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# Agricultural productivity in the northern area of the province of Esmeraldas, Ecuador

Productividad agropecuaria en la zona norte de la provincia de Esmeraldas- Ecuador

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## Abstract

In the context of Ecuador's economic and social development, the agricultural sector plays a fundamental role, and currently presents different challenges in terms of increasing productivity, so the purpose of this research is to analyze the factors that influence agricultural productivity in the northern area of the Province of Esmeraldas. It was conducted under the quantitative approach, with a descriptive type of research, the target population of the study were the producers of Eloy Alfaro Canton, located in Borbón, La Tola and other parishes, for which a sample of one hundred producers was considered. The data collection technique was the survey, whose instrument consists of a questionnaire with a Likert-type scale, the data were analyzed using descriptive statistics, with the calculation of the relative percentage frequency. As a result of the measurements made in terms of the economic dimension, it was found that most producers do not invest in crop maintenance and livestock activities, which results in risky production conditions; while, in the knowledge dimension, producers do not invest in maintenance or in innovation and technology, do not know processes and techniques to develop agricultural activities, do not have the organization and control of the

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processes they carry out, and therefore require training and technical assistance to increase productivity and be competitive in the market.
Keywords: factors, productivity, agricultural sector, society, economy.

Resumen

En el contexto del desarrollo económico y social ecuatoriano el sector agropecuario juega un papel fundamental, en la actualidad presenta diferentes desafíos en cuanto al incremento de la productividad, por lo cual el propósito de esta investigación es analizar los factores que influyen en la productividad agropecuaria en la zona norte de la Provincia de Esmeraldas. Se realizó bajo el enfoque cuantitativo, con una investigación de tipo descriptiva, la población objeto de estudio fueron los productores del Cantón Eloy Alfaro, ubicados en Borbón, La Tola y en otras parroquias, para lo cual se consideró una muestra de cien productores. La técnica de recolección de datos fue la encuesta, cuyo instrumento está conformado por un cuestionario con escala tipo Likert, los datos se analizaron mediante la estadística descriptiva, con el cálculo de la frecuencia relativa porcentual. Como resultado de las mediciones realizadas en función de las dimensión económica se encontró que la mayoría de los productores no realizan inversiones en mantenimiento de los cultivos y en la actividad pecuaria, lo que trae como consecuencia condiciones de riesgo en la producción; mientras que, en la dimensión de conocimiento, se tiene que los productores no realizan inversión en mantenimiento, ni en innovación y tecnología, desconocen procesos y técnicas para desarrollar las actividades agropecuarias, no llevan la organización y control de los procesos que realizan por lo que requieren de capacitación y asistencia técnica para incrementar la productividad y ser competitivos en el mercado.
Palabras clave: factors, productivity, agricultural sector, society, economy.

## Introduction

The agricultural sector has played a fundamental role in the economic and social development of countries, in addition to providing raw materials and food, it is a source of employment for a significant number of the population. In this regard, in Latin America, states

Rivera, Estrada, Quiñonez and Moreno (2019), most countries are seeking to boost and improve productivity in this sector, being essential for local and national development by providing socio-economic benefits, which influences the growth of the region and its inclusion in the international economic scenario.

In Ecuador, according to Pino, Aguilar, Apolo and Sisalema (2018), the domestic food demand is 95% covered by the agricultural sector, a considerable percentage of the economically active population (EAP) is engaged in agricultural production, especially unskilled, The commercialization of products is quite favorable, becoming an important foreign exchange generating sector, with a contribution to the Gross Domestic Product (GDP), according to Carrión and Garzón (2020), of 7.81%, who by means of the multiple linear regression method analyzed the time series data from 2002 to 2019 obtained from the Central Bank of Ecuador. Likewise, Bucaram and Quinde (2018), highlight that it is an important sector in food supply being this a fundamental principle in food security, established as public policy in the country.

Productivity is an indicator that expresses, according to Felsinger and Runzaque (2002), how the resources of an economy are being used for the production of goods and services. Thus, it can be considered as the relationship that exists between resources and the product obtained, where different factors such as human resources, capital, land, innovation, technology, among others, and the efficiency of these in generating or producing a good are involved.

In this sense, it is evident that in the Ecuadorian context the agricultural sector has undergone certain transformations that have led it to increase its productivity through the incorporation of technology, strengthening the importance that the sector's activity has had, as referred to by Rivera et al. (2019) it is necessary to promote processes and activities that allow reaching high levels of productivity at the national level, satisfy demand and minimize or substitute imports to a certain extent. It should be noted that this research is framed in the linkage project of the Faculty of Agricultural Sciences of the Technical University "Luis Vargas Torres" of Esmeraldas entitled

"Improvement of agricultural productivity in the rural parish Borbón of the Eloy Alfaro canton" which was executed by the Animal Husbandry Engineering Career with the collaboration of the Forestry Engineering and Agronomy Engineering careers.

