

Identify the Development of Regional Ecotourism Potential Palopo City is Geospatial Based

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ABSTRACT

The purpose of the research, identifying geographical conditions and potential tourist attractions, the social conditions of the surrounding community, the prospect of ecotourism development. Methods in this research qualitative approach with survey research with geospatial and SWOT-based geography review approach. The results of this study produced 6 thematic maps including topographic maps, geological maps, land type maps, slope slopes, tourist attraction distribution maps, and distribution maps of public facilities by containing information about the most influential geographical conditions in supporting the development of mungkajang area as an ecotourism area. Potential tourist attractions owned by the Mungkajang area there are 9 attractions scattered in the Mungkajang area by offering its attractions Latuppa area offers waterfall and bathing tours in the river stream, Kambo area offers tourism and bathing, murante area bathing waterboom and Mungkajang area offers camping and shelter attractions in addition to tourist attractions in Mungkajang area equipped with various public facilities available. in tourist attractions and those outside of tourist attractions in the Mungkajang area. The social conditions of the community include people who live in the location of the Mungkajang area have the same understanding of ecotourism, approval of the development of Mungkajang ecotourism, interest in the development of Mungkajang ecotourism. Mungkajang area development strategy as ecotourism with a geographical review approach that supports among location factors, relief factors, climate factors, biogeography factors, soil factors, water factors, geological factors, population factors, attractiveness factors, infrastructure factors, accommodation factors and facility service factors, while from the results of SWOT analysis of strategies that must be carried out to maintain the sustainability of natural wealth, involving the community, Working with government agencies, maximizing information technology, offering tourism potential different from others, providing complete facilities as needed by tourists and building good cooperation between the government, private sector and the public in the utilization of SDA that has the potential as a tourist attraction.

KEY WORDS: Identification, Ecotourism, Mungkajang, Geospatial

INTRODUCTION

Mungkajang District is one of the sub-districts in Palopo City has an area of 53.8 km², consisting of four villages namely Mungkajang Village, Murante Village, Latuppa Village, and Kambo Village. The status of the village in Mungkajang District is divided into two categories, namely urban status, namely Mungkajang Village, while the other three villages, namely Murante Village, Latuppa, and Kambo have rural status. The distance of the subdistrict capital located in Mungkajang Village is about 3 km from Palopo City.

Currently, the Mungkajang area is used as a tourist area. There are several types of tours in the Mungkajang region including natural tourism types and artificial tourism types. Total tourist attractions scattered in the Mungkajang area 5 tourist attractions are often visited by the community. This is due to the various natural phenomena that occur in this region. The Mungkajang region has a unique land span because it is dominated by mountain topography in addition there are also various rock formations in the mungkajang region and there is also a pattern of river flow that stretches along the mungkajang region plus very interesting scenery when at the top of the mountains in the Mungkajang area. The Mungkajang area also has types of plants and live animals that are in the area that have a unique or endemic and have an influence on the surrounding environment. In addition, artificial tourism around the Mungkajang area made by the community offers its attractions. This Mungkajang area also has another economic potential that is no less important, namely the value of environmental services



such as water resources, biodiversity, uniqueness of landscapes, and natural attractions. In addition to the value of economic potential in this area, the Mungkajang area also has natural potential that can be used as a source of learning, especially in the field of earth science.

Mungkajang area is very complex to be used as an ecotourism development area because this area is a nature reserve that presents the object of natural phenomenon events, where natural objects can be an ecotourism facility that almost all can be covered in this Mungkajang area.

By utilizing Geographic Information System (GIS) technology is expected to be able to analyze aspects of space in an area so that existing tourism potentials can be developed into objects and tourist attractions optimally that can attract tourists both domestically and abroad. Just like the research done by Bunruamkaew and Murayama 2011 (in Riwayatningsih. 2017) which aims to identify and prioritize the potential of ecotourism in Surat Thani Province, Thailand using GIS and AHP methods as well as research Rahayuningsih, Muntasib and Prasetyo 2015 (in Riwayatningsih. 2017) to develop spatial models of natural tourism planning based on the criteria of attractions and accessibility of tourist attractions in Bogor.

