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Factores de Innovación para Fortalecer la Competitividad de Pymes Agroindustriales del Municipio de Dosquebradas Risaralda

Resumen

La presente investigación tiene como objetivo determinar los factores de la innovación para fortalecer la competitividad en las pymes del sector agroindustrial del municipio de Dosquebradas, es por eso que se realizó un estudio de tipo descriptivo e interpretativo con un enfoque cualitativo, aplicando un instrumento de recolección de la información que en esta caso fue la encuesta, se realizó a un total de 12 gerentes como directos responsables de los procesos de innovación y desarrollo al interior de las pymes. Dentro los principales resultados de esta investigación, se encuentra que el factor de innovación que más implementan las pymes de ese sector es la innovación del producto, específicamente en cuanto al sabor, textura, cambio de empaques y envases más amigables con el medio ambiente. Por otra parte, el factor que más ha retado a las empresas para implementar innovación, es la innovación en la organización desde la creación de una cultura de innovación hasta implementación de nuevas formas de trabajo, al igual que la introducción de tecnología en todos los factores.

Palabras clave: Competitividad; Innovación; Pymes

Innovation Factors to Strengthen the Competitiveness of Agroindustry SMEs in the Municipality of Dosquebradas Risaralda

Keywords: Competitiveness; Innovation; SMEs.

Abstract

Background: Agroecology represents an important step towards achieving sustainability of agroecosystems. Objective: This paper aim to evaluate the sustainability of two agroecosystems of the agricultural and environmental network of Huila using local and participatory indicators for the planning and monitoring of agroecological programs. Methods: The sustainability indices were determined from the application of the Methodology for the Evaluation of Sustainability from Local Indicators for the Planning and Monitoring of Agroecological Programs, developed through participatory workshops that allowed the construction of a framework of analysis on the concept of sustainability. The first case study was developed in the organization Aroma de Mujer (Oporapa, Huila), an associative group of women dedicated to coffee production and commercialization. The second case study was evaluated in Vida y Campo (Neiva, Huila), a non-profit organization that aims to make uncultivated land productive through uninterrupted possession. Results: A total of 23 indicators were obtained for the two case studies. The first case study (Oporapa) shows a sustainability index of -0.24, which indicates a low contribution to sustainability due to dependence on the use of agrochemicals and poor soil conservation and fertility practices. The second case study (Neiva) shows a sustainability index of -0.39; this value represents a low level of sustainability due to the scarce good agricultural practices, the weak associativity that in turn hinders the possibility of commercializing products and the lack of rootedness due to the lack of land titles for the territory they inhabit. Conclusion: The evaluated methodology allows merging technical knowledge with the local knowledge of the communities, promoting consensus between community aspirations and technical possibilities.

Introduction

Innovation is a critical determinant in the productivity and value creation in an economy, it is what allows you to take advantage of resources to survive, grow and maintain a long-term competitive advantage and allows you to compete in a global market. What's more, it is a process by which knowledge management is generated through research, development and transformation, which allows ideas to become successful products, which then become new goods and services, which ultimately generate new business models. [1]

That is why an approach from the global to the regional is necessary, to understand the application of innovation in companies addressing the factors of change and the difficulties and challenges in knowing how these impacts the competitiveness of a region, country and economy. Thus, the World Intellectual Property Organization, [2] in the report of the Global Innovation Index, raises as a main question "Who will finance the innovation?" because, due to the COVID-19 crisis, the innovation sector that had been booming since 2018 was hit hard. At present, governments are implementing emergency packages that will help to combat the economic problems for many nations, but these neither include financing for innovation, nor the investment for the creation of emerging businesses.

In addition, in the report it indicates that innovation is the fundamental factor for strategies of economic growth which drive countries to overcome the crisis caused by COVID-19 and increase competitiveness in the future. Additionally, it informs us that, with respect to Latin America, this region presents large imbalance in terms of innovation since the region has low investment in research, development and innovation, which has an incipient system of intellectual property and a disconnect between the public, private and academic sectors; which results in not having efficient results for innovation. [2]

At present, in Colombia it can be seen that progress has been made in formalization issues in everything related to research, development and innovation, so much so that the Ministry of Science, Technology and Innovation (Minciencias) was created, which has allowed the creation of programs, policies, budget management and established indicators to measure and evaluate innovation. [3]