Within this framework, the Ecuadorian State has set among its strategic objectives the incentive of production at the national level, to achieve productivity and be competitive, and at the same time, achieve regional integration. For Rivera et al. (2019) the achievement of these objectives is based on productive technification, focused on adding value to production, on knowledge and innovation, "import substitution; as well as the effective and adequate orientation of state resources and work; bringing with it a further local development of provinces and cantons and parishes" (p.243).

In this regard, Egas, Shik, Inurritegui and De Salvo (2018) point out that the Ministry of Agriculture, Livestock, Aquaculture and Fisheries (MAGAP, 2016) as of 2012 had a recovery process and addressed agricultural policy from several approaches, including democratization of access to land, water, seeds, credits and other inputs, promoting technical assistance, training, technology, production and agricultural import substitution. However, implementation was affected by different aspects, including limitations in the operational capacity of institutions, insufficient resources due to the slowdown in economic activity in 2016.

As of 2017, the authors add, the initiative called "Gran Minga Agropecuaria" was presented, containing nine lines of action, such as the provision of irrigation, supply or replacement of equipment, agricultural credits, insurance, technical assistance and training, among others, however, a document defining how to implement this policy was not created.

On the other hand, the Toda una Vida National Development Plan for the period 2017-2021 states that in recent years production in the sector has advanced, but there is still low productivity in commodities, as well as in potentially exportable products, defining as a goal for the year 2021 to increase the productivity index from 98.9 to 112 (Toda una Vida National Plan, 2017). Therefore, it proposes to strengthen

innovation with technical assistance and training, promote the creation of markets and access to productive financing, among other actions.

Despite the different actions defined, for Escobar, Brito, Andrade, and Duque, (2017), the sector still presents vulnerability in terms of productivity and the implementation of public policies, likewise, some producers do not have adequate technology which influences productivity, placing the sector somewhat distant from adequate development models, producers with little production that in opportunities are left out of the market. Likewise, among the factors that influence the productivity of the sector are the price of products, interest rate and inflation, accessibility to public credits, Mendoza (2018).

On the other hand, MAGAP (2016) states that the agricultural sector must face different problems that influence productivity, in addition to those already known such as territorial heterogeneity, land use change, there are some more recent ones such as: There is no generational replacement of agricultural producers, reconcentration or hoarding of productive resources, loss of arable land and control of the food system by large corporations, monopolization of the supply of agricultural inputs, power problems in the last links of the marketing chains, urban occupation of arable land, the need for education and training of producers in the new competitive context, environmental restrictions related to climate change, loss of natural resources, among others.

This situation is also evident in the province of Esmeraldas, in the Eloy Alfaro Canton, in conversations between the researchers and the producers of the Borbón and La Tola parishes, it was found that they have different problems, among them, little organizational capacity and culture of innovation with limited use of technology, difficulties in obtaining credit, no marketing centers for the products, little technical assistance and training because they do not know how to develop the projects.

Likewise, there is little application of best agricultural practices, problems in the availability of natural resources (water) and materials

(equipment and inputs), loss of soil nutrients and an increase in phytosanitary problems, in addition to this, there is land grabbing by large corporations, so agricultural and livestock productivity has not had a sustainable growth in the region so far.

In relation to the above findings and in the search for an objective understanding of the situation described above, the problem can be systematized by asking the following question: What are the factors that influence agricultural productivity in the northern zone of the Province of Esmeraldas?

The purpose of the research is to analyze the factors that influence agricultural productivity in the northern area of the Province of Esmeraldas. Being the Eloy Alfaro Canton, according to the Development and Land Management Plan of 2014-2022, a region where different productive activities are developed by small and medium producers, which are concentrated in 41.44% in livestock, agriculture, fishing and forestry according to the economically active population. Particularly in the parishes of La Tola and Borbón, the predominant activities are timber production, agriculture, with cocoa, African palm and coconut, and cattle raising.

When referring to production processes, it is relevant to associate it to the management of systems due to the use of resources to transform elements that in some cases are mentioned as raw material (inputs) into finished inputs ready to be marketed (output). Each company, when seen as a production system, modifies its input elements into optimal results for the purposes described in its corporate objectives. Even when talking about people, the students that enter a given institution are not the ones that leave it, since they will go through a series of trainings, rules of coexistence, personal relationships, sports exchanges and a great number of aspects that in some way should modify their behavior, according to the vision and mission of the institution.

According to Daza (2011), the production system uses operational resources to transform inputs into some kind of desired result (products/services), and also refers to the procedures inherent to the work from the techniques, machinery and actions carried out to transform organizational inputs (materials, information, ideas) into

outputs (products and services). In this sense, all those inputs that enter the companies are organized in such a way that they are related to transform them into a product or service.