Hai-ling, Guan et.al 2011 (in Riwayatningsih. 2017), It concludes that there are strengths in integrating GIS for eco-tourism applications. GIS-based is a useful tool to help address many of the semistructured spatial decision problems often faced in the real world. To help assess the effectiveness of this application, a survey can be conducted in the future to evaluate whether the system improves the tourist experience in the field of ecotourism.

Therefore, it is important to conduct a visual study to identify geographical conditions that can support the development of ecotourism in the Mungkajang area, identifying what potential can be developed as a Tourist Attraction Object (ODTW) in the Mungkajang area and social conditions that can support the development of ecotourism in the Mungkajang area.

LIBRARY REVIEW

According to Lappo A et al, 2010 (in Rianto et al. 2014) It can be said that ecotourism is an alternative tourism concept that consistently prioritizes natural, social, and community values that allow positive interaction between the perpetrators. Ecotourism is a tourism activity that is directed to combine economic development while generating funding for resource conservation efforts as an

attraction Nadiasa M et al, 2010 (in Rianto et al, 2014). The shift in the concept of world tourism to the ecotourism model, due to the saturation of tourists to visit artificial attractions. Therefore, this opportunity should be utilized to the maximum to attract foreign tourists to visit objects based on the nature and culture of the local population of Sastria D, 2009 (in Rianto et al. 2014).

According to Law No. 4 of 2011 on Geospatial Information article 1-4, spatial is the spatial aspect of an object or event that includes its location, location, and position. Geospatial or earthly space is defined as an aspect of space that indicates the location, location, and position of an object or event that is below, on, or above the earth's surface expressed in a particular coordinate system. Geospatial data (DG) is data on the geographic location, dimensions or size, and/or characteristics of natural and/or man-made objects that are below, on, or above the earth's surface. Geospatial Information (IG) according to Law No.4 of 2011 is interpreted as DG that has been processed so that it can be used as a tool in policy formulation, decision making, and/or the implementation of activities related to the earth space.

Tourism geography is a branch of regional geography that studies a region or region on the earth's surface comprehensively, both its geographical physical aspects and its human aspects (Ahman, 2005: 1). According to Supardi (2011:62), "the words geography comes from the Greek geo (Earth) and graphene ("write or explain"). Originally geography meant "description or description" (graph) of the "earth (geo)", "geography that emphasizes the approach of environment, ecology and the relationship of life to its natural environment, and some emphasizes attention to territorial approache.

Geography as a field of science that examines natural conditions, human conditions, and the interaction between the two plays a role in efforts to contribute tourism efforts, by understanding, recognizing the characteristics of geographical elements, understanding the tourism elements of a tourism geography area is an applied science that seeks to study the geographical elements of an area for tourism purposes. Geographical elements of an area have different potentials and characteristics. Cool mountainous landscapes, white sandy sloping beaches, forests with a variety of rare plants, lakes with clean water, are the potential of an area that can be developed for tourism industry business. Other geographical elements such as location/ location, morphological conditions, population affect the possibility of developing potential tourist attractions.

According to Prahasta 2014 (in Jumardi 2021), Geographic Information Systems (GIS) or commonly called Geographic Information Systems (GIS) are computer-based systems designed to collect, manage, manipulate, analyze, and display spatial information. The purpose and purpose of using GIS are to create an effective and efficient working system and facilitate in planning, monitoring, maintaining, developing, and assisting in decision making.

The use of Geographic Information Systems (GIS) in tourism research is still very little done although GIS technology has been discussed in the tourism literature over the past decade (Gunn and Larsen, 1988) and Rimbawanti (2003) in (History of 2017). This technology has been used in research related to ecotourism planning (Bunruamkaew & Murayama, 2011), (Bunruamkaew & Murayama, 2012) and (Rahayuningsih et al., 2016) in (History 2017) assessment of visual resources and management, identification of suitable locations, and has even been used in applications related to tourism marketing. Tourism is an activity that relies heavily on environmental resources so that proper planning is needed in its management. Geographic Information System (GIS) technology can be applied to achieve sustainable tourism development.

