

## Sustainable Organic Coffee Prospects And Coffee Transaction Costs Chain In Timor – Leste (2025)

Maia de Jesus, R. Rahmadanih, A. Arsal, Lúcio Marçal Gomes, Tilman CB.

\*Correspondence: Maia de Jesus

Received: 17 Jan 2025; Accepted: 25 Jan 2025; Published: 05 Feb 2025

**Citation:** Maia de Jesus. Sustainable Organic Coffee Prospects And Coffee Transaction Costs Chain In Timor – Leste (2025). AJMCRR. 2025; 4(2): 1-11.

### Abstract

**Introduction:** The small island of Timor basically and namely of Timor-Leste plantation Hybrid Coffee is a coffee variety that is resistant disease and climate change adaptation growing on 1000-1500 meters under shade trees special Albizia and Casuarina during Portugues time until now. The Timor coffee base growing in 6 Municipality Ermera, Aileu Ainaro, Manufahi and Bobonaro more them 42% family monoculture Coffee farm. Potential can be developed sustainable economic value because it can only grow under the shade of albizzia and casuarina, but now big problem on sustainable develop. With high economic potential, needs to developed as family economic patrimonial, because more Then 90% population dependent on coffee production every year. Timor - Leste has great potential in developing organic coffee because its tropical and subtropical climate change is created some of conditions very different and geography only have two seasons, namely dry and rainy (wet and dry months). The importance of institutional arrangements in supporting small farmers to develop organic products with high added value is very important, according to progressive nature geographic and conditions are behaved cited by (WB., 2019; Maia J., 2022; Gov.TL, 2024).

**Research Objectives:** This research is aims to look at the strategic development of sustainability is coffee as a family economic asset in improving the welfare of coffee faming families and the impact of transaction cost on the basic price received by farmers, the impact of which is not satisfactory in the motivation for the innovation in development coffee farming business. In addition, to see the factor of institutional development of coffee in the terms of existing customers of coffee agribusiness agriculture sector in Timor-Leste, base of standards coffee in global market decision.

**Research Methodology:** The best method to share by qualitative and quantitative appraised focus on information representative farm, public institutional, private sector and social institution to covered information by the farms and references date during Portugues Time, Indonesia Time and Independent Time, to take comparison production analysis qualitative and quantitative or combination method by institutional analysis with sample propose random site application of in study.

---

**Result of Discussion:** *The economic contribution of coffee farmers managing coffee farming in 6 districts since the Portuguese average 4,65,9%, during Indonesia time after Independence has provided a real contribution of 20-29% coffee farmers livelihood household. The management 90% monoculture farming is managed organically environmentally friendly by local organic material. Farmers' income guaranty from coffee as source of economic, social, educational and health needs. In addition to being source income for farmers, it can absorb 3000-5000 workers every year during the 3-month coffee harvest period from the field the city, especially green ben coffee production factory. Currently, the government and donors through international institutions are working on the development coffee agrobusiness planning culture by the President of Timor - Leste Ramos Horta in 2019. CCT-NCBA the cooperative that has 21,565 base CCT-NCBA Maia de Jesus survey, 2022 permanent members registered organically provides the largest coffee supply to Starbucks Coffee every year, average 2000-3000 tons of green coffee/years, the financial cost transaction higher by transportation, labor cost, information and promotion cost impact directly to coffee price on farmer. Through sales results agribusiness diversification carried out in other farming businesses such cocoa, cloves, vanilla, pepper potential plantation areas to anticipate decline coffee production. Currently, there 5 prestigious plantation crops managed by CCT-NCBA Economic rehabilitation development by USAID to increase rural economic, Rahmadanih, 2022, Institutional strengthening of women farmers group (KWT) in developing household food security. Integrating this cultural heritage into coffee production and trade could bring economic benefits while maintaining cultural integrity.*

**Conclusion:** *Unlike typical industrialized agricultural models, Timor - Leste coffee sector could emphasize organic farming practices and traditional cultivation methods, which preserve the soil, biodiversity, and local ecosystems, contributing to sustainability. The World Bank's 2023 report said the country's economic growth is expected to increase by an average of 4.1% in 2024 and 2025, thanks to lower inflation and a healthy fiscal position. The report also said the government's emphasis on capital spending and infrastructure development, which has increased the budget from 18.4% of GDP in 2023 to 24.5% of GDP in 2024, is likely to drive further growth.*

