

technological development and innovation; It is for this reason the importance of making an analysis of the dimensions related to management development, marketing, innovation and technology for the producers of the associations of the Province of Sugamuxi, in order to identify the shortcomings and generate proposals for improvement in the aforementioned topics of knowledge management.

To this end, I implement a non-experimental descriptive exploratory methodology of cross-sectional cut in focus groups implementing Participatory Rural Innovation (IRP) model for the associations under study. This research shows as results in the analysis of the different dimensions of knowledge management; resulting in the lack of notion on the part of the producers regarding issues related to organizational structure, information technologies, marketing among other factors. It is recommended that government and academic entities support technical assistance in these areas be recommended in order to raise awareness among producers of the importance of technical advice in associations in order to improve the competitiveness of the agricultural sector.

THEORETICAL FOUNDATION KNOWLEDGE

In order to approach the concept of knowledge, we review different definitions of the term based on the main existing perspectives. Taking into account the difficulty involved in drawing a conclusion in this regard since, as he points out (Nava Bedolla, 2017) "knowledge in organizations has been considered by many, defined by some, understood by very few and formally valued by nobody"

According to (Nonaka & Takeuchi, 1995) they propose a Theory to explain the phenomenon of the creation of organizational knowledge, whose knowledge is defined as "justified true belief" (p.21) to reflect the current knowledge in which the existence of the same is framed. This creation of organizational knowledge was defined as "... the ability of a company as a whole to create new knowledge and disseminate it throughout the organization and establish it in products, services and systems "

The same authors begin their argument by stating that knowledge is initially created by individuals within organizations and that it becomes organizational knowledge, described through a process established by theory. For (Torres Briones & Rojas Davila, 2017) taking as reference (Nonaka & Takeuchi, 1995) infers Two dimensions were described for the creation of organizational knowledge, one is epistemological and the other ontological. Epistemologically, the authors recognize two types of knowledge: tacit and explicit. Explicit knowledge is knowledge that can be written down and transferred relatively easily from one person to another. Unspoken knowledge, on the other hand, is more difficult to articulate because it often arises from experience. On the other hand (Zulia & Zulia, 2009) indicates that knowledge is a philosophy of life aimed at the common welfare of all subjects in a process of permanent interaction focused on the bodily / mental. In a broad sense integrating these two trends, it can be concluded that knowledge is the processing of external and internal information to know the world from an individual, socialized and integrated perspective, with cognitive and ideal parameters, substantive of reflective action.

TYPES OF KNOWLEDGE

In order to know the role of knowledge in the organization and its effects on competitive advantage it is important to study the different types and dimensions of knowledge, there are multiple classifications of the types of knowledge (Table 1)

KNOWLEDGE MANAGEMENT

Knowledge Management has developed as a well-defined scientific field, exhibiting a rich academic structure to encourage research in the field (Gaviria-marin et al., 2019), the knowledge generated from research and its proper management, is at the center of the development of organizations. However, knowledge by itself is neither transformed nor guarantees improvement (García-martín & Mayo, 2019), Knowledge management deals with ways to exchange knowledge between those who can develop it and those who can use it (Echeverry, 2016), It has been recognized that knowledge is essential to help companies compete. It becomes essential to continue developing and managing the knowledge of the company to keep abreast of the continuous change of the internal and external environment and to obtain advantages (Pun & Balkissoon, 2011) therefore knowledge management presents great relevance in the field of research and considered as a key factor for business development (Vega & Rica, 2018). For (Alonso Arévalo, 2013) The proper management of intellectual capital in any public or private entity has become an almost indispensable element to generate competitive advantages in a market of increasing demands The importance of this

resource will allow the organization to reduce uncertainty and react better to changes in the environment; as well as raise its culture as an entity based on the use of information. One of the basic factors of Competitiveness is innovation, and it seems evident that innovation and information are intrinsically linked, since any entity that wants to survive will have to quickly incorporate the innovations that occur in its environment, and that will only be possible if it has effective information channels, as mentioned (Bustos Fariás et al., 2016). Knowledge Management (KM) can be defined as the form of management oriented to maximizing the performance of intellectual capital, understood as the set of distinctive institutional competencies, of an intangible nature, that allow creating advantages for obtaining budgets through the committed collaboration of its community and the use of processes in production, transmission and transfer of an innovated knowledge. Figure 1 shows which are the topics of greatest interest in the field of knowledge management.

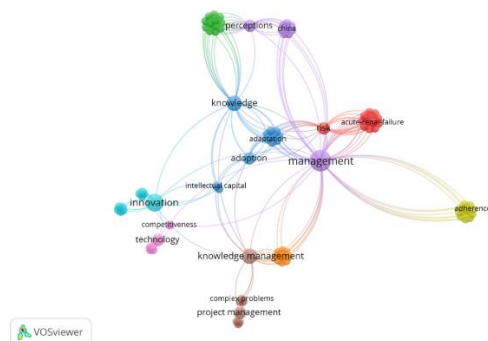


Figure 1. List of topics of interest in the field of knowledge management. Source: own elaboration based on the web database Of Ciencia

For (Pérez & Castañeda, 2009) knowledge management is important since modern companies have been showing a growing interest in this, interest that has gone hand in hand with the new vision of companies as organizations capable of generating competitive advantages through knowledge, intellectual capital and intangible assets in general. In this sense, it has become relevant that by themselves organizations can not create knowledge without individuals, knowledge originates and accumulates in people and, therefore, these become the main asset within the company and where the maximum power is focused. For (Barragn Ocaña, 2009) knowledge management as the individual or collective ability to generate, disseminate, share and use both tacit and explicit knowledge from the assimilation of information that is transferred in the form of knowledge and transformed into the experience of organizations or individuals; thus becoming a useful learning tool that allows the application of knowledge to add value within an organization, economy or society.

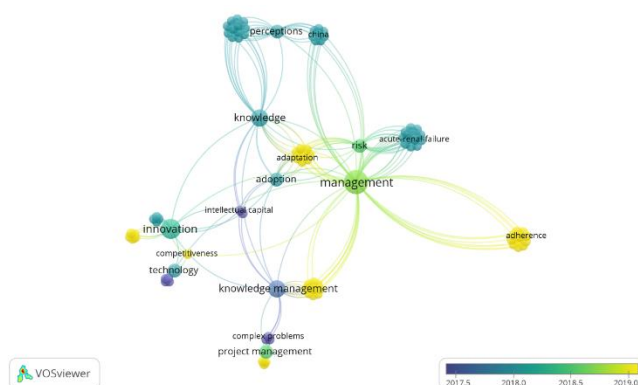


Figure 1. Trend in knowledge management research. Fountain:

Finally, it can be said that Knowledge Management is a useful catalyst for the construction and development of knowledge-based societies and economies; as well as organizations that use knowledge intensively, and that, under a continuous process of innovation, cooperation and a correct business vision, gives organizations a competitive advantage within the global economy. Based on the above, it is necessary to define the taxonomy of knowledge models, thus allowing us to understand how the function and operation of KM can be applied from various points of view, both theoretical and pragmatic, as described below Table 2:

