

# Spatial Pattern of Tourist Distribution based on Physical and Accessibility Factors in Pacitan Regency, East Java, Indonesia

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**Abstract.** Pacitan Regency has the potential natural tourism because in the south is adjacent to the Indian Ocean and that region has many caves. The number of tourists visit in Pacitan Regency has recently increased, especially in 2017 is the highest number of tourists visit. Spatial pattern of tourist distribution can be analyzed based on terrain, type of network and the distance from city center. The purpose of this study is analyzing spatial pattern of tourist distribution based on physical factor (terrain) and accessibility factors (type of road network and the distance from city center) then the factors that have significant relation. The data are collected by observation, interview, plotting, and documentation. The method used in this research was descriptive and statistics. The tourists distribution in this research are total of tourist arrivals 2017 in tourism object that registered by the department of tourism, youth, and sport of Pacitan Regency. The result shows the highest tourist distribution is on Teleng Ria Beach and Klayar Beach. Teleng Ria Beach is on flat terrain, located on local road and near from city center of Pacitan Regency. Klayar Beach is on undulating terrain, located on other road and moderate from city center of Pacitan Regency. The highest tourist distribution in Teleng Ria Beach and Klayar Beach are reinforced with the most complete primary, secondary and conditional facilities among other tourism objects in Pacitan Regency. Statistics show significant relation between tourist distribution and physical factor (terrain).

Keywords: **Tourist distribution; physical ; accessibility.**

## 1 Preliminary

Pacitan Regency has the potential natural tourism because in the south is adjacent to the Indian Ocean and that region has many caves. Pacitan Regency has a rising number of tourists rapidly from the year 2014 to 2017 [1-4]. The highest number of tourists in Pacitan Regency in 2017 [4]. Thus affect the Original Local Government Revenue in the tourism sector. A destination's topography will also influence the site of tourist facilities and the form of the transportation network, which in turn, will affect tourist flows [5]. Accessibility has thus an influence on the distribution of tourism flows, but can only explain a small part of this distribution [6]. So, Spatial pattern of tourist distribution can be analyzed based on physical factor and accessibility factor. The purpose of this study is analyzing spatial pattern of tourist distribution based on physical factor (terrain) and accessibility factors (type of road network and the distance from city center) then the factors that have significant relation.

## 2 Methods

The variables used in this study i.e., the number of tourists, physical factor (terrain), accesibility factors (type of road network and the distance from the city center). The number of tourists in this study used number of tourists each year 2017 sights that had been registered by the department of tourism, youth, and sport of Pacitan Regency. The number of tourists the year 2017 is used because it is based on the number of tourists in Pacitan Regency the highest occurred in the year 2017. Physical factors in this study is described through the terrain tourism objects. Accessibility in this study is described through a type of road network and the distance of each tourist attraction of the city centre of Pacitan Regency. The type of road that used grouped based on act of the Republic of Indonesia no.38 of 2004. The distance from city center is the straight distance from the Pacitan city. It was because Pacitan city is the center of service and governmental of Pacitan Regency. The data are collected by observation, interview, plotting using GPS (Global Positioning System) and photo of tourist attractions for documentation.

The number of tourists in this research is classified into three, classification low (<150.000), moderate (150.000-300.000), and high (>300.000). Physical factors in the study were classified based on Physical

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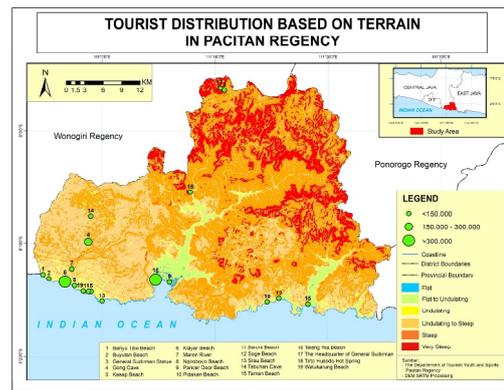
factors such as terrain data obtained by overlay the data of altitude and slope, then classified by Zuidam classification in Table 1 [7]. Type of road network in this research is divided into 3 namely collector road, local road, and other road. Distance of tourism object from city center of Pacitan Regency are divided into 3 i.e. near (<10 Km), moderate (10-20 Km), and far (>20 Km).

