



Analysis of the Potential Development of Ecological Cocoa Agrotourism to Increase Farmers' Income in Tumbudadio Village Tirawuta Sub-district, East Kolaka Regency

Rahmayani¹, Weka Gusmiarty Abdullah², Samsul Alam Fyka³

¹ Student of Agribusiness Department, Faculty of Agriculture, Halu Oleo University, Indonesia

^{2,3} Lecturer at Faculty of Agriculture, Halu Oleo University, Kendari, Indonesia

Corresponding Author: rahmayani24062003@gmail.com

Abstract

This study aims to describe the description of farmers' income source activities before and after the development of ecological cocoa agrotourism and analyze the potential of the concept of Attractions, Amenities, and Accessibility (3A) in the development of ecological cocoa agrotourism to increase farmers' income in Tumbudadio Village, Tirawuta District, East Kolaka Regency. The population in this study is farmers who are included in the ecological cocoa agrotourism development area, which is four people; the surrounding community is four people; the Village Head is one person; and the Tirawuta Sub-district is one person. This study uses census sampling techniques for the farmer population and purposive sampling for the surrounding community population, village heads, and sub-district heads. The variables in this study are farmers' income, production costs, number of agricultural products, selling prices, receipts, attractions, amenities, and accessibility. The analysis used is income analysis, income difference test analysis, and potential analysis of Attractions, Amenities, and Accessibility (3A). The results of the study show that the source of income of farmers before the existence of cocoa agrotourism from cocoa, patchouli, paddy rice, and pepper farming, with an average profit of IDR 3,397,464 per month, while after the existence of ecological cocoa agrotourism from farming activities plus tourism activities in the ecological cocoa agrotourism area, with an average profit of IDR 12,630,000 per month. The development of ecological cocoa agrotourism has high potential because the source of income for respondent farmers through ecological cocoa agrotourism has a positive impact on increasing farmers' income. Regarding attractions, ecological cocoa agrotourism offers learning activities on cocoa cultivation, the process of making cocoa products





into chocolate, and natural tourism with beautiful scenery. Appeasurable facilities include toilets, dining areas, and eco-friendly accommodations for tourists. Accessibility consists of the ease of reaching agro-tourism locations with various modes of transportation and the presence of clear directions.

Keywords: Ecological Cocoa Agrotourism, Development Potential (3A), Source of Income.

INTRODUCTION

The agricultural sector plays an important role in the national economy that can produce basic needs, clothing and shelter, provide employment for most of the population, contribute to increasing national income and provide foreign exchange. Agritourism or agricultural tourism is defined as a series of tourist travel activities that utilize the location or agricultural sector from the beginning of production until agricultural products are obtained in various systems and scales with the aim of expanding knowledge, understanding, experience, and recreation in agriculture (Department of Agriculture, 2014). The development of agritourism is directed at the form of closed spaces, such as greenhouses, open spaces such as parks, or a combination thereof. Closed room agritourism can be in the form of a variety of unique and historically valuable agricultural equipment or visualization of the history of land use and processing of agricultural products (Department of Agriculture, 2014).

Ecological cocoa is cocoa production that promotes and maintains environmental balance. It involves sustainable farming practices by reducing the use of pesticides and harmful chemicals and paying attention to soil fertility. Ecological cocoa farming also uses techniques such as polyculture, where cocoa plants are grown alongside other crops. This approach not only reduces negative impacts on the environment, but also supports biodiversity and the long-term sustainability of farmland.

Ecological Cocoa Agrotourism in Tumbudadio Village is the main tourist attraction, namely cocoa land plants accompanied by other types of agricultural commodities such as cocoa, pepper, paddy rice, patchouli. This ecological cocoa agro-tourism area is managed by the Tunas Mekar Jaya Farmer Group led by the head of the farmer group, ecological cocoa agro-tourism in Tumbudadio Village is a tourist attraction that combines tourism and cocoa farming which has unique potential with its environment.