Although it is important to clarify that little progress has been made linking the companies in the production sector of the different economic sectors to these aforementioned programmes, either due to ignorance or due to the difficulty that the entrepreneurs present when developing proposals that impact business innovation. On the other side, [4] we find the academic world that seeks to investigate, but it is obvious that there is a disconnect between what businesses want and what is proposed. It is because of this that we generate results like the declaration by the World Intellectual Property

Organization in the previous paragraphs.
On the other hand, the information outlined in the Private Competitiveness Council [1], highlights that the countries with the greatest innovation in Latin America are Chile, Mexico and Costa Rica who occupy positions 54, 55 and 56 respectively in the Global Innovation Index, 2020. Presently Colombia occupies the 6th position in Latin America and the 70th in the world according to the index, after Brazil and Uruguay who occupy positions 62 and 69.

It is important to state that these economies do not invest even 1% Gross Domestic Product2 in matters of innovation and that the global average for investment is 5.2%, as a consequence of this companies from those countries develop at a slower rate than the other economies in development, the number of patents per million inhabitants is less than one and the companies that have fewer than 100 employees do not use updated performance based human talent management systems and finally companies continue using traditional processes that don't offer them opportunities to compete in global markets. [2]

On the other hand, in Colombia the National Department of Planning in their annual report of competitiveness [5], shows the figures of investment in matters of innovation where it says that in 2019 the country invested 0.74% of it's Gross Domestic Product, a lower average than what was invested by other countries in the region. Likewise, it argues that a streamlining is needed in programs and resources that the country has to boost science, technology and innovation, so much so that only three sectors are taking 66.4% of the innovation programmes proposed by the national government.

However, according to the survey of Technological Development and Innovation (EDIT) issued [6], as a result you get 21% of manufacturing businesses in the country which were classified as innovators, whilst the service sector had 19.1%. But the argument is that the majority of the innovations from these two sectors were imitations and not radical innovations.

Given the previous information, [7] it is important to clarify that the manufacturing sector presents this percentage of innovation since it has greater competition from national and international markets within the country, which forces this sector to invest in the improvement of technology, plans, equipment, product and commercialisation to be able to survive and satisfy the needs of demand. Considering that this sector will always require the use of innovation factors since its purpose is the transformation of raw materials into finished products.

On the other hand, the Private Council for Competitiveness, [1], in its report describes that, for companies to adopt new technologies and a culture of research, development and innovation, they must modify the technology of their machinery, equipment and general processes, additionally the training of human capital and the managerial skills to plan and execute medium length plans.

Therefore, as the Private Council for Competitiveness, [1] compliments that the most frequent barriers for companies to improve all that has been mentioned in the previous paragraph are: the knowledge, the regulation and the investment. Because of this, it is hoped that the rates of research, development and innovation are expected to be higher, so that the country does not continue to lag behind in terms of innovation in comparison to the other countries of Latin America and even more with developing countries.

In agreement with the previous information, in the last few years it has been observed that companies in Colombia have invested in terms of technology, especially in the renovation of their machinery and equipment, but they have shown low capability for training of their human capital to respond these new practices and goals that the market demands, in the different positions of the organization, from operational to general roles. As for Risaralda, the report for the Departmental Innovation Index for Colombia, [8] indicates that the department has grown in terms of innovation, especially in relation to human capital and research, with the best performance in the Cafetero Region being above the departments of Caldas and Quindio, its actual grading is 48.19 and finds itself in the medium-high performance bracket. On the other hand, the department has stood out in terms of innovation, especially in software development, digital entrepreneurship, private investment in fixed capital of the industry (%GDP), investment in information and communication technologies; and new organizational methods.

In the same report it describes that Risaralda has some aspects to improve in terms of general infrastructure and environmental sustainability; highlighting that very few businesses in the department implement the quality standard ISO140001 focused on environmental certification. What's more, it mentions that logistic performance, the business financing of research and expenditure expenditure, TIC and creation of new models of business must be improved.

Also, the DNP [1], highlights the companies from the Business Process Outsourcing Metalmecania and TIC as generating a good springboard for the development and implementation of innovacion factors, with cluster initiatives having a connection with the institutions and academic sectors, and in this way to generate programs that encourage innovation.

