

Evaluating the Sustainability of Local-Based Ecotourism in Tulungagung

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Abstract. Rural areas have various kinds of tourism potential. Unfortunately, the lack of knowledge of tourism managers about sustainable tourism often makes tourism in rural areas intersect with aspects of sustainability. The concept of Ecotourism is one solution to resolve the conflict between the two. However, an Ecotourism Site in a village can cause inequality in one of its dimensions if it is not managed properly and carefully. This study aims to examine the three dimensions of Mbalong Kawuk ecotourism sustainability in Tulungagung. The method of assessing the sustainability status of Mbalong Kawuk ecotourism used in this study is the modified Multi-Dimensional Scaling (MDS) model of RAPFISH (Rapid Appraisal for Fisheries). The dimensions of sustainability assessed in this study are the Ecological Dimension, the Economic Dimension, and the Human Resource Dimension. Furthermore, leverage analysis is carried out to determine the sensitive attributes that contribute to determining and assessing the sustainability of a dimension. The results of the analysis show that the ecological dimension, having a percentage level of sustainability of 54.46%, the economic dimension (62.39%), and the human resource dimension (64.55%) in Mbalong Kawuk Ecotourism are categorized as “quite sustainable”.

1 Introduction

One solution to solving economic and environmental problems is ecotourism. Ecotourism is a journey made by tourists to unspoiled places, which is carried out responsibly in order to take conservation actions on the environment without forgetting the welfare of the local community around them and is a process of education or learning and interpretation for each individual, who is involved in these ecotourism activities [1]. The Ministry of Culture and Tourism and WWF-Indonesia previously also defined ecotourism as a concept of sustainable tourism development which has the aim of supporting environmental conservation activities including nature and culture in it by involving the community in management so that the economic benefits obtained can be returned to the community [2, 3, 4].

One of the tourism spots which is engaged in making efforts in the field of environmental conservation and still trying to maintain the welfare of the community is Mbalong Kawuk.

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Mbalong Kawuk Tourism is a tourism site located in the Hamlet of Sumberejo Kulon Village, Ngunut District, Tulungagung Regency, East Java. This tour is part of the business unit of the Sumbermulyo Village-Owned Enterprises (Called as BUMDes in Indonesia). Mbalong Kawuk Tourism is a tour that is engaged in the preservation of rice fields combined with culinary tourism. In addition, Mbalong Kawuk has a water source that unfortunately is no longer used for the water needs of the Sumberejo Kulon community.



Fig. 1. Mbalong Kawuk Sites

Mbalong Kawuk Tourism has excellent rides in the form of various kinds of entertainment for children, as a result, this tour is included in tourism whose development is very rapid. This spot was initially developed in 2018 and then in 2020 it began to be inaugurated and has been able to generate an original village income of 60 million. In addition, facilities on the site also continue to be developed and built such as children's playground, rest area, rowing boat, place of worship, and toilets, and there are many more facilities to support tourist activities. This makes tourists more interested in coming to Mbalong Kawuk Tourism and generates Original Village Income which is increasing every year. It was recorded that in 2021 Mbalong Kawuk Tourism was visited by no less than 180 thousand people and was able to contribute Locally-Generated Revenue of 60 million.

The high number of visits and the massive development carried out raises questions about how the sustainability of the eco-tourism dimension and the use of the rice field scenery in it. Given that the definition of sustainable tourism is tourism in a natural area with the aim of admiring, understanding, studying, and enjoying nature including local culture while maintaining the integrity of the environment which means not forgetting the side of its ecological dimension [5, 6], so, to be able to see how balanced the sustainability status is in the ecological dimension and other dimensions and to determine what actions must be taken by the tourism party in the future so that tourism can be balanced and continue to be sustainable, it is necessary to conduct further research through the analysis of sustainability status [7].

2 Method

This research uses tools such as laptops to manage digital camera data for documentation, stationery for recording, and various software including Microsoft Office, Microsoft Excel, and Rappfish. Microsoft Excel is used to process scoring data in the form of numbers, and Rappfish is used to process scoring data in Microsoft Excel. The materials used in this research can be obtained from journal literature studies, previous research, and interview results. The data collected in this study is in the form of primary and secondary data. Data collection techniques in a study are very important with the main objective of obtaining valid and good data. The data taken in this study are in the form of ecological conditions, economic conditions, and human resource conditions which are types of data mixture between primary data and secondary, which can be by means of field surveys, literature studies, data collection

from BPS, and interviews. Interviews in this study were conducted with the people of Sumberejo Kulon Village, both those who exist or work in tourism and village communities who do not work or are related to tourism. Using purposive sampling, we interviewed approximately 18 people of Mbalong Kawuk Stakeholders including the head of the village, 3 government representatives, 4 persons from the village-owned enterprise representative, 5 merchants, and 5 visitors.

