

**AGRITOURISM DEVELOPMENT POTENTIAL AT DESA NGGORANG, KECAMATAN KOMODO, KABUPATEN MANGGARAI BARAT USING A SYSTEM DYNAMICS APPROACH
(Potensi Pengembangan Agrowisata Di Desa Nggorang Kecamatan Komodo Kabupaten Manggarai Barat Dengan Pendekatan Sistem Dinamik)**

Gabriela T.S.Hadia¹, Marthen R.Pellokila², Yacobus C.W.Siubelan³, Maximilian M.J.Kapa⁴,

^{1,2,3} Agribusiness Study Program, Faculty of Agriculture, Nusa Cendana University

Corresponding Author: gabrielahadia@gmail.com

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ABSTRACT

This research was conducted in Nggorang Village, Komodo District, Manggarai Regency for one month (January-February). The purpose of this study was to determine the influence of Labuan Bajo tourism on agro-tourism development, agro-tourism potential, commodities that can be developed as agro-tourism and agro-tourism development models in Nggorang Village, Komodo District, West Manggarai Regency and the direction of agro-tourism development in Nggorang village with a dynamic system approach. To achieve the research objectives, there are two analytical methods used, namely Multiple Linear Analysis to determine the Effect of Labuan Bajo Tourism on Agrotourism Development in Nggorang Village and Dynamic Systems to determine the Potential for Agro-tourism Development, Commodities that can be developed as Agro-tourism, Agro-tourism Development Models, Directions for Agro-tourism Development in Nggorang village.

Based on the results of the study using multiple linear regression analysis, namely the influence of Labuan Bajo tourism, namely the number of tourist objects, tourist visits, and the availability of agricultural commodities in Agrotourism Development in Nggorang Village. Meanwhile, based on the dynamic system analysis, it shows that there are links and interactions between the components of attractions, facilities, infrastructure, transportation, hospitality towards the direction of agro-tourism development in Nggorang Village. From the results of the system analysis of 5 (five) components, it is found that the facilities and transportation components have a very increasing percentage level until 2030. less than 10%, this means that the dynamic system model in this study is valid and acceptable.

Keywords: Agrotourism, Labuan Bajo Tourism, Multiple Linear Regression, System Dynamic

ABSTRAK

Penelitian ini dilaksanakan di Desa Nggorang Kecamatan Komodo Kabupaten Manggarai selama satu bulan (Januari-Februari). Tujuan dari penelitian ini adalah untuk mengetahui Pengaruh Pariwisata Labuan Bajo terhadap Pengembangan Agrowisata, Potensi Agrowisata, Komoditi yang dapat dikembangkan sebagai Agrowisata serta Model Pengembangan Agrowisata di Desa Nggorang Kecamatan Komodo Kabupaten Manggarai Barat dan Arah Pengembangan Agrowisata di Desa Nggorang Dengan Pendekatan Sistem Dinamik. Untuk mencapai tujuan penelitian ada dua metode analisis yang digunakan yaitu Analisis Linear Berganda untuk mengetahui Pengaruh Pariwisata Labuan Bajo terhadap Pengembangan Agrowisata di Desa Nggorang dan Sistem Dinamik untuk mengetahui Potensi Pengembangan Agrowisata, Komoditi yang dapat dikembangkan sebagai Agrowisata, Model Pengembangan Agrowisata, Arah Pengembangan Agrowisata di Desa Nggorang.

Berdasarkan hasil penelitian dengan menggunakan analisis regresi linear berganda yaitu terdapat Pengaruh pariwisata Labuan Bajo yaitu jumlah objek wisata, kunjungan wisatawan, serta ketersediaan komoditi pertanian dalam Pengembangan Agrowisata di Desa Nggorang. Sedangkan berdasarkan analisis sistem dinamik menunjukkan bahwa terdapat keterkaitan dan interaksi antara komponen *attractions*, *facilities*, *infrastructure*, *transportation*, *hospitality* terhadap arah pengembangan agrowisata di Desa Nggorang. Dari hasil analisis sistem terhadap 5 (lima) komponen diperoleh bahwa komponen *facilities* dan *transportation* mempunyai tingkat persentase yang sangat meningkat hingga tahun 2030. Berdasarkan hasil validasi AME-AVE terhadap data hasil analisis sistem dinamik menunjukkan bahwa antara keadaan aktual

lapangan dengan hasil simulasi nilainya adalah lebih kecil dari 10 %, hal ini berarti model sistem dinamik dalam penelitian ini valid dan dapat diterima.