**Table 1.** Terrain Classification

Terrain	Slope (%)	Height Differences (m)
Flat	0-2	<5
Flat to undulating	3-7	5-50
Undulating	8-13	25-75
Undulating to steep	14-20	50-200
Steep	21-55	200-500
Very steep	>55	>500

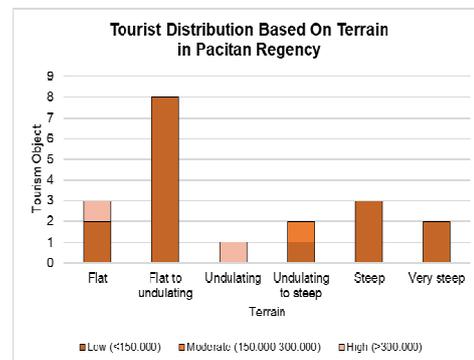
Number of tourists data processing by overlay between each number of tourists and factors tested, such as physical factor (terrain) and accessibility factors (type of the road network and the distance from the center of Pacitan Regency). The number of tourist data overlay with terrain data, the type of road network 2015 and the distance from the city centre of Pacitan Regency. Thus the generated map tourist distribution based on terrain in pacitan regency, tourist distribution based on the road network in pacitan regency 2015, tourist distribution based on the distance from the city center of pacitan regency. Data on the number of tourists, physical factors and accessibility factors are tested by the variables using statistical analysis performed by Chi-Square statistical tests on Statistical Product and Service Solution (SPSS) software to find out factors that has significant relationship with the number of tourists in Pacitan Regency. If the Chi Square statistical test shows the probability value is smaller than 0.05 then there is a significant relation between tourist distribution with the factor being tested. While, if the Chi Square statistical test shows the probability value is greater than 0.05 then there is no significant relation between tourist distribution with the factor being tested. In the table symmetric measures contained a value of contingency coefficient, the value show relations between tourist distribution with the variables tested. Value of contingency coefficient will always fall along range from a low of 0 to a high of 1. The closer value of contingency coefficient to 1, then the greater strength of the relationship between the variables. The method used in this research was descriptive and statistics.

### 3 Result and discussion



**Fig. 1.** Map of the tourist distribution based on terrain in Pacitan

#### 3.1 Tourist distribution based on terrain in Pacitan Regency



**Fig. 2.** Diagram of tourist distribution based on terrain in Pacitan Regency

The distribution of the number of tourists in Pacitan Regency are most of the coastal section of Pacitan Regency (Fig. 1). In general, the tourism object that has a low number of tourists in Pacitan Regency there are 16 tourism objects, while the number of moderaate tourist is 1 tourism object and the number of tourists is high there are 2 tourism objects.

**Table 2.** Chi square statistical test results with SPSS calculation the tourist Distribution with terrain

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	20.781	10	.023
Likelihood Ratio	13.802	10	.182
Linear-by-Linear Association	.405	1	.524
N of Valid Cases	19		

Symmetric Measures		
	Value	Approx. Sig.
Nominal by Nominal Contingency Coefficient	.723	.023
N of Valid Cases	19	

Based on terrain, most of Pacitan Regency has a total area of steep terrain and the most narrow form of terrain that is flat (Fig. 2). Tourism Objects in pacitan Regency based on terrain, most of them on the shape of the terrain flat to undulating with a total of 9 or 47.4% of the total number of overall tourist attractions. On the form of the terrain flat to undulating there are tourism objects with the number of tourists is low, i.e. Ngiroboyo Beach, Kasap Beach, Seruni Beach, Srau Beach, Pidakan Beach, Soge Beach, Taman Beach, and Maron River. Tourism objects in pacitan Regency at least are on the form of undulating terrain with a number 1 tourism object or 5.3% of the total number of overall tourist objects in Pacitan Regency. Tourism objects in the terrain of undulating that is Klayar Beach which has the high number of tourists, not only in Klayar Beach but also Teleng Ria Beach has the high number of tourist.

