

## RESEARCH ARTICLE

# TOURISM OBJECT MAPPING BASED ON GEOGRAPHIC INFORMATION SYSTEM IN BATURRADEN DISTRICT, REGENCY OF BANYUMAS

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## ARTICLE DETAILS

## ABSTRACT

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This study aimed distribution pattern attraction Attraction and knowing what is in the district of Banyumas Baturraden. Descriptive qualitative research method with a spatial approach. The research subjects Baturraden attractions in the District of Banyumas. Data collection techniques by observation, GIS (Geographic Information System), documentation. Data analysis with interactive analysis from data collection, GIS, data reduction, data presentation, conclusion. The results showed the distribution pattern of the District Baturraden attractions clustered / grouped follow the flow of the river. Because Baturraden area has many rivers including the River Pelus, turncoat River, River Banjaran, Bendo River. While water has the power erosion (erosion) is high to what is skipped. Accompanied by geological processes that occur during the next flowing river forming a waterfall. Elevation also has influence on the existence of a waterfall. Because waterfall is water body that falls from the rocky cliff to a plunge pool below. This happens as the essence of water movement is to move from a high place to a lower place. Baturraden is an area on the slopes of Mount Slamet, which is plateau, so undoubtedly Baturraden District has many waterfalls as well as other tourism objects in the area. There are 35 tourism objects in Baturraden Subdistrict with two types of tourism, namely 33 natural attractions of waterfalls and 2 educational attractions that exhibit various extra ordinary landscapes and educational theme parks that combine art, education and recreation.

## KEYWORDS

Tourism Object, Mapping, Baturraden District, Banyumas Regency.

## 1. INTRODUCTION

Tourism is one sector that has a key role in supporting the development of national economy. Countries that have a wealth of abundant natural resources, people who have a unique and interesting culture provides a distinct advantage for a country, the diversity and uniqueness that brings an attraction for tourists.

The authors suggests tourism is a series of activities that form the migration activity for temporarily to a destination outside the residence or workplace, activities done during the stay at the destination and conveniences are provided to meet their needs both during transit and at the site of the goal [1]. Another opinion expressed that Bahwan tourism is traveling from one place to another temporary, done individually or in groups, in an effort to seek a balance or harmony and happiness to the environment in the dimensions of social, cultural, natural, and science[2].

In order to meet the needs of people or tourists, the tourism sector is absolutely to be developed as it has many advantages, including supporting the development of national economy, creating jobs, increasing and leveling public revenues, as well as tourists will recognize and know the wealth of art and culture and the natural beauty that is owned, both domestic and foreign.

To be known tourist diversity and known by tourists, both domestic and foreign countries, the ease of information is absolutely necessary. Ease of information about tourist attractions gained public, it automatically brings a positive impact on the number of tourists who visit the attraction, but on the contrary if the information is difficult to obtain it will affect the least number of tourists visiting. In fact, an area with many interesting attractions, but the public is not aware of the existence and variety of tourist attraction. This is due to the ease of public information is not obtained.

In the researchers the attraction is all over the place or state of natural resources and developed tourist constructed so as to have appeal and cultivated as a place visited by tourists while defines a tourist attraction as everything that is interesting and valuable for visit and see[3,4]. Thus, the ease of information to determine the existence and variety of attractions that exist in a region indispensable.

Baturraden District of Banyumas Regency is one of the sub-districts located in the northern part of Purwokerto (Capital Banyumas), with an area of 45.53 Km<sup>2</sup> area [5]. Geographically expanse of some of its territory and part of the mountains. Subdistrict Baturraden many stores natural beauty that is worth visiting mainly nature waterfall or waterfalls, and many other tourist attractions, but in fact many tourists who do not know.

Mapping with Geographical Information Systems (GIS) is able to provide information to tourists about the presence of attractions that exist in a region, as a geographic information system is an information system designed to work with data referenced spatial or geographically coordinate. According to the researchers GIS is a computer system used to collect, check, integrate, and analyze information related to Earth surface [6]. So that it is most appropriately used to provide information about the existence and variety of attractions that exist in an area.

## 2. METHOD

This research is a descriptive qualitative study the spatial approach is one approach in geography. The research reveals a phenomenon that occurs on the distribution pattern of tourist attractions and variety or type of Baturraden tourist attractions in the district of Banyumas. Subjects were Baturraden attractions in the district of Banyumas. Sources of data are primary and secondary data. Observation data collection techniques, GIS (Geographic Information Systems) and documentation.