Table 1. Types of knowledge management models

Author	Guy	Description
MacAdam y MacCreedy (1999)	Categorical models of knowledge	This group includes models whose main characteristic lies in exposing knowledge management under an essentially conceptual and theoretical approach
	Categorical models of knowledge	These types of models assume precisely how intellectual capital can be separated into human, customer, process and development elements, which are contained within two main categories: human capital and structural / organizational.
	Socially constructed models	They assume a broader definition and vision of knowledge. These models are intrinsically linked to social processes and organizational learning.
	Storage, access and transfer of knowledge	In this type of model, the difference between knowledge, information and data is often not distinguished; Knowledge is considered as an independent entity among the people who generate and use it. These models focus on the creation of methodologies, strategies and techniques that allow knowledge to be stored and facilitate its access and subsequent transfer among the members of the organization.
Rodriguez (2006)	Cultural	They are based on the impulse of an organizational culture that promotes the generation of knowledge management processes. These types of models promote changes in attitude, confidence, creativity and awareness of the value of knowledge among the members of an organization, thus motivating collaboration and communication.
	Technological	These types of models focus on the development and use of computer systems (Intranet, expert and information systems, Internet, etc.), as well as technological tools (search engines, multimedia and decision-making tools) for knowledge management.
Kakabadse, Kakabadse and Kouzmin (2003)	Philosophical models of knowledge management	These are related to epistemology or the constitution of knowledge itself. The models belonging to this classification try to explain how it is possible to obtain information from social and organizational reality, for which they are based on three principles: 1.- Objectives (values, abstraction and thinking); 2.- The type (concepts and prepositional objects); 3.- The source of knowledge (perception, memory and reason). Additionally, this group of models tries to explain the relationships established between knowledge, certainty, justification, causality, doubt and revocation.
	Cognitive models of knowledge management	They are related to positivist science and represent mechanisms for understanding cause-effect relationships. The main utility of this type of model is focused on knowledge-based industries; understanding the latter as the commodity of trade. In the knowledge economy, the industries that are based on it generate value by the repeated use they make of it and the feedback with other forms of knowledge for the solution of problems and the satisfaction of needs.
	Knowledge management network models	Such models emerge in conjunction with network organization theories and focus on the acquisition, exchange and transfer of knowledge as fundamental aspects for organizational learning, allowing new practices to be chosen and adopted when deemed relevant. This group of models expresses the conception of knowledge from the networks of actors that participate in their socialization and that influences the actions they carry out.
	Knowledge Management Community of Practice	Probably this type are the oldest knowledge management models that exist and that contemporary organizations have taken up for their application. Its base is built from a

Models

sociological and historical perspective; They argue how knowledge intrinsically constitutes a common property among a working group and that this knowledge has its foundation in the thinking that circulates within the community, that is, there is no universal basis for knowledge; In such a way that it is the agreement and common consensus that give it validity. Precisely the term community of practice was coined in the context of organizational learning studies. This type of models can be found and applied in activities such as work, professional, among others.

Quantum models of knowledge management

Its foundation is given from a quantum perspective, which is based on works of quantum physics, emerging quantum technology and economics. These models have a wide dependence on quantum computing and assume that most intellectual work can be developed by tools based on information technologies, which helps to provide simultaneous and virtual scenarios for decision making in the construction of a desired future.

Source: Own elaboration based on MacAdam and MacCreedy (1999), Rodríguez (2006), Kakabadse, et al. (2003).

When interpreting these taxonomies of knowledge management models we can find common points that allow us to summarize and regroup them in order to homogenize the criteria in areas where the study and development of knowledge management have had an important development; These criteria include theoretical, conceptual, philosophical, technical, scientific, cognitive, intellectual capital, social and working aspects of knowledge management as previously described.

METHODOLOGY

For the development of the research, a non-experimental descriptive exploratory research design of cross-sectional section in focus groups was implemented, taking as variables those shown in the following table:

DIMENSION	VARIABLES	INDICADORES
GESTION EMPRESARIAL	CULTURA ORGANIZACIONAL	Valores Creencias Tradiciones Experiencias
	ESTRUCTURA ORGANIZACIONAL	Puestos de trabajo Áreas Documentos Planeación
	ORGANIZACIÓN ESTRATEGICA	Gestión de calidad Políticas y directrices
GESTION DEL TALENTO HUMANO	RECLUTAMIENTO Y SELECCIÓN	Género Edad Nivel académico Experiencia
	EVALUACIÓN DE DESEMPEÑO	Competencias Trabajo en Equipo Herramientas
	CAPACITACIÓN	Métodos Comunicación
GESTION MARKETING	ESTRATEGIAS DE MERCADEO	Canales de comercialización Herramientas de comunicación
	COSTOS DE PRODUCCIÓN	Costos fijos Costos variables Relación beneficio-coste
	INNOVACIÓN	Productos Diversificación
GESTION DE LAS TIC	DESARROLLO TECNOLÓGICO	herramientas Proceso productivo
	USO DE HERRAMIENTAS DIGITALES	Software Hardware Telecomunicaciones

Source: (Author,2020)

To carry out this process, the Participatory Rural Innovation Model (IRP) was implemented, which is defined by (Gutiérrez, 2010,) as "The IRP method consists of a sequence of steps to carry out a social intervention based on participation and sustainability" (p. 526), this methodology is important since it involves small producers, in this case, rural horticultural associations to be promoters of "local development, raising their self-esteem, enhancing their management capacities, promoting their autonomy and strengthening their productive skills" (Gutiérrez, 2010, p.527).

PHASES OF THE INVESTIGATION.

It is developed in order to prepare the process of the knowledge management model based on the results of the diagnosis, for this it is necessary to develop the following steps.

Selection and preparation of support staff to act as facilitators.

Selection of the topics that will be developed according to the diagnosis.

Creation of the conditions for the development of the topics for the generation of the knowledge management model.

At this stage, the strategies of business management, marketing and innovation will be deployed, which will be made known to the producers of the associations.

Stage of execution of training and knowledge management actions

For this phase, the training model in productive activity was implemented, developing under the following actions:

Location of work teams

Development of training activities.

Development of evaluation actions

Evaluation of the development of Knowledge Management activities.

With the development of this phase, business management, marketing and innovation strategies will be built.

At this stage of the research, the semi-structured interview will be implemented as a technique, taking into account the categories related to Knowledge Management focused on marketing and innovation strategies, business management and an in-depth content analysis will be carried out to identify the emerging categories, which will be analyzed through the Nvivo version 12 program.

The second technique that will be used for research is the Nominal Participatory Group technique (TNGP), "becoming on its own merits a unique tool aimed at the acquisition, stimulation and development of a set of knowledge, skills and abilities" (Olaz, 2013, p.114) which will be implemented to the associations, in this process there will be the intervention of technical assistance and technology transfer to growers of the associations object of I am a student.

RESULTS

For the development of the research phase, the semi-structured interview was applied as an instrument taking into account the following variables.

ORGANIZATIONAL CULTURE

This dimension was measured through the indicators: Values, beliefs, traditions, organizational culture, jobs, areas, records, planning, improvement practices, standards and policies. The results of these indicators are reported in the Table.

Table 1. Organizational culture dimension

Alternatives Indicator	Percentage %				
	Strongly agree	Somewhat agree	Neutral	Disagree	Nothing to agree
Organizational culture					
In the association they strengthen values such as honesty, respect, equality.	75,0	10,0	15,0	-	-
Beliefs are an important factor within the association	15,0	35,5	40,0	5,0	5,0
The association seeks to maintain traditions through activities that benefit its members	40,0	50,0	10,0	-	-
I am comfortable with the organizational culture of the association	20,0	40,0	20,0	20,0	
The association delegates certain functions in terms of jobs	5,0	30,0	40,0	15,0	10,0

Areas such as finance, marketing, production, human resources are managed within the association	15,0	15,0	20,0	45,0	5,0
I control records of the activities carried out	10,0	30,0	20,0	35,0	5,0
I carry out a planning design for the activities developed within the association	25,0	5,0	25,0	45,0	-
I carry out improvement practices so that my products are of good quality	35,0	40,0	25,0	-	-
There are established rules and policies within the association	50,0	40,0	5,0	5,0	-

Source: Author, 2021

En la asociación fortalecen valores como la honestidad, el respeto, la igualdad

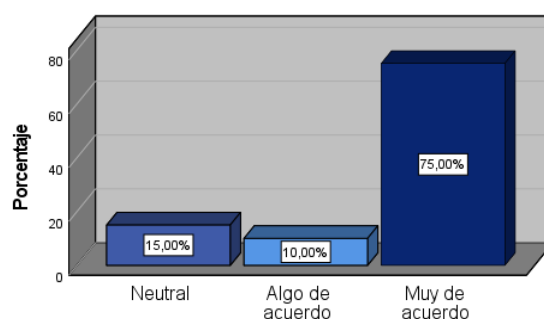


Figure 42. Values. Source: (Author, 2021)

Regarding the indicator "values" of the instrument applied to producers, 75% of respondents responded that they strongly agree that the association strengthens values such as honesty, respect and equality, compared to 15% who assured that it is Neutral which indicates that this organization is based on principles and values that allow generating a pleasant environment for associates. Likewise, for the indicator "beliefs" 40% of respondents said that it is Neutral versus 35% somewhat agree that beliefs are an important factor within the association based on the above the associates mention that the ideas are shared regarding the religious, mainly with the Catholic religion and participation in traditional festivities such as the dances of San Pascual, San Isidro among others.