According to Suratmo (1990) in (Andi Jumardi. 2016), the benefits of community participation in a development plan are as follows:

- a. The public is informed about the development plans in their area.
- b. Society will be enhanced by its knowledge of environmental issues, development, and the relationship between the two.
- c. The public can convey information and opinions or perceptions to the government, especially the people in the development site that are directly affected.
- d. Be able to avoid conflict between the parties concerned.
- e. The community will be able to prepare itself to receive benefits that will be enjoyed and avoid its negative impact.
- f. Will increase the attention of relevant government agencies to the local community.

Following the concept of tourism development that relies

on the development of local communities (community-based tourism), the development of tourism activities is expected to be able to create jobs and opportunities to strive and be directed to accommodate local community empowerment efforts. Based on the concept, the development of tourism activities is expected to be able to improve the economic well-being of local communities (Siswanto, 2003) (Andi Jumardi. 2016).

METHOD

This research uses a qualitative approach involving survey research techniques.

- a. Qualitative is one of the research procedures that utilize descriptive data in conducting explanations and analysis related to phenomena and events in the Mungkajang area.
- b. Surveyed in this study, researchers conducted a collection or investigation held to obtain facts from the symptoms in the field and look for factual information on the extent to which the development of ecotourism in the Mungkajang area.

The type of data used in this study there are 2, namely primary data and under data.

- a. Primary data is obtained by conducting surveys to research sites, recording phenomena and geographical conditions such as geological conditions, hydrological conditions, geomorphological conditions, and biogeographic conditions and potential in the Mungkajang area that can be used as a tourist attraction and document objects in the Mungkajang area.
- b. Secondary data is obtained by conducting direct observations and interviewing several related parties, such as the Tourism and Culture Office of Palopo City, the management of tourist attractions in the Mungkajang area and the people who live in the Mungkajang area, and the social conditions of the people in the Mungkajang area to support the development of ecotourism areas in the Mungkajang area.

Broadly speaking, the process in this study is divided into four stages, namely:

- a. Preparation Stage

At the preparatory stage includes the identification of problems with existing study objects in the Mungkajang area and literature studies related to the scope of the study.

b. Data Retrieval Process

At the stage of the data retrieval process in the form of spatial and non-spatial data such as the coordinate point of the location of tourist attractions in the Mungkajang area, geographical conditions in the Mungkajang area and potential attractions that can be developed as ecotourism. In taking data using heking techniques by searching the Mungkajang area to look for phenomena that can become a tourist attraction by using GPS for trecing and collecting koordiant data in addition to using cameras to take location photos, and other non-spatial data taken through observations and interviews with the service or community and the social conditions of the surrounding community in support of the development of ecotourism in the Mungkajang area.

c. Data processing process

At the stage of the data management process, namely by analyzing and inputting data on geographical conditions owned and coordinates of tourist sites and facilities and phenomena that can be used as a tourist attraction to ArcGIS 10.2 software, then create in a database that will be equipped with non-spatial data such as geological type, soil type, topography and slope and name, types, tourist attractions and public facilities in the Mungkajang area.

d. Data visualization process

At the stage of data visualization, after obtaining data on geographical conditions and coordinate points of each tourist attraction location, public facilities, and databases, then doing the map layout process, namely by displaying the geographical information owned and the location point of tourist attractions and public facilities owned on the map to show the geographical conditions of the Mungkajang area and the position of the location on the map so that the public in general and tourists, in particular, can easily identify geographical conditions and locations or objects in the Mungkajang area.

RESULTS AND DISCUSSIONS

Geographical Conditions That Can Support the Development of Ecotourism Mungkajang Area

Geographical conditions have a very large influence in efforts to develop the Mungkajang area as ecotourism. The geographical conditions in the Mungkajang area are:

