Applying Spatial Analysis in Supporting Tourism Planning Concept of Jepara Regency, Indonesia

H. B. Wijaya 1 and B. Pigawati 1

1 Department of Urban and Regional Planning, Diponegoro University, Indonesia

Email: holibinawijaya@yahoo.com

Abstract. This paper aims to analyze the decision-making process in determining the location of the tourism development center in Jepara district through spatial analysis using GIS. The method applied is map superimpose from several categories such as slope, rainfall, existing land use, and soil type. Another analysis carried out is network analysis with GIS to determine the level of accessibility of tourism locations. From the results of this analysis, alternative tourist locations were obtained as one of the supporting tourism development plans in Jepara Regency. With this result, it is easier for the government to determine the priority of development locations with visualization and location accuracy in accordance with tourism area standards.

Keywords: spatial analysis, GIS, tourism planning, Jepara Regency

1. Introduction

Planning concept of special area with a cultural tourism function need several components to support [1–4]. This is important to support the allocation of assets and physical buildings in spaces that are considered appropriate and according to their designation. However, matters such as technical and physical environment need to be identified before carrying out the realization of the Tourism Park development [5,6]. By referring to the standard of spatial planning, all forms of placement and allocation of space need to consider land suitability and spatial planning [7–11]. This is important to realize the concept of sustainable tourism and be able to bring progress to the region [12,13].

Jepara Tourism Park is one of the tourist destinations of Jepara Regency. So, there is a need for tourism development, namely with the concept of attraction planning, organizing actors, planning for infrastructure, and increasing community carrying capacity. According to the Law of the Republic of Indonesia number 10 of 2009 concerning tourism, it can be explained that a tourist destination is an area that has tourist attractions, public facilities, tourism facilities, accessibility, and people who can realize tourism.

Tourist destinations must have four components, namely attraction, access, availability of facilities (amenities), and tourism organization [14]. These four factors are related to each other. As a form of efforts to realize sustainability, it is necessary to in-depth analysis of several aspects including aspects of spatial planning, access, tourism attractions, amenity (comfort and accommodation), and ancillary (organizational) aspects. These aspects are very important to analyze because they involve the continuity of a tourism area. A good and thought-provoking attraction will become income and revenue for the region. Good access will open opportunities for affordability to tourism areas and regional
development opportunities. Amenity and ancillary aspects are also important in supporting the sustainability of the tourism area, especially in terms of visitor comfort and service to visitors.

By looking at these aspects, when a tourism area, especially cultural tourism is built, it is better to think about these things to be able to ensure that this tourism area will be sustainable. Therefore, a study was conducted on how the location of the Cultural Park tourism area will be located and be able to provide certainty of regional income and provide benefits that can support regional development.

This is very necessary because it is an effort to realize sustainable tourism. The purpose of this study is to help the government of Jepara to determine the location of Jepara Tourism Park. Jepara Tourism Park is one of the tourist destinations that is planned to be built in East Suwawal Village, Pakisaji District, Jepara Regency. This location is an existing plantation of cassava and several other strong root crops. At the beginning of tourism, of course, there needs to be tourism development, one of which is tourism development, namely with the concept of attraction planning, planning of facilities and infrastructure, organizing, and carrying capacity of the community.

2. Data and Methods

2.1 Study area

This study took Jepara Regency as the study location with several districts as the focus of the study. From the district then focus on more detailed locations as shown in the illustration in Figure 1.

![Figure 1. Study Area](image)

2.2 Methods

The suitability of the cultural park location obtained by using land suitability analysis. There are 3 determinant physical variables in conducting land suitability analysis; slope, rainfall and soil type (see Figure 2). Variables and the location of the planned cultural park were analyzed using the overlay tool on QGIS 3.16 [7]. The results of the overlay will determine the suitability of the planned location of the cultural park in Jepara Regency.
3. Results and Discussion

If viewed based on the map of the location of the planned Jepara Tourism Park, the existing land use is dominated by plantations, irrigated rice fields, dry fields, and the rest are settlements. In addition, right to the south of the planned location of the Jepara Tourism Park, there is a body of water which is a collection of water that is below the ground surface. The soil surface in this location is a natural absorption medium, in the form of plantations, irrigated rice fields, dry fields (Figure 3).
Groundwater recharge is an infiltration component that enters the groundwater body so that development on it will have a significant impact on water absorption and buffer function (Figure 3.) Therefore, it can be concluded that if there is development in this location in the long term without considering the original land use function, it will result in disruption of the function of the water catchment area. For example, it results in the loss of several groundwater sources, and a decrease in groundwater quality. So there needs to be wise and appropriate considerations in the planning process [7,12].