La asociación busca mantener las tradiciones a través de actividades que benefician sus asociados

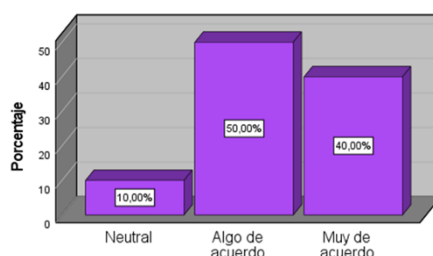


Figure 43. traditions. Source: (Author, 2021)

In the same way, for the indicator "traditions" it was established through the instrument applied, with a participation of 50% of the producers (some agreement) that the association seeks to maintain traditions through activities such as the festival of knowledge and flavors as mentioned by the associates, which allows inferring that their participation is active and that these activities benefit the producers.

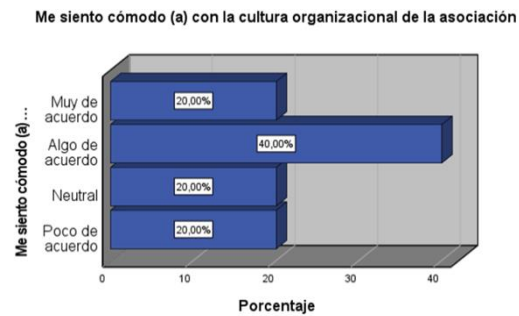


Figure 44. Organizational culture. Source: (Author, 2021)

Regarding the indicator "organizational culture" it was observed that 40% of producers are comfortable with the organizational culture, according to this they express that they feel confidence because the commitment of the association is always to ensure the integrity of each of the associates, compared to 20% who indicate that they do not agree.

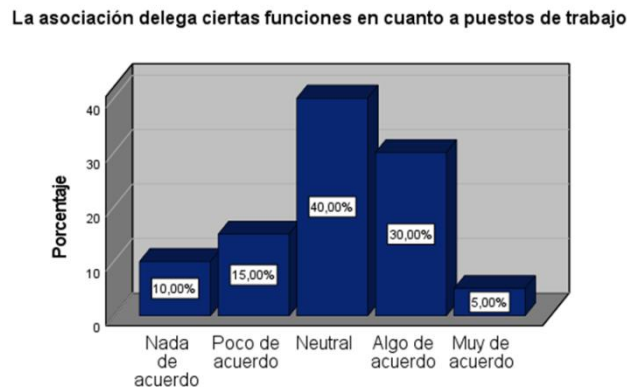


Figure 45. Jobs. Source: (Author, 2021)

On the other hand, according to the indicator "jobs" it was obtained as a result that the association can delegate certain functions but that it is not governed by jobs, but that its participation is equitable and integral, which indicates that each associate promotes and knows his responsibilities within the association, however, In terms of production they work individually.

In the same way with a participation of 45% the producers are little in agreement with which areas such as finance, marketing, production and human resources are managed within the association, they are a little more organized in the commercial part, however, this indicates shortcomings in terms of organizational structure.

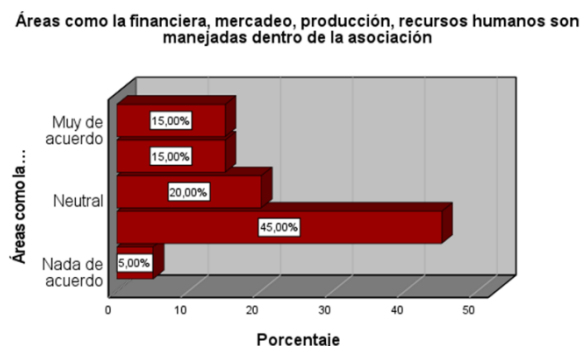


Figure 46. Areas. Source: (Author, 2021)

Realizo control de registros de las actividades realizadas

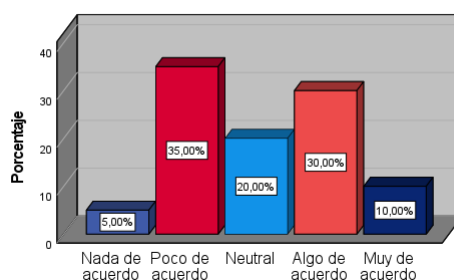


Figure 47. Records. Source: (Author, 2021)

The indicator "records" showed that the associates do not carry out an adequate control of records of the activities they develop, it is noteworthy that most do not have the necessary records neither as a producer nor as an association. However, it is a process which has been working to strengthen the organization.

Llevo un diseño de planeación para las actividades desarrolladas dentro de la asociación

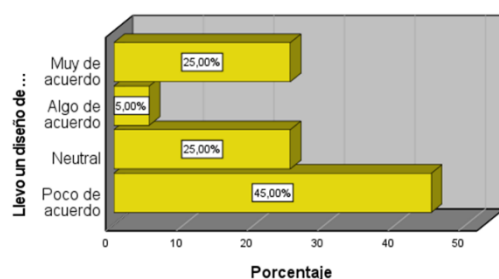


Figure 48. Planning. Source: (Author, 2021)

For the indicator "planning", 45% of respondents affirm that they do not have an adequate planning design for the activities developed within the association compared to 25% who, if they do, also the producers indicate that they carry out activities empirically. On the other hand, another 25% are Neutral with the planning of activities both individually and associatively.

Likewise, with regard to the indicator "improvement practices", it was observed that the associates agree that they carry out improvement practices so that their products are of good quality, especially in the production and marketing process, since they develop clean agriculture practices.

Realizo prácticas de mejoramiento para que mis productos sean de buena calidad

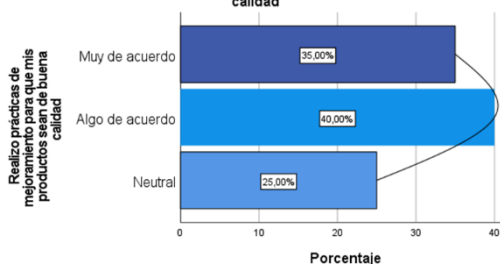


Figure 49. Improvement. Source: (Author, 2021)

On the other hand, regarding the indicator "rules and policies" of the instrument applied to producers, 50% of respondents responded that they strongly agree that there are rules and policies established within the association and that they are governed according to the statutes which strengthens and integrates as an association.

