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Vicente de Paulo Correia
Departament of Agro-Socio Economy, Universidade Nacional Timor Lorosa'e – UNTL, Dili, Timor-Leste

Graciano Soares Gomes
Departament of Livestock Husbandry, Universidade Nacional Timor Lorosa'e – UNTL, Dili, Timor-Leste

Carlito de Araújo Mali Code
Departament of Livestock Husbandry, Universidade Nacional Timor Lorosa'e – UNTL, Dili, Timor-Leste

Agostinho da Cunha Moniz
Departament of Agronomy, Universidade Nacional Timor Lorosa'e – UNTL, Dili, Timor-Leste

Oscar da Silva
Departament of Agro-Socio Economy, Universidade Nacional Timor Lorosa'e – UNTL, Dili, Timor-Leste

Corresponding Author:
Graciano Soares Gomes
Departament of Livestock Husbandry, Universidade Nacional Timor Lorosa'e – UNTL, Dili, Timor-Leste

Characterization of agricultural productivity factors in the municipalities of Aileu, Ainaro and Covalima, Timor-Leste

Vicente de Paulo Correia, Graciano Soares Gomes, Carlito de Araújo Mali Code, Agostinho da Cunha Moniz and Oscar da Silva

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Abstract
The study aims to characterize agricultural productivity factors, such as production support factors and the main agricultural productivity factors. This study was carried out in the municipalities of Aileu, Ainaro and Covalima and lasted for 3 months, from August to October 2021 and used the survey method and the intentional sampling method to determine the research sites. To determine the sample size, the Slovin method was used and the interviews were based on elaborate questionnaires. The variables observed are the production support factors and the main agricultural productivity factors. The results revealed that the average age of respondents was between 42.12 and 48.06 years, with experience ranging from 15.65 to 24.18 years. The level of schooling of respondents varies between the three municipalities and minimum total agricultural areas of 0.20 ha and maximum of 11 ha, with average operational areas between 0.75 and 1.98 ha, and abandoned areas between 0.81 and 1.97 ha per respondent. The largest production of rice and corn occurs in the municipality of Covalima and the smallest in the municipality of Aileu. About 65 to 85% of farmers finance their productive activities on their own, and the workforce of 3 to 6 people per family. The frequency of agricultural productivity varies among the three municipalities. In the municipality of Covalima, production takes place twice a year, and in the municipalities of Aileu and Ainaro, once a year. The most used production systems are conventional systems in rice and maize production and extensive systems in animal production. The result also showed that there is less interest from parents in encouraging young people to continue to cultivate in the future. The sales regime for agricultural products varies according to market access and the arrival of the buyer at the place of production.

Keywords: Characterization, factors, productivity, production, sales regime

Introduction
The subsistence agriculture sector has gained prominence in government agendas in recent years, and manifestations of non-governmental organizations, and also has opportunities in debates on the theoretical paradigms on the concept. Several social and political organizations that defend and conceptualize family farming as a starting point and strategic in development in general, considering relevant aspects that combine property and work that assume in time and space a great diversity of social forms in sustainable agriculture that it is a form of cultivation that is more respectful of the environment, in addition to reducing costs and increasing productivity.

The development of the agricultural sector in Timor-Leste resumed in 2002 after the restoration of independence, the government through the Ministry of Agriculture and Fisheries initiating various types of programs that are fundamental to eradicating poverty and hunger through large-scale sustainable production, in order to ensure sustainable consumption in the country. However, reality shows that during at least the twenty years of independence, about 75% of domestic consumption still depends on imported products due to the still limited national agricultural production. To achieve the goal of ending all forms of malnutrition, it is necessary to improve agricultural productivity and the income of small food producers, particularly women, family farmers and fishermen. Ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, help maintain ecosystems, and strengthen the capacity to adapt to climate change [2].

According to [1] the productivity of the set of agricultural production factors is currently measured by an indicator called total factor productivity (TFP), based on which the total volume of outputs is compared with the total volume inputs used in the production of these outputs. International comparisons carried out by technicians from the United States Department of Agriculture (USDA) show that Brazil is one of the countries whose productivity has grown the most, expressed in TFP, which is considered a good indicator of change [11]. Technological Agriculture has historically played a relevant role in Brazilian economic growth [5]. The authors also stated that this fact was not a Brazilian peculiarity, in the process of economic development of several countries, agriculture was important as a supplier of resources for investments in emerging activities, for the release of labor for other sectors, such as provider of savings for capital accumulation, as well as due to the supply of food at affordable prices to the population. As highlighted by [27], indicators of partial productivity of a specific factor have in their favor the simplicity of calculation and the availability of information. Denardi [8] describes all human existence, history and culture depending on the land space he occupies or is not allowed to occupy. In the historical study of civilizations, primitive man learned on land, on the banks of rivers, that it is possible to produce and create aminals with greater efficiency, and the field worker knows in a very deep way how important property is as a way of life (survival) in the countryside. Work appears in a second moment when the worker has possession or even the right to property, in whatever form: lending, leasing, partnership and others.

According to [26] the concept of sustainable agriculture can be defined as a system of ecological agricultural practices based on scientific innovations through which it is possible to produce healthy food, with respect to land, air and water, as well as the health and rights of farmers. The author highlighted that the objective of sustainable agriculture is to satisfy humanity's need for healthy food, to improve the quality of the environment by maintaining the non-renewable and agricultural resource base more effectively, to implement natural biological cycles and to support sustainable rural economic development and the quality of life of farmers. The results of the [18] revealed that there was an increase of about 4% in new households in four years, which brings the total number of households to a total of 213,417 in 2019, however, it also indicated that there was a drop of 10%. of the total number of families who abandoned agricultural activities. On the other hand, most producers still use the traditional production system, strongly affecting the productivity of agricultural production factors..Thus, in order to have credible information on this issue, a study must be carried out to characterize the factors of agricultural productivity and the cause of abandonment within the scope of making scientific data available to the institutions responsible for its resolution.The study aims to characterize the factors of agricultural productivity, including the cause of abandonment of agricultural activities. Thus, its specific objectives are to analyze the factors that support production and the main factors of agricultural productivity in these municipalities.

