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Journal of Environmental Management and Tourism is an interdisciplinary research journal, aimed to publish articles and original research papers that should contribute to the development of both experimental and theoretical nature in the field of Environmental Management and Tourism Sciences.

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Geotourism Concept Development in the Basis of Environment Sustainability, Socioculture, and Natural Science Wealth: A Case Study in Indonesia

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Abstract:

This paper presents geotourism development as a development framework of Gunungkidul Regency, Indonesia. This concept has been formulated in the consideration of policy direction of local and national tourism development, requirement of Geopark Global Network concept, consideration of environment, social and cultural environment and the demand of trend of the tourism interest improvement among society. This research was conducted with the urgency of: (1) the importance of geodiversity and geoh heritage preservation as the unrenewable resources; (2) the important values of geodiversity and geoh heritage that have a valuable knowledge for the people and their environment; (3) the importance of biodiversity as the environment wealth that plays an absolute role towards the balance of the environment; (4) The significant role of the wealth of socio-culture of people (cultural diversities) as a local wisdom that has a great power in the development process and (5) the urgency of the improvement of independency of tourism entrepreneurship as the accurate strategy in the development program for people prosperity. The direction of the geotourism development has been formulated through the synthesis of various analyses covering the analysis on government policy, analysis on the potential of tourism attraction, and SWOT analysis. The dialogue of any analyses is required to guarantee the production of formulation in the accurate and synergic direction of geotourism with any various existing development directions. The direction of the empowerment of the living environment and natural resources shows the awareness of how very fundamental the balance, harmony and aptitude of ecology, society, economic and culture is.

Keywords: Local culture; Environment wealth; Natural science; Preservation; Geotourism.

JEL Classification: L83; O13; Q26; Q56.

Introduction

Tourism is one of economic activators that are able to contribute to the improvement of prosperity. Tourism development is able to encourage the business activities to create the significant sociocultural and economic benefits for certain area particularly for the society in a destination area. The achievement of tourism is seen from the acceptance of government in terms of tourism sector that also can stimulate other sectors to develop. An achievement that is easily to be observed is related to the increase of the number of tourists from one period to another that will be realized if the tourists feel satisfied with the destination with any attributes offered by the management (Badarneh *et al.* 2001).

In Indonesia, tourism is one of important sectors in national economic development. The movement of millions of tourists is able to mobilize the economic chain-link that is related to each other to be a service industry that can bring a significant contribution to economy and the improvement of the people prosperity (Egorova, Pluzhnic and Glik 2015). Data from Ministry of Tourism and Creative Economic (2014) shows that the tourism sector has contributed 7.33 Billion US\$ or positioned at fourth rank in terms of foreign exchange after oil and gas, coal, and palm oil. The development of tourism then leads to the improvement of people prosperity as the tourism has as significant doubling impact particularly with the creative industry that has a tight relation with tourism. Tourism and creative economic are also the sectors with an inclusive growth as its added values can be directly felt by local people (Chung *et al.* 2015).

The existence of local autonomy in the implementation of the government of Indonesia has stimulated the motivation of each region to develop its area and optimize the utility of the existing potentials, including the tourism potential. The attempt of tourism development in supporting the area development will be effective and efficient as long as the process is conducted integrally by all tourism actors (stakeholder) in the local area. This is in line with the spirit growing in the era of local autonomy prioritizing the Central Government as the facilitator by encouraging the improvement of public service, creativity and community involvement and apparatus of local government. The phenomenon of community involvement is proven to obtain the positive response from all stakeholders, particularly community if they feel to have the added value as clearly seen in the economic perspective.

Referring to the Laws of Indonesia Republic Number 32 of 2009 on the Protection and Management of Environment, the development of tourism must be undergone based upon the principle of sustainable and environmentally sound development. This is on the basis of an understanding that a good and healthy environment is the human rights. This mandate is highly crucial with a fact that the quality of environment in general is getting deteriorated today and has threatened the sustainability of human life and other creatures. The more increasing global warming has led to the climate change; thus, it could worsen the decline of environment quality. Such condition needs to be responded by seriously and consistently doing the protection and management of environment by the stakeholders.

Ideally, to realize the integrated and sustainable development of tourism, all stakeholders that directly interact with the tourism world should be involved in planning, utilizing and controlling the benefits and integrally attempting to maximally develop the potential of the tourism with an accurate concept by measuring the benefits and usefulness for the people. A well-developed tourism industry will open any wide business opportunities, entrepreneurship, and work fields for the local people - even for the outsiders.