Thus, how in Risaralda it shows a good practice in the sectors mentioned in the previous paragraph versus the results in innovation, managing to venture into the international market and standing out for its quality and good processes. In addition, an integration with research centers and academia creates alliances with Parquesoft, SENA and The Technological University of Pereira (UTP), generating research that promotes innovation in different business factors and in supporting each other mutually for the improvement or technification of their products or services.

Likewise, the Colombian SMEs according to the survey of SMEs Vision [8], mentions

that after the impact generated by the global health emergency due to Covid-19, those developed certain aspects such as the reinvention of business models, the use of technology and the modernisation of operations, which contributed to the innovation of their companies. Equally, the report also shows that only 4 of every 10 businesses consider that it is better to invest in their business to improve or obtain competitive advantages over their competitors.

Finally, the director and founder of Mindhack: Manolo Castro [9] affirms that Colombian companies are facing a great gap in the way they say that they innovate and how they actually do it, as the business leaders are confronted with a sea of ideas that they do not know how to prioritize and implement them, and that in the end it results in scattered and intuitive actions that do not cause the expected impact.

Materials and Methods

The qualitative research according to Julio Meja Navarrete [10] is the methodological procedure that uses words, texts, discussions, drawing, graphics and images to comprehend and understand the set of interrelated qualities that characterize a certain phenomenon. Also, it states that the qualitative approach uses detailed descriptions of facts, direct quotes from people and extracts of full passages from documents, interviews, polls, focus groups and observations to build a knowledge of social reality.

Given the previous, this investigation will have a qualitative focus where the intention is to collect information to analyze the phenomenon from different authors and from a primary information collection instrument that allows us to establish factors of innovation that will be taken as a reference for the present investigation and from these measures, its application in the agro-industrial companies of Dosquebradas, Risaralda to understand the state of their competitiveness.

The type of descriptive study according to Hernandez Sampieri [11] maintains that this type of study describes phenomenons, situations, contexts and events to detail how they are and how they manifest themselves. Likewise, he seeks to specify the characteristics and profiles of people, groups, communities, processes, objects or whatever other phenomenon that undergoes an analysis and also states that a descriptive study aims to measure or collect information in an independent or joint manner regarding the concepts or variables to which they refer.

That is why this type of study of this research is descriptive since it is intended to specify the characteristics of the innovation factors that apply to the agro-industrial SMEs of Dosquebradas, Risaralda and to know how these contribute to the competitiveness and development of the region. As for the type of interpretative study Ricoy Lorenzo [12], states that this type of study describes the facts in which the event develops, through a rigorous contextual description of these situations that enable the possibility of intersubjectivity in the capture of reality through a systematic collection of data that

supports the descriptive analysis, which will allow understanding, knowledge and acting in relation to the phenomenon in different situations.

This research is also interpretative since primary information analysis will be carried out through the use of an information collection instrument such as a survey, to understand in depth the degree of application of the different factors of innovation in the agro-industrial SMEs of Dosquebradas, Risaralda that will allow the understanding of the phenomenon in its real context.

The population of this research was the agro-industrial SMEs of Dosquebradas, Risaralda that are classified within the code CIIU 1063 and 1089 as: production of food products, production of drinks, special coffees and secondary products. In the municipality of Dosquebradas, 14 companies were found in total, however there were 2 companies that decided not to participate in the research because they did not present interest in it and therefore the intentional sample had a total population of 12 companies.[13]

As an instrument for collecting information, a semi-structured interview was carried out, through which a questionnaire with closed and open questions (Likert scale, single answer, multiple answer and dichotomies), allowing the characterization of SMEs in the agro-industrial sector of the municipality of Dosquebradas, Risaralda to be carried out. This was in order to measure the application of innovation factors of companies and to know their relationship with business competitiveness. This questionnaire was given to managers or people in charge of the innovation part of companies, the information was systematized and then analyzed according to an analysis operation, with respect to the OECD.

Results and Discussion

Innovation Factors for the Competitiveness of SMEs

Of course, in the construction of the referential framework and specifically in the theoretical framework it is possible to respond to the specific, objective number one within the research which includes identifying innovation factors for the competitiveness of SMEs.

In the case of research, the innovation factors promoted by the OECD through the Oslo Manual in its latest version published [14] are taken as a reference, which are: Product Innovation, Process Innovation, Marketing Innovation and Innovation in the Organization; since these factors are aligned with pillar 11 which refers to business dynamism and pillar 12 which focuses on the innovation capacity of the 12 pillars of competitiveness that the World Economic Forum measures annually in 141 countries. Thus, allowing to generate a relationship between innovation and competitiveness that in this case will be applied to agro-industrial companies in the municipality of Dosquebradas, Risaralda.