The Five P's of Production.

In operations management, the resources of the production system intervene and interact with various resources and capabilities. All those that are directly involved in production processes are known as the 5Ps of operations and production:

- People: are the direct and indirect labor force.
- Plants: are the spaces or facilities where production processes are carried out (factories or buildings).
- Parts: include raw materials, materials, components or service supplies that go through the production process.
- Processes: are the equipment and sequences of steps for the elaboration of the product or provision of the service.
- Planning and Control: procedures and information used by management to operate the system.

Therefore, Koontz and Weihrich (2004) define a Production System as a set of components that are interrelated to carry out a function that consists of converting a set of inputs into outputs (goods or services) through a transformation process.

Marx (1980) proposes productivity for the agricultural and industrial sectors, stating that it is an increase in production based on productive capacity without varying the use of labor power. Martin and Farrell (2005) state that productivity is framed by factors that delineate its behavior, such as "labor, capital, technology, energy and materials, product measurement, product composition, characteristics, environmental regulation and demand policy" (p. 8).

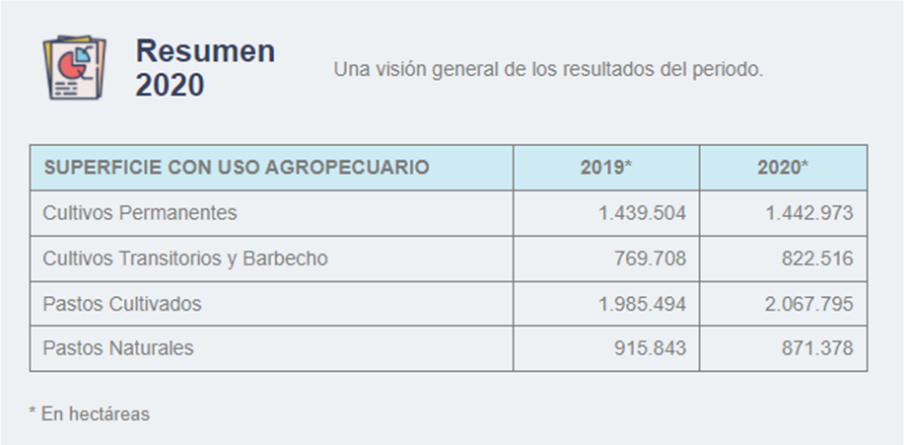
In the context of agricultural activity, Verdezoto and Viera (2016) express that it refers to the management of the productive process of the system, the adaptation to environmental changes in order to be competitive and achieve sustainability. According to Palacios and Barrientos (2014), a production system is a combination of different subsystems, such as cultivation, in relation to homogeneously

exploited plots and using technology, breeding, in reference to herds or flocks of animals, transformation of the agricultural product, as well as self-subsistence, in terms of family production with the use of resources.

Productivity in the agricultural sector, according to different documentary research, is a relevant and determining factor in the economic growth of nations. Specifically, in the second half of the 20th century, major changes and analyses were carried out that challenged economists by showing that developing and developed countries were investing in this sector. Gollin (2010) finds that, in the case of countries with a high proportion of rural population and limited access to international markets, agricultural productivity is fundamental for economic growth.

It also refers to the fact that, in most poor countries, a large part of the population is located in rural areas where their source of livelihood revolves around the commercialization of their products, whether agricultural or livestock. An analysis of the graphs presented by international organizations shows that there is a close relationship between poverty and the population living in rural areas; however, this population plays an important role in the development of nations through agricultural production, where approximately 25% of the value added in poor countries comes precisely from this population, which has a high degree of labor co-responsibility but is also neglected and unprotected by governmental entities.

*Figure 1.* Planted and harvested area of 52 agricultural products.



**Resumen 2020**

Una visión general de los resultados del periodo.

| SUPERFICIE CON USO AGROPECUARIO | 2019* | 2020* |
|---|---|---|
| Cultivos Permanentes | 1.439.504 | 1.442.973 |
| Cultivos Transitorios y Barbecho | 769.708 | 822.516 |
| Pastos Cultivados | 1.985.494 | 2.067.795 |
| Pastos Naturales | 915.843 | 871.378 |

* En hectáreas

Source: INEC with data provided by the Food and Agriculture Organization of the United Nations (FAO), (2020).

On the other hand, Estupiñán et al. (2018) in the results found points out that productivity is affected by obsolete processes, both in crop management and storage, as well as the problem in the marketing of the product, however, the opportunity they have to improve are the support measures by the state for financing and trainings for producers.