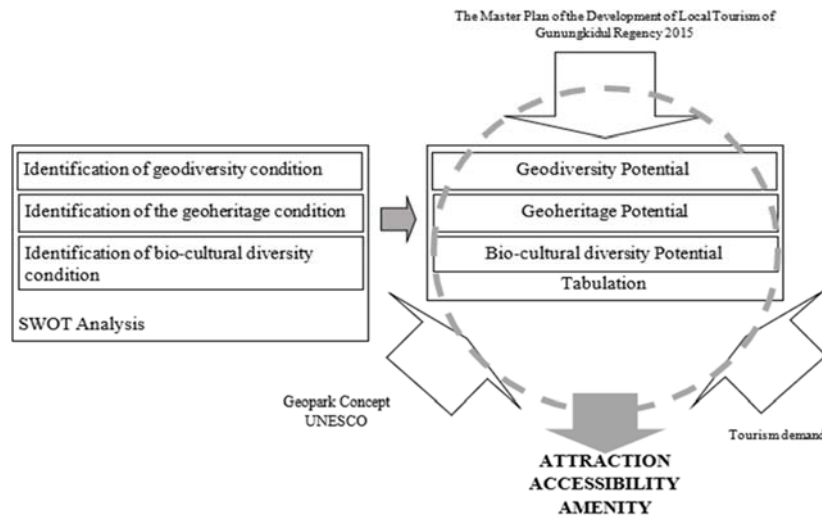
This paper presents geotourism development framework and applied in Gunungkidul Regency, Indonesia. This concept has been formulated in the consideration of policy direction of local and national tourism development, requirement of Geopark Global Network concept, consideration of environment, social and cultural environment and the demand of trend of the tourism interest improvement among society.

The rest of this paper is organized as follow. Section 2 describes methodology. Section 3 presents the obtained result and following by discussion in section 4. Finally, Section 5 concludes this work.

1. Proposed Method

In this research, the geographical condition of Gunungkidul Regency becomes the core consideration in tourism development. This is in line with the direction of national and local tourism development more addressed to optimize the local potentials. Other demand is related to the establishment of the area of Mount Sewu as the Geopark Global Network in which the parts of the area are located in Gunungkidul Regency. The direction of the local tourism development in the Regulation of Gunungkidul Regency Number 5 of 2013 on the Tourism Implementation is addressed to the implementation of tourism in Gunungkidul Regency to be implemented by still preserving the nature, and resources. This is necessary to be done for guaranteeing the sustainability of the utilization of the environment in future. The way of thinking in this research is shown in Figure 1.

Figure 1. The way of Thinking



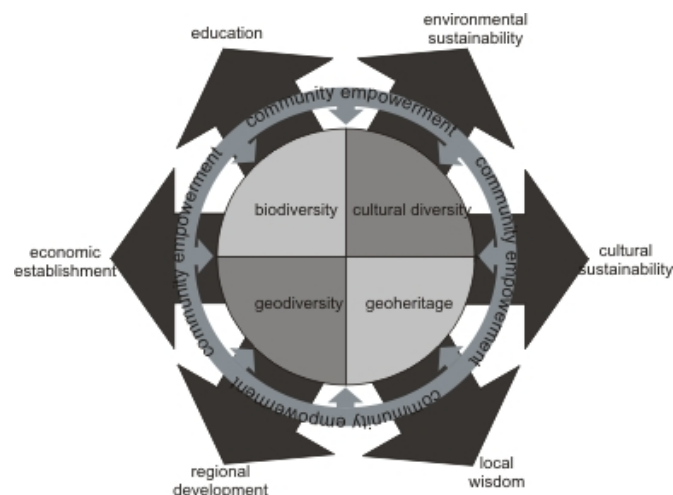
Gaining information was conducted through interview by means of purposive sampling (Young *et al.* 2018). The instrument in data collection in this study was the researcher herself to gain the information and the capture the double reality (Yeomans 2017). The mutual interaction in each collected data was possible to be confirmed with and among the respondents in order to reach the result with the better validity (Yeomans 2017). Study was conducted qualitatively and used the inductive data analysis. The interview was conducted flexibly to make the gaining specific information possible in each sample. The result of the interview was the temporary finding used as the base knowledge for the next interview. This result was respected based upon its specification and not used as the frame of the uniformity in the following interview stage. However, the finding in each sample was still rechecked in other sample.

