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ANALYSIS OF SUSTAINABILITY OF FARMING IN SOUTH CENTRAL TIMOR DISTRICT, INDONESIA

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ABSTRACT
This research aims to analyze, 1) what is the appropriate intervention for the variables that form the pillars of desire which are still low. Sustainable agriculture has an important role in maintaining food security, in Indonesia itself food availability can overcome several challenges and threats that need to be overcome. Some of these challenges include population increase, where population growth continues to increase in Indonesia, which poses a threat to food availability. This research was conducted in South Central Timor Regency. The sample size in this research was to measure 23 farmer groups in South Central Timor Regency with 100 respondents based on the Slovin formula to measure the level of desire of each based on three pillars, namely economic, social and environmental. The sampling method used was snowball sampling. Data collection was carried out through observation, interviews. The data analysis techniques used are Structural Equation Modeling (SEM) analysis and Importance-Performance Map Analysis (IPMA). The results of this research show that the desire for farming in South Central Timor Regency is multidimensional from three pillars of desire, namely economic, social and environmental at a medium desire index level. From the research results it can be concluded that the economic pillar gets 49.6 percent, the social pillar gets 57, 8 percent and the environmental pillar got 60.1 percent, which means that variations in the third pillar variable can be explained by the variables that form the third pillar. The economic pillar, social pillar and environmental pillar also positively and significantly shape sustainable farming in South Central Timor Regency, and of the 23 farmer groups there are three farmer groups that have sustainable farming performance in the low category while in the medium category there are nineteen farmer groups and there is one agricultural group in the high category. Based on the known results, the appropriate intervention is to strengthen indicators that are considered important by farmer groups in TTS Regency but implementation is still lacking, namely land productivity variables, technology and application of natural resources, integrated pest control and crop diversification, so real action is needed from TTS Regency government.

KEY WORDS
Sustainable agriculture, economic pillar, social pillar, environmental pillar, development.

Agricultural development plays a strategic role in the national economy. This strategic role is demonstrated by its role in capital formation, sustainable provision (sustainable agriculture), as part of the implementation of sustainable development. Sustainable agricultural development (including rural development) is an important strategic issue that is of concern and discussion in all countries today. Sustainable agricultural development has not only become a goal, but has also become a paradigm for agricultural development patterns (Rivai, 2011).

Discussions about sustainable development continue to develop and increase over the last decade. The peak was in 2015 when the United Nations (United Nations) set a global agenda regarding sustainable development goals or what is known as Sustainable Development Goals (SDGs) which consists of 17 main goals and 169 targets that must be achieved by 2030 (UN, 2015).

All goals and targets are integrated and balance the three pillars of sustainable development, namely economic, social and environmental. These goals and targets stimulate

action on important issues related to the 5 Ps, namely people, planet, prosperity, peace and partnership. In relation to this global dialogue, the agricultural sector is the main axis. This is because agriculture is the industrial base for derivative industrial products to fulfill human needs (Nations Framework Convention on Climate Change/COP 21 UNFCCC, 2015).

Sustainable Development Goals (Sustainable Development Goals or SDGs) are a series of goals agreed internationally by member countries of the United Nations (UN) to achieve sustainable development throughout the world. One of the SDGs targets or goals related to food is SDGs Goal number 2, namely "End Hunger, Achieve Food Security and Improved Nutrition, and Promote Sustainable Agriculture" or in Indonesian, "End Hunger, especially Food Security and Good Nutrition, and Encouraging Sustainable Agriculture" (Prasetyawati, 2018).

Sustainable development can be seen from various directions, starting from industry to the level of small-scale farming actors. So far, existing research tends to look at sustainability in the framework of large-scale businesses and is usually related to global companies (multinational companies), meanwhile research on sustainability at the scale of small businesses that play in local value chains is still relatively rare. . Therefore, in order to fill the gap in this research area, this research was conducted to examine the extent to which sustainability is implemented on a small scale farming business as part of the overall value chain. Apart from that, the research that has been carried out tends to focus on high value commodities and is part of a global value chain such as cocoa, coffee, nutmeg, palm oil (Maryono, 2018).

Results of data mapping using VOSviewer with data on the development of the number of journal publications with the main theme of Sustainable Agriculture in the Google Scholar database for the 2009-2023. The publisher with the most citations occurred in 2008. This shows that in recent years research related to sustainable agriculture has not been reviewed much, this can also be seen from the results of the visualization overlay, which in 2015 is the most recent. Terms Sustainable Agriculture has a fairly strong relationship in its visualization. Research phenomena that can be used as further research opportunities are related to Sustainable Agriculture with terms including plant growth, agricultural soil, health, sustainable production (Satrya, 2024).

Sustainable agriculture has an important role in maintaining food security. In Indonesia itself, food availability faces several challenges and threats that need to be overcome. Some of these challenges include population increase, where population growth continues to increase in Indonesia, which poses a threat to food availability. As the population continues to grow, demand for food also increases, which can result in pressure on food supplies.

The agricultural sector is one of the economic sectors that has an important role in the history of economic development in Indonesia. One of the facts that can prove this is the composition of society in the agricultural business sector which dominates the most, followed by geographical conditions in Indonesia, which has been nicknamed an agricultural country, with the majority of its people making the agricultural sector their main focus to fulfill their life needs (Luthfi, 2019).