Research Methodogy

Research Site

The study was carried out in the municipalities of Aileu, Ainaro and Covaliam for 3 months (August to October 2021). Aileu is in the northwestern part of East Timor and is one of only two landlocked municipalities, the other being Ermera. It borders Dili to the north, Manatuto to the east, Manufahi to the southeast, Ainaro to the south, Ermera to the west, and Liquica to northwest [17]. It was formerly part of what is now the municipality of Dili but was split in the final years of Portuguese administration.

Ainaro has a great abundance of rivers and fertile terrain for agriculture. It has a coastal area, on the Timor Sea, but also mountains zones, including the highest point in East Timor, Mount Ramelau (2,960 m), also known as Tatamailau, which lies near the border with Ermera municipality. The borders of the municipality are identical to that of the same in Portuguese Timor. The municipality borders Alileu to the north, Mannufahi to the south, Covalima to the southwest, Bobonaro to the west, and Ermera to the northwest.

Covalima is a municipality of East Timor, in the Southwest part of the country. It has an area of 1230 km^2. The capital oof the municipality is Suai, which lies 136 km from Dili, the national caapal. The administrative posts of Covalima are Fatululic, Fatumean, Fohorem, Zumalai, Maucatar, Suai and Tilomar. Covalima borders the Timor Sea to the south, the municipalities of Bobonaro, to the north, Ainaro to the east, and the Indonesian province of *Nusa Tenggara Timur* to the west [17].

Main Instruments in Survey

The questionnaire is one of the main instruments for interviewing respondents. The semi-structured interview can be planned or happen spontaneously and offers a lot of important data, generating quantitative and qualitative information. In general, semi-structured interviews start with generic topics and alowes follow the questions using “How?”, “What?”, “Who?”, “Why?” and when?”. It is important to respect time and let the conversation proceed as naturally as possible [16].

Research Methods

In this research, the survey method was used with a descriptive and explanatory character, as recommended by [6] To determine the municipalities as the research site, the intentional sampling method was used based on secondary data from the result of the [17] household Census and the Agricultural Census [18], with the recommendation of [24], with the formula: $n = \frac{N}{N.d^2 + 1}$ which: n = total sample; N = total population; d2 = desired percentage (in this research we determined 10% of the total population. The total number of farming families concentrated in the municipality of Aileu was 7,393 farming families, in Ainaro there were 7,530 families and in Covalima there were 10,402 families. So the formula is as follows: $n = \frac{25325}{1+25325.(0.1)^2} = 96{,}61 \cong 100$ (minimum). According to Slovin’s formula, the sample size obtained at least 100 farmer families as survey respondents. Therefore, the total sample must be interviewed and observed without limitation, at most, depending on the need for the data necessary for the study. Thus, the variables observed in this study, such as: factors that support agricultural production, main factors of production (size of agricultural areas, productivity, family workforce, investment, effect of climate change and socioeconomic).

Data analysis

The collected data were coded and submitted to a descriptive analysis with an explanatory character to determine the frequencies including mode and relative percentages of the agricultural productivity factors in the these municipalities, based on the recommendations of [6].

Results and Discussion

Age of respondents

There was variation in the age of respondents between 19 and 81 years, with an mean for each municipality is 43.86±1.93, 41.12±1.37 and 48.06±1.35 years respectively (Table 1). It was also observed the participation of the interviewees' family members as a workforce in agricultural activities. In the municipality of Aileu between 2 and 13 people, in Ainaro municipality between 2 and 15 people and in the municipality of Covalima between 2 and 10 people participate in activities agricultural. The mean for each municipality is 6.81±0.28; 6.44±0.30 and 5.57±0.18 people respectively. The average experience of respondents in agriculture in the municipality of aileu is 16.9±1.66 years, in the municipality of Ainaro it is 15.65±1.19 years and in the municipality of Covalima it is 24.18±1.25 years.

Table 1. Results of descriptive analysis on age, experience and family member of respondentsin the municipalities of Aileu, Ainaro and Covalima.

Aileu Municipality (n = 69)	**Result of descriptive analysis**						
Variable	**Mínimum**	**Maximum**	**Mean**	**SEM**	**Mode**	**Frequency**	**Valid%**
Age	19	81	43.86	1.93	35	4	5.8
Experience	2	50	16.9	1.66	5	11	15.9
Family member	2	13	6.81	0.28	7	15	21.7
Ainaro municipality (n = 93)	Result of descriptive analysis						
Variable	**Mínimum**	**Maximum**	**Mean**	**SEM**	**Mode**	**Frequency**	**Válid%**
Age	19	80	41.12	1.37	38	7	7.5
Experience	5	60	15.65	1.19	20	21	22.6
Family member	2	15	6.44	0.3	7	17	18.3
Covalima municipality (n = 100)	Result of descriptive analysis						
Varable	**Mínimum**	**Maximum**	**Mean**	**SEM**	**Mode**	**Frequency**	**Válid%**
Age	22	79	48.06	1.35	40	7	7
Experience	4	56	24.18	1.25	20	12	12
Family member	2	10	5.57	0.18	4	21	21

Obs.: SEM: Standard Error of the Mean

Age and experience can be considered as supporting factors for agricultural production. The productive age is a natural force and the greatest experience is a resource capital that is not exhausted in human life. The number of family members who participate in agricultural activity determines the workforce of the same family, which contributes to reducing the cost of labor in agricultural production. In the decision-making process to stay or leave as a farmer, it is usually a process of collecting, interpreting and analyzing alternatives, often incomplete, whose result is the making of a satisfactory and not optimal decision. In this sense [21] present four orientations of rural producers' decisions, namely: instrumental, social, expressive and intrinsic orientation, which the farmer acts with satisfaction, enjoys outdoor agricultural work, values hard work and independence in decision.