In this study, the analysis was carried out using a multi-dimensional scaling (MDS) approach using Rapid appraisal for fisheries (Rapfish) software that has been modified to be appropriate for the management of tourism became Rapecotourism [8]. Rapfish is a multidisciplinary and objective rapid assessment technique used to evaluate fisheries sustainability [9, 10]. Rapfish is also not intended to replace conventional stockworthiness in setting quotas [11]. Yusuf et al. [12] added that MDS-Rapfish is a useful sustainability analysis tool for determining the status or leveraged attributes on the sustainability of development or management. Sustainability analysis has a multidisciplinary science because it covers several dimensions such as ecology, economy, social, human resources and others.

The sustainability analysis procedure consists of a few short stages. The first stage is attribute review, followed by attribute identification and definition, scoring, Multidimensional Scaling Ordination, Monte Carlo analysis, Leverage analysis, and sustainability analysis [13, 14].

Table 1. Dimensions and Attributes

Dimensions	Attributes
Ecology	<ul style="list-style-type: none">• Attributes of Land Cover Area• Management Efforts for Biodiversity of Rice Fields Conservation• Management Efforts for Water Resources Conservation• Regulations for conservation• Management of Rice Fields• Regulations for the management of water resources conservation• Regulations for sanctions for violators of Waste Management
Economy	<ul style="list-style-type: none">• Financial support from the government• Financial support from the private sector / NGOs• Dependence on rice fields and water as a livelihood• Regulations regarding local labor in tourism• Local Community Employment Rate• The amount of income of the people who work there• Regulations regarding employees Number of tourist visits• Contribution to The Original Income of the Village
Human Resources	<ul style="list-style-type: none">• The average level of Education of the people who work in site• The average level of education of people who do not work in tourism• Knowledge of people who work in tourism regarding the conservation of rice fields and water• Knowledge of local communities / who do not work in tourism regarding the conservation of rice fields and water• Local Wisdom of the community on tourism• Competency / Skills Training for Employees in supporting tourism• Socialization of Education to the community on the importance of rice fields and water conservation• Socialization to tourists on the importance of rice fields and water conservation• Village category after tourism establishment

In the first stage, attributes consisting of three dimensions assessed are required to obtain the value of the tourist sustainability status index (see Table 1). Attribute identification and scoring ranges are based on previous research, government regulations, observation results,

interviews, and research findings. The range of scores used to assess varies between 0 and 4, describing the accountability of the attributes and dimensions studied. The scoring range establishes the assessment or reference point for good or bad and serves as an anchor. Rapfish or Rapecotourism and Experts' Judgment are the concepts of good and bad criteria on these dimensional attributes.

3 Results and Discussion

Based on the results of data processing on the sustainability of Mbalong Kawuk Tourism in Tulungagung Regency, East Java Province across all dimensions and attributes, the overall results in Table 2 show that Mbalong Kawuk Tourism was quite sustainable, with a sustainability index value of 59.76 percent. All dimensions also meet the requirements for a stress value less than 0.25 and an R² value close to 1, indicating that the results of this analysis are considered sufficiently accurate and scientifically reasonable. This category is divided into four sections: 0-25% is considered terrible or not sustainable, 25.01-50% is considered less sustainable, 50.01-75% is considered moderately or quite sustainable, and 75.01-100% is considered highly continuous.

Table 2. Analysis Results of MDS and Monte Carlo

Dimension	Sustainability Index (%)	Monte Carlo (%)	Delta (%)	Stress	R ²	Sustainability Status
Ecology	54.46	53.88	0.58	0.1375	0.9491	Quite Sustainable
Economy	62.39	61.71	0.68	0.1361	0.9511	Quite Sustainable
Human Resources	64.55	63.72	0.83	0.1464	0.9485	Quite Sustainable
Multi-dimensional	50.46	59.77	0.52	0.1400	0.9495	Quite Sustainable

Furthermore, the Monte Carlo results, which are random error evaluations on all dimensions, show that the difference between the sustainability and delta results is less than one. This demonstrates that the findings of tourism data processing are consistent with real-world conditions. All dimensions also meet the requirements for a stress value less than 0.25 and an R2 value close to 1, indicating that the results of this analysis are considered sufficiently accurate and scientifically reasonable. Furthermore, the Monte Carlo results, which are random error evaluations on all dimensions, show that the difference between the sustainability and delta results is less than one. This demonstrates that the findings are consistent with real-world conditions. Figure 1 concluded the sustainability index for three dimensions.

