


Analysis of the Identification of Local Agriculture Products in the Municipality of Aileu, Manufahi, and Ainaro That Have Potential for Export and Attract Foreign Investments in Agricultural Sector

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Abstract

The objective of this study is to identify and collect information on local agriculture products and identify local potential agriculture and livestock that can attract foreign investments. Used Stratified Random Sampling and data was collected from both primary and secondary data (both quantitative and qualitative data). The data analyzed used qualitative and quantitative analysis. The supply chain analysis was carried out to develop a description of the value chain to identify potential high-value market areas and current and potential products in the domestic and export markets. The results of the study revealed that most farmers in the research location grow different types of crops and livestock. In particular for Aileu and Ainaro where most of the areas are up-land, therefore, horticulture crops (mustard, cabbage, carrots, and tomato) and coffee are dominated in these areas. For Manufahi, some parts are low-land areas, where most crops grown are maize, cassava, and paddy rice. The study reveals that local potential agriculture products and livestock in the municipalities of Aileu, Ainaro, and Manufahi are vegetable, coffee, maize, and paddy rice, banana, shallot, tangerine, cabbage, carrot, cattle, mung-bean, and banana. To accelerate economic growth, in these municipalities, there is a need to modernize agricultural production, requiring markets for both inputs supply and for the sale of output products. Opportunities to increase the productivity of these products are feasible and this can be done through the use of high-variety seeds and better farm management, and the government and pri-

vate sector can play an important role in improving productivity as this will have a further implication in improving food security.

Keywords

Potential Product, Investment, Agriculture, Livestock, Market

1. Introduction

The economy of Timor-Leste (TL) mainly relies on the agriculture sector as it contributes to the national GDP, employs almost three-quarters of the workforce, provides over 70% of the population with their main sources of livelihood, and offers the largest potential exports and trade. To explore and develop the abundance of natural resources, private sector investment is needed as it can make a positive impact on the country, particularly investing in small-scale producers in the agricultural sector in rural areas. In addition, to increase the production and productivity of most crops grown by small producers, private-sector agribusiness investments are needed [1]. Investment in private-sector agribusiness can play an important role in delivering inclusive economic growth, environmental sustainability, and a reduction in poverty. In addition, the involvement from the private sector agribusiness is significant in promoting the use of sustainable agricultural practices in supporting small-scale producers, as well as allowing equal access, especially to land, technology, and markets. As productivity levels of the crops in TL are low by world standards, therefore, there is space for the private sector to play its role in introducing new technologies, providing access to markets, and investing capital in the intensification of production.

Due to its significant contribution to development, the agriculture sector becomes one of the priority sectors in the Strategic Development Plan (PEDN) 2011-2030 [2]. As a priority sector, agriculture in TL can provide more opportunities for investors, particularly in rural areas where most of the population is concentrating and depending on this sector. Thus, the agriculture sector has the potential to be developed, however, at present time; this sector is still far from its potential contribution to the national GDP. To improve the contribution of this sector in the era of globalization, it is important to collaborate with foreign investors as this has shown its influence in the development of the agriculture sector in TL. This can be seen through the use of various technologies including fertilizers and pesticides as well as new seeds of high-yield crop varieties. These technologies are applied with the aim of increasing food production and productivity.

To attract local and foreign direct investors to invest in the agriculture sector in the country, the government of TL through its investment and export promotion agency, as the so-called TradeInvest needs to do more promotion regarding the potentiality of this sector including the quantity of production, types of prod-

ucts, agricultural infrastructure, market linkages, and others. For a promotion to be successful, information or data as mentioned are very crucial. So far, there is a lack of information on the issues as mentioned. To obtain that information TradeInvest TL in cooperation with National Center for Scientific Research (CNIC), UNTL conducted a study to analyze and identify the potentiality of agricultural products in TL. The general objective of this study is to identify and collect information on local agricultural products and livestock in Aileu, Manufahi, and Ainaro municipalities. The specific objectives are: 1) to identify types of local agriculture and livestock productions; 2) to identify local potential agriculture products and livestock in these areas; 3) to identify the quantity of local potential agricultural products and livestock produced; 4) to identify demand and supply trend and price index; and 5) to identify major opportunities and constraints at different places in the market chain for agricultural, livestock and forestry products; and to map out the agricultural potentiality of each area in TL.