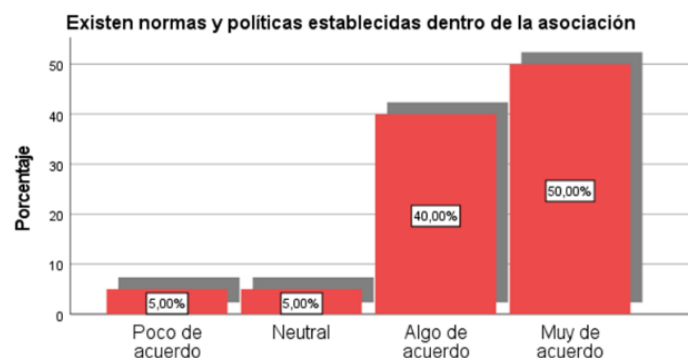
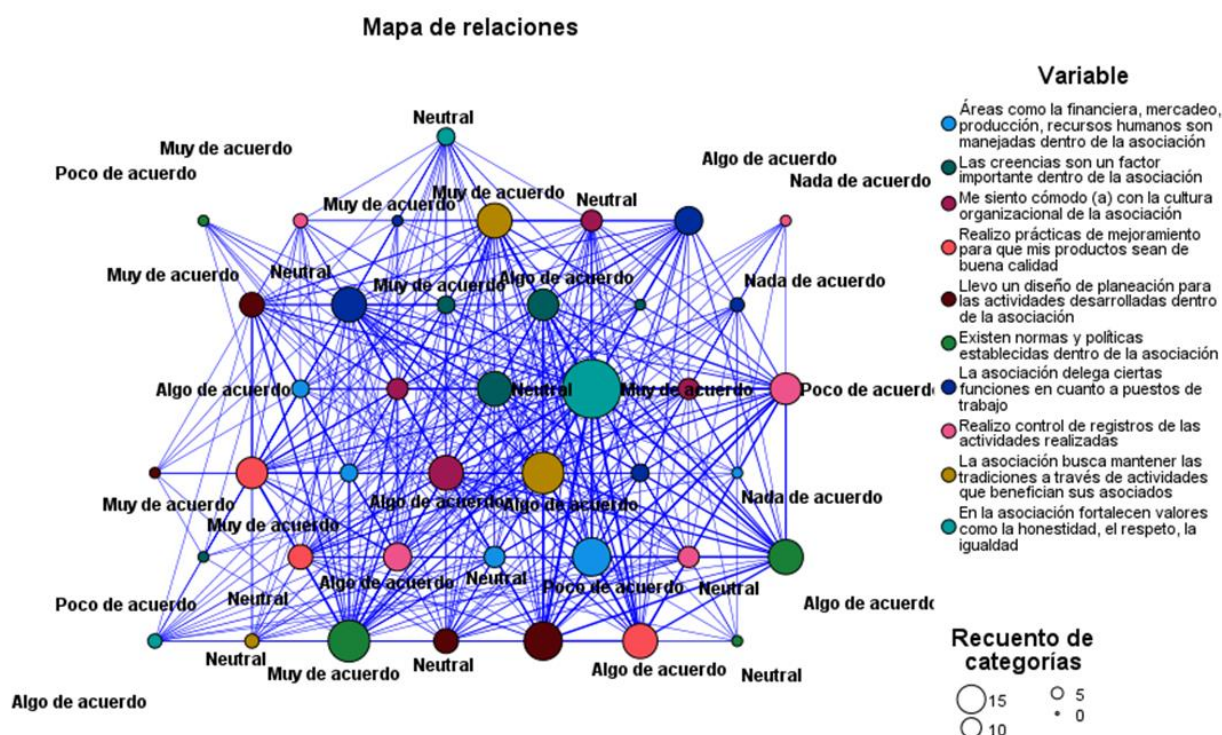


Figure 50. Políticas. Source: (Author, 2021)



ITEM II. ORGANIZATIONAL STRUCTURE

This dimension was measured through the indicators: gender, age, academic level, experience, competencies, teamwork, training, training tools and communication tools. The results of these indicators are reported in Table 2

Table 2. Organizational structure dimension

Alternatives Indicator	Percentage %				
	Strongly agree	Somewhat agree	Neutral	Disagree	Nothing to agree
Organizational structure					
There is a greater participation of the female gender in the association	35,0	50,0	10,0	5,0	-
The age range that is taken into account for those who make up the association is from 18 to 70 years	20,0	25,0	50,0	5,0	-
I must have a certain academic level to enter the association	-	10,0	45,0	40,0	5,0
I must have experience to be part of the	-	5,0	45,0	50,0	-

association

The association uses methods to measure the competencies of its members	-	20,0	35,0	35,0	10,0
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Teamwork is a fundamental part to develop the proposed activities	70,0	20,0	10,0	-	-
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Association uses mobile tools for training	5,0	35,0	55,0	5,0	-
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The association uses participatory workshops, events and talks as training tools	45,0	40,0	10,0	5,0	-
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The association uses technological tools as media	30,0	35,0	25,0	10,0	-
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Source: Author, 2021

Regarding the "gender" indicator of the instrument applied to producers, respondents responded that they strongly agree that there is greater participation of women within the association, evidencing that women are key agents of empowerment for rural development, however, it should also be taken into account that there is also related male participation to a lesser extent.

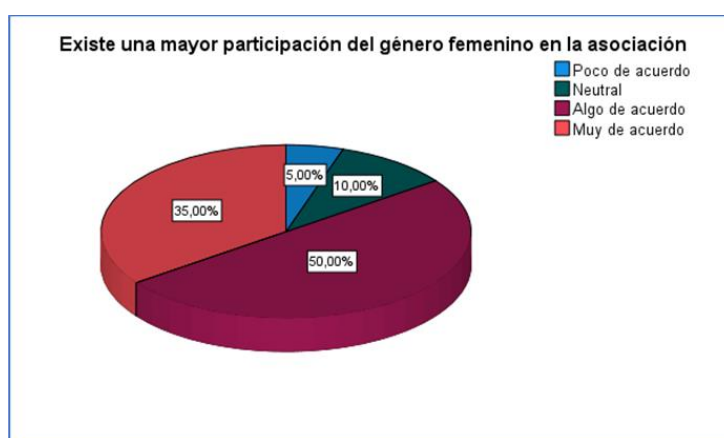


Figure 51. Gender. Source: (Author, 2021)

Likewise, for the indicator "age" 50% of respondents said that it is Neutral versus 25% somewhat agree that the age range that is taken into account for the members of the association is from 18 to 70 years, however, it is mentioned that it is not something fundamental for the associates and that they should only be willing to work and learn.

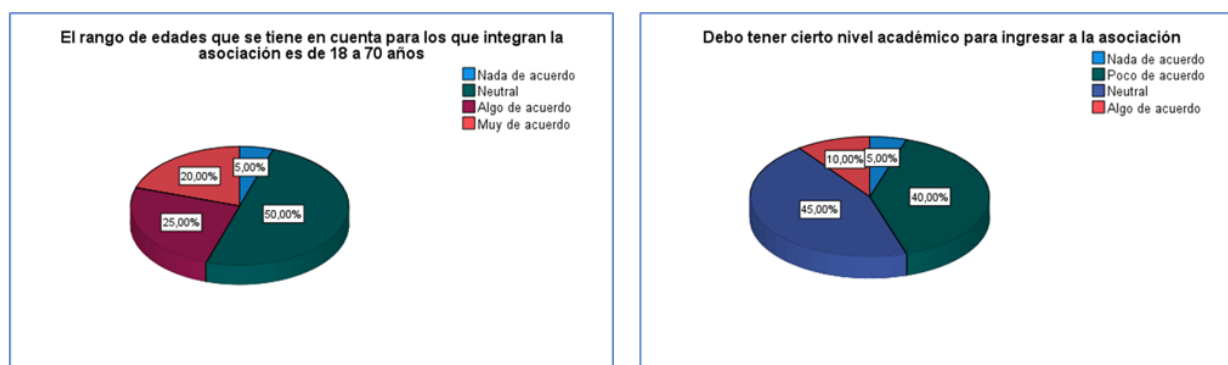


Figure 52. Age / Academic level. Source: (Author, 2021)

For the indicator "academic level" of the instrument applied to producers, 45% of respondents answered that it is a neutral aspect compared to 40% who say they disagree which indicates that the associate can have any type of study or training at the time and throughout the work process.

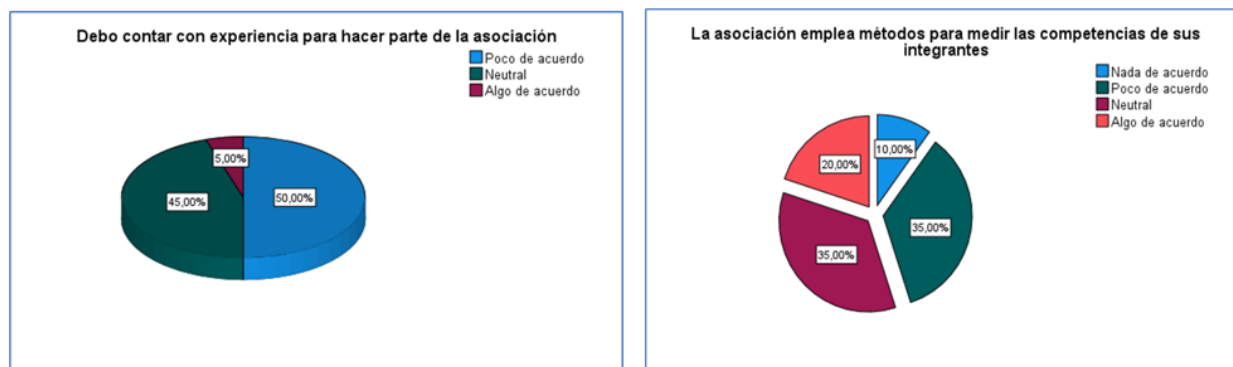


Figure 53. Experience / Skills. Source: (Author, 2021)

Another important indicator to evaluate is the "experience" to which 50% of the producers responded that they do not agree that they must have experience to be part of the association which shows that it does not become a characteristic of the associates, this is developed over time and with the attitude of each person.