The data analysis was conducted with the content analysis by considering the form of the data and information gathered from the interview and official documents that require a technique to understand and interpret it.

2. Methodology

In Indonesia, geotourism concept is new in terms of tourism development (Dowling and Newsome 2018), (Hartoko *et al.* 2018). The natural-based concept of tourism development that has been known previously was Ecotourism that according to the Ministry of Tourism and Creative Economy of Indonesia Republic is the sustainable concept of tourism development aimed to support any attempts of environmental preservation (nature and culture) and to enhance the community participation in management in order to provide the economic benefits to the society and local government (Purbasari and Wijaya 2019). Compared to this concept, the geotourism has higher complexity and wider scope of the development as seen in Figure 2.

Figure 2. The Scope of Tourism Development with Geotourism Concept



The geotourism concept is found as a synthesis result from any direction of tourism development in the area of Mulo Village, Gunungkidul Regency (Jusuf, Maas and Hartono 2018). This is in line with the concept of the geopark development of UNESCO that must be addressed to: (1) preservation and the media to apply the strategy of sustainable economic development conducted through the good and realistic management structure; (2) the creation of the work field for the local community in terms of obtaining the concrete economic benefits and (3) the development of knowledge about geology for public. In line with this direction, the condition of the area that needs to be well considered covers the physical and sociocultural condition of community (Ólafsdóttir and Tverijonaite 2018, Dowling and Newsome 2018).

The development of the tourism in Mulo Village covers the physical and non-physical tourism development. The physical development mainly covers the tourism facilities; meanwhile, the non-physical one is mainly related to the attraction of the tourism. The analysis becoming the base of the development of the concept of the tourism development includes the existing condition of planning areas, any related policies, opportunity and external challenges in tourism development before being synthesized to find the attraction (strengthening the existing tourism potential by creating the world-class attraction), accessibility (improvement of facilities and infrastructures in tourism object) and the amenities (providing the facilities and infrastructure to support the tourism). Based on the analysis, the concept of the tourism development of Mulo Village is emphasized on:

- Preservation (found from the urgency in consideration to the sustainability of the object as the geosite),
- The development of the world geopark concept including the preservation of the geological heritage, the development of the job opportunity for the local community and the development of the knowledge for public.
- The development of the world geopark concept also contains the essence that the geopark must be based upon community, local resources and sustainability.

The concept above is developed and synthesized to find the alternatives for the alternatives of the development of attraction, accessibility and amenity.