Teleng Ria Beach and Klayar Beach has a high tourist because it has the most complete primary facilities such as pool, kids planet, and gebyar wisata event, secondary facilities such as restaurant, shop sovenir and hotels or homestay, and conditional facilities such as parking area, toilet and worship place among other attractions. Based on the terrain of its tourism objects which have a high number of tourists occur in the terrain of flat and undulating, that is because the shape of the terrain on the travelers more easily reach tourism objects compared to tourism objects that was in the form of very steep terrain. It is also reinforced by the results of the statistical test chi square in Table 2. On the outcome of chi-square statistical tests on the tourist distribution according with terrain, obtained the results value of the probability is 0,023, that value smaller than 0.05 so  $H_0$  rejected. This means that a significant relation exists between the development of tourist attractions with terrain. The results of value the contingency coefficient is 0,723, which showed that tourist distribution and terrain have strong correlation.

### 3.2 Tourist distribution based on the road network in Pacitan Regency

Tourism objects based on type of road network at most on the other road with the number of 10 attractions or 52.6% of the total number of overall tourism objects (Fig. 3 and Fig. 4).

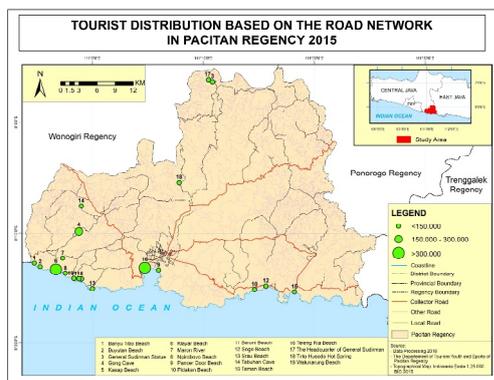


Fig. 3. Map of tourist distribution based on the road network in Pacitan Regency 2015

The number of tourists on the other road, namely low, moderate and high. On the low number of tourists totaling 8 tourism objects i.e. Banyu Tibo Beach, Buyutan Beach, Ngiroboyo Beach, Watukarung Beach, Kasap Beach, Seruni Beach, Pancer Door Beach, and The Head Quarter of General Sudirman. On the moderate number of tourists is 1 tourism object, namely Gong Cave. On the high number of tourists is 1 tourism objects, namely Klayar Beach. Tourism objects at least are in the collector road with the number 3 or 15.8% of the total number of overall tourism objects. That tourism objects have a low number of tourists there are Pidakan Beach, Soge Beach, and Taman Beach.

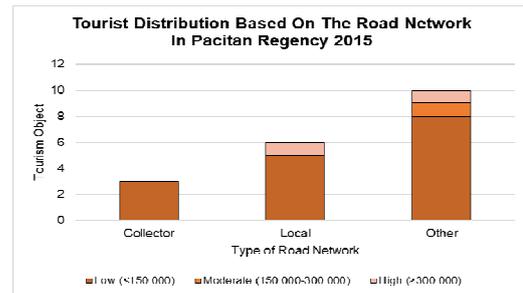


Fig. 4. Diagram of tourist distribution based on the road network in Pacitan Regency

The whole tourism objects on a collector road has a low number of tourists. If the review based on the function of the road network, the collector road is the highest road classes among local and other road so that the quality of the course better than local and other road. However, in this research was not proven that the tourism objects are on the collector road has a high number of tourists. It is proved also by the results of statistical test chi square in Table 3. Chi Square statistical test results shows a significant relationship between tourist distribution with the type of road network 2015. In that table, the value of Chi Square test obtained value of the probability 0,819, the value is greater than 0.05 it means  $H_0$  accepted. So it can be interpreted that there is no significant relationship between tourist distribution with the type of road network.

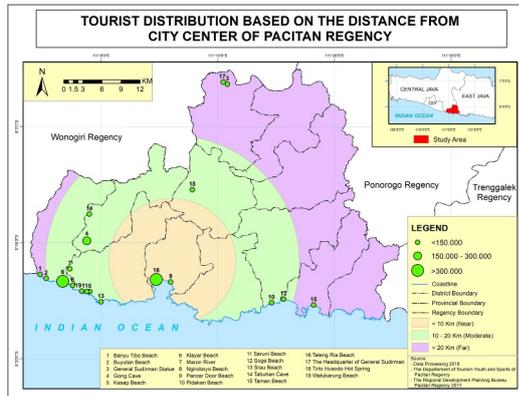
Table 3. Chi square statistical test results with SPSS calculation the tourist Distribution with type of road network