Respondent's Education Level

The result of the study showed that there was a variation in the level of education of the respondents, is described in Figure 1. It is noticed that the variation in the level of education from no education level to complete higher education. In the municipality of Covlima, the majority of respondents still had no level of education around 58%. However, respondents in the municipalities of Aileu and Ainaro had no education level around 23.19% and 30.11%, respectively. For this, the respondents' education can also be considered as one of the factors that interfere with changes in attitudes and productivity in agricultural activities, due to the lower capacity in the process of absorbing technologies for the improvement of dedicated activities. In general, people with less knowledge in specific areas find it difficult to increase their capacity and update their knowledge daily to facilitate the activities in which they are dedicate. The productive value of education has its roots in two different parts: a higher level of education can allow the producer to get more with the resources at hand, this is called the worker effect. Thus, the marginal product of education, measured by the production function, is the worker effect and the second, to be distinguished, is the allocator effect. According to [22] people with a higher level of educadion can increase the producer's ability to acuquire and codify information about new inputs and costs, facilitating the donation of new production factors and consequent modernization.

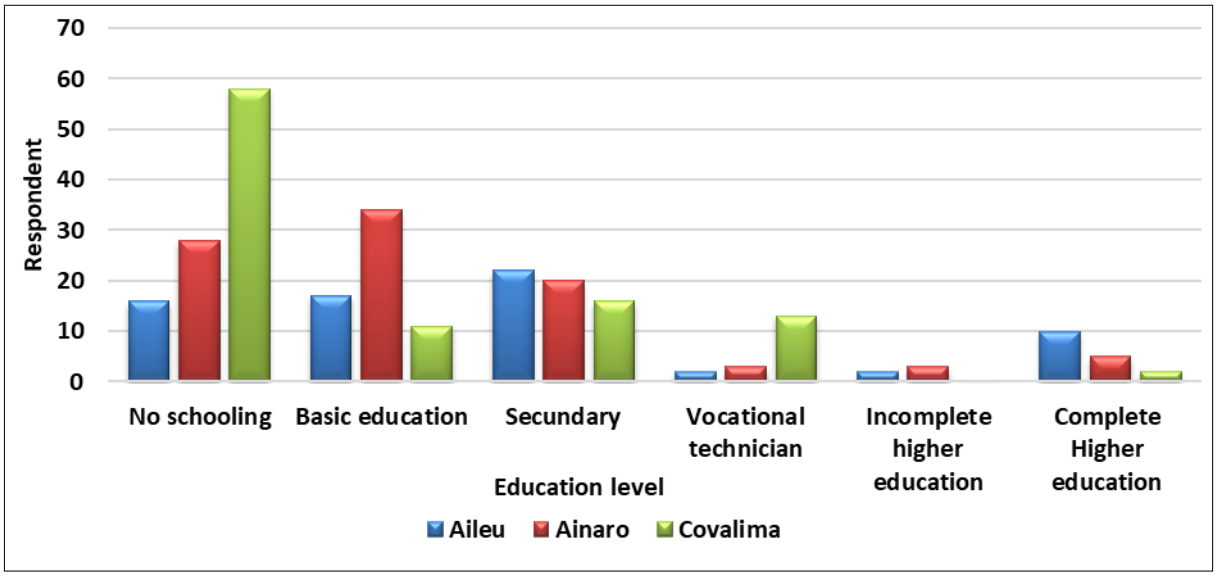


Fig 1: Education levels of respondents in municipalities of Aileu, Ainaro and Covalima, Timor-Leste.

Main Agricultural Productivity Factors

Size of Agricultural Areas

The results of the study revealed that the size of the agricultural areas of the respondents in the municipality of Aileu was 77.43 hectares and about 66.70% of the total was in operation, and approximately 33.30% of the hectares are abandoned. In the municipality of Ainaro, the productive agricultural area of the respondents was 136.15 hectares and the area in use was 107.15 hectares, that is, about 78.70% of the productive area was being used. However, in the municipality of Covalima, the total productive agricultural area of the respondents was 362.25 hectares and the area used was about 198, that is, only about 54.66% that was being used. Respondents in the three municipalities work with a total of 0.75 to 1.98 hectares and abandoned agricultural area at least about 0.81 to 1.97 hectares per household respectively. The reason for the abandonment of agricultural areas due to lower labor capacity, less investment and less production facilities. The agricultural areas are privately owned since the visas or since they were still children and some were acquired by the respondents themselves. Details information are found in Table 2.

Table 2: Size of total agricultural area, operation and abandonad area

Aileu municipality (n = 69)	**Result of descriptive analysis**						
Variable	**Mínimum**	**Maximum**	**Mean**	**SEM**	**Mode**	**Frequency**	**Válid%**
Size of Agricultural area (ha)	0.25	11	1.12	0.17	0.5	24	34.8
Size of agricultural area in operation. (ha)	0.25	6	0.75	0.09	0.5	44	63.8
Size of agricultural area abandonad (ha)	0.2	5	0.81	0.16	0.5	16	51.6
Ainaro municipality (n = 93)	Result of descriptive analysis						
Variable	**Mínimum**	**Maximum**	**Mean**	**SEM**	**Mode**	**Frequency**	**Válid%**
Size of agricultural area (ha)	0.2	5	0.75	0.1	1	29	31.2
Size of agricultural area in operation (ha)	0.2	4	1.21	0.7	1	35	37.6
Size of agricultural area abandonad (ha)	0.5	4	1.16	0.18	1	11	44
Covalima municipality (n = 100)	Result of descriptive analysis						
Variable	**Mínimum**	**Maximum**	**Mean**	**SEM**	**Mode**	**Frequency**	**Válid%**
Size of agricultural area (ha)	1	11	3.62	0.18	3&4	25	25
Size of agricultural area in operation (ha)	0.5	10	1.98	1.5	2	29	29
Size of agricultural area abandonad (ha)	0.02	7	1.97	0.16	1	22	26.5

Production of Rice and Corn

It can be seen that there was variation in the productivity of agricultural areas, with emphasis on the production of rice and corn in the three municipalities. In the municipalities of Aileu and Ainaro, production takes place once a year according to the normal cultivation session. However, in the municipality of Covalima you can cultivate rice and corn twice a year, the first occurs in the normal cultivation session and the second occurs in August to October of each year, which is a dry period for other municipalities. It is also observed that the amount of rice and corn production per period in the municipality of Covalima is higher than in the municipalities of Aileu and Ainaro (Table 3).

