

# Mapping Disaster Risk in Supporting the Development of Leading Tourism Areas in the Northern Region of Kulon Progo

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**Abstract.** Currently, the service industry, including the tourism, contributes 64% of global GDP. Tourism has proven in supporting the Indonesian economy. Tourism development, is still based on the achievements of the economic sector and there is still very little that considers the safety aspects, especially from the dangers of disasters that may occur at any time. Kulon Progo Regency has a potential tourism sector to be developed and marketed. But on the other hand, Kulon Progo Regency is one of the districts that has the potential for disasters. Regarding tourism objects in Kulon Progo, the management has so far been carried out by the Tourism, Youth and Sports Office of Kulon Progo Regency. As for disasters, their management is coordinated by the Regional Disaster Management Agency (BPBD) of Kulon Progo Regency. However, the problem that has occurred so far is that the management and handling of these two matters are carried out. Therefore, it is necessary to make efforts to carry out tourism development in Kulon Progo Regency by considering disaster aspects. This research will develop the concept of tourism management in Kulon Progo Regency by considering disaster aspects.

## 1 Introduction

The village is a community unit which is the main subject that must be guided for the development of village potential and assets to actualize shared prosperity, advance the village economy, and overcome development gaps [1]. Thus, the tendency to rely on government assistance can slowly be eliminated. Regional autonomy encourages changes in people's thinking patterns and encourages all regional government officials together with the community to be able to comprehensively explore the potential and problems of their region and make optimal use of this potential based on village size and priority scale [2]. In addition, regional autonomy also encourages the regional economy to be more open in exploring the

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potential of natural, economic, and social resources in a more comprehensive and sustainable manner among existing sectors.

Tourism villages are one of the business activities that can contribute to the development and progress of rural communities. However, in its development, there are still many things that need to be reviewed regarding the concept of a sustainable tourism village [3]. The economic aspect is the most important part in regional development because the economic base of a region determines the development of the region [4,5]. Tourism has a multiplier effect that can have an impact on the development of a region [6]. Tourism development as a production activity can be carried out with long-term production, which is by adding production factors, such as service scale and the number of managed tourist objects so that in the long term it will provide benefits to the region [7]. Saputra [8] explained that the tourism sector was formed through sector aggregation from Input-Output resulting in 5 sectors forming the tourism sector, namely Transportation, Accommodation, Information, Company, and Health.

Education, especially higher education, is one of the things that supports tourism, so that sooner or later the industrialization of higher education will occur. Education itself is a component of the tourism offer that can attract people both to study and live in educational areas or just to visit educational areas [9]. At present, the service industry including the tourism and hospitality industry contributes 64% of Global GDP, followed by the manufacturing industry 32%, then the remaining 4% is contributed by the agricultural industry [10, 11]. Tourism has also proven to be a solution in supporting the Indonesian economy. The tourism industry in various regions has been proven to be able to have a significant positive impact on economic development, such as being able to create jobs, create new business opportunities, increase regional income and so on [12, 13, 14].

Tourism development so far, in general, is still based on the achievements of the economic sector and there is still very little that considers the safety aspects of visitors or tourism service actors themselves, especially from the dangers of disasters that may occur at any time. According to Eko Teguh P. (2022), many tourist areas, especially in the Special Region, are in disaster-prone areas [15]. Natural disasters are defined as a fast, instant, and profound impact from the environment/nature on the socio-economic system of society [16, 17]. Disasters are caused by a combination of several factors, namely: natural hazards, community vulnerability to disasters, and the capacity possessed by the community to reduce hazards [18]. Disaster conditions are a process that occurs due to potential hazards that meet vulnerable factors, resulting in unavoidable damage, losses, and losses [19]. With a disaster, this encourages people to carry out mitigation, which aims to reduce the impact caused by a disaster [20]. The form of disaster mitigation is the Early Warning System (EWS) [21, 22], making disaster maps and education to increase awareness of disasters [23].

Kulon Progo is one of the districts in the Special Region of Yogyakarta (DIY). Referring to Law Number 32 of 2004 and Law Number 33 of 2004, Kulon Progo as a district has its own authority to manage the resources in its territory, including the potential resources of the tourism sector [24]. Kulon Progo Regency has a tourism sector that has the potential to be developed and marketed, starting from beaches, art, culture, tourist reservoirs, caves and highlands. Most of the tourism objects in Kulon Progo are still under the control of the district government through the Kulon Progo Regency Youth Culture Tourism and Sports Office.