With regard to innovation factors, the OECD in its Oslo Handbook [14]mentions that, in order for it to be classified as innovation, it must have been introduced, i.e. for a new product to be introduced, it must have been released to market or with a process method, marketing method, or organization method to be introduced: it must have been effectively used within the framework of the company's operations. Below, each of the types of innovation are addressed from the Oslo Handbook which should be kept in mind in this investigation [15].

Product innovation:

Introduction of new products or services or improvement of existing ones. Including significant improvements in technical features, components, materials, integrated information, ease of use or other functional features.
2) Process Innovation:

This is the introduction of a new or significantly improved production or distribution processes, involving significant changes in techniques, materials and/or computer programs. These should aim to reduce unit costs of production or distribution, improve quality or produce new or significantly improved products, as well as production or distribution methods that include techniques, equipment and software.

Marketing innovation:

This is the application of a new marketing method that involves significant changes in the design or packaging of a product, its positioning, its promotion or its pricing. This type of innovation tries to meet the needs of consumers, open new markets or reposition itself in the market in a new way to increase sales. This includes creating new sales channels, introducing new products or services, new promotional methods and pricing strategies.
4) Innovation in Organization:

This is the introduction of a new organizational method in the practices, workplace organization or external relations of the company. This aims to improve the results of a company by reducing administrative or transaction costs, improving the level of satisfaction at work through new methods to organize the routine and procedures of work management. It also includes new practices to improve learning and knowledge distribution in the company.

However, in Colombia, the innovation factors mentioned above are taken into account by the National Planning Department, as well as pillars 11 and 12 of the World Economic Forum and evaluated at the departmental level through the IDIC (Departmental Innovation Index for Colombia), [4] which is a key factor in the field of innovation, where Risaralda occupies position number 5 for 2020 and this is how you can have the performance of innovation at the departmental level and therefore at the national level.

The IDIC, [4] measures the performance of departments in 7 aspects: Institutions, Human Capital and Research, Infrastructure, Market Sophistication, Business Sophistication, Knowledge Production and Technology and Creative Production; That, as mentioned above, takes the variables of the World Economic Forum and the innovation factors of the OECD through the Oslo Manual. The measurement is given in a qualitative and quantitative way where there are 5 categories of performance: The low, medium low, average, medium high and high performance and a score of 1 to 100. Risaralda for 2020 is in the medium high-performance category with a rating of 48.12.

That is why, through the factors of product innovation, process, marketing and organization, exposed from the Oslo Manual, it is possible to articulate the academic, the company, the state and international organizations that promote, measure, implement, generate and use resources for this item to increase competitiveness.
Given the above, we can delve into the sub-factors that make up each factor, which are presented below: The sub-factors previously shown in Table 3 will serve as input to be able to develop objective number 2 and 3 of the research, where it will be possible to establish the factors that are being implemented in the agro-industrial SMEs of the municipality of Dosquebradas, Risaralda. Additionally, it is to evaluate the innovation factors of SMEs in relation to competitiveness.

On the other hand, it is important to mention that the factors and sub-factors of the Oslo manual allow the promotion and improvement of business competitiveness, that is why, the OCDE [16], mentions that the elements that contribute to the competitiveness of a company are: A) The successful management of production flows and inventory of raw materials and components b) Successful integration of market plan, R&D activities, design, engineering and manufacturing c) The ability to combine internal R&D with R&D performed in universities, research centers and other companies d) The ability to incorporate changes in demand and market developments and e) The ability to establish successful relationships with other companies within the value chain. This can be measured from the compliance or evaluation of each innovation sub-factor.

Innovation factors of agro-industrial SMEs in Dosquebradas, Risaralda.

A characterization of the agro-industrial SMEs of the municipality of Dosquebradas was carried out, to understand their reality and their interpretation on the concept of innovation in companies. As previously mentioned, of the 12 companies under study, 50% of the companies are small companies and the other 50% are medium-sized companies, 58.3% of these have been in the market for more than 9 years; 16.9% between 6 and 9 years; 16.7% between 3 and 6 years and 8.3% between 1 and 3 years, thus finding progression in the market.