In this order of ideas, García, Apolo and Bermeo (2019), point out in reference to the production of the agricultural and industrial sector:

"The two sectors studied, agriculture and industry, have contributed significantly to Ecuador's GDP, with the industrial sector making a greater contribution, with an average of 13.52% over the last 10 years, as opposed to the agricultural sector, which contributed 9.28%, despite the different economic, social and political events that have taken place in the country".

However, in the Plan del Buen Vivir 2013-2017 (national development project) it was mentioned that "if productivity in transitory crops that make up a good part of the basic food basket continues to stagnate or decrease, Ecuador will have to import food". This is one of the aspects that generates controversy among economic analysts who establish the importance of implementing agricultural and livestock development plans in the different provinces of Ecuador.

In this regard, Rivera et al. (2019) in the research conducted in the Quinindé Canton sector, Province of Esmeraldas, propose to improve the processes and technique applied in crop production through a management model with a sustainable approach, where, in addition to process innovation, producers will obtain the necessary knowledge for its implementation, which leads to benefits aimed at local economic development.

The territory, for Rancel, Cardoso, Torres and Zayas (2016), is considered an active part in economic and social progress seen as growth from economic growth, as it is a strategic element since it provides development opportunities according to its characteristics and potentialities, where a considerable amount of opportunities

and economic and social relations converge. Vásquez Barquero (2013) emphasizes that it is configured as a transforming agent and not only as a depository of resources and economic activities, since it allows the emergence of a dynamic of action where the actors of the territory are linked, interact and organize themselves in favor of economic and social development, based on economic, human and institutional resources, among others.

From this perspective, it is undeniable that it is necessary to have the capacity to identify and take advantage of the resources available in the territory, together with external resources, according to Rancel et al. (2016), in order to value the development process that can be generated by promoting the innovative capacity of the territory, the productive and social organization, establishing a common strategy that articulates the different objectives to be achieved in order to ensure sustainable development of the locality. These assertions coincide with those made by Zubieta (2004) and González (2013) who point out that local economic development must start from the promotion of the local and territorial, seeking the best living conditions through organized procedures among the actors of the region under the approach of the efficient and sustainable use of the existing resources in the territory.

According to Alburquerque (2007), local development takes into account the demands posed by the structural change from "Fordist" forms of production to forms of production based on the incorporation of knowledge on market segmentation, quality and differentiation of the productive offer and improvement of territorial networks to support production and cooperation of local public and private actors.

Migration from the countryside to the city has led to a decrease in land in the urban area dedicated to food production, as this land is used for construction to meet the need for housing, so food must be purchased in markets and shopping centers, without knowing its origin and quality and mostly at very high prices.

Aspects such as these allow us to put forward ideas that contribute to local development in both rural and urban sectors, where the economy is self-sustainable and provides the food security that

each sector needs, in some cases through organoponic crops that minimize the impact of this rural migration to urban areas.

According to (Gallicchio, 2004):

"Local Development is not, cannot be, an autarkic process. It must be articulated with national processes. Local action will be more useful if it is linked to an action to change national development frameworks. In this sense, Local Development is more political than economic".

The economic and ecological sustainability of agriculture in terms of local development, is called to the dissemination of farming techniques that conserve natural resources and the training of farmers for the industrialization of products, where through training plans and financial education they can sell their products on the local market, in addition to the subsistence of the families themselves. Some local economic development initiatives are based precisely on knowing how to take advantage of these exogenous dynamism opportunities by establishing.

In this regard, Martínez (2006) states that, in the economic dimension of local development, the efficient use of production systems is fundamental, which allows "increasing productivity and improving competitiveness in the markets", therefore, it is necessary to "transform the local productive system, increasing its efficiency and competitiveness; promote local productive diversification, to add value to local economic activities" (p.72). On the other hand, González (2013) affirms that an important factor is the mobilization and valuation of human resources, conformed as a basic actor of the process, as it requires to be the recipient of training and formation policies with the active participation of all the actors of the locality, since this process is carried out based on the needs and demands that exist.

Thus, local development, as referred to by Suarez (2006), "is a conscious and explicit intervention strategy, linked to a shared project and to identities and wills based mainly on the values of solidarity and responsibility of agents and actors with a given territory" (p. 199), a dynamic process that requires the mobilization of multiple material and human resources in an environment that

must be articulated to take advantage of the potential of the territory, aimed at satisfying the needs and problems of the locality.

## Methodology

The study was conducted under the quantitative approach, following the steps of a descriptive type of research, which seeks to establish the characterization of a fact or phenomenon to know its behavior in the context where it develops. The population under study were the producers of Eloy Alfaro Canton, in the Province of Esmeraldas, located in Borbón, La Tola and other parishes, for which a sample of one hundred (100) producers was considered, conformed as follows, Table 1, of the parish Borbón 56 dedicated to agricultural-livestock-forestry production, 26 producers from La Tola dedicated to agricultural-livestock production and 18 from the other parishes dedicated to agricultural-livestock-forestry production, to whom a survey was applied, with an instrument containing 25 items, the data was analyzed using descriptive statistics, with the calculation of the relative percentage frequency.