The State of Indonesia consists of 34 provinces spread across various islands. One of the provinces that has a lot of disaster potential is D.I. Yogyakarta, namely as many as 12 of the 13 potential disasters mentioned by BNPB. Kulon Progo Regency is one of the districts that has the potential for disasters, including floods, tsunamis, earthquakes, landslides, droughts, and volcanic eruptions. Based on the Disaster-Prone Index issued by BNPB (2011), all districts and cities in DIY are included in areas that have a high Disaster-Prone Index, as

shown in Table 1 [25]. Yogyakarta Special Region is an example of many areas that are prone to landslides, especially in Kulonprogo Regency which is part of the Menoreh Hills [26].

**Table 1.** The Indonesian’s Disaster-Prone Index

Regency	Score	Vulnerable Class	National Ranking
Sleman	97	High	3
Bantul	90	High	49
Kulon Progo	80	High	90
Gunung Kidul	76	High	120
Kota Yogyakarta	74	High	135

According to Kasriyati (2019), tourism in Kulonprogo Regency has a variety of tourist objects which include natural, cultural, tirta (water) attractions, history, religion, and education [27, 28]. Based on the DIY Tourism Office (2019), tourist arrivals or visits to tourist objects in the DIY Regency/City, in 2018 were as follows, for Bantul Regency there were 8,840,442, for Sleman Regency there were 7,898,088, for Yogyakarta City there were 4,752,351, for Gunung Kidul Regency it is 3,055,284, and for Kulon Progo Regency it is 1,969,623 [29].

Regarding tourism objects in Kulon Progo, the management has so far been carried out by the Tourism, Youth and Sports Office of Kulon Progo Regency. As for disasters, their management is coordinated by the Regional Disaster Management Agency (BPBD) of Kulon Progo Regency. Tourism and disaster in Kulon Progo Regency, especially the northern part of Kulon Progo, are something that cannot be separated. These two things are interrelated and inherently influential. Therefore, the management of these two matters requires synergy and cooperation between the Tourism, Youth and Sports Office and the Regional Disaster Management Agency of Kulon Progo Regency. However, the problem that has occurred so far is that the management and handling of these two matters are carried out separately. Therefore, it is necessary to make efforts to carry out tourism development in Kulon Progo Regency by considering disaster aspects. Furthermore, it is also necessary to obtain a tourism development concept that can improve the economic aspects of the community, but still pay attention to the aspects of disaster mitigation, which causes the impact of disasters to be minimized.

## 2 Method

To achieve the objectives, the following steps were taken:

1. Conducting FGD activities with the Tourism, Youth and Sports Office of Kulon Progo Regency; Regional Disaster Management Agency (BPBD) of Kulon Progo Regency; Kapanewon and Village Governments in the northern Kulon Progo.
2. Conducting a study review of the results of previous activities related to tourism development and tourism management.
3. Conducting a survey on disaster-responsible villages and tourism awareness groups in villages in Kapanewon-Kapanewon in the northern Kulon Progo.
4. Using Geographic Information System (GIS) software to display maps of potential, hazard, vulnerability, village capacity, as a policy basis for developing tourism based on disaster mitigation.
5. Result and Discussion

## 3 Result and Discussion

The research activities that have been carried out were coordinating with the Kulon Progo Regency Tourism Office represented by Mr. Budi. This activity was carried out at the Muhammadiyah University of Yogyakarta. Documentation of the discussions can be shown in the photo below.