On the other hand, the representatives of the companies are asked, for them, what innovation is, revealing that: innovation is the improvement of products, the transformation of the brand, moving from traditional processes to industrial processes and the

introduction of machinery and equipment of greater technology. In addition, companies express that innovation is to generate value through the development and / or application of new technologies in processes, goods and / or services, where creativity and research materialize in projects, through a structured system of innovation management.

In addition to the above, companies also stated that innovation is the ability to create something new or improve what exists, where innovation is sought to be part of the DNA of the company; that is, that people are sought to develop the ability to think and act based on continuous improvement for the permanent construction and growth of the company, and that this is reflected in the decision of the market or in the focus on new niches of specific markets to increase the satisfaction of this one.

To complement this, 75% of companies consider that investment in research and development, the opening of new markets and the internationalization of the company are the factors of innovation that allows a company to consolidate over time and be competitive; continuing with the added value of the product, investment in technology and a trained staff with 58%; companies give less value with 25% to the relationship with the state or the academic sector and with 8.3% to the development of an innovation management system transversal to all the processes of the company, innovation being part of the corporate strategy.

To complement this, 75% of companies consider that investment in research and development, the opening of new markets and the internationalization of the company are the factors of innovation that allows a company to consolidate over time and be competitive. Continuing with the added value of the product, investment in technology and a trained staff it is 58%; companies give less value, 25%, to the relationship with the state or the academic sector and 8.3% to the development of an innovative management system intersecting with all the processes of the company, innovation being part of the corporate strategy.

Therefore, we proceed to deepen the 4 factors of innovation. That is why it begins by analyzing innovation in the product, finding that agro-industrial SMEs innovate mainly in the use of chemical inputs to reduce environmental impact on the environment with an average application of 4.33 within a rating of 1 to 5. Searches for information in international databases, indexed journals and publications propose innovations in the product and the taste of the product with an average of 4.25; the lowest factors found in companies are the use of technology and patents in product innovation with an average of 2.67 and 3.0.

As for the innovation of the process, the agro-industrial SMEs of the municipality of Dosquebradas, Risaralda what they do the most are modifications in the process parameters of the product to obtain a greater productivity with an average of 3.92, in the same way, SMEs in an average of 3.75 have introduced improvements in the selection of the raw material and the manufacture of the finished product, as well as the

implementation of technology for the packaging and the decrease in time needed for improving productivity.

On the other hand, the items of underuse inside the innovation process is the implementation of technology to improve the selection of raw materials and the utilization of software for the automation of processes with averages of 2.92 and 3.08 respectively; also including as an aspect of greater challenge for SMEs is the completion of tests of biodegradable or eco-friendly materials.

Parrellely, innovation in organization presents an average performance - it fell on average in the two innovation factors mentioned above, finding that the factor in which SMEs have advanced the most is in generating innovative strategies as a way to increase sales, based on knowledge of the market and competition, as well as technological surveillance regarding trends observed in product innovation.

However, the factor of innovation which has the lowest average behavior is the implementation of technology from information inside the process of commercialisation which is equal to the use of digital marketing strategies. With respect to innovation in organization, it is evidenced that the lowest factor of innovation in the agro-industrial SMEs of the municipality of Dosquebradas, where the new forms of work, the creation of work teams for processes of innovation and the economic incentives for these types of processes are the least used on average for this type of business, with averages of 2.08, 2.75 and 2.83 respectively.

On the other hand, businesses showed advances in the assigning of leaders for the process of innovation, the allocation of human resources for the implementation of innovation in the selection of raw material, processes of creation of finished products and new packaging. Additionally, to this, the SMEs express that they have increased the motivation of the idea's makers from collaborators for the continued improvement of their organization.

Keeping in mind the previous, the agro-industrial SMEs of the municipality of Dosquebradas, Risaralda have shown advances in some of the factors of innovation, specifically those referenced in the OECD [17], that were the object of study of this investigation. Additionally, it highlights that the businesses have a commitment to the innovation of the processes and products to improve the environmental impact, substituting raw materials for others that do not damage the environment. In the following graphic you can see in a general sense the factors of innovation of the agro-industrial

SMEs of the municipality of Dosquebradas.

In the general state of innovation of the agro-industrial SMEs they present an average of 3.69 in the innovation of product, this being the highest rating and additionally having

a cohesion opposing the conceptualization they gave from the innovation, focusing in creating or improving the product or service, releasing new or differentiated products to the competition.