A buffer area is an area that can function as both protection and cultivation, which is the boundary between a protected area and a cultivated area, such as limited production forest, plantations (hardwoods), mixed gardens and other similar areas, so that it can be said that this area is vulnerable. The permitted land use is community plantation forest or gardens with very minimal land management. Therefore, if this buffer area is used for land conversion as a Jepara Tourism Park, it will result in a decrease in abiotic quality caused by air pollution originating from activities in the cultural park, transportation; environmental degradation caused by soil pollution due to waste; degradation of land quality due to development.

Based on the rainfall map (Figure 4), it can be seen that the planned location of the cultural park is in the high rainfall category, namely 3000 mm - 3500 mm. The prediction of high rainfall has the potential for heavy rains of extreme weather that will have an impact on hydrometeorological disasters such as strong winds, lightning, and floods.

The slope map (Figure 5) shows that the condition of the land in the cultural park location is sloping, the land can be used for settlement and agricultural activities. However, if there is an error in management, erosion can occur. According to the Decree of the Minister of Agriculture Number 837/Kpts/Um/11/1980 concerning Criteria and Procedures for Determination of Protected Forests, this type of red litosol soil (Figure 6) is a type of soil that is very sensitive to erosion, so it is necessary to have land management in accordance with its designation.
Figure 5. Slope Analysis (Analysis, 2020)

Figure 6. Soil Condition Analysis (Analysis, 2020)

3.1 Land Suitability Analysis

Land suitability analysis (Figure 7) is carried out to assess land suitability on land that has land capability class. Based on the results of physical analysis, rainfall, topography, and soil type, it can be seen that the land suitability of the planned location of the Jepara Tourism Park is for a buffer zone. This is indicated by the point map which is dominated by pink. The buffer area should not be designated for built-up land because the land's capacity does not support settlement activities on it [8]. If there is land use that is not in accordance with the function of the area, it can have a negative impact.
3.2 Regional Economic in Tourism

In general, tourism in Jepara Regency has not become the main sector in regional income. This is evident from some of the data that was opened, that the tourism sector only contributed 2.7 billion of all regional income. When viewed from the economic aspect, the character of Jepara tourism is coastal and waters. This is evident from the types of tourism objects that provide the highest income, namely Kartini Beach and Samudra Beach (Table 1).

3.2.1 Attraction Analysis

Tourist attraction is art, culture, historical heritage, tradition, natural wealth, or entertainment, which is a tourist attraction in a tourist destination. Based on the Jepara Tourism Park plan, this tourist attraction is a cultural tourism cluster that provides artificial tourist attractions derived from the arts of Jepara artists. For example, the art of wayang, Javanese dances that will be performed on an open stage; exhibition of Jepara painting or carving at the Gallery Building; and several other arts. Even though from the point of view around the location, the majority of existing tours are natural tourism clusters with natural attractions, namely Kelapa Park tourism with beautiful views of coconut plantations, East Suwawal Agrotechno Park, "Pandan Arum" Integrated Agricultural Area, Kampoeng Bamboo "Tuksongo" and Bumi Areas. Adi Camp. Based on the differences in the types of planned tourism clusters, will the cultural tourism that will be presented be able to attract local and foreign tourists. Based on the existing conditions, the existing tourism clusters are natural tourism clusters.
Table 1. Regional Income of Jepara