On the other hand, according to the indicator "competencies" it was obtained as a result that the association does not use methods to measure the competencies of its members, which indicates that it is not measured how the associates do the essential activities for the fulfillment of their role and therefore define the goals and objectives individual and as an association.

For the indicator "teamwork" the producers corresponding to 70% indicate that they strongly agree that teamwork is essential to develop the proposed activities and the achievement of the objectives within the association because advantages are achieved such as motivation to work and feel part of a team, Greater commitment and responsibility with the assigned tasks.

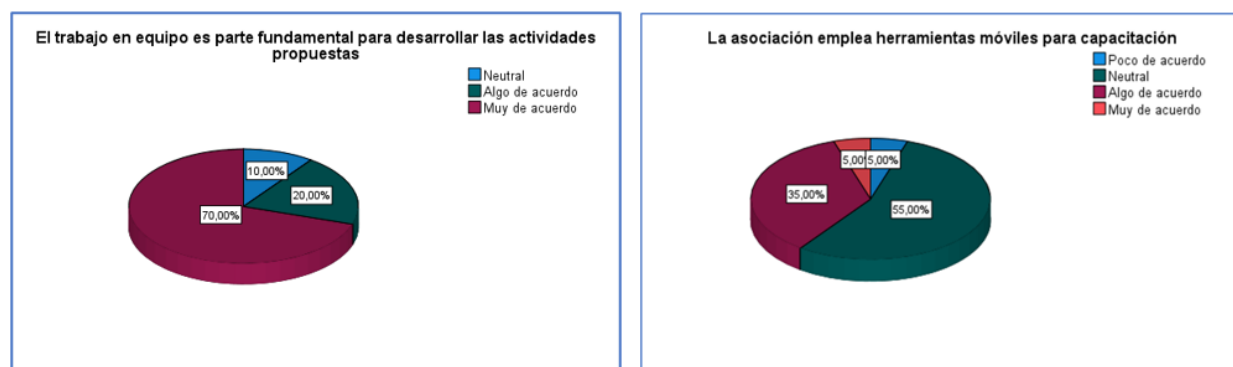


Figure 54. Teamwork / Tools. Source: (Author, 2021)

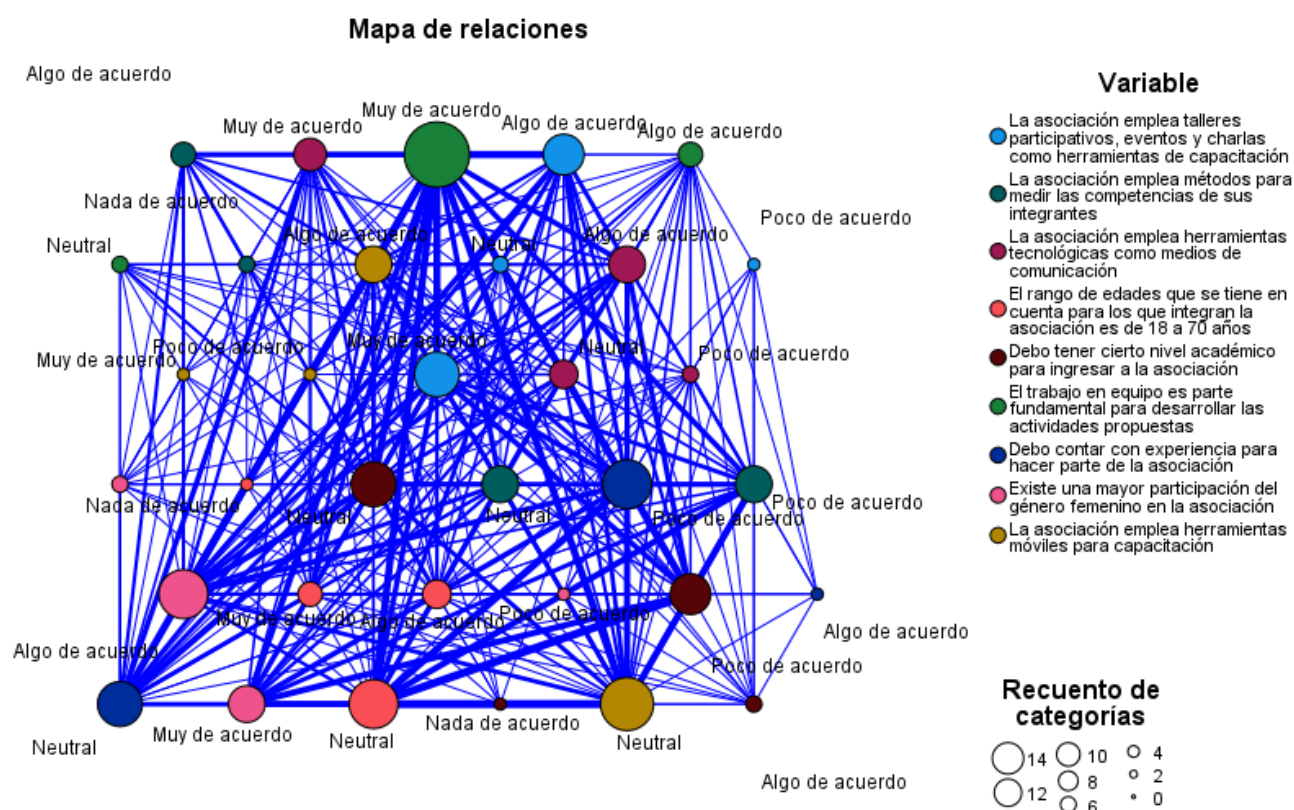
For the indicator "tools" it was obtained as a result that 55% of the producers affirm that it is neutral compared to 35% of the respondents who agree that the association uses mobile tools for training, to which some of the associates indicate that they have a cell phone and through groups maintain the information process, However, they do not have equipment to develop training.



Figure 55. Training / Communication. Source: (Author, 2021)

On the other hand, 45% of producers strongly agree that the association uses participatory workshops, events and talks as training tools compared to 40% who say they somewhat agree, which indicates that they have an active participation receiving training from different entities in addition to attending and organizing tourism events, Farmers' Market among others that strengthen the association.

Otherwise for the indicator "media" it was obtained as a result that 35% of the producers mention that they are somewhat in agreement with the association uses technological tools such as media which has served as an advantage to facilitate the entry and exit of information for the associates, however, not all have an internet connection, Therefore, it sometimes becomes a limitation in the time of arrival of such information. This shows a need in the rural sector not only for the members of the association but throughout the country, connectivity becomes an essential aspect for the development of the countryside and peasant families.



