective of an industrial dynamic. Other seminal works include those by Carrillo et al. [25], from an evolutionary approach, as well as Xavier et al. [26], which addresses the management of eco-innovation and its maturity in companies. In general, the analyzed literature can be placed into one or more of the perspectives mentioned above. For the reference frameworks used in this study, the topic of dimensions is important when qualifying the element of constituent entities (X), dealing with the various modes of realization and the flexibility inherent in eco-innovation (y), which are fundamental aspects in the development of the competencies required for SMEs. The dimensions also reflect the aspects that serve as a solution to the interests that derive from the context (C) and, with it, the ways to achieve competitiveness (Z).

As an integrative synthesis aimed at understanding the concept of eco-innovation for SMEs, the following dimensions are proposed: (1) organizational change; (2) product/service life cycle; and (3) eco-innovation management. These dimensions also serve as an analytical tool for the practice of eco-innovation and correspond to the evolutionary theory of entrepreneurial activity.

Regarding the organizational change implied with eco-innovation, the analyzed literature agrees that the most important and used theory is that of Schumpeter, which represents the magnitude of change in a matrix with the incremental/radical and component/system sets [24,25]. However, the variations for this theory observed in the publications are notable: the most significant among those analyzed are the typologies proposed by Andersen [17], including complementary, integrated, alternative and social sets, as well as by Carrillo et al. [25], with their evolutionary determinations of component, subsystem and system in relation to the sustainable performance of the company.

Following the referential frameworks used in this study, in the perspective of the functional utility of knowledge, it is considered that the perspectives previously exposed are not exclusive or incompatible. In this sense, an integrative synthesis of organizational change implied with eco-innovation is proposed, based on the arrangement of Andersen [17], given its high descriptive value of current business dynamics. This synthesis is shown in Figure 2, where the presence of two axes or assemblies, in the form of a continuum, describes the magnitude of the change in relation to environmental performance.

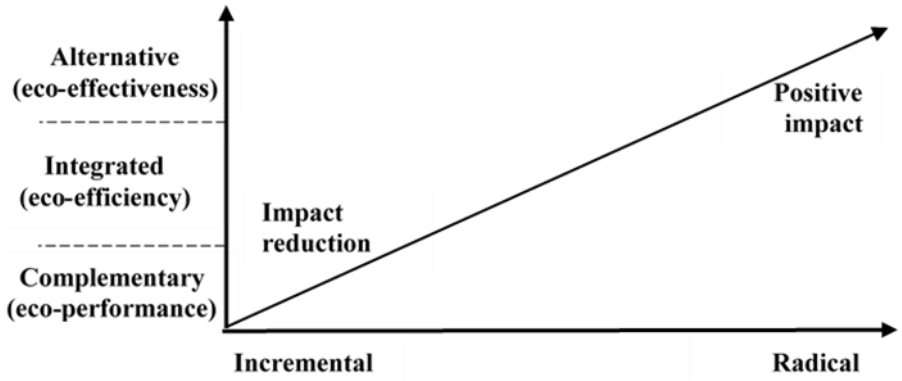

Figure 2. Typology of the modes of eco-innovation and evolution of environmental impact. Source: Adapted from Andersen [17] and Carrillo et al. [25].

The axes used for the description are defined as follows: (1) incremental/radical and (2) complementary eco-innovation/integrated eco-innovation/alternative eco-innovation. The horizontal set is the best known since Schumpeter's proposal and refers directly to the magnitude of change in the product/service system with eco-innovation: the term incremental means only gradual modifications that add value as a result, while the term radical means a discontinuity or rupture with the product/service system or parts of it [24,25].

On the other hand, the vertical axis represents an adaptation of the arrangement of Andersen [17], making it coincide and integrating it with the determinations of Carrillo et al. [25]. Both perspectives are considered to be functionally equivalent. In this case, it is a direct reference to the type of change in the product/service system: Complementary eco-innovation refers to components that are added to the system to improve environmental performance, such as, for example, technological additives or processes for pollution management. Integrated eco-innovation represents changes in the system that are a continuity of the existing one, which makes the performance more environmentally friendly or eco-efficient. Alternative eco-innovation implies a new trajectory or discontinuity with the product/service system, which seeks a positive impact on the environment or eco-effectiveness, such as, for example, replacing conventional agriculture with organic agriculture [17].

