

ORIGINAL ARTICLE

## Planning impact on the productivity of the family farming units of Progreso, Echarati - Cusco

### ABSTRACT

This study originates from the observation of the problems related to the management of family farming units in the Progreso community, Santa Elena sector, district of Echarati, department of Cusco, in 2021. Thus, the objective is to determine the influence of planning on productivity in the aforementioned farming units. This study used family farming units as the unit of analysis, with a total population of 62 families. A 95% confidence level and 5% margin of error were used to determine the sample size. The research design is non-experimental and correlational, since the relationship between the planning variable and the observed productivity variable was determined, as well as retrospective and transversal, since the observations were made over a relatively short period of time. A hypothesis was proposed in which the influence of planning on productivity is accepted, constructing the instruments for data collection, which showed consistency and reliability through the inferential statistical model and the alpha coefficient, which enabled us to contrast and verify the proposed hypothesis. Finally, as a general conclusion, it was determined that there is a significant relationship between and planning and productivity of family farming units in the Progreso community, Santa Elena sector, in 2021.

**Keywords:** planning; productivity; family farming units.

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## **INTRODUCTION**

In Peru, according to Ministerio de Desarrollo Agrario y Riego (MINAGRI, 2015), family-based farming is the most practiced agricultural model, “el 97% del total de unidades agropecuarias son unidades agrícolas familiares, asimismo, en la Agricultura Familiar laboran más del 83% de los trabajadores agrícolas” [97% of the total farming units are family-based; likewise, more than 83% of agricultural workers work in family-based farming] (p. 27). This study sought to relate the planning and productivity of producers in the Progreso community, which is mainly agricultural and particularly engaged in the production of coffee and other products on a small scale and supplementing their activities with raising small animals, especially for their own consumption.

In the district of Echarati, the majority of farming units sell their production, while a small part produce exclusively for their own consumption. These units carry out their economic activity on a small scale and their characteristics are limited to what MINAGRI categorizes as family-base agriculture. Thus, the labor force comes from the family environment, plots are small, families live in the same place where the production activity is carried out and said activity is a source of income, although it is not necessarily the only or main one, and the head of the family, in addition to managing it, also carries out activities as a worker (MINAGRI, 2015).

Until the mid-1990s, family-based farming in Latin America was marginalized, and it was considered incapable of optimizing the relationship between capital and labor, in addition to a lack of organization and management, with delays in the use of technology, inefficient and rooted in tradition. This discrimination went beyond the scale of production and had its origins in the policies of the import substitution economic model of the 1930s (Scheuer, 2019). Attempts to redirect public policy approaches to achieve development in marginalized areas should not be limited to the development of a plan, but rather adopt collective processes involving the various stakeholders who assume responsibilities in the implementation, monitoring and evaluation stages in search of rural

development. Although this has been put into practice with participatory planning in the sector following the regionalization process in Peru between 2001 and 2006 (Ordoñez Jurado and Aldapi Herrera, 2006), the scope has been limited and has not been widely replicated in rural areas. In Peru, the national agrarian policy has been developed based on six approaches: human rights, social inclusion, sustainable development, gender, interculturality and territory, in order to promote long-term sustainable agricultural development that is also competitive and inclusive (Vargas Aspíllaga *et al.*, 2022).

According to Maletta (2011), in order to visualize the agrarian structure and family-based agricultural production from a scientific perspective, it is necessary to avoid making judgments or proposing idealized social structures; on the contrary, it is necessary to focus on reality and study this structure in relation to national and global economic systems.

Likewise, Ortiz Medrano (2021) considers that in agricultural family-based businesses, types of leadership have been identified with characteristics, traditions and customs that influence the development of certain traits and behaviors in the leaders who direct these farming units. Family heads adopt a leadership style that is characterized by focusing on the group of workers, who move forward with the presence and direction of the leader, without taking into account the needs of the work group; workers are not an inclusive part of the company when contributing ideas or suggestions. The World Bank (2008) states that one of the ways to move out of poverty is to improve agricultural management at the local, national and even international levels.

From a theoretical-methodological perspective, the model of a fair agriculture must start from a point where the farmer considers principles where complex is based on functional, the agrosystem factors are integrated and take into account the relationship with their ecosystem, including concepts from agroecological science such as sustainability, adaptation and productivity (Noguera-Talavera *et al.*, 2019). Sustainable development models are based on work, innovation, construction and

invention to improve the traditional models (Jallil *et al.*, 2020).