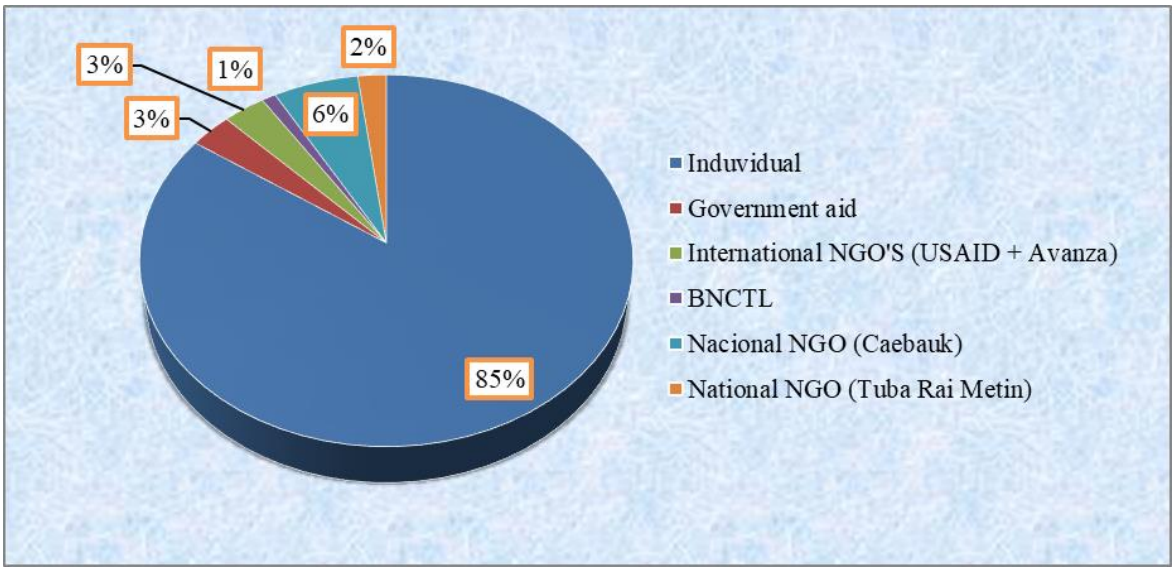
Table 3: Productivity of Agricultural Area in Use in the municipalities of Aileu, Ainaro and Covalima

Municipality	**.Mean agricultural area in use (ha)**	**Frequency of Prodution/year**	**Prodution of rice (kg)**		**Prodution of Corn (kg)**	
			Períod	**Year**	**Períod**	**Year**
Alieu	0.75±0.10	1		391.18±47.75		171.43±19.66
Ainaro	1.21±0.70	1		1782.15±68.33		176.56±17.33
Covalima	1.98±1.50	2	2460±123.96	6365±1027	913±103	1838.41.±208.33

The productivity of agricultural areas in the municipality of Aileu, with an area of 0.75 hectares with an average of rice and corn per period is 391.18 and 171.34 kg respectively. However, in the municipality of Ainaro, with an average size of agricultural areas of 1.21 hectares, it is capable of producing 1,782.15 kg of rice and 176.56 kg of maize. Unlike the productivity of agricultural areas in the municipality of Covalima, with an average area of 1.98 hectares, it is capable of producing 6,365.00 kg of rice and 1,838.41 kg of corn per year. Agricultural productivity is essential for providing more food and increasing productivity by increasing agricultural market growth, labor market and income for many families. According to [10], the stabilization of the economy, trade opening and globalization made the efficiency of the different chains increase.

Investment

The results of the study showed that in the municipalities of Aileu, Ainaro and Covalima, agricultural production activities are mainly financed by the producers themselves, with less access to some credits or financial support. As illustrated in Figures 2, 3 and 4, in the municipality of Aileu about 85%, Ainaro 83% and Covalima 65% of the surveyed producers finance their own production activities, respectively, and less than 15% to 35% that obtained credit, loans and supported by NGOs and the government. Respondents reported that the financial factor is one of the indisputable factors in the implementation of productive activities. In the context of improving agricultural productivity, greater investment is needed, there are normally three types of investment in agricultural areas, which vary according to the objectives of the productive activity, in the short, medium and long term. According to [4] when credit resources are intended for agricultural funding, the amounts received are intended for the purchase of inputs in the production process of agricultural goods (intermediate inputs and production factors).



Obs.: BNCTL – National Bank of Commerce of East Timor

Fig 2: Type of investment in agricultural production activity in the municipality of Ainaro, Timor-Leste