The analyzed literature indicates that eco-innovations can mean new ways of organizing production and consumption at the most systemic and social levels, imposing new functional interactions between organizations, families and workplaces, as well as new perspectives for organizing cities and their technical infrastructure [17,24,25,27]. Although this possibility is explicitly reflected in the description of organizational change reported in some references, in the approach to the concept of eco-innovation, it was preferentially maintained as an implicit situation in the axes or sets that were used. In practice, the action of SMEs is still far from achieving this possible performance and systemic impact.

On the other hand, the life cycle dimension refers directly to the elements of the product/service system in relation to the value result that is delivered to its users and the corresponding impact on society [25]. Therefore, this dimension emphasizes the value chain throughout the life cycle of the product/service and the relationships that are established in this sense with the different actors [28–30]. The life cycle approach is also a theoretically self-represented notion that has evolved since the second half of the last century, extending from marketing to other areas of organizational analysis and engineering. In the analyzed literature, some of the varied models that exist as a representation of the life cycle are usually used [25,29]. With a descriptive purpose only, this study assumes an adaptation of the model proposed by Kriwet et al. [31], making it correspond to the most recent determinations of Cao and Folan [32]. Table 3 shows the representation used in this study.

Table 3. Product/Service Life Cycle Model.

Phases	BOL		MOL	EOL
	(1) Design	**(2) Production**	**(3) Utilization**	**(4) Disposition**
Processes	Conception Development	Manufacturing Assembly	Distribution Use Customer Service Maintenance	Reuse Recycling
	Logistic Support			

Source: Adapted from Kriwet et al. [31] and Cao and Folan [32]. BOL: beginning of life. MOL: middle of life. EOL: end of life.

Following the method used for organizational change, it was considered that the models used for the product life cycle are not incompatible. Also, these models are considered closer to business dynamics. Although the emphasis of the used model is on manufacturing, it is also applicable to services. The characteristics that each process would

have in practice vary depending on the sector and economic activity concerned. Although material and information flows were not represented, they are assumed according to the sequence of the life cycle [31,32]. Feedback occurs between all phases and for the flow of materials according to levels of reuse, i.e., resale, spare parts and remanufacturing, or levels of recycling, such as reprocessing or incineration [31,32].

The dimension of the product/service life cycle is relevant to the concept since it indicates the different elements of the company (X) on which eco-innovation can fall (Y). In this sense, although eco-innovation can refer to the introduction of a new product or service and, as such, cover all phases of the life cycle, it can also be oriented to some phase or processes of the cycle according to the product/service system in question [25,29]. In fact, the current supply of products and services is not usually the simple result of individual organizations, so the life cycle should be considered for an extended product/service, which is served by a variety of companies along the value chain [28,32]. This is important for SMEs since they are oriented to specific phases and processes of the product/service life cycle, as is the case of marketing or maintenance companies in the automotive industry or in information and communications technologies, among many other relationships that occur in practice.

Finally, the management dimension refers to the strategic integration of eco-innovation in companies with organizational practices that guarantee its application to each new opportunity. In the analysis of the previous dimensions, it was possible to see the possibilities of eco-innovation in different elements of the product/service system (X) as well as the variations in the magnitude of the organizational change that eco-innovation can bring (Y). However, eco-innovation is not only an exercise of operational excellence; its relative complexity implies that companies continuously test management models or methods to motivate creativity and increase the ability to quickly grasp the environmental possibilities offered by the environment. That is, it is a context conducive to the effectiveness of eco-innovation, taking into account the way in which people relate to each other around the projects of the company, from the different organizational functions [28,33,34].

In the analyzed bibliography, the dimension of management had a significance of first-order or relevance. In terms of the reference frameworks used in this study, this is understood since it is the aspect that facilitates the instantiation of the different constituent entities (X) in the notion of status or eco-innovation (Y). The relevance of management is also seen in the analysis when it is found that the main barriers in the company for eco-innovation refer to this dimension, as pointed out the following: (1) lack of a culture, that is, of values and organizational climate, for sustainable development [24,35]; (2) lack of resources and appropriate initiatives [36,37]; (3) short-term learning processes that are more focused on solving specific problems than those at the organizational level [24,38]; and (4) lack of vision and strategy formulation for eco-innovation, which frames the previous ones [34,39].