Table. 1 Geographical and Krakteristic Conditions of Mungkajang Region

NO	GEOGRAPHICAL CONDITIONS	CRUSTY GEOGRAPHICAL CONDITIONS OF MUNGKAJANG REGION
1	Topographic Conditions, Slope slopes and Morphology of Mungkajang Area	The classification of slope slopes owned by the Mungkajang area includes 0-2% flat, 2-15% low slope, 15-25% moderate slope, 25-40% high slope, and > 40% steep. The establishment of lowland land, hills, and mountains.
2	Geological Conditions of Mungkajang Region	Granite intrusion, alluvial clay, Malian rock, and intermediate lava rock.
3	Land Condition of Mungkajang Area	Type of latosol soil. This type of soil falls into the category of latosol complex and latosol association.
4	Hydrological Conditions of Mungkajang Region	The rivers have a different type is type of permanent river, namely the river that flows profusely in the rainy season and the flow remains throughout the year, the river includes the Latuupa river and the Kambo river.
5	Climate Conditions of Mungkajang Region	Mungkajang with a maximum height of 1700-1900 meters and a minimum height of 200 meters above sea level, so that the average air temperature in the Mungkajang area ranges from 25.5 degrees to 29.7 degrees Celsius, and decreases by 0.6 degrees Celsius each increase of up to 85% depending on the length of solar elevation that varies between 5.2 to 8.5 hours per day. The tropical climate is wet, with rainfall conditions varying between

		500-1000 mm / year while for upstream areas of rivers in mountainous parts ranging from 1000-2000 mm / year.
6	Biogeography Conditions of Mungkajang Region	Flora that grows on the ground, among others, pepper, rambutan, langsung, durian, uru wood, lewasa tree, betel tree, guava monkey, vanilla, cloves, and cocoa. Fauna of the type of butterflies that fly around the area of Latuppa and Siguntu waterfalls.

Source: 2021 field survey results

Potential that Can Support the Development of Ecotourism Mungkajang Area as a Tourist Attraction

Tourism potential is any form of something owned by tourist destinations that can be a tourist attraction so that people want to visit these tourist attractions. Mungkajang area has natural attractions and artificial attractions scattered in the Mungkajang area and has the uniqueness and attraction of each and various facilities around the attractions including:

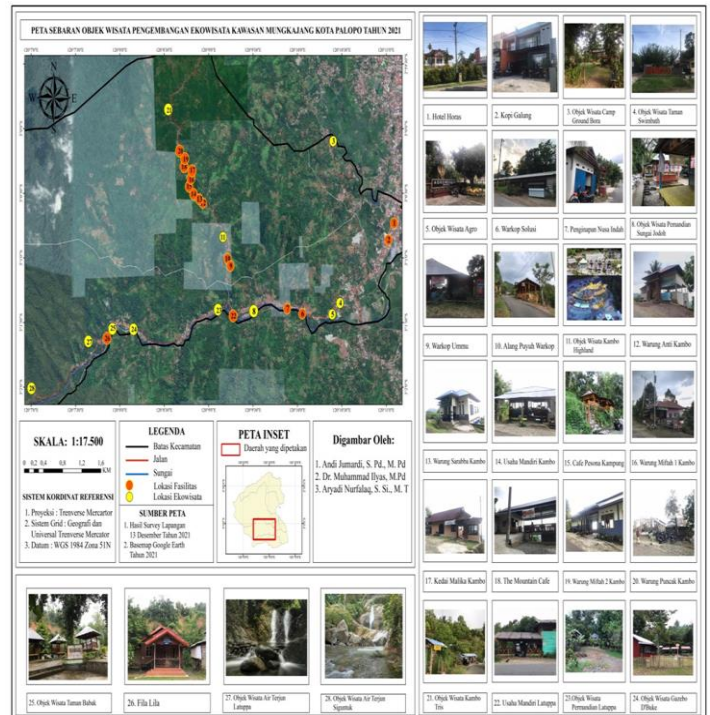
Table 2. Name of distribution of attraction attractions and public facilities owned by Mungkajang Area