**Keywords:** Organic coffee cost transaction chain.

**Introduction:** Small scale organic agribusiness The potential of Timor hybrid coffee as a unique coffee develop base on 6 district potential coffee coffee variety is resistant to disease and climate growing by farmers natural traditionally, Ermera, change, because it grows under the shade of albiz-Liquica, Aileu, Ainaro, Manufahi and Bobonaro zia and casuarina shade trees. The origin of Timor with altitude higher 1000-1500 meters sea, and per- Hybrid coffee is a natural marriage between 2 types permanent income from coffee 90% household, the of arabica and robusta varieties (Arabica Cafe) and livelihood income low under 0,1 base viability ques Robusta (Canephore) with phenotypic and genotypic study, Maia de Jesus, 2017. Timor - Leste category ic genes 2x=22 and 4x=44, very far, according to tropical island with raining time dan dray time and science biologically impossible, but with the power big her complication on climate changes impact. of natural shamans and culture ecologically this

---

natural marriage occurred in one location, namely Maluhui village, Mata nova, Fatubessi village, Municipality of Ermera Timor-Leste Lets' through detection by Portuguese government Coffee managers in 1917 when world coffee was attacked by a disease called Hymeliavastarixt, where all coffee trees died but one parent tree survived fresh and could bear fruit at that time,. These products are a relevant resource for a deeper knowledge of the situation and for the setup of proper correction strategies to optimize the cultivation and increase productivity. They will support the ordinary and extraordinary territorial management activities by dedicated Entities, Valeria Donzella, 2019, Preparation of a National Coffee Sector Development Plan for Timor-Leste

Timor Hybrid Coffee is a coffee variety that is resistant to disease and climate change. This potential can be developed sustainable economic value because it can only grow under the shade of albizzia and casuarina. With high economic potential, needs to developed as family economic asset. The economic contribution of coffee farmers managing coffee farming in 6 districts since the Portuguese, Indonesia after Independence has provided a real contribution of 20-29% coffee farmers. The management 90% monoculture farming is managed organically is environmentally friendly. Farmers' income from coffee as source of economic, social, educational and health needs. In addition to being source of income for farmers, it can absorb 3000-5000 workers every year during the 3-month coffee harvest period from the field to the city, especially the green ben coffee production factory. Currently, the government and donors through international institutions are working on the development of coffee agribusiness by planning coffee as culture by the President of Timor - Leste in 2019. CCT-

NCBA the cooperative that has 21,565 permanent members registered organically and provides the largest coffee supply to Starbucks Coffee every year, average of 2000-3000 tons of green coffee. Through the sales results, agribusiness diversification can be carried out in other farming businesses such as cocoa, cloves, vanilla and pepper potential plantation areas to anticipate decline coffee production. Currently, there 5 prestigious plantation crops managed by CCT-NCBA Economic rehabilitation development Coffee, Cocoa, Cloves, Vanilla and Pepper to anticipation climate changes impact, just the key point on implementing coffee organic cited by (Horta JR., 2019; Maia J., 2022; Gomes LM., 2023). .

**Research of Objectives:** This study aims to look at the strategic development of sustainable coffee as a family economic asset in improving the welfare of coffee farming families and the impact of transaction costs on the basic price received by farmers, the impact of which is not satisfactory in the motivation for innovation in developing coffee farming businesses. In addition, to see the factor of institutional involvement of coffee in terms of existing coffee institutions in developing the coffee agribusiness sector in Timor – Leste, based on the standards of coffee in regional and global market.

**Research of Methodology:** The method of research by qualitative method and quantitative method appraised base information representative farm, public Institutional, private institution and social institution to covered information by the farm, and reference data on Portuguese Time, Indonesia Time, and Independent Time, to take comparison production analysis qualitative and quantitative or mix method by Institutional analyze with sample propose random site applications ..