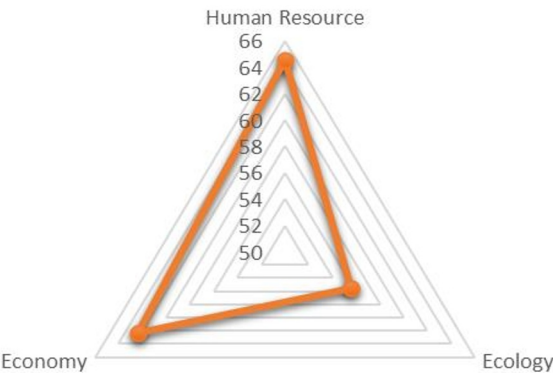


Fig. 2. Radar Chart of Sustainability Value

3.1 Dimension of Ecology

The results of data processing in Table 2, which includes each attribute of the ecological dimension of Mbalong Kawuk Tourism, show a value of 54.46%, indicating that the dimension of ecology is in the “quite sustainable” category. Furthermore, the ecological dimension has a stress value of 0.1375, an R^2 value of 0.9491, and a Monte Carlo value of 53.88%, indicating that the difference to the sustainability analysis value is less than 1%, indicating that the data processing results are consistent with the conditions observed in Mbalong Kawuk. The sustainability leverage analysis demonstrates that some of the seven variables investigated are more sensitive than others. This implies that these qualities may be altered in the future to boost the value of tourism sustainability (See Figure 2).

Rice field conservation management regulations (5.27%) and water conservation management regulations (4.76%) have the highest sensitivity. Regulations are created to bring order to the world. According to Salahudin [16], well-made laws or rules will create orderly conditions; on the other hand, if the laws are not good or do not take into account the conditions that exist in society, an imbalance will result. Despite the fact that neither the tourism nor the surrounding community has caused any damage or interfered with rice and water conservation activities, conservation regulations should have been ratified immediately, not just in the form of planning, given that Mbalong Kawuk Tourism was inaugurated in 2019. It is expected that the lack of laws governing rice field conservation and water conservation may lead to an imbalance in the sustainability of Mbalong Kawuk.

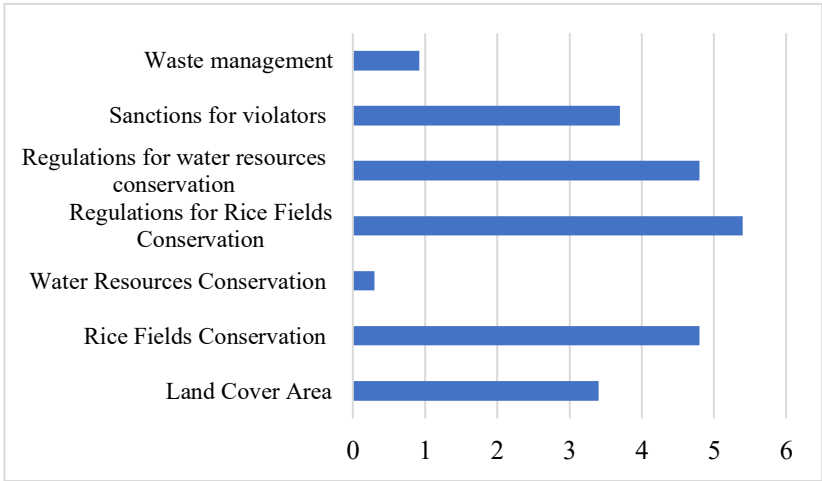


Fig. 3. Leverage Score for Ecology (%)

Rice Field (4.76% sensitivity) is the next most sensitive attribute. Mbalong Kawuk Tourism has a large rice field area. The rice fields were successfully preserved due to the collaboration of numerous other parties. The rate of extinction of biodiversity due to human intervention is 40-400 times greater than the rate of natural extinction [15]. As a result, maintaining biodiversity through preservation is critical in order to offset the existing risk of extinction and ensure the sustainability of the environment and the entire thing in it.