In terms of innovation in the process, its average application is 3.48 and is the highest rating followed by innovation in the product, where the process of improvement to increase productivity is highlighted. It is worth noting that the introduction of technology in the process is the factor of lowest rating on average, which corresponds with the answer given by the businesses as the greatest challenge in innovating.

However, as for marketing innovation, the average rating of applicability was 3.40, finding that the agro-industrial SMEs of the municipality of Dosquebradas, Risaralda evidence low implementation of technology in commercialization, such as virtual stores, social networks or virtual participation in business circles.

With respect to the innovation within organizations, it is evidenced that this is the factor of innovation with lowest application inside the agro-industrial SMEs of the municipality of Dosquebradas with an average of 3.34; these being the introduction of new forms of work, such as coworking, teleworking, networking and smart working, which are the least implemented with an average of 2.08. Likewise, the use of economic incentives for innovation inside working teams is a practice that is not often implemented inside SMEs. Given the previous, it is possible to analyze that the agro-industrial SMEs of the municipality of Dosquebradas have advanced in the innovation of the product such as the flavor, texture, change of container, packaging and wrapping, adapting them to the niche markets identified by each of them. Additionally, strategies have advanced in the introduction of substantial improvements in the selection of raw material and the manufacturing of the product, as well as the modification of the parameters of the product process to obtain a better productivity.

Furthermore, the greatest challenge that businesses have to implement the factors of innovation within their own businesses is the use, implementation and adaptation of technology within the different areas and processes of the organization. What is also important is the introduction of a culture of innovation where employees are encouraged to participate and integrate as a way of stimulating the creation, or improvement of, development and improve competitiveness in the market.[18]

It is important to mention, according to Clara Ines Pardo Martinez, [12] from within the country it can be observed that in the themes of innovation exist regional disparities: to the extent that there are cities and departments that are making a commitment to generating economic development and wellbeing through innovation, as is the case in Bogota and Medellin where there have been diverse strategies proposed to strengthen production chains and innovation processes through the improvement of the production process, products and services. This implies greater diversity, exclusivity in production

and greater added value, making more attractive exports with diversity of markets and higher incomes strengthening the economic growth, human capital and productivity.

Finally, it is important to mention that Clara Ines Pardo Martinez, [12]clarifies that to achieve the strengthening of innovation and the productivity in the regions of the country, it is fundamental to generate an ecosystem of innovation with a comprehensive vision and system where the roles of each of the stakeholders are defined in such a way that there are clear guidelines from the government to promote and strengthen innovation. The production sector can be motivated by innovation as a strategy to improve its competitiveness and profitability as it contributes to society and the productivity of the country. Academia, as a producer of science and technology, is the basis for innovation within a society that values innovation processes as a key element of social well being and quality of life.

Innovation factors of agro-industrial SMEs in relation to the competitiveness of the agro-industrial SMEs of Dosquebradas, Risaralda

Competition is a fundamental factor for the survival of businesses as much in the national as international markets. There are those who struggle day after day to maintain their position and those that are improving their competitive advantage by implementing technology and innovation in their products, processes and strategies.

That is why the question is proposed to agro-industrial SMEs about the relationship between innovation and competitiveness, where it can be observed that 91.7% of businesses affirm that they are in strong agreement that there is a relation between the factors of innovation and competitiveness and the other 8.3% agree. Additionally, it mentions that the greatest challenge to compete with innovation in the market centers principally on the technification of the process in moving from the traditional to the use of technology, not only because of the cost that this implies but also the contracting of qualified labor that can adapt, in addition to the training and creation of a culture of innovation within the organization.

Complementing the previous, the SMEs also state that another challenge is to preserve the quality and the flavor of the product with the introduction of technology into the process. At the same time, they mention that another challenge is the innovation at points of sale and with new information technologies they are able to be not only close to the client but also principally in social medias and web pages; digital marketing is a good tool that has been explored little in this field especially for the ignorance of use in this niche of the market that they occupy.

Also, they express that another great challenge is being at the forefront of innovation in products, services and processes, needing to generate competitive advantages and comparatives to compete in a market of lower margins which is dominated by the biggest food groups in Colombia, who have a much superior ability to invest in research and

development.