ITEM III. MARKETING MANAGEMENT

This dimension was measured through the following indicators: sales, advertising, differentiation, diversification, loyalty, fixed costs, variable costs, benefit-cost ratio, production and innovation. The results of these indicators are reported in Table 3

Table 3. Marketing management dimension

Alternatives Indicator	Percentage %				
	Strongly agree	Somewhat agree	Neutral	Disagree	Nothing to agree
Marketing Management					
The association has a pricing policy at the time of sale	-	20,0	20,0	15,0	45,0
The association develops campaigns and advertising to publicize the products	35,0	55,5	5,0	5,0	-
I consider organic production as a differentiation strategy	50,0	40,0	10,0	-	-

I have a wide diversification of products	35,0	50,0	5,0	5,0	5,0
I carry out customer loyalty activities	5,0	30,0	40,0	15,0	10,0
Raw material, water, electricity and rent are part of my fixed production costs	20,0	40,0	35,0	5,0	-
Inputs and labor are part of my variable costs	20,0	60,0	20,0	-	-
I know the benefit-cost ratio (what it costs to produce Vs what I earn) of my production.	20,0	10,0	40,0	25,0	5,0
Vegetables are part of the majority of my production	35,0	50,0	10,0	5,0	-
I use information technologies for innovation processes	25,0	15,0	35,0	20,0	5,0

Source: Author, 2021

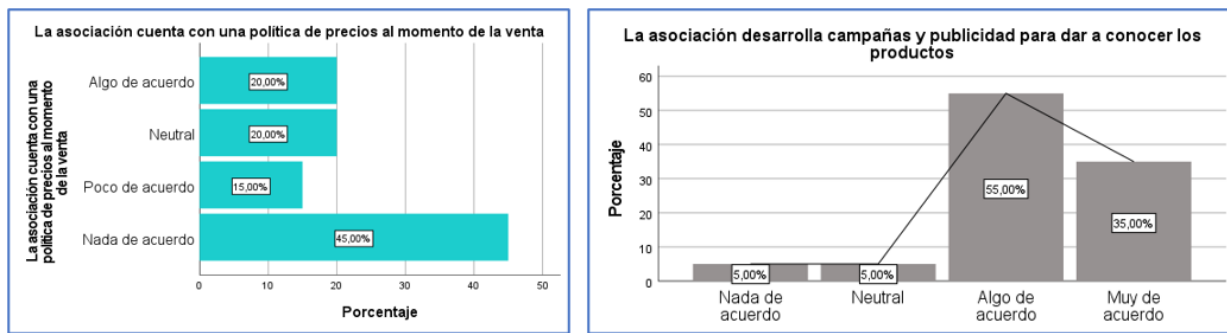


Figure 56. Price / Advertising. Source: (Author, 2021)

As for the indicator "prices" of the instrument applied to producers, the result obtained was 45% no agreement compared to 15% little agreement; In this sense, respondents responded that the association does not have a pricing policy at the time of sale because each one establishes the specific price for marketing.

In the same way, for the indicator "advertising", it was established through the instrument applied to the producers, that 55% of them somewhat agree that the association develops campaigns and advertising to publicize the products which allows inferring based on what is indicated by the producers that from the page of the association advertising spaces are developed to promote activities such as peasant market and in general activities that They carry out the associates as well as voice to voice advertising which has allowed consumers to refer the good opinion and satisfaction regarding the products and in turn be recommended to the community which has served as a competitive advantage over other local markets.

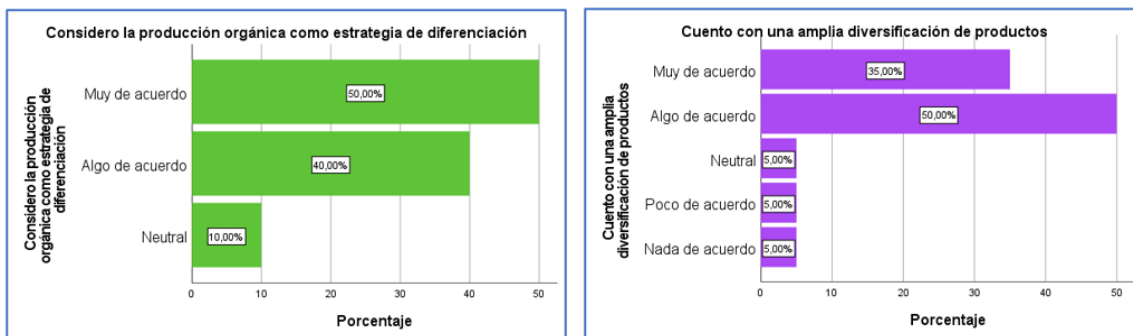


Figure 57. Differentiation/ Diversification. Source: (Author, 2021)

Regarding the indicator "differentiation" it was observed that 50% of respondents consider organic production as a differentiation strategy, compared to 10% neutral on the subject, in this sense it is inferred that organic agriculture is considered a sustainable and economic healthy food alternative, these foods are more desired for consumers because they reduce the use of agrochemicals in their production in addition to caring for the environment. The association believes that the fact of producing organically allows the consumer to see the products from a better perspective, that is, more accessible and of better quality.

On the other hand, according to the indicator "diversification" obtaining as a result that 50% of the producers is somewhat in agreement and have a wide diversification of products, which indicates that the associates not only produce vegetables but also other crops among which are potato, onion, pea, corn, bean and some fruit trees such as blackberry, gulupa, gooseberry, strawberry among others.

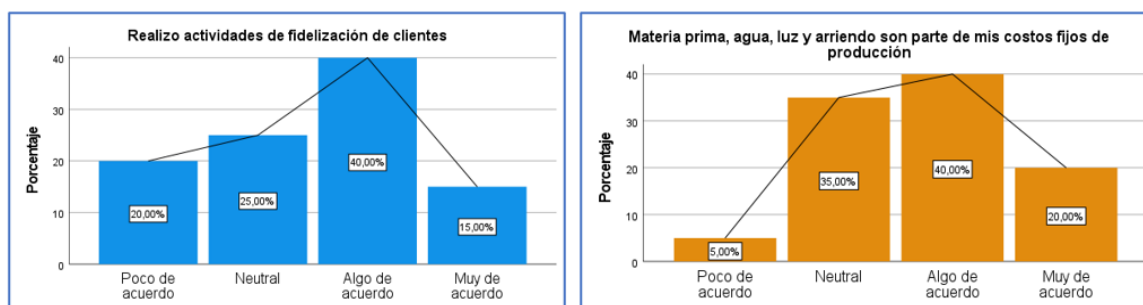


Figure 58. Loyalty / Fixed costs. Source: (Author, 2021)

In the same way, for the indicator "loyalty" it was established through the instrument applied to producers that 40% carry out customer loyalty activities compared to 20% that do not. For this, producers negotiate directly with consumers and promote products.

It should be noted that 40% of respondents consider that raw material, light and lease are part of their fixed production costs, however, 35% are neutral on the subject, which indicates that producers do not establish the cost part as an essential part within their production systems, to know the viability of their business both individually and associatively.

Likewise, 60% of producers indicate that inputs and labor are part of their variable costs, to which it is established that, although there is empirical knowledge of the costs in the production process, an orderly and systematized record is not kept, however, the associates point out that it is a process that is being carried out step by step.

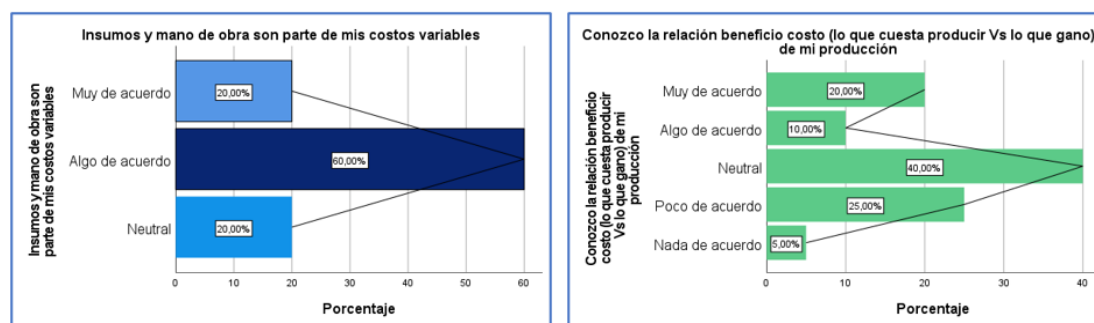


Figure 59. Variable costs / Benefit-cost ratio. Source: (Author, 2021)

Regarding the indicator "cost-benefit ratio" of the instrument applied to producers, 40% of respondents answered Neutral in terms of knowing the cost-benefit ratio (what it costs to produce vs. what they earn from their production) compared to 20% who agree, therefore, it is necessary that producers include more efficiently and know the profitability of their production systems in this way the Productive development of the association.