The high number of workers who depend on this sector for their livelihood indicates the importance of the agricultural sector in efforts to reduce poverty, reduce income gaps and increase community prosperity. South Central East Regency (TTS) GRDP, the contribution of the agricultural sector in the last two years still dominates the economy of TTS Regency and NTT Province. In the last two years, GRDP growth in the agricultural sector has increased and is still the sector that dominates GRDP growth in TTS Regency and NTT Province.

This proves that in TTS Regency and NTT Province the agricultural sector is still the leading sector, where the livelihood of the people of TTS Regency and NTT Province is still in the agricultural sector and the harvest area and production produced in TTS Regency is very supportive in supporting the agricultural sector in TTS Regency , there are three sub-districts, namely North Mollo, KiE, and Kuanfatu, which are the three highest sub-districts in terms of harvest and production area in TTS Regency.

South Central Timor Regency itself, in an effort to meet household food needs, the people of South Central Timor Regency have developed types of food crops with the main

product being corn. Meanwhile, rice plants are cultivated by the community in several areas depending on the availability of water, while other types of plants such as tubers, bananas and beans are developed by the community as alternative crops in anticipation of crop failure; each type of food crop shows production developments that continue to increase every year. In 2020 it increased by 12,680 percent, while in 2022 the amount of food crop production decreased by 2,301 percent. Sufficient agricultural land and supporting natural conditions and geographic location should enable farmers in TTS Regency to have equal income, but in reality the Farmer's Exchange Rate (NTP) in TTS Regency is still below average and cannot meet consumption and capital goods needs farmer.

Table 1 – TTS Regency Farmer Exchange Rates per Subsector May-June 2022

Subsector	Month		Percentage Change
	May	June	
1. Rice-Palawija Plants			
a. Accepted Index	99,99	99,39	-0,60
b. Paid Index	107,21	107,06	-0,14
c. Farmer Exchange Rates	93,26	92,83	-0,46
2. Horticulture			
a. Accepted Index	113,69	112,71	-0,86
b. Paid Index	106,91	106,83	-0,08
c. Farmer Exchange Rates	106,33	105,50	-0,79
3. People's Plantation Plants			
a. Accepted Index	97,40	97,99	0,61
b. Paid Index	107,38	107,26	-0,12
c. Farmer Exchange Rates	90,70	91,36	0,73

With the NTP still low, it can be said that there is no moral justice and equality of farmers' income for the goods and services distributed. The lack of level of education from extension institutions can also be a factor that makes farmers does not have knowledge about how to distribute goods and services, plus the level of education that farmers have completed is limited, and the availability of information about agriculture is lacking.

This research tries to apply a sustainability analysis method using the Confirmatory Factor Analysis (CFA) method approach for the first problem formulation and Importance-Performance Map Analysis (IPMA) analysis for the second problem formulation which is applied at the farming scale in South Central Timor Regency during 2023. which is seen from the three pillars of sustainable development, namely economic, social and environmental.

In general, this research will examine the multidimensional level of sustainability of farming in South Central Timor Regency from the three pillars of sustainability, namely economic, social and environmental. Next, analyze the variables that form the pillars of sustainability which are still low so that from this background, the author wants to conduct research with the title "Analysis of Farming Business Sustainability in TTS Regency".

METHODS OF RESEARCH

The data used in this research prioritizes primary data obtained from interviews with respondents using structured question guides in the form of a questionnaire. Secondary data is used only as support, which is obtained from data from the TTS Regency Central Statistics Agency, as well as literature from previous research. This research was conducted in South Central Timor Regency. The sample size in this research was to measure 23 farmer groups in South Central Timor Regency with 100 respondents based on the Slovin formula to measure their respective levels of sustainability based on three pillars, namely economic, social and environmental. The sampling method used was snowball sampling.

This research aims to examine the multidimensional level of sustainability of farming in South Central Timor Regency from the three pillars of sustainability, namely economic, social and environmental. Next, analyze the variables that form the pillars of sustainability which are still low so that the need for appropriate intervention can be identified. This research uses

descriptive qualitative and quantitative analysis using ratio and Likert scales, to answer related objectives using Structural Equation Modeling (SEM) and the Importance-Performance Map Analysis (IPMA) method (Pangan, 2019).

Research requires identifying variables in the research model to make it easier to analyze research data. The variables identified are Exogenous Variables (X) namely the Economic Pillar (X1) with Land Productivity (X1.1), Farming Income (X1.2), Benefit and Cost Ratio (X1.3), Social Pillar (X2) with, Access to education (X2.1), Social Capital (X2.2), Existence and Frequency of Meetings with Extension Officers (X2.3), Effectiveness of Extension (X2.4), Availability and Access to Information (X2.5), Justice and Equality (X2.6) and Environmental Pillar (X3) with Technology and Application of Natural Resources (X3.1), Integrated Pest Management (X3.2), Crop Diversification (X3.3), Farming Sustainability variable (Y).

In this research, Second Stage Confirmatory Factor Analysis was used, using the PLS technique to specify the relationship between variables, including: 1) inner model and 2) outer model. Evaluation of the measurement model or outer model is carried out in several ways, namely Convergent Validity (CV), Construct Reliability and Validity, and Discriminant Validity (DV). In PLS the inner model is also called inner relations which describe the relationship between latent variables based on the substance of the theory. Apart from that, R2 is also considered for the dependent latent variable. An R2 value of around 0.67 is said to be good, 0.33 is said to be moderate, while 0.19 is said to be weak. Then look for the probability using a standard normal distribution, which then creates a classification of the sustainability of farmer groups with the following classification: < 40 %: Low Sustainability Index; 41 – 70%: Medium Sustainability Index; 71 %: High Sustainability Index.