Kata Kunci: Agrowisata, Pariwisata Labuan Bajo, Regresi Linear Berganda, Sistem Dinamik

INTRODUCTION

Background

For Indonesia, the national tourism sector plays an increasingly important role in line with its development and contribution through foreign exchange earnings, regional income, regional development, investment and labor absorption, and business development across Indonesia's various regions. The Ministry of Finance reported that state revenues of IDR 530.7 trillion, or 24.51% of the 2019 State Budget target of IDR 2,165.1 trillion, as of the end of April 2019 came from the tourism sector (Liputan6.com, May 16, 2019). This data places Indonesia among the 20 countries with the fastest growth in the tourism sector. The multiplier effect of tourism can accelerate economic growth and job creation. This has become the focus of attention of the President of the Republic of Indonesia, Mr. Jokowi, by forming 10 Bali in 2016, giving six points to four super priority tourism destinations, one of which is Labuan Bajo, known as Komodo Island, in 10 New Bali, namely infrastructure, connectivity access to tourist destination areas, availability of facilities at tourist locations, human resources around tourist destinations, attractions and products at tourist attractions related to markets, art markets, and culture that need to be presented (Kemenpar.go.id, July 17, 2019). Sukamdani (2012) said that to maximize tourism promotion, promotions can be carried out during the low season, creative economy, and green tourism, ecotourism/agrotourism. Agrotourism is a concept of agricultural tourism that can provide opportunities for local farmers to increase income, open business opportunities and employment opportunities for the community, while protecting and preserving natural and biological resources.

Nggorang Village is a village in Komodo District, West Manggarai Regency, located 19.4 km from Labuan Bajo City. The village covers an area of 2,107 km², most of which is covered by vast rice fields flanked by hilly drylands. Agrotourism development has great potential in Nggorang Village due to its fertile soil, year-round water availability, location on the Trans-Flores Road, terminal, and Weaving House, which sells various NTT traditional fabrics, especially Manggarai accessories such as scarves, hats, and songke motifs.

In Sugiarto (2020), the world-famous Komodo National Park provides an opportunity for agrotourism to develop well. This is in line with the medium-term development plan of West Manggarai Regency (2011-2015) where tourism is expected to develop ecotourism, agrotourism, culinary tourism, and local tourist attractions. This study aims to develop a policy-making scenario by modeling a real system for agrotourism development in Nggorang Village using a dynamic system and observing the influence of Labuan Bajo Tourism on agrotourism development. Therefore, the author is very interested in researching the Potential for Agrotourism Development in Nggorang Village, West Manggarai Regency Using a Dynamic System Approach.

RESEARCH METHOD

This research was conducted in January-February 2022 in Nggorang Village, Komodo District, West Manggarai Regency. The analytical methods used in this study were Multiple Linear Regression Analysis and a Dynamic Systems Approach. The multiple regression analysis formula is as follows:

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + e$$

Individual Parameter Significance Test (t-Test)

The t-test is used to examine the extent to which the independent variable partially explains the dependent variable. The significance level used is 0.05 ($\alpha = 0.05$). The criteria for accepting or rejecting the null hypothesis (H_0) are as follows (Ghozali, 2016):

- a. H_a is accepted, H_0 is rejected if $t \text{ count} > t \text{ table}$ or $\text{sig} < \alpha$ (0.05)
- b. H_0 is accepted, H_a is rejected if $t \text{ count} < t \text{ table}$ or $\text{sig} > \alpha$ (0.05).

Simultaneous Test (F Test)

The F-test was used to determine the influence of the variables Number of Tourist Attractions, Number of Tourist Visits, Number of Hotels, Number of Restaurants, and Availability of Commodities on agrotourism development in Nggorang Village.

The hypotheses used in this study are:

H_0 : There is no influence of the variables number of tourist attractions, number of tourist visits, number of hotels, number of restaurants, and availability of commodities on agrotourism development.