This is a qualitative research, making use of interactive analysis combined with Geographic Information Systems from the stage of data collection, GIS, data reduction, data and drawing conclusions or verification.

In explaining the tourist attractions distribution pattern Baturraden District of Banyumas using nearest neighbor analysis in GIS with software Arc GIS 10.1. Results nearest neighbor analysis will explain the distribution pattern attraction, whether to follow the pattern of random, clustered or uniform, as indicated by the value T. Then give an idea of the tendency of why show trends in a particular pattern, associated with the analysis of factors that influence it.

Rated T/index closest neighbor deployment itself obtained by the formula:

$$T = \frac{j_u}{j_h}$$

Information:

- T : Index This deployment nearest neighbors
- $j_u$  : The average distance measured between one point by the nearest neighbor
- $j_h$  : The average distance obtained suppose all points have random patterns =  $\frac{1}{2\sqrt{p}}$
- P : Point density in each square kilometer that is the number of points (N) divided by total area (A)

The Q value, subsequently interpreted by continuum Nearest Neighbor Analysis, as in Figure 1.

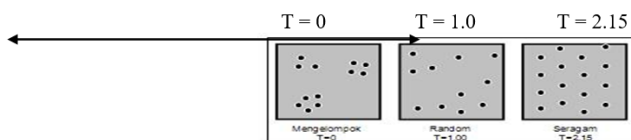


Figure 1: Nearest Neighbor Analysis [7]

Furthermore, to know that there are a variety of attractions in the district based on data Attraction Baturraden of DINPORABUDPAR Banyumas and based on the results of field observations. In observation than to take the coordinates of attractions based on data from existing attractions, as well as additional data do attraction if the observation discovered a new tourist attraction or attraction that has not been included in the list, and then analyzed the variety or type of tourism object.

### 3. RESULTS AND DISCUSSION

#### 3.1 Location, Area and Boundary

Baturraden sub-district is one sub-district which is ± 7 Km north of the city of Purwokerto (Capital Banyumas). Geographically expanse of some of its territory and part of the mountains [8].

Based on data from the Central Statistics Agency Baturraden District of Banyumas 2016, District Baturraden boundary system:

1. North : Purbalingga District
2. South side : North Purwokerto Districts
3. West Side : Kedungbanteng Subdistrict
4. East: Sumbang Sub district

Baturraden Sub District boundary can be seen in Figure 2.

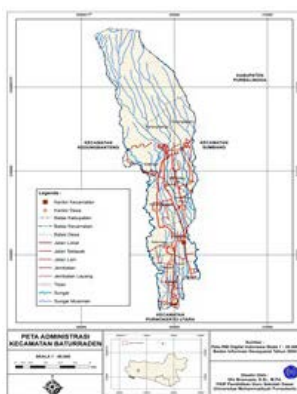


Figure 2: Administrative Aap of Baturraden Sub District

The total area of 45.53 Km<sup>2</sup> Baturraden the District, based on data from the District Baturraden monograph, there are 20.75% is agricultural land in the form of paddy fields and more than 50% is state forest area of ± 2551.2 Ha.

Subdistrict Baturraden consists of 12 Village the Purwosari Village, Kutasari Village, Pandak Village, Pamijen Village, Rempoah Village, Kebumen Village, Karangtengah Village, Kemutug Kidul Village, Karangsalam Village, Kemutug Lor Village, Karangmangu Village, Ketenger Village (Statistics Baturraden 2016).

#### 3.2 Land Use

The use of land in the district is dominated by the state forest Baturraden. Comparison of regional land use studies can be used to determine changes in land use and development within a certain time, the ratio of the area of land use study are presented in Table 1.

From the Table 1 it can be seen that changes in land use in the district area Baturraden generally unchanged during the period 2013, 2014 and 2015 [9].