The development of agro-tourism in East Kolaka Regency has great potential to develop ecological cocoa agro-tourism because of its available natural conditions, fertile soil conditions and cool climate. This is very supportive for cultivating various agricultural commodities by





implementing an environmentally friendly land management system, because environmental conditions are the most important factor to attract tourists. So that environmental conditions must be utilized by tourism managers so that they provide a sense of comfort, tranquility, and can have a positive impact on tourists which will provide satisfaction to visiting tourists.

East Kolaka is a region that has excellent natural resources and agricultural environment for cocoa commodities. Tumbudadio Village is a district located in East Kolaka that has the potential to develop ecological cocoa agro-tourism. This research needs to be done because it has multifaceted impacts, first, this research can be a foundation for local economic development by providing alternative sustainable income for farmer groups in the East Kolaka region. Secondly, through the ecological cocoa agritourism approach, it will not only improve the economic welfare of farmers, but also broaden their understanding of environmentally friendly agricultural practices. Thirdly, this research has the potential to increase the tourist attractiveness of the area, attracting tourists who care about the environment to visit and support the development of local ecotourism. This research will not only increase the income and welfare of the farmer groups, but will also provide wider benefits to the community and environment in Tumbudadio Village and the surrounding area.

METHOD

The study population included 4 cocoa farmers in the ecological cocoa agro-tourism area, 4 surrounding communities, 1 Village Head, and 1 Tirawuta Sub-District Head. Samples were taken using census sampling technique for farmers, as well as *purposive sampling* for the community, Village Head, and Sub-district Head to obtain relevant and in-depth information. The total sample was 11 people: 4 farmers, 4 communities, 1 village head, and 1 sub-district head. Data collection techniques were observation, interview, and documentation. The data analysis used to answer the problems of this research is as follows:

1. Ecological Cocoa Agrotourism revenue is obtained based on the following equation (Nicholson, 1995):

$$I = TR - TC$$

Description:

I	Income(Rp /Month)
TR	Total Revenue (Rp /Month)
TC	Total Cost (Rp/Month)

2. Sukirno (2016) total cost can be calculated using the following formula:

$$TC = FC + VC$$



$$TC = (TF1 + TF2 + TF3 + \dots TF_n) + (VC1 + VC2 + VC3 + \dots VC_n)$$

Description:

TC = Total Cost (Rp/month)

FC = Fixed Cost (Rp/month)

VC = Variable Cost (Rp/month)

TF1 - TF_n = Nth Fixed Cost (Rp/Month)

VCI - VC_n = Nth Variable Cost (Rp/Month)

3. The amount of fixed costs can be determined by the following formula: (Munawir, 2004)

$$D = \frac{I}{N}$$

Description:

D = Equipment depreciation (Rp)

I : Price of an item (IDR)

N : Economic life of goods

4. Riwayadi (2016) variable costs are shown by the following equation:

$$VC = (P_x \cdot X)$$

Description:

VC: Variable Cost / variable cost (Rp / month)

X : Tools used to produce the product (unit)

P_x: Tool price (Rp/unit)

5. According to Manurung (2011) depreciation is calculated using the formula:

$$\text{Depreciation} = \frac{\text{Acquisition Price} - \text{Residual Value}}{\text{Estimated Economic Life of Assets}}$$

6. The mathematical acceptance formula can be calculated as follows:

$$TR = P \cdot Q$$

Description:

TR = Total revenue (total revenue) (Rp / month)

P = Selling price (IDR/month)

Q = Total production (Rp / month)

The formula of the t-test is as follows:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{(n_1-1)s_1^2 + (n_2-1)s_2^2}{n_1 + n_2 - 2} \left(\frac{1}{n_1} + \frac{1}{n_2} \right)}}$$