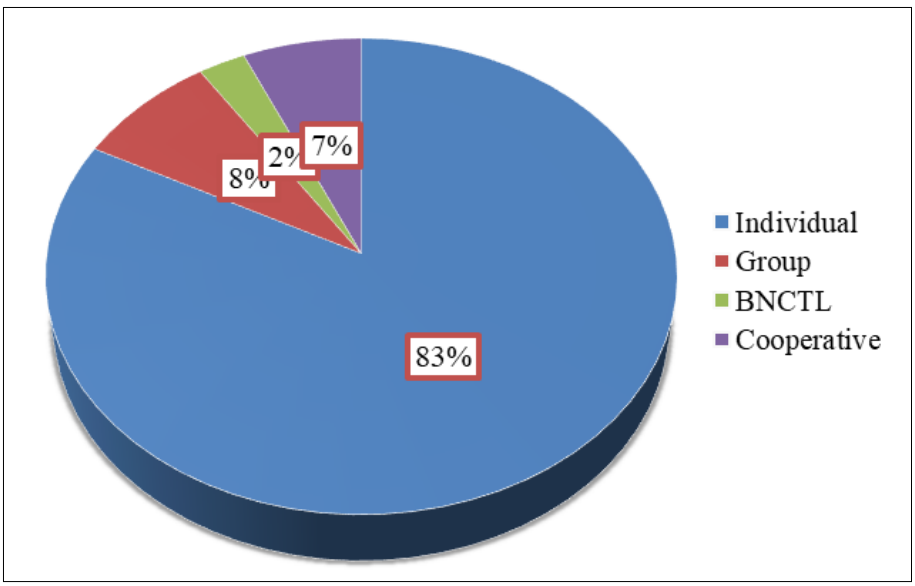


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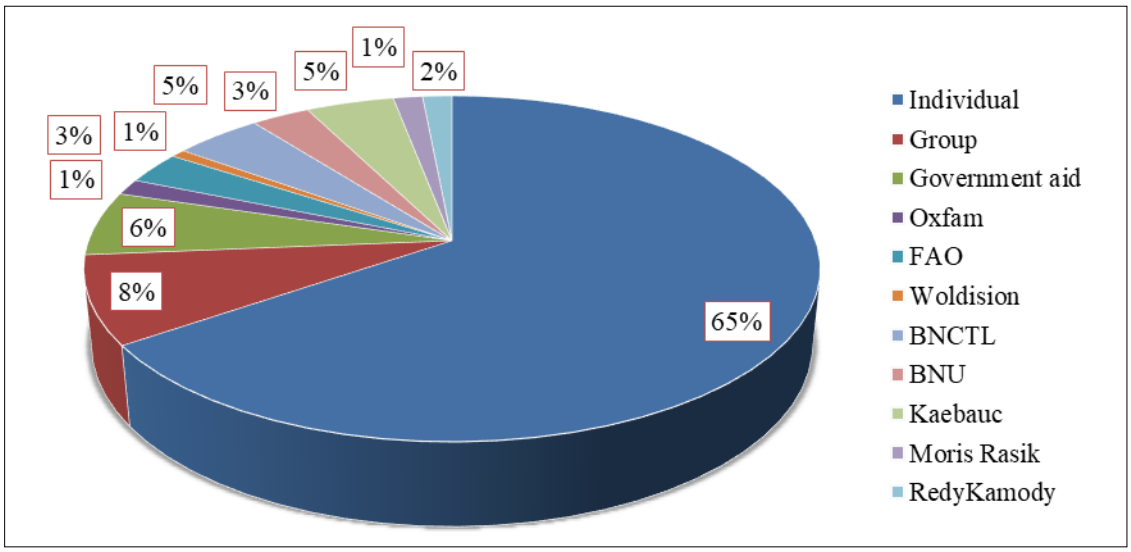
Fig 3: Type of investment in agricultural production activity in the municipality of Aileu, Timor-Leste



Obs.: BNCTL – National Bank of Commerce of East Timor; BNU – *Banco Nacional de Ultramarino*; FAO – Food Agriculture Organization

Fig 4: Type of investment in agricultural production activity in the municipality of Covalima, Timor-Leste

Family Workforce

The result obtained in this study showed that the average workforce per household of respondents shown in Figure 6, mainly in terms of gender participation, is still balanced. Thus, it can be seen that it is a very strong and important indicator in the agricultural development process, especially in the municipalities surveyed, and it was observed that each family or household manages to employ an average of 4.76 people in agricultural areas. The result of the study also showed that gender participation in agricultural activities, about 39.70% of the total family members are men and 35.20% are women. Regarding the participation of young people, about 14.44% are male and 10.67% are female. Thus, it was found that gender participation in agricultural activities in the municipalities in surveyed is still balanced, and it is expected that this situation will continue, and will be better in the future in the context of improving the sustainability of agricultural production. According to [1], in peasant production units, it is also up to the worker, in his condition of domicile and of the person who embodies the family work unit, to organize production and distribute the tasks to be performed. and, himself, lead the work. Description of age and sex of respondents, as described in Table 4.

Table 4: Result of analysis on age and gender of respondents.

Municípality	Respondent	NFM	Results of descriptive analysis							
			M	F	YM	YF	Mean (M)	M (%)	Mean (F)	F (%)
Aileu	69	355	131	113	65	47	2.8	55	2.3	45
Ainaro	93	334	166	132	29	8	2.1	58	1.5	42
Covalima	100	558	198	194	86	79	2.8	51	2.7	49
Total	262	1247	495	439	180	134	2.6	54	2.2	46

Obs.: NFM: Number of family member; M: Masculine; F: Femenine; YM: Young male; YF: Youang Female

According to [7], in general, the whole family is involved in the production process, which, in a way, becomes responsible for subsistence and income generation for families and communities. The author also stated that this type of agriculture retains some traditional practices such as specific periods for planting different crops, little use of inputs and activities in line with the cycles of nature.

Agricultural Production System

It is observed that there was variation in the use of agricultural production systems in the municipalities surveyed. About 75.35% and 49.00% of respondents from the municipalities of Aileu and Covalima said they preferred to use conventional production systems because they are low cost and do not require specialized technicians as shown in Figure 5. On the other hand, the surveyed in the municipality of Ainaro, about 60.22% of the total respondents reported that they still prefer to use traditional production systems due to financial capacity and less labor. The production system used is also considered as one of the main production factors that affect the productivity of agricultural factors, mainly such as land and seeds.

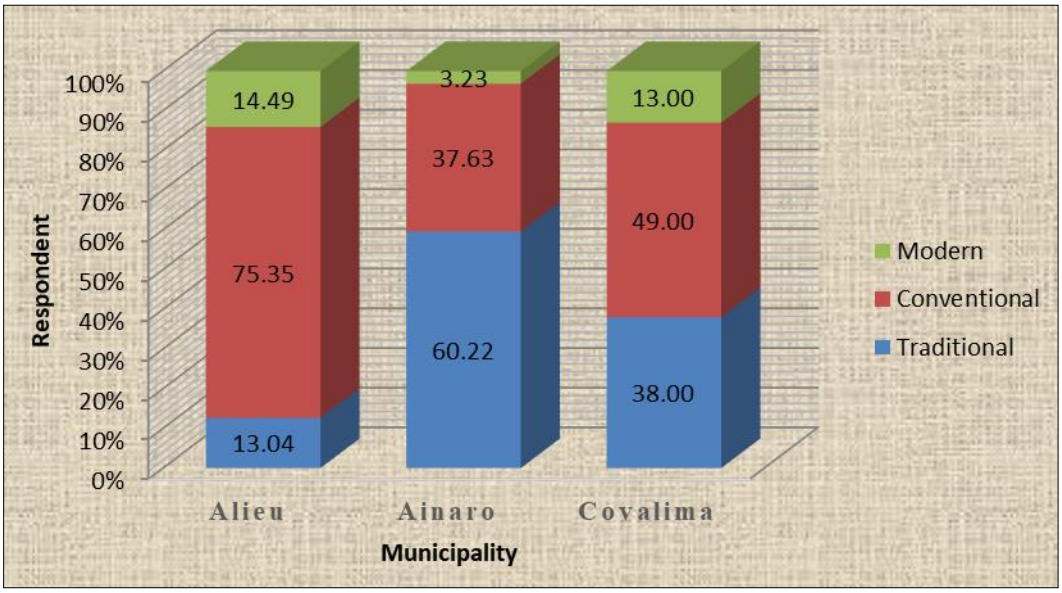


Fig 5: Desired Agricultural Production System in municipalities of Aileu, Ainaro and Covalima, Timor-Leste.