Table 1: Changes in Land Use Size Baturraden Subdistrict Banyumas Regency of 2014, 2015 And 2016

Land Use	2013	2014	2015	Amount
Technical Irrigation (Ha)	-	-	-	-
Half Technical Irrigation (Ha)	944.91	944.91	944.91	<b>283.473</b>
Simple Irrigation (Ha)	-	-	-	-
Rainfed (Ha)	-	-	-	-
Dry Land (Ha)	-	-	-	-
Building (Ha)	412.27	412.27	412.27	<b>123.681</b>
Gardens (Ha)	496.19	496.19	496.19	<b>148.857</b>
Meadow (Ha)	-	-	-	-
Swimming (Ha)	13.96	13.96	13.96	<b>4.188</b>
State Forest (Ha)	2,551,20	2,551,20	2,551,20	<b>765.360</b>
Community Plantations (Ha)	5.00	5.00	5.00	<b>1,500</b>
Other (Ha)	129.48	129.48	129.48	<b>38.844</b>
<b>Amount</b>	<b>455.301</b>	<b>455.301</b>	<b>455.301</b>	

Source: District Baturraden in Figures 2014, 2015 and 2016

Most of the land in District Baturraden used as a state forest with an area of 2551.20 hectares or 56.03% from the 2013, 2014 and 2015 [10]. This is because Indonesia including the country hotspot that countries that have the highest level endangered of biodiversity, because many cases occur such as forest fires, deforestation on a large scale. To save the forests, including biodiversity conservation, the various efforts made. Subdistrict land use Baturraden presented on Figure 3.

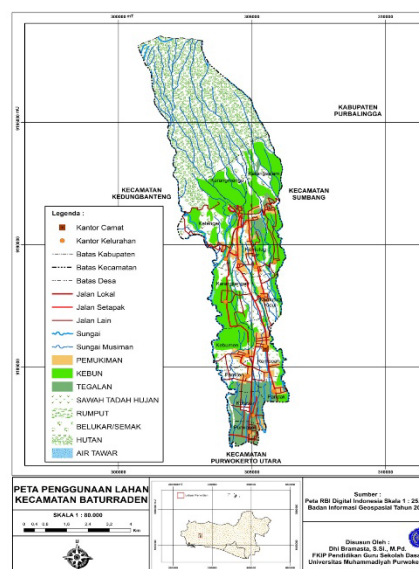


Figure 3: Land Use Map of Baturraden Sub-District

Noting that the geographical map of the District of Baturraden is a mountainous area and some of its territory is a stretch so rational if mostly covered in forest and has a unique habitat. In addition to the District of Baturraden is one area that is the target of the government in conservation efforts to save biodiversity and maintain forest destruction as their protected areas, national parks, build Botanical Baturraden, it is rational if the majority of land use Subdistrict Baturraden is state forest ,

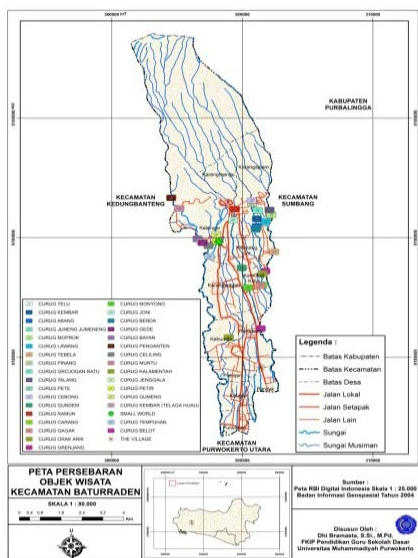
The lowest percentage of land use in plantations with an area of 5.00 hectares or 0.11% of the total land area of 4553.01 ha. This is because the majority of District residents Baturraden more involved in the trade sector, where the District Baturraden the tourist areas frequented by tourists and domestic and foreign countries so that trade flourished in this area.

**4. DISTRIBUTION PATTERNS ATTRACTIONS**

In knowing the distribution pattern in the District Attractions Baturraden done plotting the coordinates using Global Positioning System, Point coordinates are used to determine the exact location of the attraction, then it can be seen from the distribution pattern attractions in District Baturraden.

Distribution Baturraden attractions in the district are presented in Table 2.

According to the table above there are 35 attractions in the District Baturraden yng scattered in several villages. Attraction average of Attraction is a waterfall / waterfall Attraction besides small world and the village. Attraction Distribution District of Baturraden served on Fig. 4.



**Figure 4:** Map of the distribution tourist attractions in Baturraden sub-district

Noting the spread map tourist attraction, Karangsalam Village is the village with the most waterfall attractions, because Karangsalam village has the highest level of a place other than the village which has a sloping topography with a height difference of 25 m with altitude between 500-600 m above sea level, including in the highlands. While other villages have had a sloping topography with a height difference of 25 m with altitude between 175-200 m above sea level, including in the lowlands. Except Karangmangu village which is also included in the highlands, as it has a sloping topography with a height difference of 25 m with altitude between 500-550 m dpal.