$\bar{x}_1$ = Mean of sample 1

$\bar{x}_2$ = Sample mean 2

n_1 = Number of samples 1

n_2 = Number of samples 2

s_1 = Standard deviation of sample 1

s_2 = Standard deviation of the sample

Class interval = $\frac{\text{Skor tertinggi} - \text{Skor terendah}}{K}$

Based on the above formula, the respondent's answer by finding the interval can be seen the level of each value as shown in Table 1 below:

Table 1 Score value

No.	Category	Score	Category Value
1	Low potential	1	1,00 - 2,33
2	Medium Potential	3	2,34 - 3,66
3	High Potential	5	3,67 - 5,00

RESULTS AND DISCUSSION

Overview of Farmer Income Source Activities Before and After the Development of Ecological Cocoa Agrotourism in Tumbudadio Village

Prior to the development of ecological cocoa agro-tourism, farmers in Tumbudadio Village, Tirawuta Sub-district, East Kolaka Regency mostly depended on their income from agricultural products, such as the cocoa crop itself, paddy rice, pepper, and patchouli. This income is often erratic and depends on market price fluctuations and weather conditions that affect crop yields. After the development of ecological cocoa agro-tourism, there was a significant change in farmers' income sources. With agritourism, farmers do not only rely on their agricultural harvest as their main source of income, but also get additional income from the tourism sector. These tourism activities include cocoa farm tours, education on the cocoa production process, and the sale of processed cocoa products directly to tourists.

1. Sources of Farmer Income Before the Development of Ecological Cocoa Agrotourism

Sources of income for farmers in Tumbudadio Village, Tirawuta Sub-district, East Kolaka Regency can be seen in Table 2.

Table 2 Total Sources of Farmers' Income Before the Development of Ecological Cocoa Agrotourism Development in Tumbudadio Village, Tirawuta Subdistrict , East Kolaka Regency in 2024

No.	Type of Revenue Source	Number (Person)	Farm Profit (Rp/Month)	Average Profit (Rp/Month)
1	Cocoa farming	4	18.769.528	4.699.132
2	Patchouli farming	3	1.083.313	361.104
3	Rice paddy farming	2	2.963.353	1.481.677
4	Pepper farming	3	21.143.826	7.047.942
	Total		43,960,020	13.589.855
	Average		10,990,005	3.397.464

The sources of profit for farmers in Tumbudadio Village, Tirawuta Subdistrict, East Kolaka District, vary depending on the type of farming. The highest profit was obtained from pepper farming, amounting to IDR 21,143,826, with a monthly average of IDR 7,047,942, supported by high selling prices and stable market demand. In contrast, patchouli farming recorded the lowest profit of only Rp1,083,313, with an average of Rp361,104 per month, influenced by low market prices and high production costs.

2. Potential Sources of Farmer Income After Ecological Cocoa Agrotourism Development
Sources of income from ecological cocoa tourism activities in Tumbudadio Village, Tirawuta Sub-district, East Kolaka Regency can be seen in Table 3.

Table 3 Potential Benefits of Tourism Activities in an Ecological Cocoa Area in Tumbudadio Village, Tirawuta Sub-district, East Kolaka Regency in 2024.

No.	Description	Profit (Rp/Month)
1	Food/Beverage Menu	3.600.000
2	Types of snacks	18.000.000
3	Parking Services	300.000
4	Tour Guide Services	1.800.000
5	Product Lodging Business	67.500.000
6	Workshop Services	2.310.000
7	Camping Equipment	16.500.000
8	Fish Product Fishing Business	3.150.000
9	Public Bathroom Services	510.000

Total Profit	113.670.000
Average Profit	12.630.000

Table 3 shows that the highest profit from ecological cocoa tourism activities in Tumbudadio Village, Tirawuta Sub-district, East Kolaka Regency, comes from the lodging business with monthly income ranging from Rp2,250,000 to Rp67,500,000. This high income reflects the attraction and high demand from tourists who enjoy the comfort and experience of staying in a natural cocoa environment. In contrast, parking services recorded the lowest revenue, ranging from IDR10,000 to IDR300,000 per month, due to limited parking spaces, tourists' preference for public transportation, and relatively low parking rates. The focus on ecological cocoa is a key difference from previous studies.