No	Name of Attraction	Status of Attractions	Coordinates
1	Kambo Highland Park/Kambo Village Attractions	Made/Private Attractions	3° 0'52.17"S and 120° 9'11.26"T.
2	Jodoh River/Murante Village Attractions	Made/Private Attractions	3° 1'27.16"S and 120° 9'28.86"T,
3	Latuppa Waterfall Attractions/Latuppa Village	Nature/government attractions	03°01'32,10"S and 120°07'36,75"T
4	Siguntu Waterfall Attractions/L	Nature/government attractions	3° 1'56.55"S and 120°6'58.28"T

	atuppa Village		
5	Agro/Murante Village Attractions	Made/Private Attractions	3° 1'27.65"S and 120°10'27.30"T
6	Bora Bathing/Murante Village Attractions	Made/Private Attractions	3° 0'5.37"S and 120°10'17.24"T
7	Babak Latuppa Park/Latuppa Village Attractions	Made/Private Attractions	3° 1'33.92"S and 120° 7'56.03"T.
8	Camp Ground Bora/Mungkajang Village Attractions	Objek Made/Private Attractions	3° 0'6.74"S and 120°10'25.05"T.
9	Swimbath Latuppa Park/Latuppa Village Attractions	Nature/government attractions	3° 1'21.31"S and 120°10'29.95"T

Source: Field survey results, 2021

Figure 1. Map of distribution of tourist attractions and public facilities around Mungkajang area attractions



Source: Spatial data processed results, 2021

Distribution of Public Facilities that Can Support The Development of Ecotourism Mungkajang Area

In the development of the Mungkanjang area into an ecotourism area, of course, public facilities can support the development of the Mungkajang area into an ecotourism area. Based on the results of surveys in the field that in the area of Mungkajang there are various public facilities spread across 4 (four) villages that can be utilized by the community including worship facilities, filing advice, educational facilities, health facilities and there are facilities for filling Pertamina's Fuel Oil (BBM).

Figure 2. Development general facility distribution map Ecotourism Mungkajang area



Source: Spatial data processed results, 2021

Social Conditions of Communities Around Mungkajang Area

The level of community education around the Mungkajang area is mostly SLTA graduates or equivalent, which is as much as 56 percent of 30 respondents. This indicates that the level of education of respondents is quite good. The level of education can affect the development of a region, with higher education the process of

developing a region will be faster, in this case, is the development of the Mungkajang area as ecotourism compared to those who are poorly educated tend to be difficult to accept technological developments from outside so that the development of a region will be slow.

The attitude of community acceptance can be concluded that from the level of understanding of ecotourism or tourism the average community has been heard about ecotourism or tourism, this is due to the existence of tourist attractions scattered in the Mungkajang area. From the level of approval of the development plan on average people agree on the plan to switch the function of the Mungkajang area into a tourist destination because it can bring more visitors. From the level of interest involved in the development of the Mungkajang area, the average community wants to be interested in getting involved because the community can take advantage of the development of the Mungkajang area.

People who do not understand ecotourism, do not agree with the development plan and are less interested in development due to lack of socialization of programs or conservation extensions continuously to the community. This needs to be done so that the public knows and can participate in the development activities carried out. In addition, this socialization activity can increase people's understanding of the development of the Mungkajang area into ecotourism.

Prospects for Ecotourism Development of Mungkanjang Area

1. Internal Factor Analysis

Strategic analysis of internal factors includes factors that support strengths and weaknesses. The total strength factor score is 3.5. The largest score for the strength factor comes from the potential geographical condition factor, the physical appearance of each tourist attraction in the attractive Mungkajang area, the appearance of the attraction that every tourist attraction in Kawasan Mungkajang has that is interesting, interesting tourist attractions and the uniqueness of the attractive panorama that is 0.4, 0.4, 0.4 and 0.4 which are some of the factors offered as attractions for tourists. The total score of constraint/weakness factor is -1.1 which is the biggest obstacle or weakness in the development of the Mungkajang area, namely uneven morphology and road conditions to Siguntu tourist attractions that are not adequate.

2. External Factor Analysis

Strategic analysis of external factors includes external factors including factors that support opportunities and threats. The total factor score for the analysis of opportunities is 1.5 which is the largest opportunity in the development of the Mungkajang area, namely Palopo City which is a sago producing area in addition to the location factor of tourist attractions in Kawasan Mungkajang which is the largest strategic opportunity to develop this Mungkajang area with a score of 0.6 and 0.3, respectively. It is expected that the lack of similar tourist attractions in South Sulawesi can increase the level of tourist visits. Threat factors that must be considered are the existence of similar tourist attractions near the Mungkajang Area, offers of natural and artificial attractions elsewhere, the lack of support from the local government, and the lack of tourism promotions carried out by the local government with a score of -0.74.