---

**Results of Discussion:** Base on the analysis qualitative and quantitative analysis conduct from the research to know how about Institutional contribution on organic coffee sustainable develop significant or now, and what indicators aspect impact on agrobusiness coffee develop and transaction cost chain impact motivation farm organic coffee growing during 450 years by Portuguese and economic contribute 4,65,9%, Indonesia time first 24 year last coffee more contribution Timor economic develop innovation until 1999 Timor - Leste referendum on 30 August. And 20 years after independence. In this study, researchers have strong indicators on the problem of farmer character, institutions and access to transportation, infrastructure can create high transaction costs contribute to low minimum price. Externally factors climate change affects the sustainable development of farmer agrobusiness coffee activities. This will affect the income of coffee farmers in 6 municipalities whose family income is 90 % from coffee on 20-29% income benefited by coffee production every year, according to the reality-based options are available for coffee of Timor-Leste in market local, regional and International (Horta JR., 2022; WBG., 2023).

The researcher's focus will be to see the internal and external aspects that influence strategic development through the role of government, private sector in terms of cooperatives, economic institutional institutions, social institutions, cultural customs in the sociology of coffee farming culture in 6 municipalities of Timor-Leste in maintaining the existence of hybrid coffee as an economic asset for sustainable farming families. Timor - Leste coffee plantation potential was recorded at 72,000 hectares during the Portuguese time as a good productivity coffee, but after independence the number decreased to just 51,000-52000 hectares with quantity production average 600-900kg read been chary coffee /hectares, with base price 0,30-0,50 Non-Linear every year impact directly not satisfied of farmer. The indicator due to the loss of people's plantation areas due to road construction and climate change as well as the age of the plants and the age of the shade which was quite old or aged between >50 years for coffee plants, and shed tress reaches 100 years. The impact of climate change is a crisis in the fertility of coffee plantation land and causing production to decline, causing many farmers to switch land functions, Farmer Informant consent by survey conducted of research mentioned by (Maia J., 2022).

**Contribution of the economic value of coffee is very fundamental.**

The since 1920, coffee production from Timor contributed more than 1865 tons (more than 50%) of the value of coffee exports in the Portuguese colonial time, at that time coffee from Timor promoted its identity internationally even though it experienced quite severe challenges to complications, declining production, coffee remains a source of economy until now the coffee farming community earns income from coffee 20-29% of the total population of Timor Lets' 1,340 million currently (population census data, 2022). This is evident through CCT-NCBA as a National and International institution that has been active in the coffee agribusiness in Timor - Leste on 1994 until now has 21,565 organic farmers, with an area of coffee plantation\_+ 42000 hectares, 21,565 farmers as the largest coffee supplier to Starbucks coffee every year between 1000-2500 green bean coffee, but the income from coffee compares by the benefited financial analyze cost not satisfaction correlation factors. But In addition, coffee contributing to the income of coffee farmers, it can absorb labor every year

---

between 3000-5000 people for 3 months starting from the field to the coffee export production unit built by CCT-NCBA since the Indonesian time until now. It is undeniable that CCT-NCBA has been present in Timor-Leste since the Indonesian time through political approval by Prof. Dr. Bustanil Arifin SH through the Director of NCBA Mr. Samuel D. Filiace and 2 Timorese Sir Abel Ximenes and Sir G. Amaral, the struggle for Timor-Leste independence at that time brought organic coffee activities into Timor-Leste through PUSKUD under the Ministry of Cooperatives and BUMN. From the results of organic activities began to develop in Ermera organic farm registration in village of Liquimea and Talimoro (Lodudo) registered organic farmers and developed to 6 coffees producing municipality in Timor-Leste. Initially from this organic activity began the openness of the market and basic coffee price competition between PT-DENOK in terms of the management of BUMN coffee (Former SAPT) of the Portuguese government which was left in 1975. Timor - Leste coffee began to be certified organically by OCIA until 2005 and continued by SKALINT-CUC, then C.A.F.E. Practice until now. The entry of organic coffee activities in Timor – Leste is an advantage of the existence of market openness and price competition until now carried out by international and international competitors such as Timor Global, Timor Corp. Coffee, ETO,PWJ Cafe with CCT-NCBA until now, but they do not have clear membership from the beginning, only because of free economic politics, the market is open to buyers with basic price competition between 0.30-0.50 cents / kg of red fruit coffee beans in the community. Viewed from a microeconomic perspective, although coffee production is low, there are changes in the economic, socio-cultural and educational activities of farmers' children compared to the Portu-