**Table 1.** *Distribution of the population.*

| No. Producers | Type of production | Parish |
|---|---|---|
| | Agriculture-livestock-forestry | Bourbon |
| | Agriculture and livestock | La Tola |
| | Agriculture-livestock-forestry | Other parishes |
| Total: 100 | | |

## Results

In order to respond to the purpose of analyzing the factors that influence agricultural productivity in the northern zone of the Province of Esmeraldas, the measurements were made based on two dimensions and the corresponding indicators. The economic

dimension was measured using the indicators investment in maintenance and technology, and the knowledge dimension was focused on the study of the indicators knowledge of procedures and techniques, organization and control of production.

In this sense, Table 2 presents the results referred to the indicators of the economic dimension obtained according to the investment made by the producer in order to maximize production and be efficient in the activity, with respect to the investment in maintenance, most of the producers, 80%, never do it, 17% rarely and 3% always, this shows that they do not apply maintenance techniques for their crops and plantations, in the preventive sanitary control, as well as in the facilities for livestock, possibly because they are unaware of the importance of applying it in the agricultural activity, the lack of maintenance according to production requirements generates risk conditions, involves high costs, directly influencing productivity, profitability and product costs, as referred by Duffuaa, Raouf and Dixon (2009), its execution is a fundamental factor for the production process and therefore for product quality, so it is considered a system that works in parallel with production and quality, in order to increase profits and competitiveness.

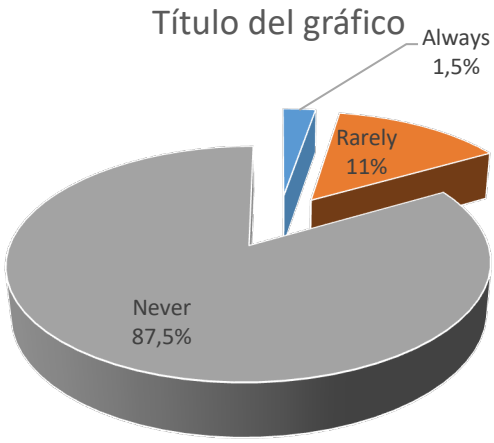
Table 2. *Economic dimension.*

| Alternative | Maintenance investment (Fr%) | Investment in innovation anc technology (Fr%) | Average |
|---|---|---|---|
| Always | | 0 | 1,5 |
| Rarely | | 5 | |
| Never | | | 87,5 |
| Total | | | |

In the results of investment in technology, Table 2, it is observed that 95% of the producers never invest in this aspect, and 5% rarely do so, the results indicate the non-use of technology by local producers in the production processes they develop, currently using traditional techniques, which possibly affects productivity, in agreement with Ramírez, Ruilova and Garzón, (2015), who state that investing in innovation is to work with current technology in the agricultural sector to achieve improvements in productivity and production quality, as well as to achieve process sustainability and efficiency.

Likewise, Herrera and Gutiérrez (2011) state that agricultural technological innovation is made up of several factors, among them, knowledge, adaptation, exploration, experimentation, which allow the different actors in the agricultural sector to achieve optimization and improvement in production methods and satisfy their productive realities, from the aspect of economic and social benefits. The economic dimension, the result of the average of the indicators mentioned above, shows the results in Figure 1, where it is observed that most producers do not invest in maintenance or technology, 87.5% stated that they never, 11% rarely and only 1.5% always, These results show that they do not consider investment as an important factor in productivity. On the other hand, Baily (cited in Felsinger and Runzaque, 2002), states that the characteristics of the product, including maintenance and technology, are factors that influence the behavior of production, which for Felsinger et al. (2002), is an indicator of the use of resources.

*Graph 1.* Economic dimension.




On the other hand, Verdezoto and Viera (2016), express that it is necessary to adapt to environmental changes in order to be competitive, being an activity made up of different processes so that the agricultural product reaches the market and the final consumer. In agreement with Martínez (2006), who proposes the transformation of

processes in order to make efficient use of production units, thus increasing productivity and adding value to the economic dimension of local development.

The knowledge dimension was measured with the indicators knowledge of procedures and techniques, organization and control of production, the results of which are shown in Table 3. In relation to the indicator knowledge of procedures and techniques, it is observed that 17% stated that they always apply the knowledge, 13% rarely and 70% never, this last figure indicates that more than half of the producers do not know the procedures used to develop the projects, as well as, This last figure indicates that more than half of the producers do not know the procedures used to develop the projects, as well as the techniques that should be applied to increase production in the area of crops, such as grafting, soil fertilization, phytosanitary controls, as well as, for livestock, rotation of technified pastures, those aimed at improving the quantity and quality of the biomass of pastures.