Although the government of TL has provided intensive support and assistance to the agriculture sector, it has not achieved yet its potential. One example is agriculture productivity to date remains low and this is due to weak agricultural management and practices. There are a number of limitations preventing the productivity of crops in TL which includes extensive use of local seeds, lack of knowledge and skills, dependency on rain as a source of irrigation, and lack of capital. On one hand, the agriculture sector has the potential to contribute to the national GDP, but on the other hand, there is a lack of private investment in this sector. To diversify the economy of TL, the VI Constitutional Government has put a significant effort to improve the investment climate by re-establishing TradeInvest TL as a public institute responsible for investment and export promotion. To improve the investment environment for private capital, the government of TL has provided some highly attractive incentives for investors, which includes state property leases of the maximum of 50 years for investment projects, tax benefits of up to 100% income tax exemption, and custom benefits up to 100% exemption custom duties on capital goods & equipment [3].

TradeInvest TL has been created under the government Decree-Law number 45/2015 of 30th December, with some main functions to promote TL's investment and export potential, attract foreign direct investors, stimulate more national investment, and facilitate both national and international investors during pre-investment and post-investment. To accelerate investment in TL, particularly in the agricultural sector, there is a need to gather credible baseline data. With a credible data, it will help develop this sector as well as attract more local and foreign investors to invest in the country. The research question is "how to obtain credible and comprehensive data from producers and relevant stakeholders and institutions in TL?" A good quality data can contribute to the successful promotion of this sector. This can help TradeInvest to promote local agricultural products and livestock that are the potential for export to niche local and international markets.

2. Research Methodology

The site of this research includes the municipality of Aileu, Manufahi, and Ainaro. These sites are known as potential areas for the development of the agricultural sector including horticultural products, coffee, and vanilla. The population in this study constituted farmers, community leaders, Ministry of Agriculture and Fisheries (MAF) staff, extension workers, NGOs and International Agencies and other relevant institutions with a total of 200 people. These populations were treated as sample for the study. Methods used were “Stratified Random Sampling”. Data was collected from both primary and secondary data (both quantitative and qualitative data) Methods used for gathering data included direct interview/face-to-face, Focus Group Discussion (FGD), in-depth interview and review of literature related crop production and marketing and others. In addition, Participatory Rural Appraisal was used in this study such as physical field survey of the study areas. This study also the data was analyzed using qualitative and quantitative analysis. In addition, supply chain analysis was carried out to develop a description of the value chain to identify potential high value market areas and current and potential products in the domestic and export markets in relation to the volume, specification, value and growth trends used a semi-structure interview with community leaders, government institutions and local and international NGOs in order to understand institutional framework, available basic resources and organizations in the study areas. Other direct observation and documentations were also applied into this study according to Hill [4]. Thus, computer-assisted qualitative and quantitative data analysis software was used in this study. The study conceptual framework is shown in **Figure 1**.

3. Results and Discussion

3.1. Characteristic of Respondent

This study was conducted in the municipality of Aileu, Manufahi, and Ainaro, and it covers 11 Post Administrative and 45 villages. The total sample is 254 respondents, which composed of 92 respondents from Aileu, 73 from Ainaro and 87 respondents from Manufahi. For the gender balance, male accounted for 80.8% and female is 19.2%. In terms of the education of the respondents, it constituted of 52.6% finish secondary school, 29.2% primary school, 10.8% graduated from university and 7.4% illiterate. The details of the characteristic of respondents are shown in **Table 1** below.

3.2 Existing Local Agriculture Products and Livestock in Aileu, Manufahi, and Ainaro

The result of the study reveals that most farmers in Aileu, Manufahi, and Ainaro grown different types of crops and livestock. In particular for Aileu and Ainaro where most of the areas are up-land, therefore, horticulture crops (e.g. mustard,

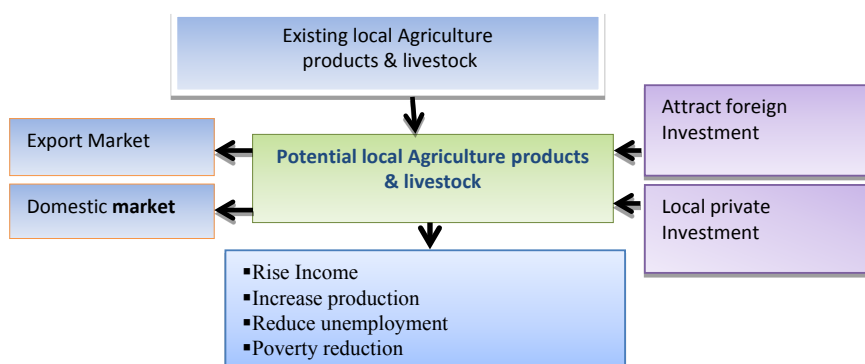


Figure 1. Conceptual framework of the analysis on the identification and development of agriculture local potential products.