guese time, where children could only achieve education up to grade of elementary school in the Portuguese time, moreover, ordinary people's children found it difficult to obtain higher education, but after 24 years with Indonesia and after independence everyone has the same rights in obtaining education, health and socio-cultural access through coffee income, some can even build houses with coffee income from permanent or semi-permanent houses. This fact shows that there is an economic change in the coffee farming community in six municipalities cited by (Tilman CB & Maia J., 2025).

### **PDB and GNP National Contribute in development Countryside.**

In terms of GDP and GNP contribution nationally, coffee has made a real contribution, where CCT-NCBA's national GDP contribution is second only to oil and natural gas, not counting other private companies, in national figures the coffee sector's contribution reaches \$10 million/year to national income. However, one problem faced by CCT-NCBA and other private companies is road infrastructure, causing high labor and transportation costs so that sometimes, many coffee companies not commitment invest continuity coffee develop. Moreover, the local managerial character causes low transaction costs in the middle of the road, making investors increasingly reluctant to invest. There are no local or national entrepreneurs who are able to invest in coffee agribusiness, because the operational costs are high and the production and processing chains are long according to organic criteria. CCT-NCBA is a strong national and international institutional organization that has survived until today, 26 years of being active in coffee agribusiness activities, but seen from the results in the field, there has been no change in the character of farmers or managers who are established and expe-

---

rienced in managing this community coffee plantation sector well according to the expectations of the world market in terms of implementation.

One thing that needs to be realized is that building the character of this farming business is indeed difficult to this day, even though many things have been done well, training and technological innovation in agrobusiness have been carried out by CCT-NCBA through USAID grant activities through TERDP (Timor-Leste economic development project) for 15 years in the development of the coffee plantation sector, but until today CCT itself has not been able to stand alone as a coffee agribusiness actor in Timor-Leste still needing assistance from NCBA (National Cooperative Business Association) to seek funding from donors. A question that needs to be sought is what is really going on, whether the institutional elements or the strategic model that has been built have not hit the target, or human resources in a managerial manner, or are there other factors behind this. A question that needs to be sought is what is really going on, whether the institutional elements or the strategic model that has been built have not hit the target, or human resources in a managerial manner, or are there other factors behind this. In institutional theory according to Norman Uphoff 1986, that strong and healthy institutions can involve the community/farmers as decision makers, and they feel they have the right to vote and the right to speak in institutional activities is very importantly about it for the coffees cited by (Tilman CB & Maia J., 2025).

### **Problems of Coffee Agrobusiness Development in Timor-Leste.**

The people of Timor – Leste come with a character that has been built since long ago to farm coffee as a source of main income, but the coffee production

results each year decreased from 900 kg to 800 kg, 700 kg, even 600 kg/hectare of red coffee or equivalent to 200-400 kg of original horn coffee. This makes farmers feel at a loss in coffee investment and must convert land functions. Land conversion activities every year are 10-15%. This makes farmers feel at a loss in coffee investment and must convert land functions. Land conversion activities every year are 10-15%. Viewed from the aspect of human development, the character of farming has not been formed well in managing its coffee plantation business properly, there are activities that are financial assistance so that they prey on farmers with money. The result of farming is to increase their own income. The management elements in terms of middle management are not yet serious in implementing a good farming system, and assistance to farmers by field PPLs, makes the community reluctant to continue their activities properly. The government's legislation in determining the strategic development of the coffee plantation sector has very little investment in the agricultural, plantation, fisheries and livestock sectors, even though the agricultural potential is very large to be developed. The government's legislation in determining the strategic development of the coffee plantation sector has very little investment in the agricultural, plantation, fisheries and livestock sectors, even though the agricultural potential is very large to be developed. The role of local, social and religious institutions has not fully supported coffee agrobusiness activities in Timor - Leste, making it difficult for local institutions to be independent in participating in sustainable coffee plantation management. The lack of academic research that supports the government's program in developing the coffee plantation sector. The existence of strong political egos of parties in developing national development strategies through the National RPJP, because of