3.2 Dimension of Economy

The results of data processing in Table 2 that include each attribute of the Mbalong Kawuk Tourism's economic dimension show a value that was slightly higher than the ecological dimension, which is 62.79%, indicating that it is also classified as quite sustainable.

Furthermore, it has a stress value of 0.1361, an R2 value of 0.9511, and a Monte Carlo value of 61.71%, suggesting a difference to the value of sustainability or delta analysis of less than 1%, and demonstrating that the data processing findings are consistent with real-world tourism situations. Meanwhile, the Leverage analysis reveals that, of the 9 qualities examined, some attributes are more sensitive than others (See Figure 3). This suggests that these characteristics have the potential to be manipulated in the future to increase the value of tourism sustainability.

The first attribute with the highest sensitivity is the income of persons working in tourism (employees) in relation to the regional minimum wage (6.28%). The wage for employees at Mbalong Kawuk Tourism is 2 million rupiahs, according to the findings from interviews, while daily workers, who are normally rotated every day and are needed when tourism is active, such as weekends and holidays, are 110 thousand. When compared to the UMR for Tulungagung Regency based on the Governor of East Java's Decree, which is in the range of 3 million, the wage for tourist personnel is only slightly more than half and yet less than the mandated minimum wage for Tulungagung Regency, despite the fact that the Minimum Wage is set by Regulation of the Minister of Manpower and Transmigration Number 7 of 2013 to determine a reasonable wage for employees to satisfy their necessities. Furthermore, according to the concept, sustainable tourism may improve the social and economic conditions of the local community [16, 17].

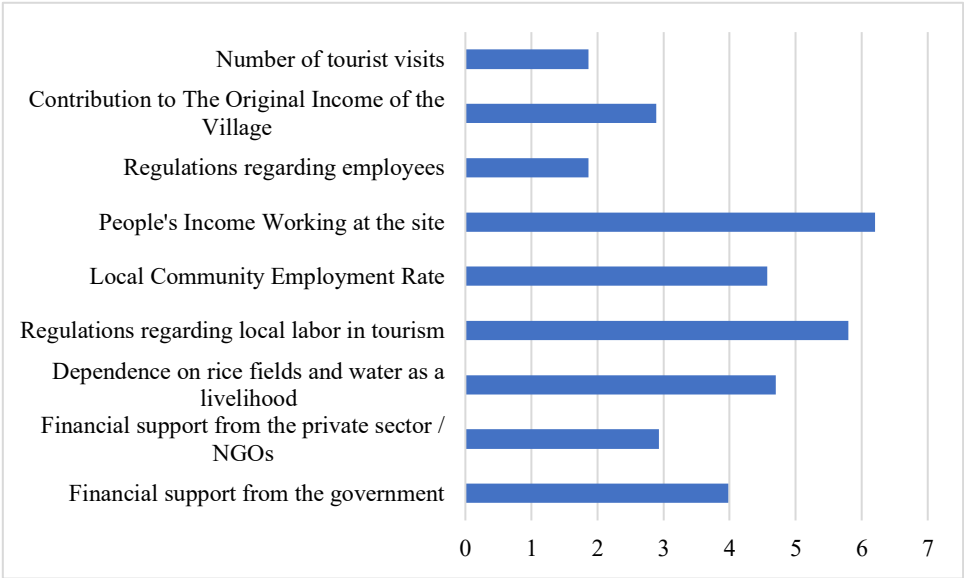


Fig. 4. Leverage Score for Economy (%)

The second most sensitive feature is legislation affecting local employees in tourism (5.70%), followed by the degree of employment of local people (4.61%). There are some intriguing things going on in Mbalong Kawuk, where laws for local community employees do not yet exist and are being developed, yet the absorption rate for local community workers here is 100%. Starting with employees, daily employees, traders, service tenants, and other jobs that fill in, locals develop unwritten regulations that anybody who works or makes a livelihood in tourism must be a Sumberejo Kulon Village resident. Nonetheless, legislation governing local labour should be enacted as quickly as possible so that tourism locations can benefit. In accordance with Minister of Home Affairs Regulation Number 33 of 2009 which aims to aid local communities by improving their revenue so that they may become drivers of regional growth.