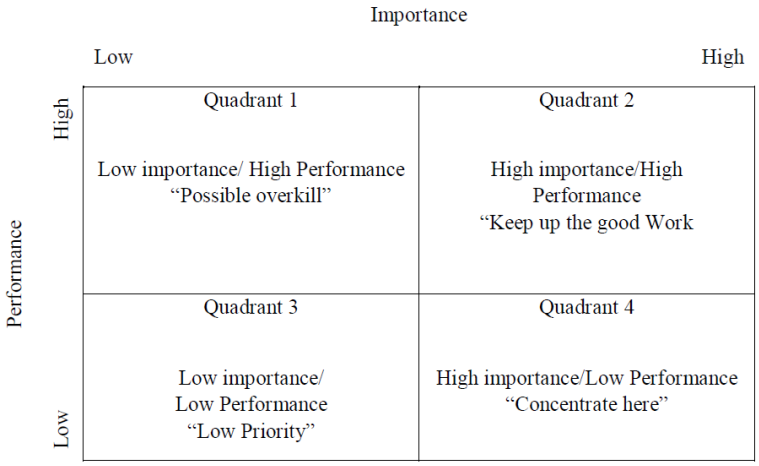

Figure 1 – Importance & Performance Analysis Quadrant (IPMA) Importance

The use of IPMA in this research is IPMA to answer the problem formulation of how to appropriately intervene in the variables that form the pillars of sustainability which are still low (Martilla & James, 1997) and increase insight into which areas need to be targeted by identifying the most critical indicators of strengths and weaknesses (Abalo et al, 2007). The IPMA map is not limited to constructs, but can be expanded to the indicator level by identifying placement in specific areas. According to Martilla & James (1977) there are four quadrants that can determine the level of importance and performance values. Possible analysis results can be seen in Figure 1.

RESULTS AND DISCUSSION

Based on calculations using the Slovin formula (Darmawan, 2016), the number of samples that will be used in this research is 100 respondents from 23 farmer groups in South Central Timor Regency and the number of samples is divided based on the number of members from each farmer group in the South Central Timor Regency.

Table 2 – Respondent's Identity

No	Farmers	Number of people
1	Feto Mone Etfe	5
2	Paloil Pah	4
3	Nekmese	4
4	Taim Monit	4
5	Tahat Toen	5
6	Tafena Kuan	3
7	Sehati 2	4
8	Feto Mone	4
9	Haufomeni	4
10	Gapoktanhut Berdikari	4
11	Gapoktanhut Nekfeu	5
12	Gapoktanhut Haumen	5
13	Tunas Baru	5
14	Rimbah Cemara	5
15	Gapoktanhut Setia	4
16	Bersaudara	5
17	Upan	5
18	Paloilpah	5
19	Taneopah	4
20	Talekopah	4
21	Haklelon To, Lakemtasa	4
22	Oenopo	4
23	Fetomone	4
24	Total	100

The data shows that all variable statement items are valid and reliable, so after testing using SPSS, respondents' perceptions of the economic, social and environmental pillar constructs in this research consist of several indicators, namely: land productivity, farming income, ratio of benefits and costs of Access to Education , Social Capital, Diversity and Frequency of Meetings with Extension Institutions, Effectiveness of Extension, Availability and Access to Information, Justice and Equality, Technology and Applications of Natural Resource Conservation, Integrated Pest Management, and Crop Diversification, Respondents' perceptions of the twelve economic and social pillar indicators, and environment of 100 respondents are presented in Tables 4-6.

Table 3 – Respondents' Perceptions of the Economic Pillar Construct

Indicator	Score and Percentage of Respondents					Total	Average	Appreciation
	1	2	3	4	5			
E.1	18,00	64,00	15,00	2,00	1,00	100,0	2,04	40,80
E.2	15,00	29,00	29,00	17,00	10,00	100,0	2,78	55,60
E.3	2,00	15,00	75,00	5,00	3,00	100,0	2,92	58,40
Average	11,67	36,00	39,67	8,00	4,67	100,0	2,58	51,60

Note: E1 = Economic Pillar; E1.1 = Land Productivity; E1.2 = Farming Income; E1.3 = Benefit and Cost Ratio.

The highest appreciation value for these three indicators is the Benefit and Cost Ratio indicator of 58.40 percent, while the lowest is the Land Productivity indicator of 40.80 percent. This is in line with the answers given by the heads of Feto Mone Etfe Poktan Mr. Isak Kause said that "The land owned by farmers has not been utilized properly so that land productivity has not had maximum results". Meanwhile, the average appreciation value of the Economic Pillar construct was 51.60 percent. In accordance with the research journal conducted by Maryono regarding Farming Sustainability Index in Tasikmalaya, where in this research the economic pillar is the lowest and the value of land productivity is the lowest value compared to the value of the ratio of benefits and costs and the value of farming income.