| No. | Tourism Object                          | Visitor (1) | Income (2)  |
|-----|----------------------------------------|-------------|-------------|
| 1.  | Museum Kartini/Kartini Museum          | 10,825      | 8,012,000   |
| 2.  | Pantai Kartini/Kartini Beach           | 232,951     | 847,876,000 |
| 3.  | Pantai Tirta Samudra                   | 305,902     | 1,148,132,564 |
| 4.  | Makam dan Masjid Mantingan/ Mantingan Grave and Mosque | 293,634 | - |
| 5.  | Benteng Portugis/Portuguese Fortress   | 112,300     | 166,575,750 |
| 6.  | Pulau Panjang/Panjang Island           | 43,650      | 24,001,000  |
| 7.  | Wana Wisata Sreni Indah / Forest Tourism of Beautiful Sreni | - | - |
| 8.  | Goa Tritip/Tritip Cave                 | -           | -           |
| 9.  | Taman Nasional Laut Karimunjawa / Sea National Park of Karimunjawa | 92,115 | 80,050,000 |
| 10. | Sonder Kalinyamat                     | 33,532      | -           |
| 11. | Air Terjun Songgo Langit/ Songgo Langit Water Fall | 9,106 | - |
| 12. | Monumen Ari-ari Kartini/ Monumen of RA Kartini Afterbirth | 10,321 | - |
| 13. | Akuarium Kura Kura                    | 54,155      | 488,689,000 |
| 14. | Wisata Kuliner Pungkruk/ Culinary Tourism of Pungkruk | 6,948 | - |
|     | Jepara                                 | 1,205,439   | 2,763,336,314 |

Source: Analysis, 2020

3.2.2 Accessibility Analysis

Access is the level of ease, convenience, and security to achieve the goal. This level of convenience, comfort, and security can be created by the availability of transportation facilities and infrastructure, the dimensions of the road according to the road class, the arrangement of the shape of the road network, and circulation. In general, access to the availability of roads to get to the design area is quite good. This is supported by its location on Jalan Collector, Jl. Raya Kawak-Lb. Ease of access within the area is relatively low due to the unavailability of public transportation and an unplanned arrangement. In addition, there is a need for road maintenance, additional road facilities (road markings, road signs). The location point to the main road can be reached with a distance of 5,981 km via collector roads whose asphalt conditions are very good, can be passed by private vehicles and public transportation. But for now, it can only be reached by private vehicle only. Meanwhile, the location point to the district capital can be reached by a distance of 11,113 km (Figure 8 and 9). With the width of the existing road, it is necessary to also prepare for strengthening and adding access through widening the road so that access to the Cultural Park is easier with various modes of transportation.
Figure 8. Accessibility Analysis with network analysis in GIS (Analysis, 2020)

Based on the master plan above, the facilities that will be provided at that location are the art building and gallery building which is a place for artists to show their artistic results; the art market is a place for buying and selling which is provided so that artists can sell their work and tourists can buy and take them home as souvenirs; parking is a much needed place to park tourists’ vehicles safely; the open stage is a place for performing arts, from here tourists can enjoy art offerings that will be displayed by artists; forest as an open space for tourists to unwind; places of worship are provided for tourists, artists, and the surrounding community to worship according to their beliefs; and several other supports such as herbal gardens, catfish gardens, toilets, sutet, batik gardens, and security posts. Globally, it can be concluded that the actual supporting facilities provided are quite complete, but it would be nice to add lodging places for distant tourists so that they can stay and enjoy the arts at the tourist attraction for more than one day. And it should be understood that all the facilities that will be planned must have regular maintenance to minimize damage.

Figure 9. Masterplan of Tourism Resort in Jepara (Analysis, 2020)
3.2.3 Amenity Aspect Analysis

Amenity and Ancillary is an additional service, namely the availability of an organization to manage the Jepara Tourism Park tourist attraction. In this planning process, it is coordinated by the Jepara Culture and Tourism Office by cooperating with consultants to create a master plan for the Jepara Tourism Park, in addition to planning the master plan itself has been discussed with artists. However, there is no organization that will manage the Jepara Tourism Park.

4. Conclusion

Based on the map of the location of the planned Jepara Tourism Park, the existing land use is dominated by plantations, irrigated rice fields, dry fields, and the rest is settlements. In addition, right to the south of the planned location of the Jepara Tourism Park, there is a body of water which is a collection of water that is below the ground surface. So that there needs to be wise and appropriate considerations in the planning process. The suitability of the land for the planned location of the Jepara Tourism Park is for a buffer zone. This is indicated by the point map which is dominated by pink. The buffer area should not be designated for built-up land because the land capacity does not support settlement activities on it. If there is land use that is not in accordance with the function of the area, it can have a negative impact.