3.3 Dimension of Human Resource

Regarding the dimension of human resources, Table 2 shows a value that is greater than the ecological dimension and the economic dimension, specifically 64.55%, indicating that it is in the quite sustainable category. Furthermore, the human resource dimension has a stress value of 0.1464, an R2 value of 0.9485, and a Monte Carlo value of 63.72%, indicating that the difference to the sustainability or delta analysis value is less than 1%, indicating that the data processing results are consistent with the real conditions in the site. In terms of the leverage analysis for sustainability, it reveals in Figure 4 that of the 9 traits examined, some are more sensitive than others. This suggests that these characteristics have the potential to be manipulated in the future to increase the value of tourism sustainability.

The first feature with the highest sensitivity is competency/skill training for tourist personnel (4.25%) (Figure 5). Employees with adequate training and competencies are more likely to comprehend and master the profession they work in [18, 19]. In practice, training by bringing resource individuals or conducting comparison studies to a tourism destination is not done on a large scale, and it is not applied by tour employees, making the desired competency mastery difficult to accomplish.

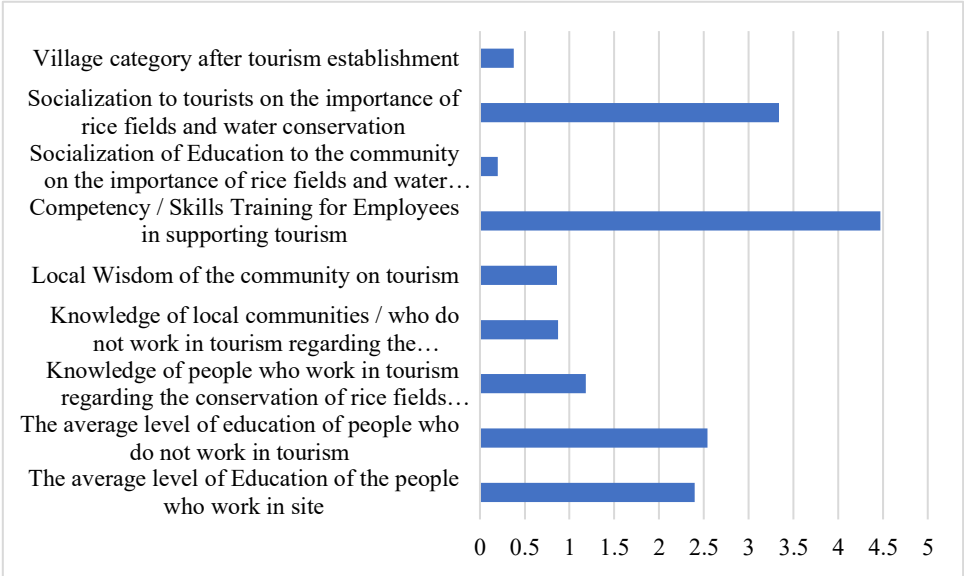


Fig. 5. Leverage Score for Human Resource (%)

The second most sensitive feature is teaching tourists about the importance of conservation (3.25%). The purpose of socialization and education is to provide learning for someone. Conservation education is a learning process that fosters a sense of care for the environment [20, 21]. In reality, despite the fact that there are currently various information boards with the varieties of rice fields and barcode scanners mentioned on them, this is still not optimum since visitors as educational targets are unaware of the message imparted. The interviews conducted revealed that the majority of tourists were unaware that the trip was a conservation area for diverse types of rice crops.

4 Conclusion

According to the findings of this study, Mbalong Kawuk tourism is generally sustainable. This is demonstrated by the three elements of tourism, all of which are quite sustainable.

Furthermore, each dimension has a Monte Carlo value, the difference between which is a sustainability value of no more than one. This shows that the results of existing tourist sustainability data processing are consistent with the actual field circumstances. The results of the Leverage analysis on these dimensions also suggest that interventions on the traits that are leverage factors for sustainability in each dimension be considered. The objective is to develop sustainable tourism that is balanced between the dimensions. The Leverage Analysis results also reveal that critical legislation linked to the conservation of rice fields and water, personnel, and local community workers must be passed soon so that there is a legal foundation for the administration of this tourism. Furthermore, the quantity of tourist staff wages must be evaluated because it is related to employee wellbeing. Employee competency training must be performed on a large scale so that it may be applied by the community for their own benefit. Finally, educational socialization about the value of paddy and water conservation must be promoted.

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