Table 1. Characteristics of respondent.

| Description | | Total |
|---------------------------|---------------------------------|-------|
| Total respondent (people) | | 254 |
| Gender (%): | Male | 80.8 |
| | Female | 19.2 |
| Year (average) | | 43.4 |
| Education (%): | Primary school | 29.2 |
| | Secondary school | 52.6 |
| | University | 10.8 |
| | Not school at all (illiterate) | 7.4 |
| Occupation (%): | Farmer | 58.3 |
| | Community leader | 6.6 |
| | Public servant | 20.9 |
| | Private sector | 4.7 |
| | Others (e.g. Trader, NGOs, etc) | 9.5 |

cabbage, carrots, tomato, etc.) and coffee are dominated in these areas. For Manufahi, some parts are lowland areas such as Betano and Fatuberlihu, and most crops grown are maize, cassava, paddy and rice. For the up-land areas farmers generally have grown coffee, beans and fruit. In addition, livestock that mostly raised by farmers are including cattle, buffalo's, goats, chicken, pigs and horse. Despite the existing crops as mentioned, there are a number of new high value crops introduced, which includes broccoli, cauliflower, strawberry, and some new lettuce varieties.

A study done by Sendall [1] estimates that Timor-Leste currently does not produce enough of the main commodities to feed itself, let alone produce a surplus for export. Therefore, there is an urgent need to increase agricultural production and productivity in Timor-Leste, to satisfy local demand, and produce a surplus for export [5]. Rahim [6] added Timor-Leste has certain attributes that on paper lend it to being suitable to grow produce that could be sold in export markets [7]. The influence of globalization on agriculture development in Ti-

mor-Leste can be seen through the use of various technologies including fertilizers and pesticides as well as new seeds of high yield crops varieties. These technologies applied with the aim of increasing food production and productivity.

3.3. Potentiality of the Local Agriculture Products and Livestock in Research Site

The concept of “potentiality” of local agriculture products and livestock defined in this study are including: the product need to have a significant contribution to the municipality overall production, current level of production, there was an existing and potential market and export potential of the product [5] and the total household involvement to produce the product. Based on that concept, the study reveals the top five local potential agriculture products and livestock for each municipality as shown in **Table 2**.

The study also shows that most stakeholders interviewed describe that these products are potential because it contribute significantly to the income of rural household in these areas; in terms of market, so far there was an existing market both domestic market and export (e.g. vegetable products and others deliver to Dili market, coffee and vanilla products to export market); these products are also engaged large number of population to produce and offer employment opportunities to rural population. Sahan and Mikhail [8] concluded that a positive agricultural investment can benefit investors, small-scale farmers, communities and government. Therefore, government should give priority to investments in key public goods including capacity building, infrastructure, and research systems to help small-scale farmers who are not yet market-ready to ensure their food security and livelihood, and private sector on the other hand should complement public sector investment. AIP-PRISMA [9] revealed that from 2008-2012 the national consumption of shallots averaged 1.04 million tons per year. To fulfill the domestic consumption, Indonesia imports an average of 110,000 tons (7 - 15%) of shallot annually, and most of this product is imported from Thailand, Philippines, Vietnam, India and Myanmar.

3.4. Potentiality of Local Agriculture Products and Livestock in Manufahi

Most of the households in Manufahi depend on agriculture as a source of livelihood and income. The total potential area for agriculture is 20,332 hectares. From this, there is only 2286.1 hectares are planted or only 11.24% of the total potential area was cultivated [10]. The major crops cultivated by most of the population in Manufahi are including maize, cassava, sweet potato, horticulture crops, paddy rice and others. Meanwhile livestock that generally raised by population in this area are cattle, buffalo's, goats, chicken and horse and others. Farmers generally still applied traditional and semi-traditional system in managing their farm with some is moving from subsistence to commercial farming. The details of potential area and planted area are shown in **Table 3**.