For Carmagnani (2008), there is traditionally a bimodal view of agricultural activity, family-based farming and corporate farming. This typology places land ownership in the rural world in a central position; with that in mind, agriculture can be classified from sub-family to large multifamily. Although some features of family-based farming can be seen in units with more than 5 ha, it is the units with more than 10 ha that fully acquire the characteristics of what is defined as family-based farming: having a modest endowment of physical capital at their disposal, being able to integrate agricultural income with other income and having innovative capacity (Carmagnani, 2008).

On the other hand, Samper (2016) points out that the atomization of family-based farming represents a weakness when it comes to achieving social legitimacy and influence on the generation of public policies, making it necessary for them to organize and actively participate in social management of the development of their territories. For Rodríguez (2015), one of the obstacles to the development of regional concentration of production points in the country is small-scale farming, since it increases transaction costs and makes coordination between producers, input sellers, and processors difficult. Another production factor associated with territorial expansion is the level of capitalization, which is related to the lack of availability of assets and the low level of relative productivity.

This notion about the productive behavior of family-based farming units is transferred to the political apparatus, which blurs the approach to the generation of public policies and promotes welfarist policies, causing the sector to fall into a vicious circle between lack of capital, low productivity and little appreciation of the work of the family-based producer (Rodríguez Sperat, 2014).

Such low valuation of the producer's work is perceived not only by stakeholders in the environment, but also by family members, which represents a greater risk for these units, as it is evident in the loss of labor (Eche, 2018). In recent decades in Latin America, small-scale

agriculture has significantly decreased in terms of the number of families and people dependent on it, as the families involved have stopped prioritizing agricultural production.

More specifically, it has been estimated that of the total number of family-based farmers in 1950, only 22% of their descendants remained in agriculture in 2010, and the vast majority did so under subsistence conditions. 22% remained in the countryside but engaged in non-agricultural activities, and 66% (the vast majority) migrated to urban areas. Between 1985 and 1990, the rural population reached its highest peak in Latin America, and since the 1990s it has been declining in absolute terms (Maletta, 2011).

Regarding technical assistance, business advice and training, according to data from Censo Nacional Agropecuario (CENAGRO, 2012), it can be seen that there are training and assistance regarding the agricultural technical aspect. However, in terms of training and advice on business management, these are almost non-existent (Instituto Nacional de Estadística e Informática [INEI], 2012).

In recent decades, public policies have focused mainly on agro-exports, leaving family-based agriculture at a more neglected level; this is reflected in the low productivity of this sector and in the poverty rates in these areas. Only 4.2% of family-based farmers in the domestic market have access to technical assistance, 9.2% to training and credit, and only 3.6% have some form of association to market their products. Family export agriculture has better access to these services, except in the case of credit, where only 12.1% have access. Overall, more than 90% of family-based farmers in Peru do not receive basic agricultural services (Zegarra, 2020, cited by Castillo Fernández, 2021).

However, the objective of extension or technical advisory systems is to provide information and services that farmers and other actors in the innovation system need and want, while improving their technical, organizational and management capabilities, which in turn enables them to improve their quality of life. These systems enable farmers, their organizations and other market agents to access knowledge in

various forms, interact with institutions related to research and teaching in the agro-industry, and thus promote the development of technical, management and production practices and skills. organization (Christoplos, 2010, cited by Ortega and Ramírez, 2018).

According to Santini *et al.* (2017), the current access to information and communication technologies has created a new model of society called the knowledge society, which is nourished by access to information, freedom of expression, linguistic and cultural diversity, and access to quality education for all (UNESCO, n.d.).

Thus, information and communication technologies (ICTs) are tools with enormous potential for the development of family-based farming, facilitating access to markets and value chains, promoting associativity and the possibility of accessing finance. In addition, they motivate the generation of knowledge in the region (Santini *et al.*, 2017).

Following the guideline proposed by the World Bank regarding the importance of improving agricultural management at the local level, this study considers planning, a key factor, as an important axis for improving productivity that should take into account family-based farming activity.

Planning is one of the main axes in business management and should also be present in the management of family-based farms, through which certain concepts need to be reviewed. According to García Guilianny *et al.* (2017), strategic management is based on the analysis of the organization from an internal and external perspective, from which it is possible to set long-term objectives that must be achievable and measurable, which can be materialized in strategies with indicators and targets that enable monitoring the process.