H_a : There is an influence of the variables number of tourist attractions, number of tourist visits, number of hotels, number of restaurants, and availability of commodities on agrotourism development.

The decision-making criteria are as follows (Ghozali, 2016):

- a. If $\text{Sig} > 0.05$, then H_0 is accepted and H_a is rejected, where $F \text{ count} < F \text{ table}$ at $\alpha = 5\%$.
- b. If $\text{Sig} < 0.05$, then H_0 is rejected and H_a is accepted, where $F \text{ count} > F \text{ table}$ at $\alpha = 5\%$.

The second analysis method is System Dynamics. System dynamics is a framework that focuses on systems thinking through feedback loops and takes several additional structural steps and tests them through computer simulation models (Forrester, 1994). This is also supported by research conducted by Widhianthini (2018) that system dynamics can be applied in the agricultural sector, where agritourism is agriculture-based tourism. This analysis method is used to answer the second, third, and fourth research objectives. There are five (5) variables that influence agrotourism development: Attractions, Facilities, Infrastructure, Transportation, and Hospitality (Muchlis, 2017).

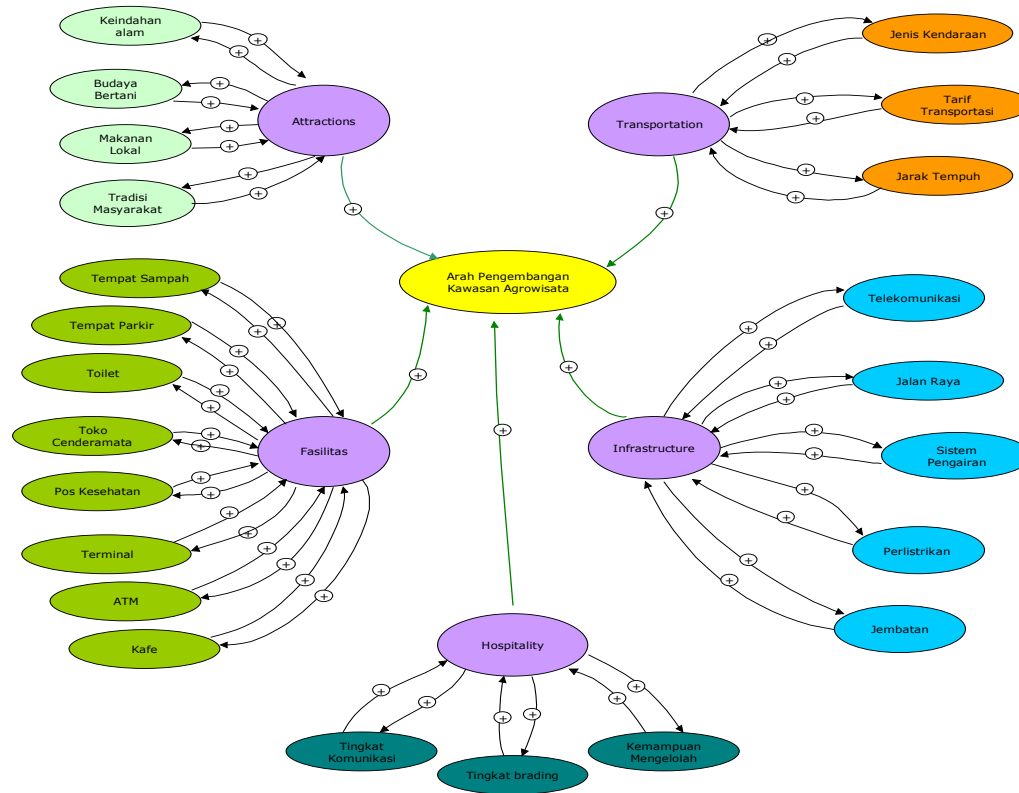


Figure 2 System Modeling / Conceptualization

Based on the Causal Loop above, it can be explained that there are 5 variables that influence the direction of agrotourism development with each indicator.