Table 2. Top 5 local potential agriculture products and livestock in Aileu, Manufahi, and Ainaro.

| Municipality | Top 5 local potential agriculture product and livestock | | | | |
|--------------|---|--------|------------|---------|-----------|
| | 1 | 2 | 3 | 4 | 5 |
| Aileu | Vegetable | Coffee | Tangerine | Clove | Shallot |
| Manufahi | Cattle | Maize | Paddy rice | Banana | Mung-bean |
| Ainaro | Coffee | Maize | Red bean | Cabbage | Carrot |

Table 3. Area potential and area planted for agriculture in Manufahi.

| Crops | Potential area (ha) | Planted area (ha) | Percentage (%) |
|---------------|---------------------|-------------------|----------------|
| Maize | 12,000 | 1536.3 | 12.80 |
| Cassava | 1500 | 19 | 1.27 |
| Sweet potato | 200 | 131.25 | 65.63 |
| Potato | 50 | 5 | 10.00 |
| Soybean | 250 | 7 | 2.80 |
| Mung-bean | 250 | 7 | 2.80 |
| Taro | 500 | 12 | 2.40 |
| <i>Kontas</i> | 100 | 14 | 14.00 |
| Paddy rice | 3908 | 474.55 | 12.14 |
| Legume | 389 | 22 | 5.66 |
| Horticulture | 285 | 58 | 20.35 |
| Total | 20,332 | 2286.1 | |

Source: MAPM (Ministério de Agricultura e Pescas do Município de Manufahi, 2016)

The result of the study shows that the top five local potential agriculture products and livestock in the municipality of Manufahi are cattle, maize, paddy rice, banana, and mung-bean. Stakeholders interviewed mostly describe that these products play an important role in providing food security and also income for most of the population in Manufahi. Cattle for example, provide a significant income for rural household in this area; and maize, cassava and sweet potato become an important diet for population in Manufahi.

3.5. Potentiality of Local Agriculture Products and Livestock in Ainaro

Ainaro is one of the municipalities in Timor-Leste, which situated in the southern part of the country. The total area is 869.80 square kilometer with the total population of 63.136 people [11] and the total household is 10,600 with household size of 5.94 and population density of 72.59 per square kilometer. The source of livelihood and income for most households in Ainaro is deriving from agriculture sector (e.g. horticulture, industrial crops, cash crops, food crops, li-

vestock and fisheries) Total area potential for agriculture in Ainaro was 16.126 hectares; and from this only 3546.5 hectares was planted or 22% of the potential area [12]. The major crops planted by most of population in Ainaro are maize, cassava, sweet potato, horticulture crops, coffee and others. Meanwhile livestock raised includes, cattle's, buffalos, chicken, horse, pig and others. In general, farmers still applied traditional and semi-traditional system in managing their farm.

The result of the study shows that the top 5 local agriculture products and livestock that are potential in Ainaro are coffee, maize, red bean, cabbage, and carrot. These products are potential because it engages a significant number of households in the production and marketing; contributed to the livelihood and income of most of the household in Ainaro; availability of the market both domestic and export market; and these products contributed to the overall economy of the municipality of Ainaro.

The coffee produced in Ainaro is destined to export market, with only small volume distributed through domestic market. The main buyers are CCT and PARCIC from Japan. These buyers have their own operational office in Mau-bisse. Most coffee bought is Arabica coffee, and it must be organic. The price of one-kilogram coffee cherry is 0.32 cents, while for dry beans, it cost \$2.15 per kilogram. The demand for Timorese coffee is high; however, the production is very low. To fulfill the demand for the export market, improving productivity is an option that needs to be taken into consideration [13]. Indeed, maintaining the current market for "organic" coffee is also important.

4. Conclusion

To accelerate economic growth in the municipality of Aileu, Manufahi, and Ainaro, there is a need to modernize agricultural production, requiring markets for both inputs supply and for the sale of output products. The strengthening of the existing markets and the development of new markets can be done through the improvement in infrastructure, improvement in access to information, reduction in transaction costs, and promotion competition. The result of the study shows that the existing crop producers generally grow are vegetable crops, coffee, maize, cassava, mung-bean, taro, and others. Thus, livestock raised are including cattle, buffalos, chickens, pigs, goats, and others. Despite the existing crops as mentioned, however, there are a number of new crops, that are also grown which includes vanilla and some vegetable crops such as broccoli, cauliflower, strawberry, *jukini*, and lettuce. Local potential agricultural products and livestock identified in Aileu, Manufahi, and Ainaro are vegetable, coffee, maize, paddy rice, banana, shallot, tangerine, cabbage, carrot, cattle, mung-bean, and banana. As a potential product, it contributes significantly to the income of the population in these areas, engages a large number of households in the production and marketing sector, and the availability of the existing market both domestic and export market.

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Conflicts of Interest

The authors declare that there is no any conflict of interest regarding this publication.

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