The social pillar construct in this research reflects the performance carried out by the government in order to improve people's living standards. The construct uses indicators: Access to Education, Social Capital, Diversity and Frequency of Meetings with Extension

Institutions, Effectiveness of Extension, Availability and Access to Information, Justice and Equality. Based on Table 4, it can be seen that the average appreciation of the Social and Cultural Pillar construct is 64.63 percent or in the medium category. The highest appreciation was given to the Social Capital indicator, which was 78.00 percent, while the lowest was to Availability and Access to Information, with an appreciation of 51.20 percent. This inadequate availability of access to information was also expressed by all existing farmer group leaders. in the district of South Central Timor who said "access to information is hampered due to inadequate internet networks and human resources lacking in technological developments so that the information provided does not reach farmers because access to information is currently almost entirely done via online media". This is in line with the journal written by Suparmoko in 2020 with the title the concept of sustainable development in national and regional development planning that social capital which is able to maintain good cooperative relations between various government, private and community institutions is needed to support the success of sustainable development.

Table 4 – Respondents' Perceptions of the Social Pillar Construct

Indicator	Score and Percentage of Respondents						Average	Appreciation
	1	2	3	4	5	Total		
S.1	32,00	23,00	13,00	12,00	20,00	100,0	2,65	53,00
S.2	11,00	9,00	10,00	19,00	51,00	100,0	3,90	78,00
S.3	4,00	27,00	18,00	24,00	27,00	100,0	3,43	68,60
S.4	2,00	1,00	62,00	25,00	10,00	100,0	3,40	68,00
S.5	25,00	36,00	8,00	20,00	11,00	100,0	2,56	51,20
S.6	19,00	17,00	9,00	10,00	45,00	100,0	3,45	69,00
Average	15,50	18,83	20,00	18,33	27,33	100,0	3,23	64,63

Note: S2 = Socio-Cultural Pillar; S2.1 = Access to Education; S2.2 = Social Capital; S2.3 = Occurrence and Frequency of meetings with Extension Institutions; S2.4 = Effectiveness of Extension; S2.5 = Availability and Access to Information; S2.6 = Justice and Equality.

Table 5 – Respondents' Perceptions of the Environmental Pillar Construct

Indicator	Score and Percentage of Respondents					Total	Average	Appreciation
	1	2	3	4	5			
L.1	79,00	12,00	9,00	0,00	0,00	100,0	1,30	26,00
L.2	83,00	12,00	5,00	0,00	0,00	100,0	1,22	24,40
L.3	73,00	22,00	5,00	0,00	0,00	100,0	1,32	26,40
Average	78,33	15,33	6,33	0,00	0,00	100,0	1,28	25,60

Note: L = Environmental Pillar; L3.1= Natural Resources Conservation Technology and Applications; L3.2 = Integrated Pest Management; L3.3 = Crop Diversification.

Based on Table 5, it can be seen that the average perception of respondents towards the Environmental Pillar construct is with a value of 25.60 percent, or in the medium category. The highest perception of respondents is on the Crop Diversification indicator. This program is carried out by providing awareness or socializing how people can immediately improve land quality by diversifying crops so that land can be productive. Natural Resource Conservation Technology and Applications is how farmers use environmentally friendly agricultural technology and practices such as using organic fertilizer. Among the Technology and Application indicators for Natural Resource Conservation, Integrated Pest Management, and Plant Diversification, the indicator for integrated pest control has the lowest appreciation. In interviews, all heads of farmer groups said that "in controlling integrated pests, it is recommended to use natural remedies or the use of herbal medicines". This has not been fully implemented because it is difficult to access plant-based medicines to repel pests and the natural efforts made have not produced maximum results." This is in line with the journal written by Parmila in 2022 with the title Study of Organic Agriculture in an effort to formulate sustainable agricultural development policies in Buleleng Regency, that this program is relatively more difficult, because it must provide assistance in real form, either in the form of money or capital, as well as equipment, where the use of organic fertilizer is needed to

reduce synthetic pesticides which are harmful to the environment and crop rotation to maintain soil fertility as well as the use of local seeds that are resistant to pests, diseases and extreme weather.

Table 6 – Outer Loading Indicators for the Economic, Socio-Cultural and Environmental Pillar Constructs of Sustainable Farming in South Central Timor Regency

Relationship between Indicators and Constructs	Original Sample (O)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Note
E.1 <- Economic Pillar	0,937	0,014	67,292	0,000	Significant
E.2 <- Economic Pillar	0,906	0,021	44,117	0,000	Significant
E.3 <- Economic Pillar	0,849	0,026	32,417	0,000	Significant
L.1 <- Environmental Pillar	0,818	0,056	14,694	0,000	Significant
L.2 <- Environmental Pillar	0,888	0,029	30,673	0,000	Significant
L.3 <- Environmental Pillar	0,774	0,073	10,622	0,000	Significant
S.1 <- Socio-Cultural Pillar	0,725	0,051	14,325	0,000	Significant
S.2 <- Socio-Cultural Pillar	0,778	0,040	19,679	0,000	Significant
S.3 <- Socio-Cultural Pillar	0,769	0,049	15,798	0,000	Significant
S.4 <- Socio-Cultural Pillar	0,680	0,069	9,879	0,000	Significant
S.5 <- Socio-Cultural Pillar	0,791	0,038	20,835	0,000	Significant
S.6 <- Socio-Cultural Pillar	0,792	0,039	20,247	0,000	Significant

Note: E1 = Economic Pillar; E1.1 = Land Productivity; E1.2 = Farming Income; E1.3 = Benefit and Cost Ratio. S2 = Socio-Cultural Pillar; S2.1 = Access to Education; S2.2 = Social Capital; S2.3 = Occurrence and Frequency of meetings with Extension Institutions; S2.4 = Effectiveness of Extension; S2.5 = Availability and Access to Information; S2.6 = Justice and Equality. L3 = Environmental Pillar; L3.1= Natural Resources Conservation Technology and Applications; L3.2 = Integrated Pest Management; L3.3 = Crop Diversification.