Based on the above, it can be noted that the lack of knowledge of processes and techniques has a negative impact on production, as referred by Mejía and Calle (2016), who emphasize that the problem can take root if the different techniques and characteristics related to the crop, the soil, the use of new varieties for the producer and the production cycles, among others, are unknown.

Table 3. *Knowledge dimension.*

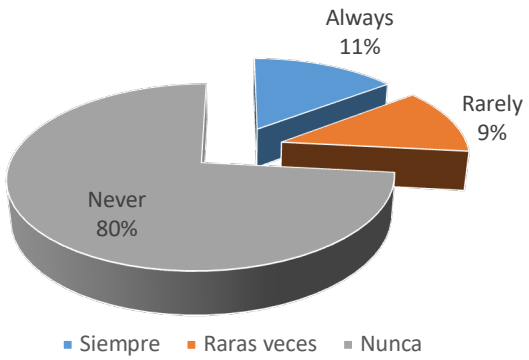
| Alternative | Knowledge of procedures and techniques (Fr%) | Production organization and control (Fr%) | Average |
|---|---|---|---|
| Always | | 5 | |
| Rarely | | 5 | |
| Never | | | |

The results of the organization and control of production indicator, Table 3, show that 90% of the producers do not keep adequate records in accordance with the activity they carry out, such as the control and registration of the genetic crosses made, also in relation to the amount of production and its commercialization, therefore, they do not know the amount invested and what they produce. In this

regard, the organization and control of processes will allow the producer to keep a record of all the activities carried out in the production unit, establish the results obtained and know if they are as expected, have the information available if needed, determine if the resources are efficiently used, and if improvements are required, as stated by Ferrada (2003, as cited in Martínez and López, 2011).

In relation to the knowledge dimension, the results are the product of the average of the indicators knowledge of procedures and techniques, organization and control of production, Graph 2, where it is observed that the majority of producers, 80%, do not have the necessary knowledge to carry out procedures concerning the development of projects and the techniques to be applied to improve production, This is in contrast to Infante's (2016) approach, who points out that the knowledge factor is an added value to reactivate productivity in the sector and be competitive in the new market, in order to achieve significant changes and reverse the current situation of economic and productive uncertainty.

*Figure 2*. Knowledge dimension.




On the other hand, the results presented in both dimensions show that producers in the agricultural sector require training and technical assistance to carry out the different agricultural and livestock activities for which their production units are intended, in agreement with Pinto (2006), who states that it is the learning of the knowledge, abilities, attitudes and skills required by the individual to join the productive system in a specific occupation. González (2013) agrees by stating that the producer is one of the main actors in the development

process of the locality and therefore requires training and education policies based on the needs he/she presents.

## Conclusions

The agricultural sector requires changes in order to increase productivity, for its own benefit and for the local economy, by entering the market in a competitive manner. These changes should be aimed at developing production capacities, implementing innovation and developing projects with support and advice from public and private entities in the region.

From the economic dimension it was found that most producers do not invest in crop maintenance and livestock activity, which results in conditions of risk in production, likewise, they do not invest in innovation and technology, a situation that influences productivity, profitability, costs, quality of production, as well as the sustainability of the processes. This context is consistent with the research of Estupiñán (2018), who found that among the weaknesses of producers in Rioverde Canton, Esmeraldas Province, is the application of traditional techniques, the use of warehouses that are not in accordance with the type of storage required by the product, and the lack of adequate irrigation systems for the crop.

In relation to the knowledge dimension, it was found that producers do not have the necessary knowledge to carry out procedures concerning project development and the techniques to be applied to improve production. When compared with the research of Rivera et al. (2019), they coincide in pointing out the need for the producer to possess knowledge in accordance with the activity they perform, since in the study developed in Quinindé Canton, Esmeraldas Province, they expose that knowledge becomes the starting point for the implementation of a new management model that allows a better sustainable performance of processes and productivity, They emphasize that the linkage of the applied technique, crop diversification process, with the management model under the sustainability approach, generates an innovative process that will increase the economic benefits of the producer, as well as the development of the locality. On the other hand, they found that the

producers require a new vision regarding the production and commercialization of the products.

In that order of ideas, it can be noted that producers in the agricultural sector require training and technical assistance to carry out the different agricultural and livestock activities they develop, thus adding value to production through the application of appropriate technical processes for the development of projects, as well as the organization and control of activities aimed at production. Similarly, Estupiñán (2018), found that the greatest opportunity that producers in the Rioverde Canton of Esmeraldas Province have to achieve benefits related to their performance and productivity is the possibility of access to financing programs, training and assistance agreements for the development of projects by government entities.