For SMEs, strategic integration is cardinal since it is in this aspect, as a rule, where they present the greatest problems of adequate systematization. Taking into account the above regarding barriers to eco-innovation, the analyzed literature indicates the following categories as fundamental elements to consider in the management of eco-innovation [26,40–42]: (1) strategy; (2) culture; and (3) organization. It is argued that this classification also allows a causal analysis of sustainable performance and the determination of the evolutionary stage or level of maturity in which eco-innovation is present in companies. Additionally, it is recognized that eco-innovation does not necessarily correspond to an area of R + D; the key factor is the practical knowledge (know-how) that provides a solution to a potential demand with the feasible means to develop innovation, which can be performed from the existing units coordinating its implementation [28].

3.3. The Economic Approach to Eco-Innovation

A well-known perspective on the classification of approaches to sustainability that was accepted in the analyzed literature is that provided by Hopwood et al. [43]. They classify the

approaches into the following three groups according to the degree of correlation with the social and environmental correspondence: (1) defense of the status quo, as a predominant group, where sustainability is a technological problem to be solved within the current economic system; (2) reform of the economic system, where most of the academy is located, proposing the inclusion of social and environmental aspects in economic rationality; and (3) radical change in the economic system, which advocates the transformation of political, economic and social institutions.

The analysis suggests that the so-called status quo and reform groups, each with a different scope, follow an instrumentalist approach that advocates the design and deployment of environmentally friendly technologies that should be able to extend the limits imposed by the current socioeconomic model and thus minimize the impact of human activity on ecosystems [5,6,43]. These groups are based on the idea originated by the Brundtland report, which states that environment and economic development are not incompatible and that technology is capable of achieving an ecological transition of markets [44–46]. For their part, those who support a radical change, i.e., a position in which technology is far from neutral, argue that sustainability eventually depends on new sociocultural values instead of technologies and that the competitiveness imposed by markets is not an adequate way for the ecological transition of society [43,47,48].

From the analysis, it can be claimed that the concept of eco-innovation is born within the framework of the instrumentalist economic approach, whose position is to move toward an "ecological modernization" of industrial societies "through eco-innovation" [48] (p. 560). However, the analyzed literature also recognizes that markets by themselves fail to solve environmental externalities, so it is proposed that the process of ecological transition does not only involve technological change, but it is necessary to address the various institutional implications by inserting environmental and social aspects into the analysis of economic activity [5,6,15,48].

Knowing the economic approach for eco-innovation is relevant to the concept used in this study by framing the epistemic foundations for the relationships that occur in the context (C) and practical relevance (Z) of eco-innovation. According to these fundamentals of eco-innovation, the realization of a functional economy, oriented to products/services feasible for the environment without affecting the welfare of consumers, implies, as a perspective of sustainable development, the dematerialization of the economy, that is, an absolute reduction in the amount of materials and energy necessary to serve the functions of consumption in society, with a change in the direction of innovation that prioritizes saving resources over saving labor [6,15,48,49].

3.4. Drivers of Eco-Innovation

In the analyzed bibliography, the topic of drivers was the most treated subject of eco-innovation. Similarly, the importance given to the various drivers varied according to the academic perspective from which it is approached: while sources inclined to environmental economics place greater emphasis on regulation, articles on business management place greater emphasis on consumer preferences and pressures on corporate social responsibility [50–52]. For the referential framework used in this study, the topic of drivers explicitly considers the relationships that occur in the context (C). Every enterprise is located in a social and institutional setting, for which differences can be expected at the national and regional levels [53]. It was also recognized that, consequently, there are specific patterns in the greening of markets that affect the capacity for innovation and that it is part of the selection of the company, highlighting the importance of collaboration in addressing eco-innovation [54,55].

The following three orders of categorizations for the drivers of eco-innovation were identified in the analyzed literature: (1) one that classifies drivers according to the theory of stakeholders [50]; (2) those that classify drivers according to the role they play in the type of environmental impact [52]; and (3) one that analyzes drivers in the interrelation between the levels of the social structure and eco-innovation [51]. In the synthesis of the

concept that has been presented, the first classification indicated was used because it is less dependent on the specific context and also more relevant in the orientation to SMEs. In this sense, the importance of stakeholder theory lies in the fact that strategy, as an element that determines the direction of an organization, is considered a function of the synergy among the various stakeholders [8,56].