3. Conservation Efforts

Based on its understanding, ecotourism is a tourist activity that contributes to conservation to the intended area. Various conservation efforts have been carried out by the Government to protect the ecosystem of the Mungkajang area, such as the establishment of various protected forests, as well as cultural reserves. However, this has not shown satisfactory results due to various interests. This is evidenced by the amount of damage done to protected areas that have been determined. Damage usually occurs such as environmental damage that is commonly done by the community and butterfly hunting that is commonly done by the people of the Mungkajang area. In addition to conservation efforts in the form of institutional protection. The government should protect ecosystems, flora, and fauna in the form of legislation and government regulations, perhaps even in the form of local regulations. Some government legislation and regulations include the protection of ecosystems and various types of faunal flora, among others, namely: Indonesian Law No. 41 of 1999 on Forestry Law No. 5 of 1990 on conservation of biological natural resources and ecosystems and all decisions of the Minister of Agriculture concerning the protection of fauna flora types, so that the environment of the Mungkajang area is maintained to its natural, especially in the Mungkajang area.

4. Community Participation in Tourism Development

Increased tourist visits have consequences for changes in natural and cultural resources that are the attraction of a

tourist area. To overcome these problems need to be raised and increased community participation in tourism development. In the sense of including the community in the process and efforts of tourism development, so that the sense of belonging and responsibility grows in the community towards tourist attractions in the area. With this sense of belonging and responsibility, the community will participate in caring for and maintaining the environmental sustainability of the Mungkajang area. The participation of local residents in maintaining natural and cultural resources is a large contribution and has the potential to become a tourist attraction. This can be seen from the daily life of people around the Mungkajang area who are environmentally conscious because they know that the Mungkajang area has the potential to be made one of the tourist attractions and has a high value.

Given the huge tourism potential in the Mungkajang area as a national development asset, we need to think together about how to plan the development of the tourist attraction for the welfare of the community, especially the people who live around the Mungkajang area. For this reason, the involvement of local communities must be part of a development plan that considers the interrelationship of all factors that affect the success of the development and management of the Mungkajang area for tourist destinations.

CONCLUSION

Based on the results of the research that has been done, it can be concluded as follows:

1. Geographical conditions that support the development of the Mungkajang Area as an ecotourism area. Where geographical conditions that support the development of ecotourism Mungkajang area include, the geological condition of the Mungkajang area, morphological form or relief/topography of the Mungkajang area, the condition of hydrology in the Mungkajang area, the condition of the land owned by the Mungkajang area and the type of biogeography in the Mungkajang area.
2. The potential that exists in the Mungkajang area that can be developed as a Tourist Attraction and Attraction (ODTW) includes 2 (two) types of tourist attractions including natural attractions and artificial attractions scattered in the Mungkajang area, the number of tourist attractions there are 9 (nine) tourist attractions that have their attractions, including having a panorama and a cool atmosphere because it is in the area of the hills, especially in the Kambo and Latuppa regions, It has

swampland, waterfall bathing, waterboom, swimming pool and Latuppa river which is used as a tourist location including Jodoh River attractions and Babak park attractions. In addition to the attractions owned by tourist attractions scattered in the Mungkajang area, this area is also supported by various public facilities that can be utilized by visitors and the public in addition to the many public facilities closest to the tourist attractions in the Mungkajang area including hotels, villas and cafes and restaurants.

3. In terms of the social condition of the Mungkajang area around the Mungkajang area can be concluded that the community around the Mungkajang area is very enthusiastic about the development of the Mungkajang area and supports the development of the Mungkajang area into a tourist destination or ecotourism Mungkajang because it can provide benefits and benefits to the surrounding community.
4. Prospects for the development of ecotourism in the Mungkajang area of Palopo City, based on the results of data analysis using the approach to the role of geographical factors and SWOT methods, it can be seen that the Mungkajang area is in a very strong position and has the opportunity to be developed. Where the strategy recommendations offered are progressive, namely by utilizing all the power to seize and take advantage of the greatest opportunity.

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