---

the system of dismantling and reassembling the institutional structure of the government, has hampered national development, especially in the development of the people's coffee plantation sector. The coffee industry in Timor - Leste has the potential to grow through institutional strengthening and reducing transaction costs in agribusiness. The Coffee and Agroforestry Livelihoods Improvement Project aims to train 2,000 farmers on good agricultural practices and access to finance. Furthermore, the importance of collaboration between stakeholders, including government and communities, is recognized to ensure sustainability and increase farmer incomes. Investment in research on climate-resilient coffee varieties is also needed to increase the sector's resilience to climate change is the message (Gomes LM., 2023; cited by Tilman CB & Maia J., 2025), official channel <https://www.ajmcrr.com>.

### **The role of CCT-NCBA in 26 years' experience in Timor-Leste.**

In the real terms, the contribution of CCT-NCBA to the development of coffee agribusiness for coffee farmers shows that there is market openness, social services for members, product diversification based on market demand, but human character development in terms of farmers and managers has not shown significant results because there has been no technological innovation by farmers through activities carried out in each region or area. For 26 years, CCT-NCB has done many things, such as people's economic development activities through crop diversification activities, but farmers do not feel that they have an institution and contribution. Many activities have been carried out but failed, namely TERDP USAID, New Zealand aid with RICE program the government through the Ministry of Agriculture has not determined a fixed

and appropriate pattern and policy for the development of the coffee plantation sector. Examples of project failures as mentioned. In reality, there has been no change in the character of farmers and the pattern of coffee farming activities that are fixed and appropriate in developing the coffee plantation sector in Timor- Leste. Through CCT-NCBA has helped education and health through Fair Trade premium funds and the development of coffee production facilities in the central coffee areas of Ermera and Ainaro Maubissi. From year to year, training and demonstrations or demo plots have been carried out everywhere (coffee production areas), but cannot be imitated by the community, (Maia J., 2022). .If we look at the contribution of several private institutions and cooperatives that are currently involved in coffee agribusiness activities, there is very big competition, but in terms of physical development, technological innovation is very low, what is the cause of this problem, it is necessary to conduct an in-depth study in this research to make an academic recommendation in the development of coffee agribusiness activities in Timor – Leste according to the (Gomes LM., et al, 2023),, Identity The Level of Sustainable Arabica Coffee Farming Insights Three Municipalities based on the fields study conducted.

**Acknowledgements:** It's important to understand how the country's unique coffee heritage can be leveraged for sustainable development. Here is a potential outline of the novelty that could be discussed within the proposal: **1**). The approach of patrimonial economics, rooted in the understanding of local heritage and resources, focuses on using traditional knowledge and the socio-cultural heritage of coffee production as a foundation for economic development. Coffee in Timor - Leste is not only an economic commodity but also a symbol of local

---

identity and history. Integrating this cultural heritage into coffee production and trade could bring economic benefits while maintaining cultural integrity.**2).** Unlike typical industrialized agricultural models, Timor -Leste coffee sector could emphasize organic farming practices and traditional cultivation methods, which preserve the soil, biodiversity, and local ecosystems, contributing to sustainability. Involving local communities in the value chain through cooperatives or social enterprises could provide fair trade opportunities, ensuring that profits are distributed equitably and help lift rural communities out of poverty.**3).** The novelty lies in combining the heritage of Timor – Leste coffee culture with modern branding techniques. This could involve leveraging the distinct flavors, origins, and sustainable practices that make Timor - Leste coffee unique, thus appealing to the global market, particularly to eco-conscious consumers. Developing marketing campaigns that tell the story of Timor – Leste coffee – from its colonial history to its role in contemporary society – would add significant value and authenticity to the product.**4).** By adopting a patrimonial economic approach, Timor - Leste can prioritize long-term sustainability, both environmentally and economically. This includes promoting agroecological systems, reducing the environmental footprint, and ensuring that farmers benefit from more stable and equitable incomes. , it's important to understand how the country's unique coffee heritage can be leveraged for sustainable development. Here is a potential outline of the novelty that could be discussed within the proposal: **a).1.** The approach of patrimonial economics, rooted in the understanding of local heritage and resources, focuses on using traditional knowledge and the socio-cultural heritage of coffee production as a foundation for economic development. Coffee in Timor - Leste is not only an eco-