For Delgado *et al.* strategic planning enables to prioritize and focus on the strengths of the organization to solve problems that arise in the environment and it depends on it to achieve the goals of the organization (Delgado Litardo *et al.*, 2022). According to the same authors,

la aplicación de las herramientas de la planificación estratégicas permite alcanzar en las microempresas la capacidad de adaptarse a los entornos políticos, sociales y económicos, para posicionarse en el sector donde cubre la necesidad y permite a la microempresa tener un desarrollo sostenido [the application of strategic planning tools enables micro-enterprises to achieve the ability to adapt to the political, social and economic environment, to position themselves in the sector where they meet the need and enable the micro-enterprise to have a sustainable development]. (p.7)

For Samper (2016), there are essential tasks in the management of small-scale farming units. First, the preparatory planning steps, which are nothing more than the review of agreements between the organizations, authorities and institutions involved, and the election of a working team. Then there are the organizational tasks, in which the relevant actors and groups that will participate are identified; followed by the strategic tasks, the establishment of a prospective vision and the territorial development strategy, as well as the intermediate plans and structural projects. Finally, there are the operational tasks, which include short-term plans and objectives, specific projects and their implementation. Toro Beleño (2014) points out the short-term vision as a problem in small-scale farming, which reduces the possibilities of competitiveness and sustainability. Other important aspects are informality and the low degree of associativity.

In order to measure productivity, economic profitability and productive efficiency levels, it is necessary to make an estimate of the previous and current yields of the relevant crops and simple crops, in order to make comparisons with previous studies in the area (Mendoza-Robles, 2018), as well as with studies in areas where characteristics are shared, especially those related to the physical conditions of the land, and where other types of products are grown that can represent alternatives for change.

For his part, Galván (2022) considers that there are two ways to increase the productivity and profitability of the sector: one of them focuses on increasing the production volume through the implementation of technologies and innovations that enable farming units to achieve economies of scale that enable them to participate in export markets and increase their profitability through access to better prices and margins. The second, through the implementation of sustainable practices that minimize production costs and increase the profitability of local products (Galván Vera, 2022).

With this in mind, the objective of this research work is to determine the influence of planning on the productivity of the Progreso community family farming units, Santa Elena sector, (Echarati, 2021).

## METHOD

The research design was non-experimental and correlational, since the variables were not deliberately altered, and the objective was to determine the relationship between planning and productivity. Furthermore, it was observational, since the phenomena studied were observed to be described, and it was retrospective and cross-sectional because the observations were made in a relatively short period of time.

The unit of analysis is made up of each family farming unit, the population of this research work is made up of all the farming units of the Progreso community, Santa Elena sector, Kiteni zone, district of Echarati, province of La Convención, department of Cusco. In total there are 62 farming units, from the smallest to the largest. The average size of the plots of these units varies between 5 and 20 hectares, distributed over a 1,173 hectares total area. To obtain the sample size, the 62 farming units have been considered and a confidence level of 95% was defined, with an error margin of 5%.

The data collection techniques consisted of participatory surveys for which structured questionnaires with closed questions were developed based on the operationalization of the planning variable and the productivity variable. The questionnaires were prepared in simple and clear language in order to channel the topics to the participants of the

sample. The Likert scale was used to measure the instruments.

## RESULTS

By means of the Alpha test, it was determined that the instrument applied to collect data on the Planning variable had a very high reliability, with a result of .903. Similarly, the Productivity variable was tested by means of the Alpha test and the result was .872, which indicates that the reliability of the instrument is considered very high.

To determine the correlation coefficient to be used, the Kolmogorov-Smirnov test was performed, which yielded a  $<.05$   $p$  value, indicating that the data do not have a normal distribution; therefore, Spearman's Rho was used, which measures the degree of association between both variables. The correlation observed between planning and productivity is .787, which is interpreted as a very high positive correlation between both variables. The significance is  $<.001$ , which guarantees its veracity, rejecting the null hypothesis:  $H_0$ : There is no direct relationship between planning and productivity of farming units of the municipality of Progreso, left bank, Santa Elena sector, Echarati, in the year 2021, thus accepting as true the alternative hypothesis: There is a direct relationship between planning and the productivity of farming units of the Progreso municipality, left bank, Santa Elena sector, Echarati, in 2021.

Spearman's Rho correlation coefficients for the hypothesis are presented in Table 1.

Next, the data extracted from the instruments are presented, which are the surveys constructed from the operationalization of the Planning and Productivity variables, the same ones that were applied to the sample made up of 54 family farming units from the Progreso community.

### Presentation of the planning variable data

The results obtained in the survey referring to the planning of family farming units show that 51.9% of those surveyed have a poor degree of planning; 35.2%, regular; 7.4%, good; and 5.6%, a very poor degree of planning. These results can be interpreted as an indication that farming units do not consider this variable as

**Table 1**  
Spearman's Rho correlation for the general hypothesis

		Planning	Productivity
Spearman's Rho		Correlation coefficient	1.00
	Planning	Sig. (two-tailed)	.787 **
		N	<.001
			54

Note. \*\*The correlation is significant at the 0.01 level (two-tailed). Prepared by the Author, 2024.

an important stage for the development of their activity and it is presented as a great opportunity for improvement in their management.