**Table 2:** Distribution of the District Attractions Baturraden 2018

Name Attractions	Locations	Coordinate	
		X (mT)	Y (mU)
Curug telu	Karangsalam RT 5 RW 1 Baturraden	305 881	9190744
Curug Kembar	Karangsalam RT 5 RW 3 Baturraden	305 560	9190783

Curug Abang	Karangsalam RT 5 RW 3 Baturraden	305 552	9190471
Curug Juneng Jumeneng	Karangsalam RT 5 RW 3 Baturraden	305 516	9190332
Curug Moprok	Karangsalam RT 5 RW 1 Baturraden	306 109	9190954
Curug Lawang	Karangsalam village, Baturraden	305 899	9190674
Curug Tebela	Karangsalam village, Baturraden	306 224	9189409
Curug Pinang	Karangsalam village, Baturraden	305 385	9191426
Curug Grojogan Ratu	Karangsalam village, Baturraden	305 589	9191137
Curug Talang	Karangsalam village, Baturraden	306 044	9191154
Curug Pete	Karangsalam village, Baturraden	305 876	9190600
Curug Cebong	Karangsalam village, Baturraden	305 363	9191550
Curug Gundem	Kemutug Lor village, Baturraden	304 980	9188737
Curug Ramun	Kemutug Lor village, Baturraden	304 722	9191193
Curug Karang	Kemutug Kidul village, Baturraden	305 772	9188020
Curug Gagak	Kemutug Kidul village, Baturraden	305 698	9188000
Curug Orak Arik	Kemutug Kidul village, Baturraden	305 785	9188492
Curug Grenjang	Kemutug Kidul village, Baturraden	305 885	9188598
Curug Monyong	Kemutug Kidul village, Baturraden	305 221	9187910
Curug Joni	Karangmangu village, Baturraden	304 651	9190738
Curug Benda	Karangmangu village, Baturraden	305 515	9190367
Curug Gede	Ketenger village, Baturraden	303 489	9189781
Curug Bayan	Ketenger village, Baturraden	303 290	9189944
Curug Penganten	Ketenger village, Baturraden	302 280	9191658
Curug Celiling	Ketenger village, Baturraden	303 709	9189658
Curug Muntu	Ketenger village, Baturraden	302 591	9191218

Curug Kalamintah	Kebumen village, Baturraden	304 486	9185825
Curug Jenggala	Ketenger village, Baturraden	302 286	9191661
Curug Petir	Ketenger village, Baturraden	304 054	9189850
Curug Gumeng	Ketenger village, Baturraden	303 999	9190127
Curug Kembar (Green Lake)	Ketenger village, Baturraden	303 444	9189828
Small World	Ketenger village RT 9 RW 2 Baturraden	304 105	9189173
Curug Tempuhan	Ketenger village, Baturraden	303 745	9189211
Curug Belot	Rempoah village, Baturraden	305 708	9186202
The Village	Rempoah village, Baturraden	305 718	9184577

Source: DINPORABUDPAR Banyumas and Field Observation 2018

Altitude contribute to the presence of tourist objects, in this case is the waterfall. Because the waterfall is a river or body of water that falls from the top of a rocky cliff to the plunge pool below. Because substantially higher water moves from place to place lower. So it is rational if the more numerous waterfalls in areas that have a higher plateau.

But the region has a plateau as the village Karangmangu not too much there is a waterfall, but the area has a lowland like there Ketenger village waterfall or waterfall more. This is due to the formation of the waterfall can not be separated from the geological processes that occur during the river flows. It is known that water is an agent that can lead to erosion, the water has a high erosion power of what is skipped. So depending on the rock layers that exist in an area of the level of water erosion resistance. While there are rock layers of hard rock and soft rock. Examples of rock hard rock is granite rock and soft rock is usually a sandstone rock.

The process is more or less starting from a body of water or a river flowing through the slopes of the mountains or highlands and at the same time eroding the various kinds of rock layers that exist. The water will erode the soft rock more than hard rock. Resulting in formation of a plunge pool as the inner area. Then the overhang (hard rock layer that stands out) collapsed due to weakened by erosion and weathering and pulled down by gravity. In a long period of time, the river water down into the valley and then into waterfall taller. Not only that, the plunge pool is also getting in because of the erosion of river water that falls continuously. Falling rocks used as a water erosion to continue to erode the depth of the plunge pool. So not surprisingly, if a region even in the low category can be found more have a waterfall or a waterfall as compared to the higher areas. So in addition to altitude also influences the composition of rock layers that exist in some areas.