Before discussing the significance of the direct influence of each exogenous variable on the endogenous variables in the research model, the validity of the model is first discussed. There are three criteria in using data analysis techniques with Smart PLS to assess the outer model, namely convergent validity, discriminant validity, as well as average variance extracted (AVE) and composite reliability (Ghozali, 2008). Using data analysis techniques using Smart PLS, the outer model is assessed by looking at convergent validity (the size of the loading factor for each construct). This research uses a minimum loading factor limit of 0.5. The processing results are shown in Table 6 which shows that the outer model values have met the convergent validity criteria where all indicators have loading factors above 0.50. It can be concluded that the construct in the research has good convergent validity.

Table 7 – Cross Loading of Indicators on Economic, Socio-Cultural and Farming Environment Pillar Research Constructs in South Central Timor Regency

	Economic Pillar	Environmental Pillar	Socio-Cultural Pillar
E.1	0,937	0,287	0,195
E.2	0,906	0,238	0,283
E.3	0,849	0,334	0,320
L.1	0,236	0,818	0,312
L.2	0,274	0,888	0,386
L.3	0,288	0,774	0,266
S.1	0,206	0,294	0,725
S.2	0,258	0,268	0,778
S.3	0,296	0,390	0,769
S.4	0,095	0,197	0,680
S.5	0,251	0,318	0,791
S.6	0,208	0,281	0,792

Note: E1 = Economic Pillar; E1.1 = Land Productivity; E1.2 = Farming Income; E1.3 = Benefit and Cost Ratio. S2 = Socio-Cultural Pillar; S2.1 = Access to Education; S2.2 = Social Capital; S2.3 = Occurrence and Frequency of meetings with Extension Institutions; S2.4 = Effectiveness of Extension; S2.5 = Availability and Access to Information; S2.6 = Justice and Equality. L3 = Environmental Pillar; L3.1= Natural Resources Conservation Technology and Applications; L3.2 = Integrated Pest Management; L3.3 = Crop Diversification.

Discriminant validity of the measurement model with reflective indicators (factors) is assessed based on cross-loading of measurements with constructs. If the construct's

correlation with the measurement item is greater than the measure of the other construct, then this indicates that the latent construct predicts the measure in their block better than the measure in the other block. The data in Table 7 explains that the cross loading value indicates good discriminant validity. This can be seen from the correlation value of the indicator with the construct (loading factor) which is higher than the correlation value of the indicator with other constructs.

Another way to evaluate Discriminant Validity is to look at the Fornell-Larcker Criterion by comparing the root value of the Average Variance Extracted (AVE) of each construct with the correlation between the construct and other constructs. This can be seen in Table 8.

Table 8 – Discriminant Validity Fornell-Larcker Criterion and Correlation Between Constructs Economic, Socio-Cultural and Environmental Pillars of Farming in South Central Timor Regency

	Economic Pillar	Environmental Pillar	Socio-Cultural Pillar
Economic Pillar	0,898		
Environmental Pillar	0,321	0,828	
Socio-Cultural Pillar	0,298	0,391	0,757

Table 8 shows that the root of AVE, namely the numbers in bold for each construct, is much greater than the correlation value of that construct with other constructs or the numbers next to it. Therefore, the construct analyzed can be said to be valid. Reliability can be determined by evaluating the Cronbach's Alpha and Composite Reliability values. Cronbach's Alpha measures the lower limit of the reliability value of a construct, while Composite Reliability measures the actual value of the reliability of a construct (Salibury, et al, 2002). The role of thumb Cronbach's Alpha or Composite Reliability value must be greater than 0.70, but if the results obtained are close to 0.70 (such as 0.6), this is still acceptable in exploratory studies.

Table 9 – Cronbach's Alpha and Composite Reliability Values, Average Variance Extracted (AVE) Research Constructs for Economic Pillars, Social Pillars and Environmental Pillars in South Central Timor Regency

Variable	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Economic Pillar	0,879	0,926	0,807
Socio-Cultural Pillar	0,851	0,889	0,573
Environmental Pillar	0,769	0,867	0,686

Based on the results of data processing, it can be presented in Table 9 which contains Cronbach'Alpha, Composite Reliability and AVE. Based on Table 9, it can be seen that the Cronbach's Alpha, Composite Reliability, and Average Variance Extracted (AVE) values for all research constructs are above 0.50. Thus, the structural equation model created is suitable for use for prediction. In an Inner model, it describes the relationship between latent variables based on substantive theory by evaluating Goodness of Fit. In assessing the Goodness of Fit of a model with PLS, start by looking at the R-Squares for each endogenous latent variable. The R-Square value of the endogenous construct in this study can be seen in Table 10.