### Presentation of the productivity variable data

The results obtained in the survey referring to the productivity of family farming units show that 46.3% of those surveyed show a deficient production level; 24.1%, regular; 14.8%, very poor, and 14.8%, a good production level. These results demonstrate the low productivity of most farming units.

### DISCUSSION

The results of the study for the general hypothesis are a  $Rho=.787$  and a  $p<.001$  significance level, which show a very high positive correlation between Planning and Productivity variables in family farming units. This would demonstrate the great potential in increasing their productivity if the incorporation of planning is considered -within the structure of their process- in accordance with a business focus management. As indicated by Llanos Chamorro *et al.* (2013), to ensure that this strategic planning is implemented successfully, it is necessary for the producer association to take the lead, extensively communicating plans and changes that will occur, seeking the commitment of each stakeholder, seeking to act as a cohesive sector in order to obtain various benefits.

On the other hand, the results obtained from the surveys show that the Planning variable has, for the most part, a deficient level in family farming units planning. From this, it is interpreted that most of them do not consider this variable as an important stage for the development of their activity, and it is presented as a great opportunity for improvement in their management. As García Guilianny *et al.* (2017) state,

strategic management necessarily requires an analysis from an internal and external perspective that enables establishing objectives, goals and strategies with indicators that facilitate monitoring the process. In this way, strategies can be developed that enable the family farming unit to adapt to the political, social and economic environments to position themselves in their sector. (Delgado Litardo *et al.*, 2022).

Regarding the farming units Productivity variable, a low productivity of the majority of family-based farming units is shown. This variable provides indicators to measure efficiency and effectiveness in an organization, related to the execution of strategies and the achievement of the goals and objectives set in the planning stage. For La Mota Terranova *et al.* (2021), the measurement of productivity is affected by the decisions made in the planning stage and in the production process. This measurement must have the precision of the magnitude, it must have reliability and be a support tool for new decision-making and for the development of new plans.

It is important to note that the study is observational, and as such, the relationship established by the results does not establish causality. On the other hand, an experimental study would provide more information that could be used as relevant data for specific strategic planning for the community. As Rodríguez Sperat (2014) shows, this would have to be created through initiatives by the state, focusing on the productive behavior of farming units, rather than from a welfare policy perspective.

However, access to production factors, strengthening associativity, market integration, sustainable management, knowledge management and innovation are the guidelines and strategies to improve productivity and

competitiveness and promote family-based farming as an axis of development in rural Peru (MINAGRI, 2015).

Given this, the complexity of solving problems in family-based agriculture requires that both farmers and researchers be involved at every stage of the process to ensure that changes in their practices lead to more sustainable production systems. Rossing refers to this process as “co-innovation”, an approach that combines complex systems, social learning, and dynamic project monitoring and evaluation to stimulate the strategic reorientation of family-based farming systems (Rossing *et al.*, 2010 as cited in Dogliotti *et al.*, 2014).

From the results, it can be deduced that the Progreso community management model is not very dynamic. With that in mind, it can be considered that the farming units have adopted a passive strategic vision, where a traditionalist methodology is observed from which many of the decisions, techniques and knowledge with which they manage their productive activities are perceived. Moreover, they do not consider a business perspective or a scientific methodology to carry out their activities, due to the lack of information and tools that enable them to venture or pivot towards a new model.

While it is true that there is no formula for managing rural development, especially family-based farming, it can be approached in many different ways, but it is necessary to understand how this process works in general terms. However, due to the heterogeneity of the activity and the diversity of factors involved in it, it is necessary to consider specific management models. The principles, conceptual foundations and general methodological orientation of the territorial approach suggest specific types of measures, such as social construction and participatory implementation of development strategies, according to the potential of each region and specific ways of implementing them. For example, active and specific implementation of relevant collective and institutional stakeholders through participation in decision making (Samper, 2016).

The management levels of the farming units find their limits in the demographic conditions in which they develop, the geographical

location, accessibility, level of training, etc. Although there is an approach on the part of the Echarati Municipality to satisfy the demand for technical assistance, this is not necessarily part of a comprehensive, articulated and sustained policy compared to other areas where technical advice has contributed to the development of small-scale agriculture. As indicated by Vargas Aspillaga *et al.* (2022), from the approach of social inclusion, the national agrarian policy has assumed that Peru has been determined by the lack of opportunities in the highlands and jungle rural sector for its agricultural development due to its isolation and difficult connectivity as a result of inadequate transportation routes.