Although authors such as Waddock et al. [57] follow the traditional classification of stakeholders according to the possibility of exerting influence, that is, primary, secondary and environmental, it is currently preferred to do so from the following three large groups [58]: (1) capital market stakeholders; (2) product market stakeholders; and (3) organizational stakeholders. The first would include, among others, shareholders and banks, which are important since they expect to generate a return for the risk assumed with the financial investment. On the other hand, the second and third groups frame, among others, customers, suppliers, employees and managers, which are essential when determining the company's strategy and its realization [58].

According to Munodawafa and Johl [50], based on the role of stakeholders in eco-innovation and performance, the largest percentage of the literature focuses on product market stakeholders and organizational stakeholders, while a minimal part of the studies focuses on capital market stakeholders. In this sense, the work on the relationship between eco-innovation and performance identifies the following key drivers, which are grouped together with the stakeholder group from which they emanate [50,52,59]: (1) market demand (customers); (2) market competition (competitors); (3) regulatory pressures (government); (4) financial incentives (government); (5) human capital (employees); (6) strategic alignment (managers); (7) value chain action (suppliers); and (8) business model (shareholders).

Market dynamics, i.e., consumer action and competition, are recognized in the literature as one of the key drivers for eco-innovation [45,50,52,60]. In fact, the growing awareness of consumers about environmental issues is creating a distinct group of customers oriented toward sustainable consumption, both with the growing consumption of organic products and with other value propositions created using eco-processes and cleaner production technologies [45,50]. For this part, regulation and financial incentives for environmental performance, mainly due to government action, are unanimously recognized as a strong precedent for eco-innovation [50–52,61,62].

Finally, the action of organizational factors is what makes eco-innovation possible for companies and determines its scope [46,50–52,61,63]. It has been argued that strategic alignment with eco-innovation is one of the keys to achieving value creation using sustainable performance [50,63]. Managers, shareholders and suppliers are essential in the formulation of strategy and for the effective and efficient use of organizational resources in the development of capacities for eco-innovation [64]. Employees also increasingly have a fundamental role in the innovative capabilities of organizations, being the main factor of absorption and creation of new knowledge, and, therefore, they are key in the strategic alignment toward eco-innovation [46,50,51,61,63].

4. Conclusions and Future Directions

At present, the demand for sustainable development demands the transition to a functional economy with the potential to address the current consumption levels of materials and resources, including emissions and waste, without minimizing the well-being of users [49]. In this sense, it is proposed that the fundamental requirement for satisfaction is the function, not the product itself. This points out the validity of an orientation to the value of use and performance of the products and, with it, to the management of the most essential resources of human activity such as nature, goods and knowledge [51].

Studies on a functional, evolutionary economy indicate that eco-innovation is not only an issue for large companies with greater weight in the life cycle of the product/service system but also for SMEs, which will increasingly be subject to the constraints of sustainability. While eco-innovation can be framed within the broader innovation process, it is also associated with and responds to specific types of actions, both institutional and

individual in the market, as a result of the sustainable development policy agenda. For both reasons, it was necessary to establish a concept of eco-innovation as a knowledge base and conceptual framework, which was the objective of this study, that would facilitate a thorough understanding and its possible implementation in SMEs.

The reference framework designed from the constitutive rules was very useful given that eco-innovation is also an institutional and dynamic concept. In this sense, governance processes in society generate numerous determinations, multilevel and coevolutionary, such as gradual adaptations in the coordination of public policies, regulations, corporate strategies and social learning for the greening of markets [65]. This framework, typical of institutionalism, allowed us to better establish a functional and practical sense of the concept of eco-innovation and the description of its essential elements, such as the definition, dimensions, economic approach and drivers.

For the concept of eco-innovation, self-management was taken into account as the most appropriate principle for the context in which SMEs develop their activity. With this, the proposed definition responds to a pragmatic position, where the motivation does not have to be a prescribed environmental performance but to the competitiveness of the companies as a response to the relationships that occur in the specific context. Likewise, in dealing with aspects whose realization is not automatic, emphasis is placed on management, thus framing the dynamics of the formulation of strategies in their relationship with stakeholders as the way to guide and coordinate resources to achieve the objectives that are specified with eco-innovation.