Ease of access within the area is relatively low due to the unavailability of public transportation and an unplanned arrangement. In addition, there is a need for road maintenance, additional road facilities (road markings, road signs). Based on the master plan, the facilities that will be provided at that location are the art building and gallery building; art market; parking; open stage; Forest; worship place; and several other supports such as herbal gardens, catfish gardens, toilets, suutet, batik gardens, and security posts. This planning process is coordinated by the Department of Culture and Tourism of Jepara by cooperating with consultants to create a master plan for the Jepara Tourism Park, in addition to planning the master plan itself has been discussed with artists. However, there is no organization that will manage the Jepara Tourism Park.

5. Acknowledgements

This research was financially supported by The Faculty of Engineering, Diponegoro University, Indonesia through Strategic Research Grant 2021.

6. References

[1] Hermawan A and Syahbana J 2015 Pemetaan Perkembangan Perhotelan di Pusat Perdagangan dan Jasa Kota Semarang dengan Sistem Informasi Geografis Geoplanning J. Geomatics Plan. 2 38–50
[2] Yang Y, Wong K K F and Wang T 2012 How do hotels choose their location? Evidence from hotels in Beijing Int. J. Hosp. Manag. 31 675–85
[3] Assaf A G, Josiassen A and Agbola F W 2015 Attracting international hotels: Locational factors that matter most Tour. Manag. 47 329–40
[4] Taylor F 2020 Phi Phi Revisited. A Continuation of Disaster Vulnerability? Tour. Plan. Dev. 18 111–9
[5] Salmiatin S, Basuni S and Sunarminto T 2017 A Study on Tourism Development in the Rawa Aopa Watumohai National Park South Konawe District, Southeast Sulawesi Province Media Konserv.
[6] Zhang Y, Li X (Robert) and Su Q 2017 Does spatial layout matter to theme park tourism carrying capacity? Tour. Manag. 61 82–95
[7] Sejati A W, Buchori I, Kurniawati S, Brana Y C and Fariha T I 2020 Quantifying the impact of industrialization on blue carbon storage in the coastal area of Metropolitan Semarang, Indonesia Appl. Geogr. 124 102319
[8] Rudiarto I, Rahmawati I and Sejati A W 2020 Land Degradation and Community
Resilience in Rural Mountain Area of Java, Indonesia *Gully Erosion Studies from India and Surrounding Regions* ed P K Shit (Springer Nature Switzerland AG) pp 449–60

[9] Sejati A W, Buchori I, Rudiarto I, Silver C and Sulistyo K 2020 Open-Source WEB GIS Framework in Monitoring Urban Land Use Planning: Participatory Solutions for Developing Countries *J. Urban Reg. Anal.* **12** 19–33

[10] Buchori I, Pangi P, Pramitasari A, Basuki Y and Sejati A W 2020 Urban Expansion and Welfare Change in a Medium-sized Suburban City: Surakarta, Indonesia *Environ. Urban. ASIA* **11** 78–101

[11] Buchori I, Rahmayana L, Pangi P, Pramitasari A, Sejati A W, Basuki Y and Bramiana C N 2021 In situ urbanization-driven industrial activities: the Pringapus enclave on the rural-urban fringe of Semarang Metropolitan Region, Indonesia *Int. J. Urban Sci.*

[12] Buchori I and Tanjung K 2013 Developing a Simulation Model for Predicting Innundated Areas Affected by Land Use Change: A Case Study of Keduang Sub-watershed *Int. J. Environ. Sustain.* **9** 79–108

[13] Sugiri A, Buchori I and Ma’rif S 2015 Towards participatory spatial policy: Facilitating rural non-farm activities in Susukan suburb of Semarang Metropolitan Region *Int. J. Civ. Polit. Commun. Stud* **13** 1–17

[14] Santo D 2016 Archipelago tourism: policies and practices *Tour. Plan. Dev.* **13** 377–8