RESULTS AND DISCUSSION

The Influence of Labuan Bajo Tourism on Agrotourism Development in Nggorang Village, Komodo District, West Manggarai Regency

To determine the influence of Labuan Bajo tourism on agrotourism development in Nggorang Village, Komodo District, West Manggarai Regency, a multiple linear regression analysis was conducted using f-tests and t-tests. According to Kiwang (2020), Labuan Bajo tourism indicators that will influence agrotourism development are the number of tourist attractions, the number of tourist visits, the number of hotels, the number of restaurants, and the availability of commodities. In this study, these five indicators were identified in Nggorang Village, Komodo District, and then analyzed using a dynamic system.

Table 1. T-Test and F-Test Results

Independent Variabless	F-stat	Sig	T-stat	Sig
Number of Tourism Object (X1)	.975	.036 ^b	2.016	.041
Number of Tourims Visit (X2)	.975	.036 ^b	2.089	.031
Number of Hotel (X3)	.975	.036 ^b	.787	.454
Number of Restaurant (X4)	.975	.036 ^b	1.668	.134
Commodity Availability (X5)	.975	.036 ^b	2.369	.028

Source: Processed Primary Data

F-tabel = 0,198

t-tabel = 2.01505

Sig = 0,05

Based on the F test, it was obtained that $F_{count} 0.975 > F_{table} 0.198$ and significant F of $0.036 < 0.05$ (5%) so it can be concluded that there is a simultaneous influence of independent variables (X) consisting of Tourist Attractions, Tourist Visits, Number of Hotels, Number of Restaurants, and Availability of commodities on the dependent variable (Y) Agrotourism Development. Based on the Partial Significance Test (t Test) it can be seen that if the variables Number of Tourist Attractions, Number of Tourist Visits, and Availability of Commodities increase then agrotourism development also experiences an increase. This is based on the tcount value of these three variables > ttable with a significance value of < 0.05 while the Number of Hotels and Number of Restaurants do not have a significant effect.

Agrotourism Development Model in Nggorang Village, Komodo District, West Manggarai Regency.

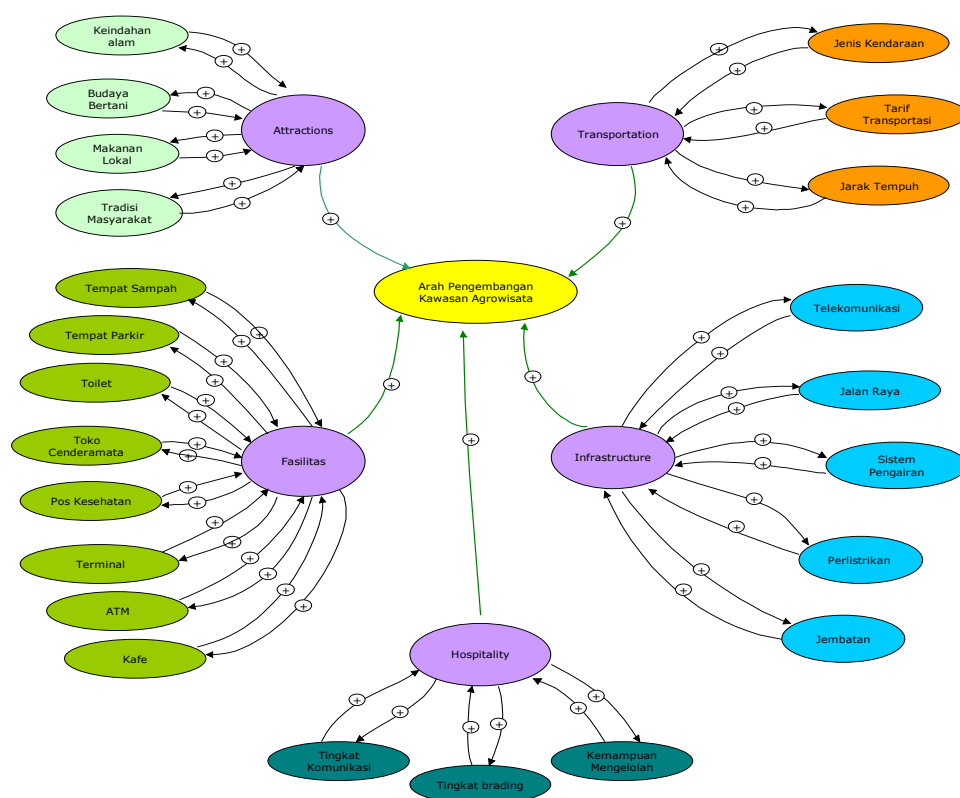


Figure 3 Directional Causal Loop Diagram

Agrotourism Development

According to Spillane (1994), five elements must be considered in developing an area into an agrotourism destination: Attractions, Facilities, Infrastructure, Transportation, and Hospitality.