Agricultural systems are a set of technical activities, production alternatives and an industrial production area. It can be supplied in an intensive or extensive system. This classification will depend on a series of factors to know how to differentiate-an example of the index of obtaining results.

The integrated systems of sustainable agricultural production are strategies of productive innovation in process that formulation in management. According to [17] it is defined that the agricultural system refers to the regional organization of the different systems of vegetal and/or animal production, which it considers as peculiarities and similarities of these different systems. This organization develops the construction of production models and arrangements, allowing it to describe as accurately as possible the production systems in the region. The production system comprises the set of cultivation and/or creation without scope of a rural property, based on production factors such as land, capital and labor, and interconnected by a management process. Integrated system when cultivation/breeding systems for different purposes (agriculture or farming, livestock and forest) are integrated with each other, on the same plot, with the aim of maximizing the use of the area and the means of production, and also diversifying an income.

In a perspective that is often used by agrarian economists, the production system represents the production company of productions and factors within the productive unit or decision center that is, being the productions [21] The result of activities for the farmer to dedicate himself or intend to dedicate himself to human and material resources and economic economy, to achieve the desired result. In this context, it should be noted that if there is a link between the technical considerations and the economic prospects of the system.

Animal Breeding Systems

Most of the producers in the municipalities surveyed still live with the extensive conventional and semi-intensive of animal production systems (Figure 6), especially in the context of the quantity and quality of the source supplied. Regarding the frequency of feeding the animals, there was an occurrence among producers in the three municipalities. In the municipalities of Aileu and Covalima, most producers feed their animals twice with quality without worries. However, in the municipality of Ainaro, most food producers feed the animals only once a day, also without worrying about the quality of the food.

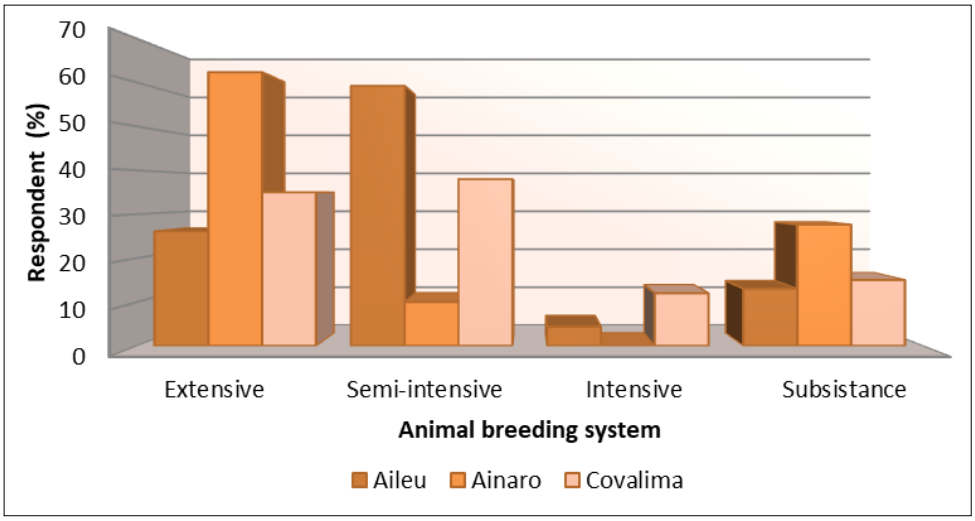


Fig 6: Desired animal breeding system in municipalities of Aileu, Ainaro and Covalima, Timor-Leste.

According to [13], production in an extensive system without technical assistance, especially food quality control, causes animals to have low productive performance. Most farmers still maintain their activities in the traditional extensive production system due to low production costs, less labor and no need for professional technicians. In addition, due to livestock activity it is only a secondary family activity [12]. In livestock, maintenance management will determine the success or failure of the production activity, especially the management of the quality factor of the food provided, in addition to reproductive and sanitary management. The frequency of feeding the animals as described in Figure 7.

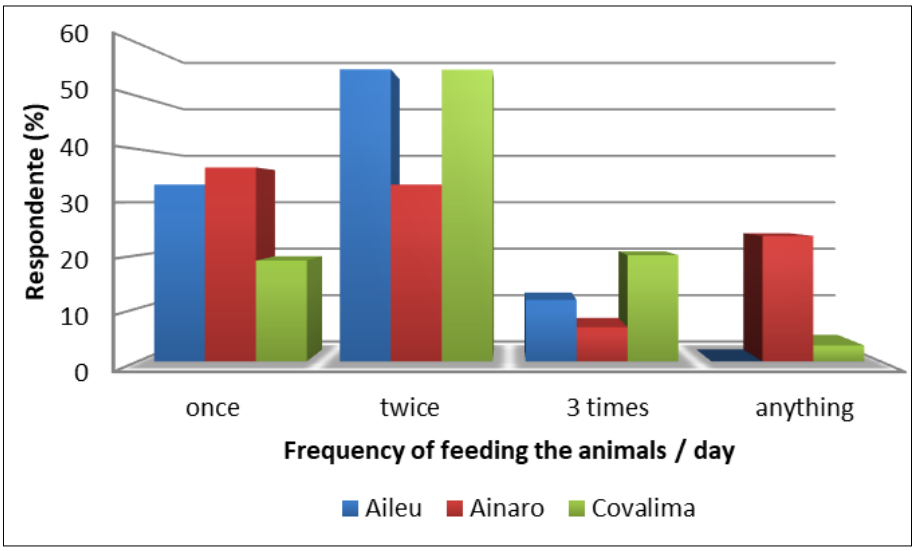


Fig 7: Frequency of feeding the animals per day in municipalities of Aileu, Ainaro and Covalima, Timor-Leste.