**Fig. 1.** Discussion with the Government Tourism Office of Kulon Progo Regency.

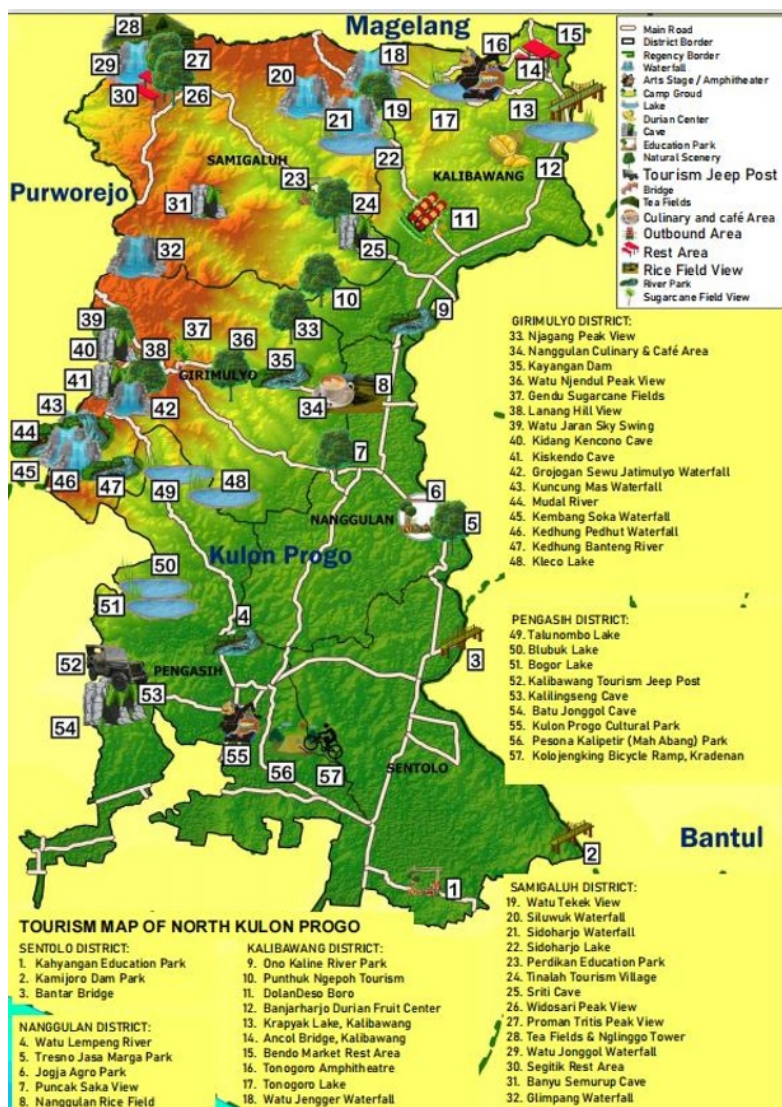


**Fig. 2.** Documentation After Discussion with the Regency Government Tourism Office Kulon Progo.

Based on discussions with the Kulon Progo Regency Tourism Office, a mapping of various potential disasters including infrastructure that supports tourism in the northern region of



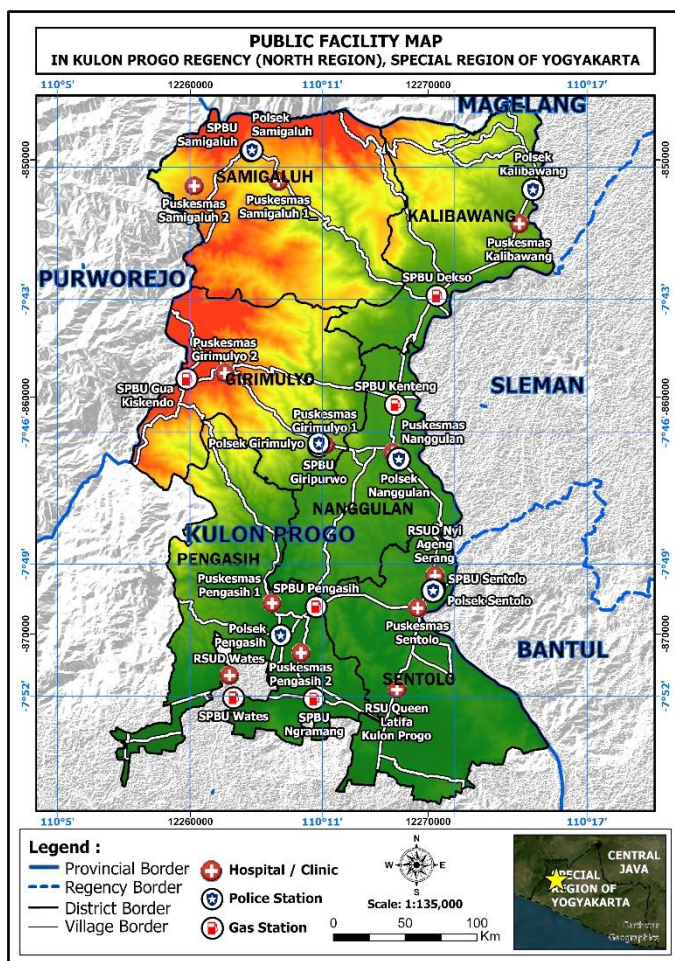
Kulon Progo Regency was carried out. The results of the mapping can be seen in the figures below.



**Fig. 3.** Mapping Results Tourism Potential in the Northern Region of Kulon Progo, Consists of Natural and Culinary Tourism.

Figure 3 shows potential tourist destinations in the northern part of Kulon Progo Regency. The existing types of tourist destinations are divided into 3 major categories, namely natural tourism, man-made tourism and culinary tourism. Natural tourism potential consists of mountain views, caves, waterfalls and rivers. For artificial tourism, it consists of dams, agro parks, education parks, and bridges. The number of tourism potentials in each district, is sequentially as follows: Girimulyo District (16 locations), Samigaluh District (14 locations), Kalibawang District (10 locations), Pengasih District (9 locations), Nanggulan District (5 locations) and Sentolo (3 locations). Based on the amount of existing tourism potential, this shows that the tourism sector has great economic potential in the northern part of Kulon Progo Regency.