It is evident that the problems found in the sector in the Eloy Alfaro Canton of the Province of Esmeraldas related to the factors that influence productivity coincide with the situation found in other regions, where training, technical assistance and innovation in the agricultural sector represent the way to obtain knowledge in order to obtain results that combine the correct use of human, material, technical and financial resources, through the adequate coordination of the sector's potential, the existing demand and an effective work methodology that subsequently allows evaluating the impact exerted in the area.

As a prospective, this work represents the starting point to encourage and promote the development of training plans for agricultural producers, as well as the collaboration and technical and financial support that arises through coordinated work between government authorities, agricultural associations and producers for the benefit of the sector's activities, and therefore the development of the region.

In this sense, the contribution of this research is of great relevance when considering the producers in their natural spaces and observing the socioeconomic development that they manage with the few resources they have, this means that future research will serve for the incorporation of sustainability and sustainability plans for families and surrounding areas in such a way that social conditions are achieved for the future of this productive sector in the northern area of the province of Esmeraldas. In addition to serving as a replica in other

regions of the country with similar characteristics, where small and medium producers need to be oriented in relation to the culture and administrative education, which allows to enhance and energize the market through training and annual or biannual meetings where ideas are socialized in relation to production mechanisms and marketing actions.

## References

Alburquerque, F. (2007). Theory and practice of the local development approach. *OIDLES*, pp. 39-61.

Carrión, J. and Garzón, V. (2020). Analysis of the Ecuadorian agricultural gross domestic product and its main products in the period 2002 - 2019 *Scientific journal Dominio de las Ciencias 6* (4), 940-952 http://dx.doi.org/10.23857/dc.v6i4.1513

Daza Villadiego, C. (2011). *Operations Management. Introduction to the supply chain.* Quito: Centro de publicaciones. Pontificia Universidad Cátolica del Ecuador.

Duffuaa, Raouf and Dixon (2009). *Maintenance Systems Planning and Control*. Mexico: Editorial LIMUSA

Egas, J., Shik O, Inurritegui, M. and De Salvo, C. (2018). *Agricultural policy analysis in Ecuador. Inter-American Development Bank* https://publications.iadb.org/publications/spanish/document/analisis-de-politicas-agropecuarias-en-ecuador.pdf

Escobar, I. O., Brito, M. E., Andrade, A. C., and Duque, D. V. (2017). *Change of the productive matrix in the agricultural sector of Ecuador.* http://www.eumed.net/cursecon/ecolat/ec/2017/matriz-productivaecuador.html

Estupiñan, N. (2018). *Analysis of the current situation of cocoa production in the canton Rioverde, Esmeraldas Province*. [Degree Thesis, Pontificia Universidad Católica del Ecuador Esmeraldas].

https://repositorio.pucese.edu.ec/handle/123456789/1532?mode=full

Felsinger, E. and Runzam, P. (2002). *Productivity: A Case Study in a Claims Department.* [Graduate Thesis, Universidad del CEMA]. https://ucema.edu.ar/posgrado-download/tesinas2002/Felsinger_MADE.pdf

González, A. (2013). The university as a factor of sustainable local development. *Ra Ximhai*, *9* (1), 65-78. http://www.redalyc.org/articulo.oa?id=46127074007.

Gallicchio, E. (2004). *La migración del campo a la ciudad, ha generado una disminución La migración del campo a la ciudad, ha generado una disminución.* Argentina: Cordova.

Garcia, D., Apolo, N., & Bermeo, J. (2019). Economic evaluation of the agricultural and industrial sector in Ecuador 1980-2015. *ECA Sinergia Magazine.* , pp. 116-128.

Gollin, D. (2010). Agricultural productivity and economic growth. *Elsevier*, pages 3825-3866.

González, A. (2013). The university as a factor of sustainable local development. *Ra Ximhai*, *9* (1), 65-78. http://www.redalyc.org/articulo.oa?id=46127074007

Herrera R. and Gutiérrez, J. (Edt.) (2011). *Knowledge, innovation and development*. University of Costa Rica. http://www.casatic.org/wp-content/uploads/2015/03/RafaelHerreraCR_conocimiento.pdf

Infante, S. (2016). The importance of productive factors and their impact on agricultural organizations in león Guanajuato Mexico. *AGO.USB 16* (2): 359 - 678. https://www.redalyc.org/articulo.oa?id=407755354003

Koontz, H., & Weihrich, H. (2004). *ADMINISTRATION: A global perspective.* Mexico D.F: Mc-Graw-Hill Interamericana.