economic commodity but also a symbol of local identity and history. Integrating this cultural heritage into coffee production and trade could bring economic benefits while maintaining cultural integrity.**b).2.** Unlike typical industrialized agricultural models, Timor - Leste coffee sector could emphasize organic farming practices and traditional cultivation methods, which preserve the soil, biodiversity, and local ecosystems, contributing to sustainability. Involving local communities in the value chain through cooperatives or social enterprises could provide fair trade opportunities, ensuring that profits are distributed equitably and help lift rural communities out of poverty **c).3.** The novelty lies in combining the heritage of Timor - Leste coffee culture with modern branding techniques. This could involve leveraging the distinct flavors, origins, and sustainable practices that make Timor - Leste coffee unique, thus appealing to the global market, particularly to eco-conscious consumers. Developing marketing campaigns that tell the story of Timor – Leste coffee – from its colonial history to its role in contemporary society – would add significant value and authenticity to the product **d).4.** By adopting a patrimonial economic approach, Timor - Leste can prioritize long-term sustainability, both environmentally and economically. This includes promoting agroecological systems, reducing the environmental footprint, and ensuring that farmers benefit from more stable and equitable incomes. Timor- Leste Leste's coffee sector could benefit from stronger collaboration between government institutions, local communities, international organizations, and coffee roasters. These partnerships can facilitate capacity building, access to markets, and investment in sustainable farming practices. Integrating the local knowledge of coffee cultivation and the community's understanding of land management into the national agricultural pol-



---

icies could enhance productivity and sustainability while respecting the cultural practices that have been passed down through generations. World Coffee Research projects a robusta coffee shortage of up to 35 million bags by 2040. Declining productivity and increasing demand worsen the global coffee market. "Climate change with unpredictable weather, such as rain when coffee is flowering, greatly reduces productivity per hectare," said the Director of Minister transportation and trad, Prayudi quoted from Zona Business, on Metro TV, Thursday, August 15, 2024. (Nanda Sabrina et al, 2023; Maia J., 2022).

**Conclusion:** This study shows that the farmers who have adopted the F1 hybrids range from micro-producers to large scale coffee farmers, and representative large latitudinal and altitudinal area. This denotes that the F1 hybrids have the potential to adapt to different environments and farmer types. The results from the farmers' survey are in line with the conclusions from the recent agronomic performance study of Marie et al. (Hendry, 2024).

The agricultural sector, including coffee plants, is greatly affected by climate change or uncertain climate crises. The climate crisis causes extreme weather, unpredictable rainfall, landslides, prolonged heat and other weather conditions that can make it difficult for farmers to determine the planting and harvesting seasons for their crops. So, what are the concerns and steps of coffee farmers in dealing with these extreme conditions to coffee plant on tropical area. Farmers adopt the F1 hybrid varieties because they offer higher and more stable yields, fruiting precocity, uniform maturation, better plant growth, satisfactory management and excellent cup quality, as well as fewer risks than other coffee varieties, as they are more resistant to P&Ds, which makes them a safer investment than traditional vari-

eties. Nevertheless, having access to the plantlets, both physically and financially, are the major determinants for adoption. Farmers who have adopted them are willing to continue growing them despite the costs of the plantlets because of the rapid investment return perspective to Timor Leste coffee sectors development by Institutional harassment develop base on potential sectors to contribute National economic develop. Providing easy to follow guidelines for farmers to make farm assessments and select the most suited varieties cultivation, innovation technologic, financial support base strategic plan. This would increase the independence of smallholder coffee producers, who may not be economically attractive to large coffee trading companies, In the light of a changing climate, resilient coffee varieties and adoption of improved agricultural practices are need by Agronomic studies have promoted the first generation of *Coffea arabica* hybrid cultivars (F1 hybrids) as resistant to pest and diseases and able to grow under shade, Nureia, Turreia,2022.