3. Differences in Farmers' Income Before and After the Development of Ecological Cocoa Agrotourism

The results of the *independent sample t-test* can be seen in Table 4.

Table 4 Independent sample t-test results

Revenue		F	Sig.	t	df	Sig. (2-tailed)
before	Equal variances assumed	400.020	,000	2.909	9	,017
after	Equal variances not assumed			2.105	3.000	,026

Based on Table 4, the results of the Independent Sample t-Test using SPSS show the Sig. 2-tailed values of 0.017 and 0.026, which are smaller than 0.05. This means H_0 is rejected and H_a is accepted, so it can be concluded that there is a significant difference in farmers' profits before and after the development of ecological cocoa agro-tourism. This difference is due to the increase in the source of farmers' profits, not only from the sale of agricultural products but also from the distribution of entrance ticket revenues and the sale of processed cocoa products directly to visitors. This study focuses on analyzing the potential and influence of agritourism on farmers' income before and after development, in contrast to previous studies that only analyzed the impact of income in general.

Potential Development of Ecological Cocoa Agrotourism with the Concept of Attraction, Amenity and Accessibility (3A) to Increase Farmers' Income

Tourism development is an effort to improve the quality of tourism objects and attractions through optimal management to utilize the natural wealth, cultural arts traditions, and unique heritage of a region (Rezi, 2015). Ecological cocoa agro-tourism in Tumbudadio Village has great potential to be developed as a tourist attraction. The successful development of this tourist area is highly dependent on the 3A components: attraction, accessibility, and amenities. Tourism products are a combination of attractions, facilities, and ease of access that support destinations. The analysis of 3A potential in Tumbudadio Village can be seen in Table 5.

Table 5 Potential Attractions, Amenity and Accessibility (A) in Ecological Cocoa Agrotourism in Tumbudadio Village, Tirawuta Sub-district, East Kolaka Regency in 2024

Variables	Average	Category
Attractions	39,3	High
Amenity	38,0	High
Accessibility	3,5	High

Based on Table 5, the potential of Attraction, Amenity, and Accessibility (3A) in ecological cocoa agro-tourism in Tumbudadio Village, Tirawuta Sub-district, East Kolaka Regency in 2024, shows a high category in all variables. Attraction has an average score of 39.3, reflecting the strong attractiveness of this agritourism, both in terms of environmental beauty, education, and unique experiences offered to visitors. Amenity recorded an average value of 38.0, which indicates the quality of supporting facilities such as lodging, dining, and other comforts, able to meet the needs of tourists well. Meanwhile, Accessibility with an average of 3.5 is also in the high category, indicating that this agritourism location is easy to reach and has adequate transportation infrastructure. Overall, these results indicate that ecological cocoa agro-tourism in Tumbudadio Village has great potential to continue to be developed as a leading destination.

CONCLUSION

Based on the results of the discussion in the research on the analysis of the potential development of ecological cocoa agro-tourism to increase farmers' income in Tumbudadio Village, Tirawuta Sub-district, East Kolaka Regency, it can be concluded that the source of farmers' income before the existence of ecological cocoa agro-tourism comes from cocoa farming, paddy fields, patchouli and pepper, and the source of farmers' income after the existence of ecological

cocoa agro-tourism comes from tourism activities income and there is a difference in farmers' income before and after the development of ecological cocoa agro-tourism. Farmers' income after ecological cocoa agrotourism is higher than farmers' income before ecological cocoa agrotourism.

The potential of the concept of Attraction, Amenity, Accessibility (3A) in the development of cocoa agro-tourism in Tumbudadio Village, Tirawuta Sub-district, East Kolaka Regency is very high to be developed.

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