MAGAP (2016). *Ecuadorian agricultural policy: towards sustainable rural territorial development 2015-2025*. Part I. http://extwprlegs1.fao.org/docs/pdf/ecu183434.pdf

Martínez, E. and López, M. (2011). Management control in dual-purpose livestock production units. *Visión Gerencial*, 2: 325-340 http://www.redalyc.org/articulo.oa?id=465545891007

Martínez, L. 2006. The University as a Local Development Agent. *CLASPO Notebooks*. Argentina.

Martin, B., & Farrell, D. (2005). *"A roadmap for European economic reform"*. Retrieved from The McKinsey Quarterly;: http://www.mckinseyquarterly.com.

Marx, Karl (1980) *El Capital, Siglo XXI*. Publishers: Spain, Argentina.

Mejía, C. and Calle, D. (2016). *Training and technical accompaniment in agricultural production to small producers*. [Degree thesis, Universidad Nacional Abierta y a Distancia]. Colombia. https://repository.unad.edu.co/bitstream/handle/10596/13133/1047994674.pdf?sequence=1&isAllowed=y

Mendoza, N. (2018). *Incidence of determinants in the agricultural sector in Ecuador: banana, cocoa, coffee and African palm*. Study period 2000-2017. [Graduate thesis, Universidad Católica de Guayaquil] http://repositorio.ucsg.edu.ec/bitstream/3317/11674/1/T-UCSG-PRE-ECO-CECO-252.pdf

Palacios, V. and Barrientos, J. (2014). Technical and economic characterization of production agrosystems in two indigenous resguardos of Putumayo, Colombia. *Acta Agronómica, 63* (2):91. http://dx.doi.org/10.15446/acag.v63n2.29358

Palacios, V. and Barrientos, J. (2014). Technical and economic characterization of production agrosystems in two indigenous resguardos of Putumayo, Colombia. *Acta Agronómica, 63* (2):91. http://dx.doi.org/10.15446/acag.v63n2.29358

Pino, S., Aguilar, H., Apolo, A. and Sisalema, L. (2018). Contribution of the agricultural sector to the economy of Ecuador. Critical analysis of its evolution in the dollarization period Years 2000 - 2016. *Revista Espacios 39* (32) ,7 https://www.revistaespacios.com/a18v39n32/a18v39n32p07.pdf

Pinto, R. (2006). *Training Processes*. Editorial: Diana

Development and Land Management Plan of Eloy Alfaro Canton 2014-2022. http://www.prefecturadeesmeraldas.gob.ec/web/assets/canton-pdot-eloy-alfaro.pdf

Pinto, R. (2006). *Training Processes*. Editorial: Diana

Quinde, V., Bucaram, R., Bucaram, M., & Quinde, F. (2018). Economic and business sciences Research article. *Dominio de Las Ciencias, 4*(2), 63-80. https://dialnet.unirioja.es/servlet/articulo?codigo=6870904. https://dialnet.unirioja.es/servlet/articulo?codigo=6870904

Ramírez, I., Ruilova, B. and Garzón, J. (2015). *Innovación Tecnológica en el sector Agropecuario* [Degree thesis, Universidad Técnica de Machala]. repositorio.utmachala.edu.ec/bitstream/48000/6848/1/84%20INNOVACION%20TECNOLOGICA%20EN%20EL%20SECTOR%20AGROPECUARIO.pdf.

Rancel R.,Torres, C., Zayas, S. (2016). Agricultural sector planning as the axis of the provincial development strategy in Pinar del Río. *Journal of Cooperativism and Development, 4*(2). https://dialnet.unirioja.es/servlet/articulo?codigo=5768620

Rivera, M., Estrada, J. Quiñonez, R. and Moreno, R. (2019). Theoretical and applied approach to the model of integral crop diversification for agricultural and economic development in Quinindé Canton, Esmeraldas Province, Republic of Ecuador. *Mikarimin. Revista Científica Multidisciplinaria 6,*241-258.

http://45.238.216.13/ojs/index.php/mikarimin/article/view/1723/0.

Suárez, M (2006). University and local development in Latin America. In Girardo, C., De Ibarrola, M., Jacinto, C. and Mochi, P. (Coord.). *Estrategias educativas y formativas para la inserción social y productiva.* Montevideo: interfor/OIT, (Herramientas para la transformación, 31), 195-211. https://www.oitcinterfor.org/sites/default/files/file_publicacion/est_edu.pdf.

Vázquez-Barquero, A. (2013). Local development, a strategy for times of crisis. *Apuntes del CENES, 28*(47), 117-132.

Verdezoto V. and Viera, J. (2018). Characterization of Agricultural Production Systems in the Guarguallá-Licto irrigation project, Riobamba canton, Chimborazo province. *Cienc Tecn UTEQ 11*(1) p 45-53. https://doi.org/10.18779/cyt.v11i1.198

Zubieta, J. (2004). Public and private roles in municipal economic promotion. http://www.condesan.org/e-foros/DesLocal/JZubieta.pdf.