These observations serve to point directions for future research coffee development in Timor Let's to chain family economic household in the future. The quantity of coffee production is decreasing, the quality of coffee can also decrease due to prolonged dry months of more than 3 months (Willson, 1985). The increase in the intensity of climate variability (such as El Nino and La Nina) due to climate change can cause prolonged dry months to occur more often and the intensity of rainfall is not evenly distributed throughout the year, but the sustainable development program adaptations in new model and actually condition cited by (Gomes LM., et al, 2023; Tilman CB & Maia J., 2025), official channel <https://www.ajmcrr.com>

---

## References:

1. Deus Carlos (2015), Timor - Leste Coffee Value Changes during independence by CCT-NCBA in Timor Leste
2. Maia de Jesus, (2021,2022), CCT-NCA Survey Coffee Agribusiness Development Sustainable”
3. Dian Suardi et al (2023) Sustainability of Cocoa Farming from the Perspective of Farmers in Luwu District, South Sulawesi Selatan, IOP Conf. Dian Suardi et al (2023) Sustainability of Cocoa Farming from the Perspective of Farmers in Luwu District, South Sulawesi Selatan, IOP Conf. Ser.: Earth Environ. Sci. 1272 012026
4. Timor - Leste Coffee-Indonesian Coffee, By Koen (2023). Initially Timor – Leste Coffee and Indonesian Coffee by the Portuguese and Dutch in the 16th-18th centuries
5. Hendry, (2024). The agricultural sector affected climate changes and sustainable development
6. Dodo Hawe, (2023). Hybrid of Timor the mainstay of Timor Island coffee in the eyes of the world Colonization was not always negative in the development of a region or a nation.
7. Joaquim Gusmao, (2019). Ministry of Agriculture and Plantations of Timor – Leste National Coffee Sector Develop 2019-2030.
8. Henriette Friling and María Fernández Del Moral, (2022), United Nations Development Program and the Global Coffee Platform. MDF, -Timor - Leste (2021), Annual Report, Coffee rehabilitation and climate change adaptation Ananta Triyogo1\* and Siti Muslimah
9. L. Fosberg Dale R. Wright, Sarah A. Bekesy, Pia E. Lentini, Georgia E. Garrard, Ascelin Gordon, Amanda D. Rodewald, Ruth E. Bennett, Matthew J. Zalinski, Sustainable coffee: A review of the diverse initiatives and governance dimensions of global coffee supply chains, received: 8 May (2023 / Revised: 6 November 2023 / Accepted: 20 February 2024, Ó The Author(s) 2024. Melese 1, \* and Semagn Asredie Kolsch, 2009, Coffee (*Coffea arabica* L.): Methods, Objectives, and Future Strategies of Breeding in Ethiopia—Review.
10. Lucio Marcal Gomes, Mohammad Saleh, Haji Ambro Ala, Darmawan Salaman, (2023)”” Identity The Level of Sustainable Arabica Coffee Farming Insights Three Districts of Ainaro, Ermera, Liquiçá in Timor – Leste.
11. Tilman CB (2024). Association Amid Self-Concept and Motivation in Learning Outcomes, 11th Grade Student at General Secondary School of Railaco Ermera of Timor-Leste. DOI:10.58372/2835-6276.1182. Official channel, <https://www.ajmcrr.com>
12. The World Bank's 2023 report said the country's economic growth is expected increase.
13. The World, (2024). Coffee Research projects a robusta coffee shortage development.
14. Maia de Jesus, (2017). Coffee farm livelihood viability in Poteete Place, Ermera Municipality
15. Maia de Jesus, (2022), CCT-NCBA Survey Updating potential farmer Coffee Plant Production and Sustainable development.
16. Nerea Turreira-García, (2023)”” Farmers’ perceptions and adoption of *Coffea arabica* F1 hybrids in Central America
17. Rahmadanih et al 2020 IOP Conference Rahmadanih et al (2020) IOP Conference Ser.: Earth Environ. Sci. 486 012044, Institutional strengthening of women farmers group (KWT) in developing household food security.
18. Sudaryanto, (2012), Enhancing Climate Changes Adaptation for Food-Crop Farmers
19. Valeria Donzellia, (2019). Preparation of a National Coffee Sector Development Plan for Timor-Leste

---

20. (Willson, 1985). The increase in the intensity of climate variability (such as El Nino and La Nina).