In this way, it is considered that the objective of establishing a concept of eco-innovation as a conceptual framework for practice in SMEs was sufficiently covered. The proposed concept also responds to the generally accepted theoretical determinations that the starting point is the company and the way it organizes production and learning in an environment of rapid changes, based on the threats and opportunities offered by the ecological modernization of markets [17,25]. Additionally, the concept assumed the theoretical approach of knowledge-based competitiveness [17,66,67].

For future directions, the realization of a comparative historical study on eco-innovation in SMEs in Latin America is proposed. This would be relevant since there are few articles that address this issue taking into account that the theory of contingency and resources and capabilities are fundamental in the analysis of performance in a given context. Additionally, within the framework of a broader study on SMEs in Colombia, the design of a measuring model for eco-innovation is proposed that includes the most relevant relationships and variables for this group of companies and that also serves to determine the degree of maturity of the practice and establish prescriptive procedures for its development in SMEs.

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Appendix A

No. of Reference	Year	Name of the Periodical/Publisher	Databases	Citations
[2]	2017	*Journal of Cleaner Production*	ScienceDirect Scopus WoS	660
[5]	2012	*R&D Management*	Scopus WoS	1001
[6]	2021	*Environmental Science and Pollution Research*	Scopus WoS	50
[14]	2014	Springer International Publishing, Cham	WoS	59
[15]	2022	*Sustainability*	WoS	No data
[16]	1996	Prentice Hall	Scopus	1271
[17]	2008	The 25th Celebration DRUID Conference	WoS	290
[19]	2009	*Technological Forecasting and Social Change*	ScienceDirect Scopus WoS	566
[20]	2020	*Technological Forecasting and Social Change*	ScienceDirect Scopus	886
[21]	2000	Springer	Scopus WoS	239
[22]	2006	*Journal of Business Ethics*	Scopus WoS	2129
[23]	2023	*Heliyon*	ScienceDirect Scopus	No data
[24]	2007	*Sustainable Development*	WoS	534
[25]	2010	*Journal of Cleaner Production*	ScienceDirect Scopus WoS	1195
[26]	2020	*Sustainability*	WoS	No data
[28]	2016	*Journal of Cleaner Production*	ScienceDirect Scopus WoS	157
[30]	2007	*Journal of Operations Management*	ScienceDirect Scopus WoS	2385
[33]	2014	*Journal of Cleaner Production*	ScienceDirect Scopus WoS	4058
[34]	2012	*World Journal of Entrepreneurship, Management and Sustainable Development*	Scopus WoS	122
[35]	2019	*R&D Management*	Scopus WoS	78
[36]	2011	*Corporate Social Responsibility and Environmental Management*	Scopus WoS	No data
[37]	2008	*The International Journal of Human Resource Management*	Scopus WoS	654

No. of Reference	Year	Name of the Periodical/Publisher	Databases	Citations
[38]	2014	*Journal of Cleaner Production*	ScienceDirect Scopus WoS	105
[39]	2016	*International Journal on Interactive Design and Manufacturing*	Scopus WoS	No data
[41]	2017	*Organization & Environment*	Scopus WoS	No data
[43]	2005	*Sustainable Development*	WoS	3429
[44]	2022	*Journal of Cleaner Production*	ScienceDirect Scopus WoS	No data
[45]	2018	*Journal of Cleaner Production*	ScienceDirect Scopus WoS	190
[46]	2016	*British Food Journal*	Scopus WoS	76
[48]	2008	*Journal of Cleaner Production*	ScienceDirect Scopus WoS	783
[50]	2019	*Sustainability*	WoS	59
[51]	2015	*Innovation*	WoS	474
[52]	2012	*Ecological Economics*	ScienceDirect Scopus WoS	1640
[54]	2013	*Ecological Economics*	ScienceDirect Scopus	826
[55]	2000	*Business Strategy and the Environment*	Scopus WoS	202
[60]	2014	*International Journal of Sustainable Development & World Ecology*	Scopus WoS	92
[61]	2014	*Journal of Cleaner Production*	ScienceDirect Scopus WoS	1417
[63]	2017	*R&D Management*	Scopus WoS	90
[64]	2010	*Journal of Operations Management*	ScienceDirect Scopus	1630
[65]	2011	*Sustainability*	WoS	226

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