Table 10 – R-Square Value of Endogenous Constructs

Endogenous Constructs	R Square	Note
Economic Pillar	0,496	Moderate
Socio-Cultural Pillar	0,578	Moderate
Environmental Pillar	0,601	Moderate

The R-Square value in Table 10 for the Economic Pillar construct (X1) is 0.496. This figure can be interpreted to mean that 49.6 percent of the variation in the Economic Pillar is explained by variations in cultural and structural factors, while the remaining 50.4 percent is explained by variations in other variables outside the model. For the Social Pillar construct (X2) it has an R-Square of 0.578. This means that 57.8 percent of the variation in the Social

Pillar construct is explained by variations in the construct of cultural factors and structural factors, while the remaining 43.2 percent is explained by variations in other variables outside the model. The Environmental Pillar construct (X3) has an R-Square of 0.601. This means that 60.1 percent of the variation in the Environmental Pillar construct is explained by variations in the construct of cultural factors and structural factors, while the remaining 39.9 percent is explained by variations in other variables outside the model.

Apart from looking at the R-Square of each endogenous construct, in evaluating the Goodness of Fit you can also look at the Stone Gejser value or Q2 value, which is an overall evaluation, as well as a correction to the R-Square value of the endogenous construct. Based on R^2 in Table 10, the Q2 value can be calculated as follows:

$$Q^2=1-\{(1-R\_1^2)(1-R\_2^2)(1-R\_3^2)\} = 0,915$$

The Q2 value of 0.915 means that 91.5 percent of the variation in sustainable farming in South Central Timor is influenced by variations in the economic, socio-cultural and environmental pillar constructs while the remaining 8.5 percent is influenced by other factors.

Testing the direct influence of research is known through the value shown by each relationship path between significant latent constructs. Testing of the hypothesis in the PLS method is carried out using simulations for each hypothesized relationship, in this case the bootstrap method is carried out on the sample. The bootstrap method also functions to minimize the problem of non-normality of the research data used. The level of probability significance can be seen from the p-values which are below 0.10 or $p < 0.10$. A p value of less than 0.10 indicates that the latent construct is significant both in terms of the direct influence and indirect influence of the construct. Hypothesis testing regarding direct effects is presented in Table 11.

Table 11 – Test of Direct Influence Between Research Constructs

Variable Relationships	Original Sample (O)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Note
Y -> E	0,704	0,095	7,439	0,000	Significant
Y -> S	0,760	0,044	17,089	0,000	Significant
Y -> L	0,775	0,048	16,303	0,000	Significant

Note: E = Economic Pillar L= Environmental Pillar S = Socio-Cultural Pillar Y = Sustainable Farming.

Sustainable farming is positively and significantly formed by economic pillars as indicated by a path coefficient of 0.704 with a P. Value of 0.000 or less than 0.1. Sustainable farming is positively and significantly shaped by socio-cultural pillars as indicated by a path coefficient of 0.760 with a P. Value of 0.000 or less than 0.1. 3.) Sustainable farming is positively and significantly formed by economic pillars as indicated by a path coefficient of 0.775 with a P. Value of 0.000 or less than 0.1.

Table 12 – Important Performance Map Analysis (IPMA) for Farming Sustainability in South Central Timor Regency

Indicator	Score		Classification		Quadrant
	Important	Performance	Important	Performance	
E.1	0,363	2,04	2	1	3
E.2	0,365	2,78	2	2	4
E.3	0,387	2,92	2	2	4
S.1	0,212	2,65	1	2	2
S.2	0,225	3,90	1	2	2
S.3	0,252	3,43	1	2	2
S.4	0,169	3,40	1	2	2
S.5	0,235	2,56	1	1	1
S.6	0,222	3,45	1	2	2
L.1	0,388	1,30	2	1	3
L.2	0,440	1,22	2	1	3
L.3	0,377	1,32	2	1	3
Average	0,303	2,58			

Based on the data processing results of the average respondent perception scores and outer weight values produced by the PLS program, in Attachments 5 and 6, the IPMA table can be obtained as presented in Table 12. Based on Table 12 it can be seen that as many as 6 indicators have levels of importance (important) is low and 6 indicators have a high level of importance (important). In terms of performance, it is known that 5 indicators have a low level of importance (performance) and 7 indicators have a high level of importance (performance). Based on the IPMA table, a distribution of indicators can be made based on their importance and performance to make policy recommendations, as presented in Figure 5.3. For policy making, both the government and other stakeholders pay attention. Based on Figure 2 it can be explained as follows.