This is shown in the number of the waterfall in the village Ketenger Baturraden District of Banyumas far more numerous than the Karangmangu village which has a higher ground.

In accordance with the results of the analysis of the nearest neighbors (nearest neighbor analysis) by SIG, the distribution pattern of the District Attractions Baturraden presented in Figure 5.

Distribution pattern patterned Attractions Baturraden District of clustered / grouped follow the flow of the river. This is because water has the power erosion (erosion) is high to what is skipped. Water bodies or river flowing past the slopes of the mountains or highlands and at the same time eroding the various kinds of rock layers that exist. Then the water will be eroding the rock layers that exist in the area, the geological processes that occur during the river flows will then form a waterfall.

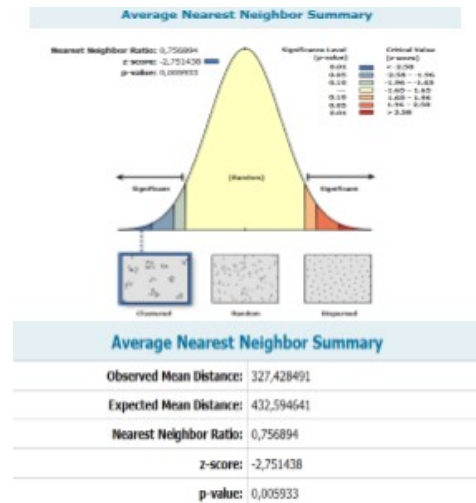


Figure 5: Results of Nearest Neighbor Analysis / Nearest Neighbor Analysis (Primary Data 2018)

Baturraden area has lots of rivers including the River Pelus, turncoat River, River Banjaran, Bendo River and many other rivers. So it is not surprising that the District has many attractions Baturraden waterfall or waterfall.

#### 4.1 Variety Or Type of Tourism Object Baturraden District

Here is a tourist attraction in the District Baturraden based on variety or type, which is a nature tourism and education tourism. There are 33 natural attractions namely Curug telu, Curug Kembar, Curug Abang, Curug Juneng Jumeneng, Curug Moprok, Curug Lawang, Curug Tebela, Curug Pinang, Curug Grojogan Ratu, Curug Talang, Curug Pete, Curug Cebong, Curug Gundem, Curug Ramun, Curug Karang, Curug Gagak, Curug Orak Arik, Curug Grenjang, Curug Monyong, Curug Joni, Curug Benda, Curug Gede, Curug Bayan, Curug Penganten, Curug Celiling, Curug Muntu, Curug Kalamintah, Curug Jenggala, Curug Petir, Curug Gumeng, Curug Kembar (Green Lake), Curug Tempuhan, and Curug Belot who are natural attractions of harnessing the potential of natural resources both unspoiled nature and have been developed that presents the beauty and charm of nature such as waterfall or waterfall.

Then there are 2 attractions educate namely Small World and The Village. Both an educational tour that is a tourist attraction associated with a particular knowledge and used as a vehicle for learning. This tour displays incredible variety of miniature masterpiece spread across the world and also a vehicle for education that combines art, education, and recreation.

Attraction based on the data that has been mentioned, it is known that there are 35 attractions in the District Baturraden Banyumas. Of these four are the findings of attraction in the field, namely Curug Benda, Curug Kembar (Telaga Sunyi), The Village and Small World which was initially only 31 attractions based on data from DINPORABUDPAR Banyumas to 35 attractions.

#### 5. CONCLUSIONS

Distribution pattern patterned Attractions Baturraden District of clustered / grouped follow the flow of the river. Because the area has many river basins Baturraden. While the water has the power erosion (erosion) is high to what is skipped. Accompanied by geological processes that occur during the river flows will then form a waterfall. So that the District has many attractions Baturraden waterfall or waterfall.

There are 35 attractions in the District Baturraden with two varieties or types, namely 33 natural attractions waterfall or a waterfall and 2 educational attraction featuring a variety of miniature masterpiece of the world and also a vehicle for education that combines art, education, and recreation.

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