Figure 4 shows the existence of facilities and infrastructure that support tourism activities in the northern part of Kulon Progo Regency. These facilities include access roads, gas stations, police stations and health facilities. There are 6 police stations in total. There are 8 health facilities and 6 refuelling stations. Most of the existing road infrastructure has been paved. In general, the existing facilities and infrastructure are sufficient to support tourism activities, but there are two sub-districts that still have a small number of supporting facilities, namely in the Smaigaluh sub-district and Girimulyo sub-district, while the number of tourist destinations is quite large. Apart from that, the existence of lodging is still very minimal, so the possibility of tourists staying in the area is very small. Therefore, it is necessary to consider the procurement of accommodation facilities in the region.



**Fig. 4.** Results of Mapping Supporting Infrastructure for Tourism Activities in North Region of Kulon Progo Regency.

Figure 5 shows the earthquake risk map for the northern part of Kulon Progo Regency. From the figure it can be shown that the risk for the northern part of Kulon Progo Regency is in the category between medium and high. Only one village in Sentolo sub-district has a low-risk category. Regions with a high category are Samigaluh Sub-district, Part of the sub-districts of Nanggulan, Girimulyo, Kalibawang, Pengasih and Sentolo. Thus, it can be concluded that potential tourist destinations in the region are also very vulnerable to the risk of earthquakes. Therefore, it is necessary to consider reviewing aspects of tourism potential and potential disaster aspects. So that it is hoped that policies regarding disaster-oriented tourism areas will soon be realized. This is in the context of being one of the steps for disaster mitigation, but economic activities are still running well.



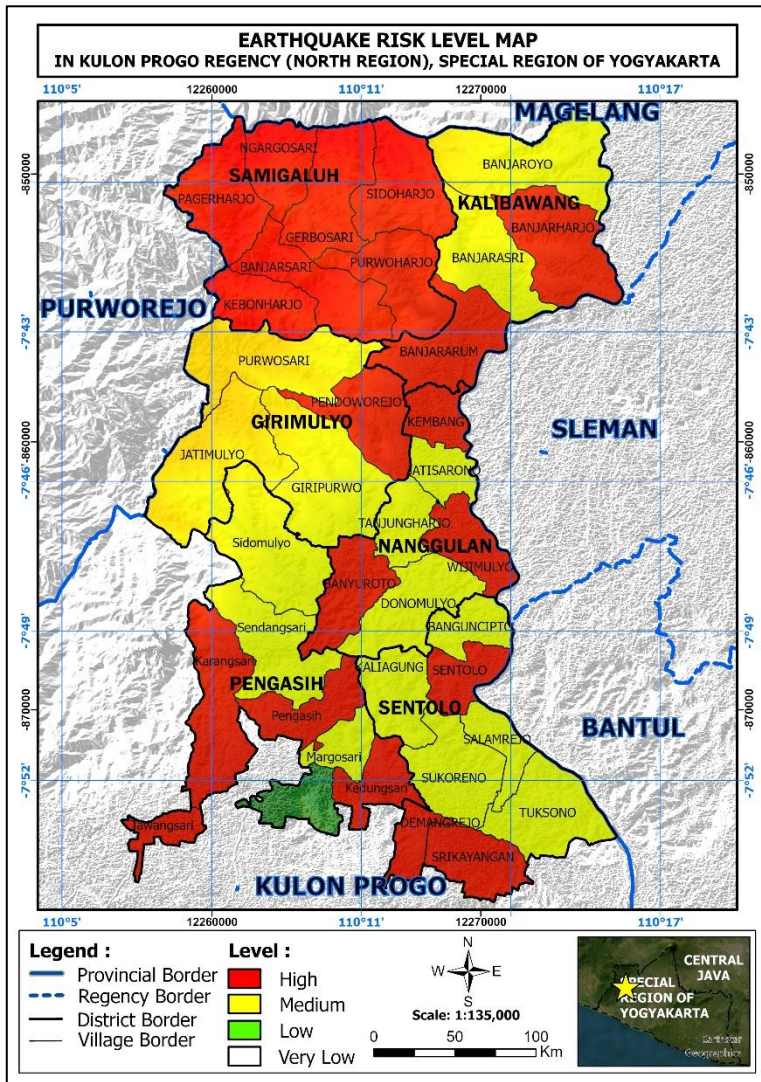


Fig. 5. Results of Earthquake Risk Level Mapping in Kulon Progo Regency, North Region.

## 4 Conclusion

The conclusion from this activity is that the northern region of Kulon Progo Regency has enormous potential as a tourist destination. Facilities and infrastructure supporting tourism activities are also available, although they need improvement. Besides that, the northern area of Kulon Progo Regency also has a big disaster risk. The potential types of disaster risk are earthquake, drought and landslides. Therefore, disaster-oriented tourism development policies need to be implemented.

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