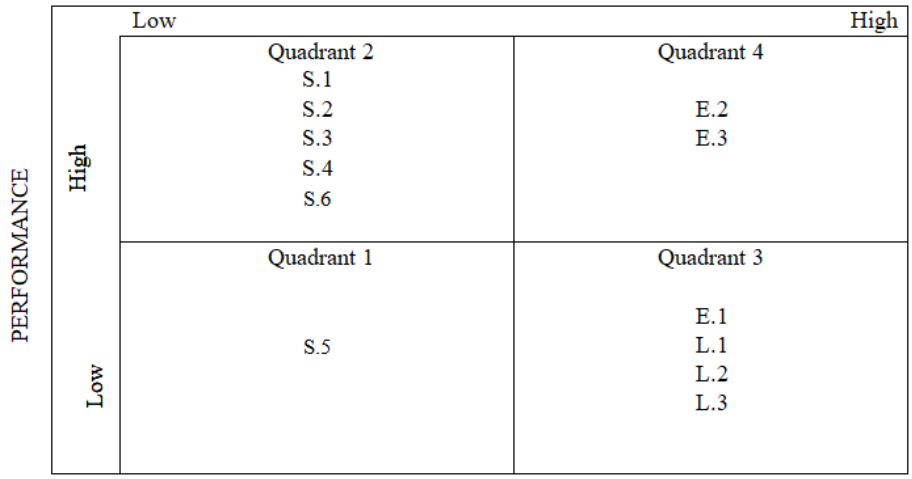

Figure 2 – Importance & Performance Analysis Quadrant (IPMA) IMPORTANT

Note: E1 = Land Productivity, E2 = Farming Income, E3 = Benefit and Cost Ratio, S1 = Access to Education, S2 = Social Capital, S3 = Difference in Frequency of Meetings with Extension Institutions, S4 = Effectiveness of Extension, S5 = Availability and Access of Information , S6 = Justice and Equality, L1 = Natural Resource Conservation Technology and Applications, L2 = Integrated Pest Management, L3 = Crop Diversification Quadrant 1 (Low Priority) implementation has poor or mediocre performance. Only one indicator is in this quadrant, namely S5 (Availability and Access of Information).

This shows that the indicator in this quadrant has a low influence on the targeted construct or has a low priority. Improvements to indicators included in this quadrant need to be reviewed by looking at their role in the targeted construct and to prevent these indicators from shifting to quadrant 1.

Quadrant 2 (Excessive), with Low importance and High performance results, namely the quadrant of indicators with low importance but high performance so this is considered excessive. In the research there are 5 indicators in quadrant 2, namely: S1 (Access to Education), S2 (Social Capital) S3 (Existence and Frequency of Meetings with Extension Institutions) S4 (Effectiveness of Extension), and S6 (Fairness and Equality). This shows that the indicators in quadrants that influence the intended construct are considered excessive in implementation.

Quadrant 3, with high importance and low performance (Top Priority) results, namely the quadrant that contains indicators with a high level of importance but has relatively low results/performance. Indicators included in this quadrant are: E1 (Land Productivity), L1 (Natural Resource Conservation Technology and Applications), L2 (Integrated Pest Management), and L3 (Crop Diversification). This shows that this indicator has a high influence value on the intended construct but in reality the implementation produces unsatisfactory results. This means that the government or other parties need to focus on indicators in this quadrant as a top priority.

Quadrant 4 (Maintain), with high importance and high performance results, namely containing indicators that have high importance and in their implementation show good performance for the organization. These indicators are: E2 (Farming Income) and E3 (Benefit

and Cost Ratio). This shows that indicators that influence the targeted construct must be maintained. Therefore, it is necessary to maintain it in subsequent operations (keep going) so that the results will remain satisfactory.

By using factor scores from the economic, socio-cultural and environmental pillars, it will be possible to determine the sustainability of farming in South Central Timor Regency. The factor score is a composite index of indicators that form the economic, socio-cultural and environmental pillars. Based on the average score obtained from each farmer group studied, then the percentage results in a standard normal distribution which represent the performance of each pillar are searched for, which are presented in Table 13.

Table 13 – Factor Scores and Performance of Economic, Socio-Cultural, Environmental and Sustainability Pillars of Farmer Groups in South Central Timor Regency

	Performance (Percent)				Performance Category			
Farmers	Economic	Socio- Cultural	Environmental	Sustainable	Economic	Socio- Cultural	Environmental	Sustainable
1	43,48	39,66	82,05	55,06	Medium	Low	High	Medium
2	50,31	47,86	33,55	43,91	Medium	Medium	Low	Medium
3	35,74	80,00	48,12	54,62	Low	High	Medium	Medium
4	66,08	39,44	33,79	46,44	Medium	Low	Low	Medium
5	57,47	66,54	75,13	66,38	Medium	Medium	High	Medium
6	73,19	12,18	35,51	40,29	High	Low	Low	Medium
7	62,95	46,27	33,79	47,67	Medium	Medium	Low	Medium
8	32,21	34,89	54,21	40,44	Low	Low	Medium	Medium
9	43,14	41,30	68,09	50,85	Medium	Medium	Medium	Medium
10	32,21	66,59	68,09	55,63	Low	Medium	Medium	Medium
11	53,90	54,08	65,44	57,81	Medium	Medium	Medium	Medium
12	49,60	48,85	54,20	50,88	Medium	Medium	Medium	Medium
13	65,27	32,59	32,40	43,42	Medium	Low	Low	Medium
14	31,83	41,96	37,30	37,03	Low	Medium	Low	Low
15	5,50	27,79	41,57	24,95	Low	Low	Medium	Low
16	57,85	78,60	61,84	66,10	Medium	High	Medium	Medium
17	45,08	59,74	48,71	51,18	Medium	Medium	Medium	Medium
18	70,10	25,41	42,62	46,04	Medium	Low	Medium	Medium
19	35,74	45,51	27,96	36,40	Low	Medium	Low	Low
20	61,21	41,76	27,96	43,64	Medium	Medium	Low	Medium
21	50,31	34,93	66,90	50,72	Medium	Low	Medium	Medium
22	49,16	78,40	41,57	56,37	Medium	High	Medium	Medium
23	87,38	88,23	47,86	74,49	High	High	Medium	High

Note: Low Category if performance is <40%; Medium if 40 – 70%; High if 71% or more.

Based on Table 13, it can be seen that only three farmer groups (Poktan) have sustainable farming performance in the "Low" category, namely Poktan numbers 14, 15, and 19. A total of 19 Poktans have sustainable farming performance in the "Medium" category, and only one Poktan has sustainable farming performance in the "High" category, namely Poktan number 23.