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.544	4	.819
Likelihood Ratio	2.206	4	.698
Linear-by-Linear Association	.301	1	.583
N of Valid Cases	19		

Symmetric Measures		
	Value	Approx. Sig.
Nominal by Nominal Contingency Coefficient	.274	.819
N of Valid Cases	19	19

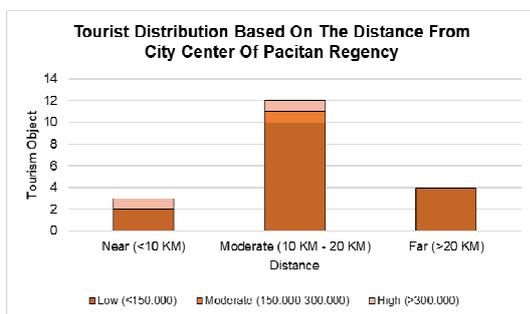
### 3.2 Tourist distribution based on the distance from city center of Pacitan Regency

Tourism object based on the distance from the city center of Pacitan Regency is approximately at most moderate (10 Km – 20 Km) with a population of 12 or 63.2% of the total number of overall tourism objects (Fig. 5 and Fig. 6). The number of tourists at tourism objects with moderate distance (10 Km – 20 Km) that the number of tourists are low, moderate, and high.



**Fig. 5.** Map of tourist distribution based on the the distance from city center of Pacitan Regency

On the low number of tourists there are 10 tourism objects i.e Ngiroboyo Beach, Watukarung Beach, Kasap Beach, Seruni Beach, Srau Beach, Pidakan Beach, Soge Beach, Tabuhan Cave, Tirto Husodo Hotspring Beach, and Maron River. On the moderate number of tourists there are 1 tourism object namely Gong Cave. On the high number of tourists there is 1 tourism object, namely Klayar Beach. Tourism objects at least is near by the number 3 or 15.8% of the total number of overall tourism objects. Tourism objects at near distance have a low and high number of tourists. On the low number of tourists there are two tourism objects i.e. Pancer Door Beach and Taman Beach. On the high number of tourists there 1 tourism object, namely Teleng Ria Beach.



**Fig. 6.** Diagram of tourist distribution based on the distance from city center of Pacitan Regency

Tourism objects with a high number of tourists not only in close from the city center, but there is also at a moderate distance from the city center. Tourists tend to chose the tourism objects near from the city center to visit a tourism objects compared to far from city center. It is because the secondary facilities such as restaurants, hotels and shops sovenir more available in the city

center. Thus should the tourism objects is located close to the center of the city can attract more tourists. However, in this research were obtained that not all tourism objects which are close to the city center has a high number of visitors, because every tourism objects has a different attraction. The statement also reinforced with chi square statistical results in Table 4. In Table 4 shows the results of chi square statistical tests of between tourist distribution with distance from the city center of Pacitan Regency. Obtained a value of the probability 0.597 which means greater than 0.05, so that H0 is accepted. Based on these results, it can be interpreted that there is no significant relationship between tourist distribution with distance from the city center of Pacitan Regency.

**Table 4.** Chi square statistical test results with SPSS calculation the tourist Distribution with distance from city center of Pacitan Regency

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.771	4	.597
Likelihood Ratio	2.988	4	.560
Linear-by-Linear Association	1.727	1	.189
N of Valid Cases	19		

Symmetric Measures		
	Value	Approx. Sig.
Nominal by Contingency Coefficient	.357	.597
N of Valid Cases	19	19

### 4 Conclusion

The distribution of the number of tourists in Pacitan Regency are most numerous in the coastal District of Pacitan. Overall, there are 2 high number of tourist in Pacitan Regency. The highest tourist distribution in Pacitan Regency. The highest tourist distribution in Teleng Ria Beach and Klayar Beach are reinforced with the most complete primary, secondary and conditional facilities among other tourism objects in Pacitan Regency. The tourists distribution in pacitan Regency has a significant relationship with physical factors (terrain). The high distribution of tourists influences the rapid development of tourism in Pacitan Regency. In addition to development, environmental conservation is carried out to support low carbon development. The effort was made by the community in Pacitan Regency by planting mangrove trees on tourism objects such as Pancer Door Beach and Taman Beach through the Mangrove Tree Planting Movement Program.

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