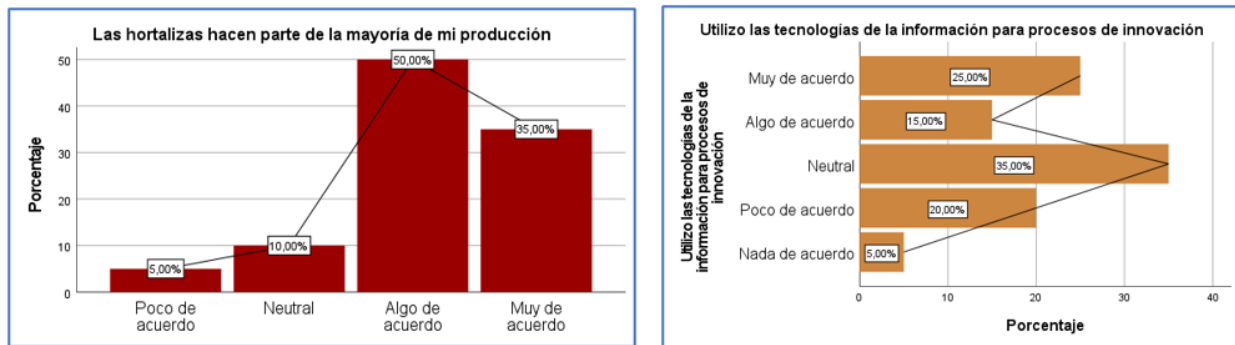


Figure 60. Production / Innovation. Source: (Author, 2021)

For the indicator "production" 50% of the associates somewhat agree that vegetables are part of the majority of their production, 35% strongly agree compared to 5% who disagree little, evidencing a greater participation for horticultural production, however, here the diversification of their products must be taken into account.

On the other hand, for the indicator "innovation" it was established that 35% are neutral with respect to the use of information technologies for innovation processes, as well as 25% of them who are very much in agreement for which innovation is evidenced as a limitation for the association, it is necessary to incorporate this type of processes to improve the role of the association within local agricultural development.

ITEM IV. TECHNOLOGICAL DEVELOPMENT

This dimension was measured through the indicators: technological tools, technological machinery, technological needs, technological platforms, competitiveness, programs, networks, apps, soft technologies. The results of these indicators are reported in Table 4

Table 4. Technological development dimension

Alternatives Indicator	Percentage %				
	Strongly agree	Somewhat agree	Neutral	Disagree	Nothing to agree
Technological development					
The association has technological tools to facilitate the development of activities	10,0	25,0	25,0	15,0	25,0
I make use of technological machinery in my production process	5,0	20,0	5,0	15,0	55,0
I consider that the association has technological needs for the development of activities	40,0	45,0	5,0	10,0	-
Technology platforms are fundamental in the commercialization of agricultural products	70,0	20,0	5,0	5,0	-
The use of computers and cell phones is essential to make the association more competitive	70,0	15,0	10,0	5,0	-
Within the information programs I use, I manage programs such as Word and Excel	20,0	10,0	30,0	25,0	15,0
I use platforms or networks such as Facebook, WhatsApp or Instagram to sell my products	15,0	30,0	45,0	10,0	-
I manage other types of Apps for the commercialization of products	5,0	10,0	50,0	10,0	25,0
Within information technologies I know and use soft technologies	10,0	20,0	5,0	35,0	30,0

Source: Author, 2021

For the indicator "technological tools" of the instrument applied to producers, respondents responded with 25% frequency for each alternative somewhat agreed, neutral and not at all agreed that the association has technological tools to facilitate the development of activities, so it is evident that, although they use tools such as cell phones, they have a limitation in terms of other technological elements.

La asociación posee herramientas tecnológicas para facilitar el desarrollo de actividades

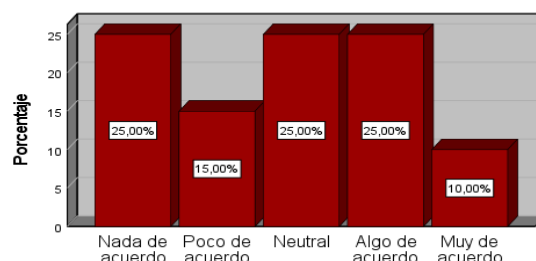


Figure 61. Technological tools. Source: (Author, 2021)

Similarly, for the indicator "technological machinery" it is evident that producers do not use technological machinery in their production process, mostly using traditional tools such as hoe, pick, rake, knives among others that facilitate cultural work and perform these manual and empirical processes.

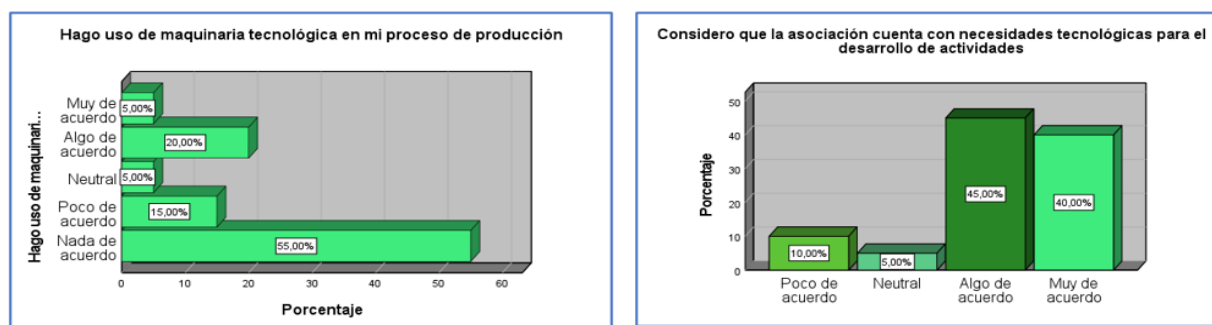


Figure 62. Technological machinery / technological needs. Source: (Author, 2021)

Similarly, for the indicator "technological machinery" it is evident that producers do not use technological machinery in their production process, mostly using traditional tools such as hoe, pick, rake, knives among others that facilitate cultural work and perform these manual and empirical processes.

Regarding the indicator "technological needs", 45% of producers (somewhat agree) and 40% (strongly agree) indicate that the association effectively has technological needs for the development of its activities, both in training processes and in production processes, for which it is necessary to investigate and see possibilities of support in this aspect.

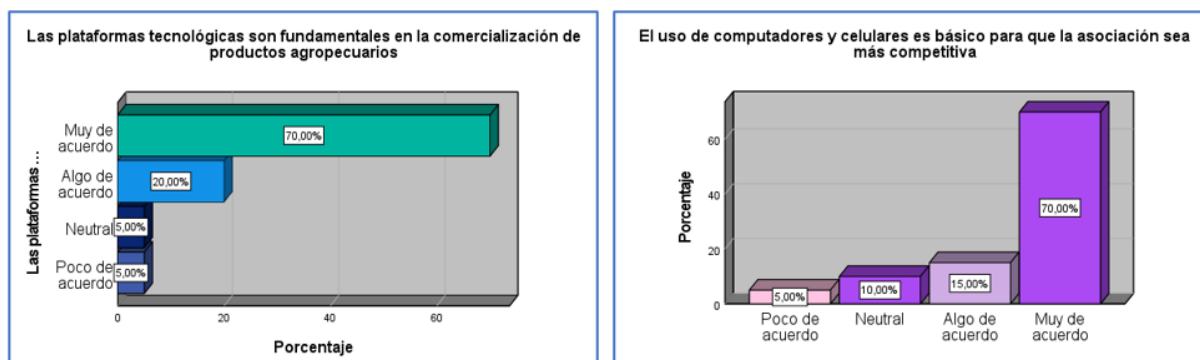


Figure 63. Marketing / competitiveness. Source: (Author, 2021)

Now for the indicator "technological platforms" 70% of producers (strongly agree) consider that technological platforms are fundamental in the commercialization of agricultural products because one of the limitations of agricultural trade is the number of intermediaries, however at present the platforms bring the producer closer to the consumer by reducing the intermediation network. On the other hand, for the competitiveness indicator, 70% of the associates strongly agree that the use of computers and cell phones is essential for the association to be more competitive because it is increasingly necessary to be updated with information, especially in the agricultural sector in production processes, prices, innovation, technology, marketing strategies among others that through these tools facilitate access to such information and therefore the association aims towards greater competitiveness.