The plus (+) sign indicates that each component influences the direction of agrotourism development in Nggorang Village. This is based on the responses of 25 Nggorang Village farmer respondents who agreed with agrotourism development, as well as the results of a survey conducted by researchers in Nggorang Village to adjust the respondents' responses.

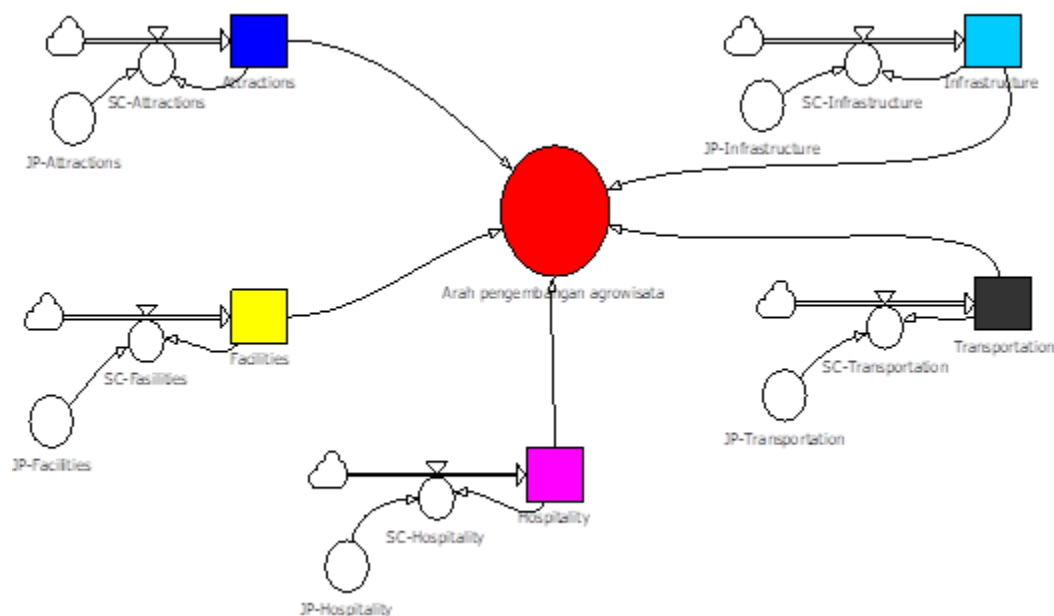


Figure 4 Flowchart of agrotourism development direction

Figure 4, obtained from processing respondent responses to a questionnaire, was created by assigning scores to respondents who agreed with the development of agrotourism in Nggorang Village.

Model validation aims to assess the objectivity of the data. This testing is based on the AME and AVE values. The test results indicate that the output of the dynamic model of the direction of agrotourism development in Nggorang Village is still valid because the AME and AVE values are below 10%. This indicates that this model is capable of simulating actual changes in the field (Siubelan, Yacobus et al., 2015).

In the model above, the relationships between each parameter can be analyzed. They are directly and indirectly interconnected. If one parameter or variable is omitted, the simulation model will become discontinuous. All data from the simulation model above is time-based.