Regarding the difficulty of financial resources, integrated systems require considerable initial investment, as they are production innovations with a gradual return over time [3]. In this sense, there are government incentive programs for the use of new technologies and low-carbon agriculture. The first aims to encourage the use of new technologies and the second are aimed at encouraging integrated systems and sustainable production technologies.

Socioeconomic

Interest in encouraging young people to work as farmers in the future

In the context of the interest in encouraging young people to continue to be involved in agricultural activities in the future, respondents reported that they depend on the interest of young people, including their children. There were the same responses as most respondents in the three municipalities (Figure 8). This result shows that there are serious challenges in the development of agricultural production in the future due to the smaller number of people who want to continue with the agricultural activity. According to the interviewees, in recent years, the life of producers has been getting worse, causing young people to start abandoning agricultural activities and looking for other effective activities that bring benefits in improving their daily lives. Internal and external influences are crucial in the decision to leave, stay or return to the field, which are noticeable in the young people in question [20].

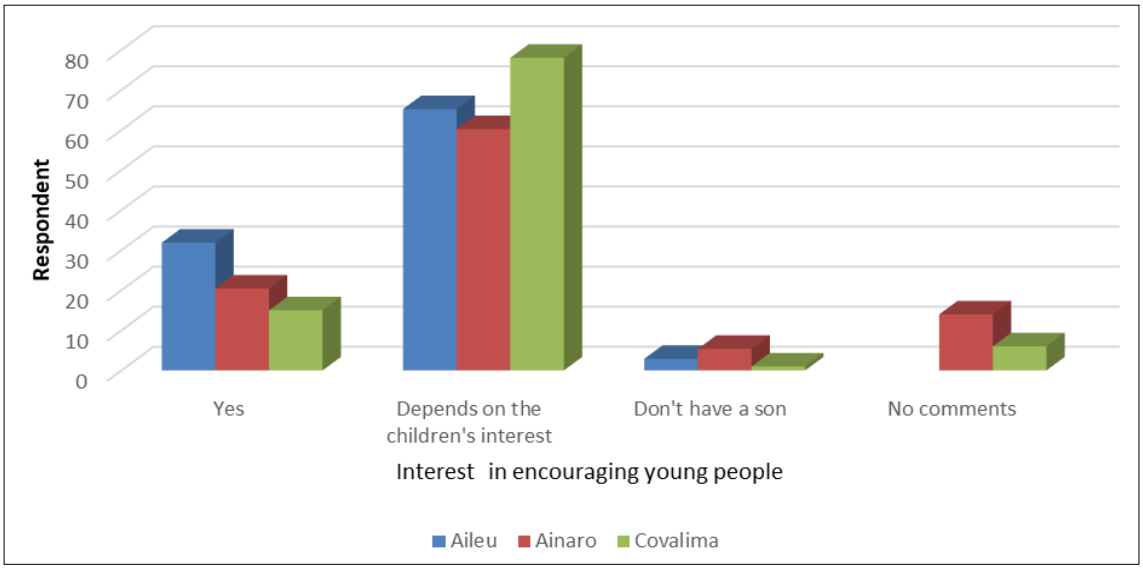


Fig 8: Interest Encourage the younger generation to continue farming activities in the future in municipalities of Aileu, Ainaro and Covalima, Timor-Lesste.

Agricultural Products Trading System

It was found that the form of marketing of agricultural products in the three municipalities varied according to the access to the buyer's market. In the municipalities of Ainaro and Covalima, most respondents (Figure 9) reported that buyers usually go to their homes to buy products and generally sell them in 50 kg bags, for example, each bag of rice is sold at a variation between $21 and $24 ($0.42 to $0.48/kg) depending on consumer market demand. However, respondents in the municipality of Aileu reported that they usually sell agricultural products directly at the market and sometimes there are sales at production sites.

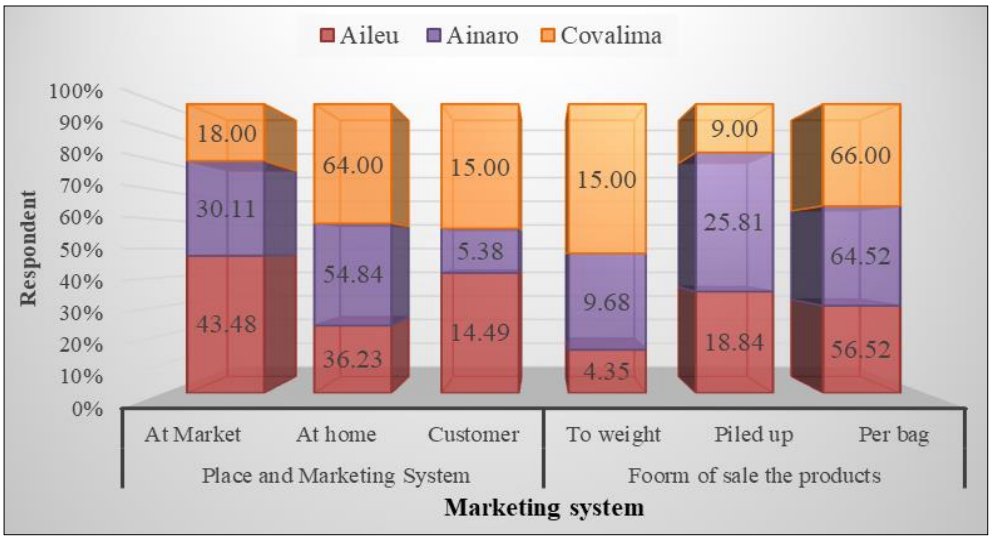


Fig 9: Regime and form of Sale of Agricultural Products in municipalities of Aileu, Ainaro and Covalima, Timor-Leste.