On the other hand, to carry out an evaluation of innovation with reference to innovation, the variables of the different innovation factors mentioned by the OECD (product, process, commercialisation and organization) were selected and the innovation factors were taken to measure the competitivity at a regional, national and international level from the World Economic Forum where, in its 13th pillar it mentions innovation, taking into account research, registering of intellectual property and business dynamics. It obtained the following results.

Firstly, in regards to intellectual property registration 42% of businesses never register intellectual property, 42% always register, 8% almost never do it and the remaining 8% almost always do. This is due to the fact that small and medium-sized companies are being evaluated, where small companies are responsible for never registering and medium-sized companies are the opposite.

Secondly, the innovation variables that point to research are taken, a factor that is part of the measurement of innovation in the 12 pillars of competitiveness. They find, in this way, that in terms of product research, 42% of businesses always do research, that 41% almost always do research and that remaining 17% sometimes do. Being that this item is one of the most important and utilized by businesses to compete in the market, they also mention that they do so through databases, industry magazines, index journals and other national and international publications.

Thirdly, the execution of studies into the viability and feasibility of adding added value to raw materials, production or packaging found that 33% of businesses almost always do it, 33% sometimes do it, 17% almost never do it and the remaining 17% always do it. It found that the medium sized businesses almost always and always carry out these studies and that the small sized businesses have room to improve, as they sometimes or almost never do it.

Fourth, in the face of development of research projects focused on innovation and economic backing of the company, it is evidenced that 33% of companies never carry it out, 25% always do, 17% almost always do, 17% almost never do and the remaining 8% sometimes do. Agro-industrial SMEs mention that the greatest challenges for why they do not implement this is, firstly, due to the lack of economic resources and, secondly, due to the low understanding of how to implement it, especially in the smaller companies.

What is more, it is found that business dynamics within the items of innovation of competitiveness, where the monitoring of the competition in their physical and virtual (social networks, websites and apps) was evaluated, 33% sometimes perform that monitoring, 25% always do, 25% never do and the remaining 17% never do.

To complement the previous information, [19] mentions that presently the development

of countries and regions depends on each stage that innovation is considered, since its creation, diffusion and application guarantees economic growth and the well-being of society. She also mentions that it is important that the public policy makers and decision makers examine the potential that exists in the country or region so that different strategies and instruments are correctly designed to strengthen innovation throughout the entire production cycle with a view to the creation of value and increase in productivity and competitiveness.

Likewise, argues that it is fundamental to monitor and evaluate each of the processes and instruments that are applied and directed around innovation effectively and with the desired impact, keeping in mind its objectives that can be the adoption, increase, growth of capacity, its impact on the value chain, the role of social innovation, the connection between innovation and research and the strengthening between the production sector, academia and the government.

Finally, innovation plays a fundamental role, where the state is key to correct the failure of markets which arise throughout innovation processes that involve cooperation between all stakeholders, intellectual property issues and social profitability that goes beyond the economy and risk mitigation.

Conclusiones

The factors implemented by the agro-industrial SMEs in the municipality of Dosquebradas, Risaralda is the factor of innovation in products, to a greater extent, especially in regards to the flavor of the product, the use of alternative chemicals as well as alternative parcels and packaging which results in the reduction of their environmental impact. Following this, it is the process of innovation, especially in the modification of production frameworks, that can be attributed for the increase in productivity in the manufacturing of products. The factors of innovation less implemented are the factors of innovation relating to the commercialisation and innovation within organizations. However, there is a significant advance in the implementation of innovators strategies to increase sales and training of human resources, in the selection of raw materials, manufacturing, packaging and storage of products respectively.

In the face of evaluation of innovation factors of the agro-industrial SMEs of the municipality of Dosquebradas, in relation to competitivity, the greatest contributor is product innovation, which allows them to have good product quality, a greater way of distributing to the client and the product remains up to the standard of flavor and similar properties, so as to have a stand out detail versus the competition and greater satisfaction in the market.

On the other hand, the innovation factors that the agro-industrial SMEs should improve to boost their competitiveness are the innovation factors in commercialisation such as the use and implementation of digital marketing tools, the use of websites, social media

presence and the use of e-commerce. Likewise, this is the innovation within organizations with the lowest evaluation, where it must strengthen the introduction of new forms of working to improve productivity and the implementation of innovation strategies. Finally, it is important to mention that the four factors of evaluated innovation find a similarity in low technology implementation and technology surveillance.

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