Table 2. Table of the relationship between the components of the direction of agrotourism development and the time variable

Time	Attractions	Facilities	Infrastructure	Transportation	Hospitality
Jan 1, 2020	18.00	18.70	21.10	20.00	17.90
Jan 1, 2021	21.98	30.21	27.92	31.05	21.01
Jan 1, 2022	26.85	48.81	36.93	48.19	24.65
Jan 1, 2023	32.79	78.85	48.86	74.81	28.92
Jan 1, 2024	40.05	127.39	64.64	116.12	33.94
Jan 1, 2025	48.92	205.80	85.52	180.26	39.83
Jan 1, 2026	59.74	332.49	113.14	279.81	46.74
Jan 1, 2027	72.97	537.15	149.68	434.35	54.85
Jan 1, 2028	89.11	867.80	198.03	674.24	64.36
Jan 1, 2029	108.84	1,401.99	261.99	1,046.61	75.53
Jan 1, 2030	132.93	2,264.99	346.60	1,624.65	88.63

The data in Table 2 was obtained from a questionnaire completed by 25 respondents, who were farmers in Nggorang Village, Komodo District. The data above represents the percentage score for each answer given by the respondents. The simulation data above shows that the infrastructure and transportation components have experienced rapid growth. This is related to the designation of Labuan Bajo as a premium tourism area, particularly as the venue for the G20 Summit and the 2023 ASEAN Summit, which will undoubtedly require massive development in the infrastructure and transportation sectors.

Nggorang Village Agrotourism Development Model

Nggorang Village is a fertile area that can accommodate a variety of agricultural commodities. Based on productivity, food crops have a higher yield of 487.91 tons/ha, with cassava contributing the highest productivity. Horticultural crops rank second with a productivity of 137.44 tons/ha, with cabbage and tomatoes being the crops with the highest productivity. In addition to agricultural commodities, fisheries are another potential agrotourism sector in Nggorang Village.

In 2021, the Nggorang Fish Seed Center (BBI) produced approximately 4,000 tilapia broodstock, 150 catfish broodstock, 250 carp broodstock, 19,000 tilapia fingerlings, and 4,000-5,000 carp fingerlings. This potential also allows Nggorang Village to become a hub for fisheries agrotourism development (Patrolipost.com).

The types of agrotourism that can be developed in Nggorang Village are based on the Bogor Agricultural Institute's (2013) agrotourism types:

1. Food Crop Agrotourism
2. Horticultural Agrotourism
3. Forestry Agrotourism
4. Fisheries Agrotourism

Directions for Agrotourism Development in Nggorang Village

Based on the results of the simulation analysis of the agrotourism development direction model, several policy directions can be formulated regarding the development of the potential in Nggorang Village, Komodo District, West Manggarai Regency. These guidelines include:

1. Government support is needed to provide insight and training in developing the agricultural potential in Nggorang Village, which serves as the foundation for agrotourism development.
2. The local government needs special attention to components influencing agrotourism development, such as attractions, facilities, infrastructure, transportation, and hospitality, which have a positive influence on agrotourism development in Nggorang Village.

CONCLUSION AND RECOMMENDATION

Conclusion

Based on the research results above, it can be concluded that:

1. Labuan Bajo tourism has an influence on the development of agrotourism in Nggorang Village. The variables with a significant influence are the number of tourist attractions, tourist visits, and the availability of agricultural commodities.
2. The dynamic system analysis shows a relationship and interaction between the components of attractions, facilities, infrastructure, transportation, and hospitality, affecting the direction of agrotourism development in Nggorang Village. The system analysis of the five components revealed that the facilities and transportation components have significantly increased percentages until 2030. Furthermore, the AME-AVE validation results of the analysis data indicate that the difference between actual field conditions and simulation results is less than 10%. This indicates that the dynamic system model in this study is valid and acceptable.
3. Based on the availability of commodities in Nggorang Village, there are four types of agrotourism that can be developed as potential Nggorang Village areas: food crop agrotourism, horticultural agrotourism, forestry agrotourism, and fishery agrotourism.
4. The agrotourism development model in Nggorang Village, Komodo District can be carried out using two approaches, namely conservation-based development and community-based development.

Recommendations

1. Government support is needed to provide insight and training to develop the agricultural potential of Nggorang Village, which is the foundation for agrotourism development.
2. The local government needs to pay special attention to the components that influence agrotourism development, such as attractions, facilities, infrastructure, transportation, and hospitality, which have a positive influence on agrotourism development in Nggorang Village.
3. The government needs to create a policy limiting the import of agricultural products from outside West Manggarai to encourage farmers to pursue farming activities by ensuring a clear market.

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