According to [25], the marketing system ranges from the existence of a road or railroad, to the establishment and operation of a purchasing power, or the installation of an agro-industrial plant or a storage center is an importance factor in the trade of agricultural products. The authors also state that this aspect is of extraordinary importance and often constitutes one of the main points for the expansion of production. According to [23] in terms of marketing agricultural products, peasants or their organizations have implemented various types of "interfaces," allowing for cohabitation, an articulation between reciprocity practices and exchange practices. Some of these mechanisms are already old and, in addition to the nations of the South, they also work in the countries of Europe. The author also stated that the first interface is the direct sale that allows the meeting between producer and consumer, such as selling on the farm or in nearby markets, such as the markets of producers in France, Africa or Brazil. There is an exchange relationship, but the direct contact between producer and buyer makes it possible to redouble it with a face-to-face relationship of binary reciprocity, which generates affective values: feelings of friendship, mutual recognition or ethnic values of fidelity and respect.

Importance of Technical Assistance from Extensionists

The results of the interviews on the importance of technical assistance from the Ministry of Agriculture and Fisheries (MAP) through extension agents to farmers are shown in Figure 10. Respondents reported that technical assistance in the context of technological knowledge transfer is very important to increase the knowledge of farmers in the process of absorbing technologies to improve production quality.

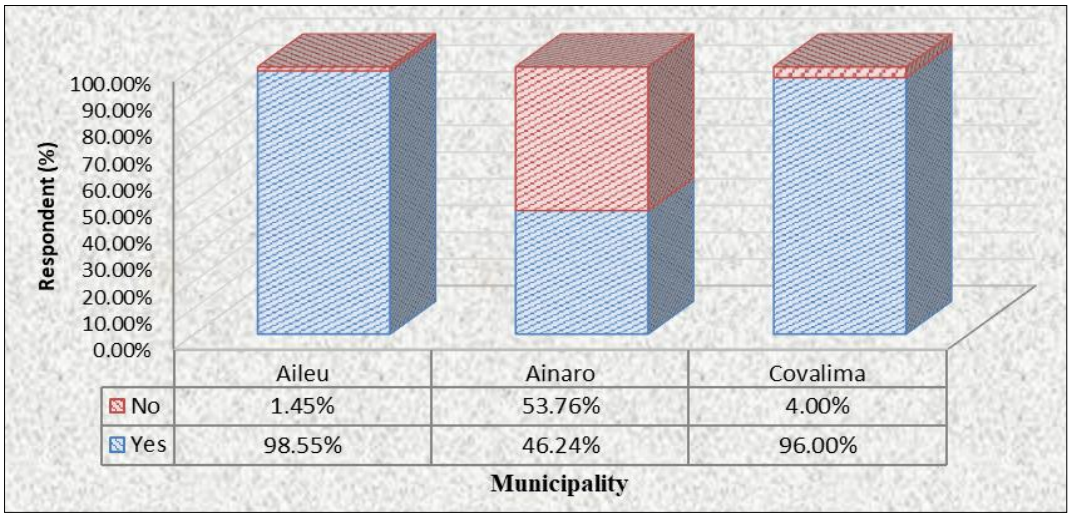


Fig 10: The importance of technical assistance from extension workers in agricultural activities for farmers in municipalities of Aileu, Ainaro and Covalima.

Most respondents (Figure 10) from the municipalities of Aileu and Covalima stated that the presence of extension workers is very important for them, but it is unfortunate because the frequency of visits by extension workers is very rare. However, interviewees from the municipality of Ainaro reported that they had never received technical assistance from extension workers, they only heard that the extensionists only attended to those who worked in the groups of farmers formed by the Municipal Agricutural Division. The respondents reported that few received technical assistance, and some producers who received technical assistance but not show the significant result in their production, so it make them things that the technical assistance not importance to improve or moving their live in agricultual area. Generally, some of the producers are interested in receiving technical assistance, but many are discredited in technicians for lack of correct follow-up, or for not showing confidence in what they say, this shows that there a need for better training of technicians to improve technical skill.

Technical assistance and rural extension services are essential or importance for the sustainable development of family farming, especially with regard to the insertion and feasibility of new agroecological practices. Such promotion that still appears timidly in the daily life of family farming, and needs a systemic and adequate coverage for this economic activity [19]. Sustainable agricultural techniques and technologies usually reach the farmer through technical assistance and rural extension, technical assistance alone is not a determining, unique and sovereign factor for the development or not of a settlement area or even a rural community [9].

Conclusion

According to the survey results, concluding that the average age of respondents was between 42.12 and 48.06 years, with experience as a producer of 15.65 to 24.18 years. The level of schooling varies between the three municipalities with the majority of respondents without schooling occurring in the municipality of Covalima. Minimum total agricultural areas of 0.20 ha and maximum of 11 ha with a minimum total area of use of 0.75 and maximum of 1.98 ha, and abandoned areas between 0.81 and 1.97 ha per respondent respectively. The largest production of rice and corn occurs in the municipality of Covalima and the smallest production occurs in the municipality of Aileu. Regarding the financing of agricultural activities, most farmers finance their activities on their own, and the family member who works in agricultural activities around 3 to 6 people per household.

The frequency of agricultural productivity varies among the three municipalities. In the municipality of Covalima there is twice the production per year, but in the municipalities of Aileu and Ainaro it occurs only once a year. Most interviewees use conventional agricultural production systems, mainly rice and maize, and use extensive systems in animal breeding. The lesser interest of parents in encouraging young people to continue agricultural activity in the future, in this case, depends on the choice of the young people to define their own future. The sales regime for agricultural products varies in terms of market access and the buyer who arrives at the place of production between the three municipalities. About technical assistance, most respondents said it is very important in the context of introducing technological knowledge in rural areas.

Recomendation

Based on the conclusion of the study, the following cases are recommended that needto empower farmers with technical assistance, seeds, fertilizers and other free resources to improve the productivity of agricultural factors in the context of raising the quality of production. Provide low-interest loans to help farmers finance their productive activities, strengthening the market system and prices for agricultural products and implement a policy of bringing the graduates in agricultural area back to their home villages to become modern farmers with subsidized support for at least one year along.

Conflict of Interest

We declare that no conflict of interest regarding de publiction of this article.

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