It is well known that there are barriers for the technical assistance market to reach farming units in a specialized way and thus have the possibility to assess its true impact on productivity and the opportunity to access new technologies. These shortcomings can have different causes, from the absence in different areas due to their geography, to the lack of information that enables productivity dimensioning. For Ortega and Ramírez (2018), a mechanism that enables the optimal development of a technical advice system would mean an increase in the number of these per year, and the impact on productivity could be at least a 16% improvement.

Although policies have been implemented that try to address the problem of small-scale agriculture, efforts need to be more focused, especially in the mountains and the jungle, where strategies need to be more specific according to local conditions. As stated by Barrantes Mann *et al.* (2021): “El Perú implementó la política nacional agraria, sin embargo, es necesario reformular los métodos de seguimiento para el cumplimiento de los ejes de la política agraria” [Peru has implemented the national agrarian policy, but it is necessary to reformulate the monitoring methods in order to comply with the axes of the Agrarian Policy] (p. 14).

With regard to the level of association, a minority of producers stated that they are part or have been part of an association. It is necessary to strengthen the associative efforts in the community, so that they reach an organizational level with a certain relevance in the

generation of public policies and in the planning of the development of the sector to compete in the market. As Urcola (2018) points out, "la articulación de intereses de estas organizaciones de la agricultura familiar está relacionada en cierto grado con la posibilidad de conectar sujetos agrarios, rurales, periurbanos o urbanos que de otra manera permanecerían aislados y desprovistos de significado" [the articulation of the interests of these family-based agricultural organizations is to some extent linked to the possibility of linking agricultural, rural, peri-urban or urban subjects that would otherwise remain isolated and meaningless] (p. 194-195). Similarly, the factors with which they plan their activities are not sufficiently taken into account, such as the geopolitical situation (zone of indirect intervention of the Valle de los ríos Apurímac, Ene y Mantaro [VRAEM]), the behavior of potential markets beyond the local markets where they sell their products, sustainable economic trends, and information and communication technologies.

## **CONCLUSIONS**

According to the development of the study and the statistical analysis of the data obtained, the resulting correlation coefficient is  $Rho = .787$  and  $\rho < .001$ ; therefore it is concluded that there is a very high level of positive correlation between Planning and Productivity variables.

Thus, the results lead to the conclusion that the level of planning of the farming units under study is, for the most part, deficient due to the lack of strategic vision, as well as an internal analysis in which greater emphasis is placed on the management of human resources, quality of products, marketing management and the possibility of entering other markets, as well as access to information and communication technologies. On the other hand, it is necessary to carry out an external analysis to improve the development of farming units, taking into account national policies, the possibilities offered by associativity and taking into account new trends in the sector, based on environmentally sustainable models.

Similarly, the results show poor productivity, which proves the alternative hypothesis. The main indicators that lead to these results are the uncertainty about the variation of the

Economically Active Population (EAP) and the availability of labor, the competitiveness of their crops and the valuation in the choice of products with higher yield per hectare that project a potential to enter new markets.

Furthermore, the traditionalist perspective with which farming units are managed, by the population, is due to their resistance to change and, by the authorities, due to the deficiency in the policies developed that focus solely on agricultural technical assistance and welfare, leaving aside administrative management that enables scaling up from family-based farming to business farming. To achieve this, one of the first steps to be taken by the farming units is to consolidate an association that, among its main objectives, seeks the demand for holistic rural development centers that give a superlative degree of importance to that of training and accompaniment in business management, and from which models can be generated that adapt to the heterogeneity of family-based farming units.

According to the results, the level of planning in family-based farming units is, for the most part, deficient and is conditioned, among other factors, by the type of leadership and human resources management which is carried out with characteristics delimited by custom. It is recommended that this management be carried out considering sustainable development models and concepts of agroecological science such as sustainability, adaptation and productivity.

Likewise, according to the results of the study, it is observed that there is little associativity in the community. It is recommended that family farming units, through the consolidation of associations, participate in the formulation of public policies and propose that they focus on extension systems that go beyond technical improvement to provide services that improve farmers' organizational and management capacities.

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#### Conflict of interest

The author has no conflicts of interest to declare.

#### Author contribution

Alan Isaac Rosell Moscoso (lead author): conceptualization, formal analysis, research, project administration, data curation, funding acquisition, methodology, supervision, validation, visualization, writing (original draft, review and editing).