In research conducted in South Central Timor Regency by looking at the sustainability of farming of 23 farmer groups in South Central Timor Regency in a multidimensional manner from the three pillars of sustainability, namely economic, social and environmental, the results showed that there were 3 farmer groups that had a low sustainability index, while 19 farmer groups have a medium sustainability index, and only 1 farmer group has a high sustainability index.

From the results of the Impotance-Performance Map Analysis test, there is one indicator which is in quadrant I which means Low Importance and Low Performance, namely the indicator of availability and access to information which is considered not a priority by respondents who are farmer groups and whose performance is also lacking, this attracts attention because in nowadays it is actually thought that advances in information technology and internet networks are widespread, but in reality in the interior areas of South Central Timor district there are still those who do not have good internet networks and some farmers who cannot use information technology such as smartphones are wrong. one reason this indicator is in quadrant I.

This is in line with research from Maryono in 2018 which also stated that availability

and access to information are the lowest indicators of farming sustainability in Tasikmalaya Regency, so intervention is needed by reevaluating priorities or resource allocation and increasing awareness that these indicators are important. and the government's role in handling the availability and access of information by equalizing the internet network as well as the use of smartphones which are hampered by age factors and those who lack understanding can be replaced by other family members who can use smartphones so they don't miss out on information.

In quadrant II, which means Low importance and High performance, there are indicators of access to education, social capital, existence and frequency of meetings with extension workers, effectiveness of extension, justice and equality which are considered not a priority by respondents who are farmer groups but are good in their performance so they are considered excessive. This good performance is also in line with the theory of sustainable agriculture which also prioritizes social welfare which includes social justice, farmers' rights, decent working conditions and fair access to agricultural resources, but unfortunately it is not considered a priority by respondents who are farmer groups. .

Interventions for indicators of access to education, social capital, existence and frequency of meetings with extension workers, effectiveness of extension, justice and equality which are considered not a priority by respondents who are farmer groups but are good in their performance are still maintaining this good performance even though they are considered not important for respondents, namely farmer groups, because it can help understanding in running a sustainable farming business and it is necessary to review the role or function of each indicator, such as showing the results of ongoing counseling so that farmer groups also consider these indicators to be important for the sustainability of farming businesses.

In quadrant III, which means High importance and Low performance, there are indicators of Land Productivity, technology and application of natural resource conservation, integrated pest control, and crop diversification which are considered important by respondents who are farmer groups but whose performance is lacking, this is in line with previous research from Maryono in 2018 where it was said that the lack of production results was caused by a lack of natural resource conservation technology in using organic fertilizers and attacks by pests and diseases where minimal efforts were made using natural remedies or the use of vegetable medicines as well as a lack of crop diversification or crop rotation which in The theory of sustainable agriculture itself says that sustainable agriculture prioritizes the use of environmentally friendly inputs and requires crop rotation to maintain soil fertility levels and reduce soil damage caused by monoculture.

Interventions for indicators of Land Productivity, technology and application of natural resource conservation, integrated pest control, and crop diversification which are considered important but whose performance is lacking include innovation in handling these indicators, such as real government action in carrying out socialization of organic fertilizers, pest control, and diversification Plants must be supplied with the help of organic fertilizers, plant medicines and plant seeds so that farmer groups can more easily access these things because there are constraints in the availability of organic fertilizers, plant medicines and plant seeds that they do not have so that if this has been overcome then naturally land productivity will also increase.

In quadrant IV, which means High importance and High performance, there are indicators of farming income and cost benefit ratio, which are considered important by respondents who are farmer groups and their performance is good, this is what needs to be maintained in order to maintain the sustainability of farming in South Central Timor Regency. This is in line with one of the goals of sustainable agriculture, namely creating an economically sustainable agricultural system. In research conducted by Maryono in 2018, the results were the same, namely that the indicators of farming income and the cost-benefit ratio were relatively high, although not all farmers had the same values. This is what farmer groups in South Central Timor Regency need to maintain in terms of their marketing methods, even though there are several farmer groups that are on a low economic pillar because their marketing system is still not good.

CONCLUSION

In research conducted in South Central Timor Regency by looking at the sustainability of farming of 23 farmer groups in South Central Timor Regency in a multidimensional manner from the three pillars of sustainability, namely economic, social and environmental, the results showed that there were 3 farmer groups that had a low sustainability index, while 19 farmer groups have a medium sustainability index, and only 1 farmer group has a high sustainability index. From the results of the Importance-Performance Map Analysis test, there are only two indicators that are in quadrant IV which means High Importance and High Performance, namely the farming income indicator and the benefit- cost ratio so that the other indicators require intervention such as equal distribution of the internet network and the use of smartphones which is hampered by Age factors that are less well understood can be replaced by other family members who can use smartphones so as not to miss out on information, increase understanding in running a sustainable farming business and it is necessary to review the role or function of each indicator, such as showing the results of ongoing counseling so that farmer groups also consider these indicators important for the sustainability of farming businesses. Providing assistance with organic fertilizers, plant medicines and plant seeds so that farmer groups can more easily access these things because there are constraints in the availability of organic fertilizers, plant medicines and plant seeds which they do not have so that if this has been resolved then it will be done by itself. Land productivity will also increase.

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