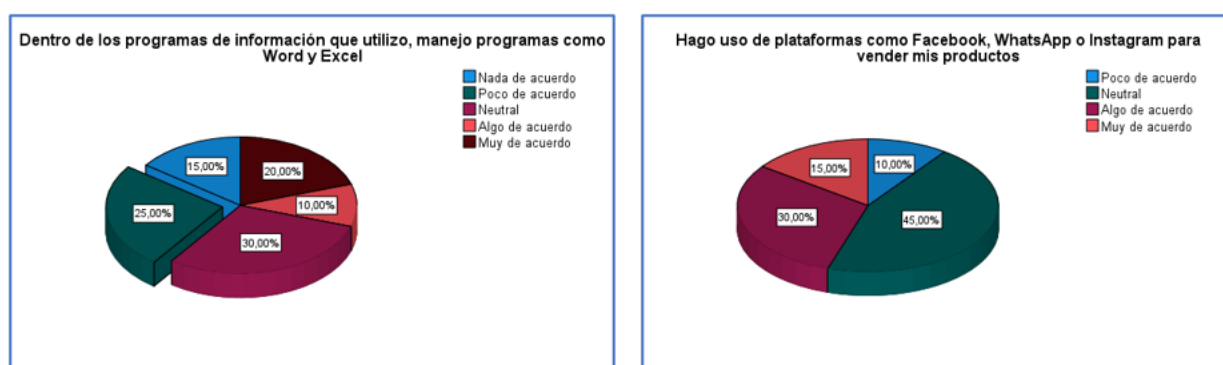


Figure 64. Programs / platforms. Source: (Author, 2021)

Likewise, for the "programs" indicator, it is evident that 30% of the associates are neutral compared to the fact that within the information programs they use, they handle programs such as Word and Excel. In this regard, it should be noted that since the fact of not having access to basic technology is a limitation, it is possible that such programs are unknown.

Regarding the indicator "platforms" 45% of respondents responded in a way (neutral) versus 35% (somewhat agree) regarding the use of platforms such as Facebook, WhatsApp or Instagram to sell their products according to what was indicated by the producers in their majority their sales are direct to the consumer. However, currently through these platforms it is possible to create and develop meaningful relationships with potential customers.

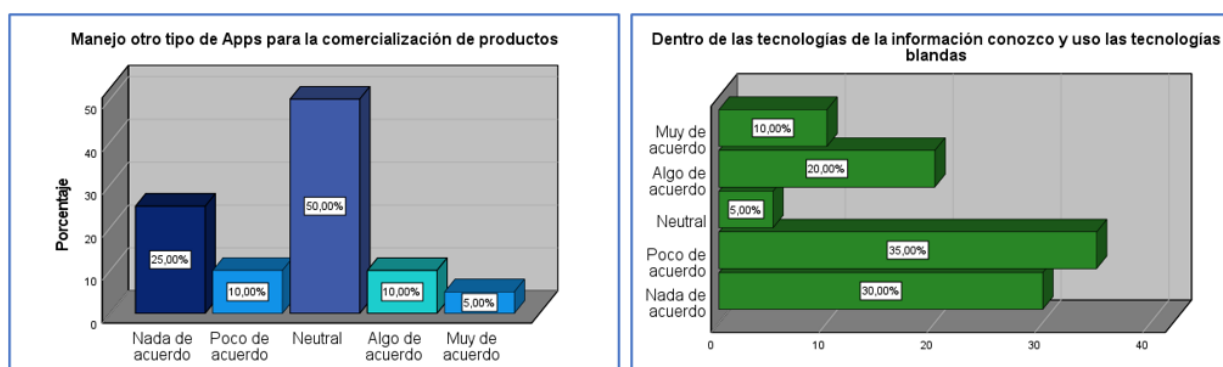


Figure 65. Apps / soft technologies. Source: (Author, 2021)

Regarding the "Apps" indicator, it was observed that with respect to the management of other types of Apps for the commercialization of products, 50% of the associates think in a Neutral way regarding this issue, which shows that there is a lack of information regarding new applications and platforms for the commercialization of agricultural products, which generates greater local development and productivity to the association.

For the indicator "soft technologies" it was observed that there is a lack of knowledge regarding the use and conceptualization, in this sense it should be noted that this type of technologies are based on old or empirical principles guaranteeing good results only using the deep knowledge of the productive system, which is why it becomes essential for producers.

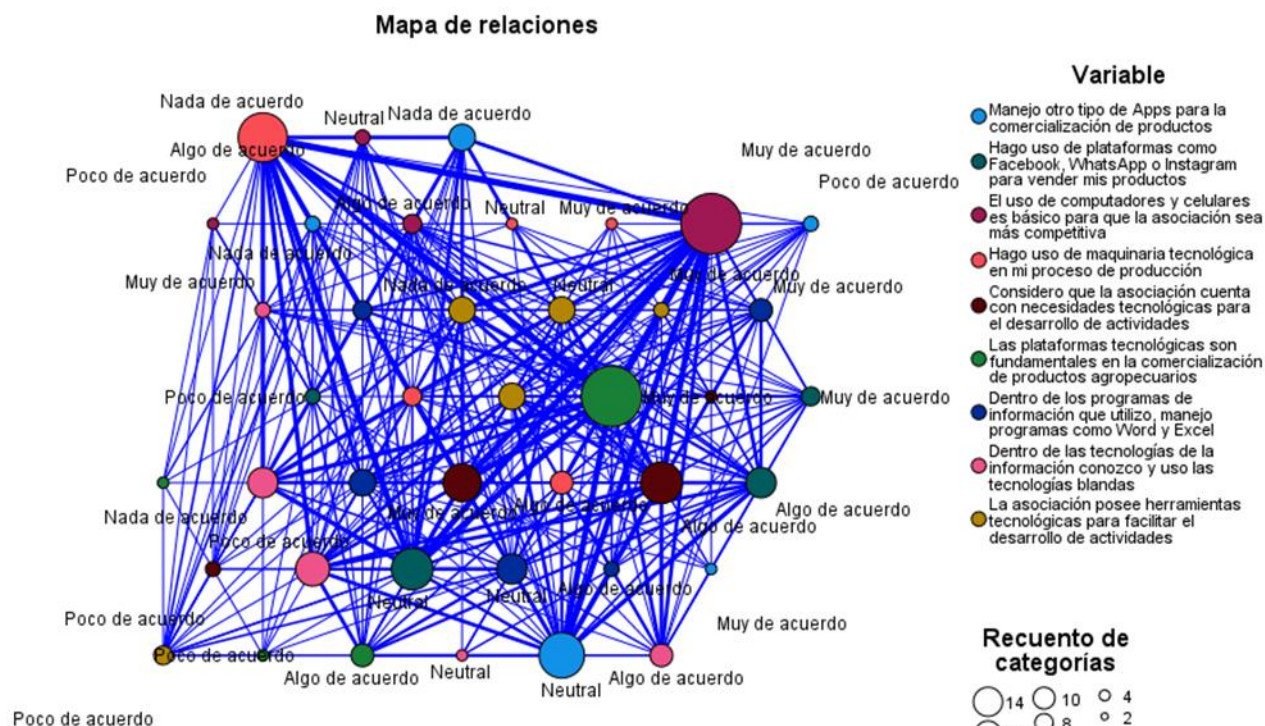


Figure 66. Map of relationships. Source: (Author, 2021)

In the knowledge it is evident that these producers lack information related to knowledge management, making known the causes of this phenomenon, among which there is the lack of training, the commitment on the part of government entities to lead these methods and the low economic income that they have to face the changes that the owners of the orchards must assume to successfully carry out the development of these processes. They also emphasize the importance of partnering, specifically to improve cultural work and marketing channels, in order to reduce intermediaries.

In the same way, the attitude that these producers present is positive, since they are willing to train to acquire knowledge specifically highlighting the advantages and strengths that this theory brings to small producers, they mention the importance of involvement by state entities to acquire economic financing; since this is one of the strong limitations of the agricultural sector.


CONCLUSIONS

With the development of the research, the importance of knowledge management for the agricultural sector is evidenced, based on the fact that this theory is fundamental to identify the strengths and weaknesses of the object of study; based on dimensions such as administrative, technological and information management.

It is important for academic entities to support the process of technical assistance to agricultural associations in Colombia, especially in particular; that they lack knowledge and confidence for the development of production processes.

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