Table 1. Finding of attraction, accessibility and amenity of tourism

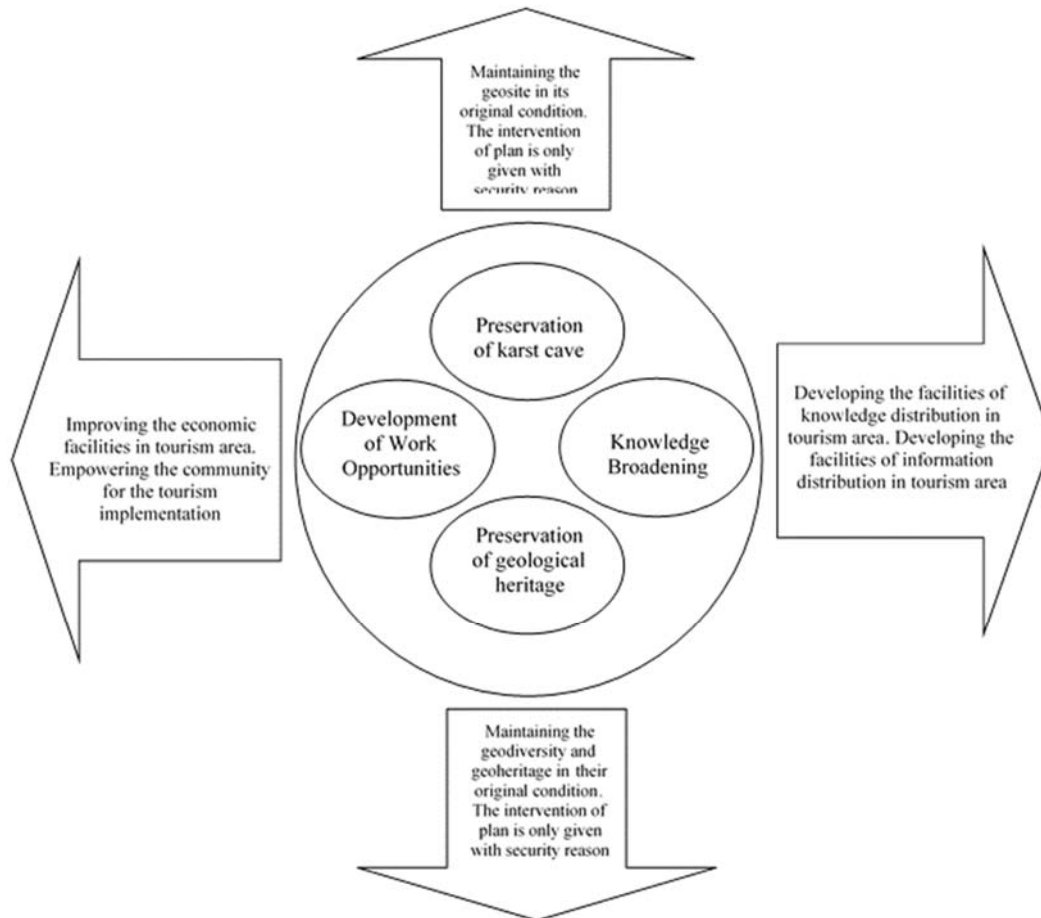
Tourism Components	Consideration of the tourism development	Facilities of information and knowledge distribution	Economic Facilities
The development of tourism attraction	Visual attraction	Tourism Information Centre	Handicraft centre
		Amphitheatre	Craft
		Taman Pintar (Smart Park)	
		Museum	
		Gallery	
	Interesting attraction	Taman Pintar (Smart Park)	Handicraft Centre
Something that can be taken home as a souvenir	Something that can be taken home as a souvenir	Camping ground	Skilled Art
		Handicraft Centre	Handicraft Centre
		Craft	Craft
Development of accessibility	Visual attraction	Gate of area	
		Landmark of area	
	Interesting attraction	Track to/from cave	
		Safety Fence	
	Something that can be taken home as souvenir	-	-
Development of tourism amenity	Visual attraction	Tourism Information Centre	Craft centre
			Craft
	Interesting attraction	Taman Pintar (Smart Park)	Craft Centre
			Camping ground
	Something that can be taken home as a souvenir	Craft centre	Craft Centre
			Craft
		Culinary	

The concept of the geosite preservation is elaborated with the following understandings: (a) maintaining the geosite in its original condition; (b) Intervention of the design given only by security consideration. The concept of the heritage preservation is outlined with the understanding of (a) maintaining the Geodiversity and Geoheritage in its original condition; (b) intervention of the design given only by considering the security. The development of the work opportunities for the local community is outlined with the following understanding: (a) developing the economic facilities in the tourism area; (b) empowering the local community for the implementation of tourism. The development of the knowledge for public is outlined with the understanding of (a)

developing the facilities of the knowledge distribution in tourism area, (b) developing the facilities of the information distribution in the tourism area. The outline of the concept can be seen in Figure 3.

The development of the concept above is synthesized to find the attraction, accessibility and amenities. The development of these tourism components also considers the demand of visual attraction that is the development of the tourism objects and tourism objects that are different as in other areas; the demand of “an interesting attraction” meaning the object development that can facilitate the recreational activities that can make the visitor feel comfortable to stay longer and the demand of “something that can be taken home” meaning the development of facilities to shop, particularly the gifts. In detail, the finding of attraction, accessibility and amenity of tourism is presented in Table 1.

Figure 3. The outline of the concept of tourism development in Mulo Village



The development of geosite as geotourism is an accurate strategy to optimize the sustainable utilization of geodiversity, geoheritage, and bio-cultural diversities. This is in line with the government direction in the Government Regulation Number 50 of 2011 on the Master Plan of National Tourism Development in the period of 2010-2025, which explicitly states that one of the tourism potentials that can be developed in Indonesia is the type of natural tourism. A similar direction is also mentioned in the Strategic Plan of the Directorate of Tourism Destination Development in the period of 2012 - 2014 that one of the Tourism Destination Developments is the Geotourism Destinations associated with the formations or geological sites. In line with this policy, in the Master Plan of the Regional Tourism Development in Gunungkidul in the period of 2011-2025 is programmed to realize Gunungkidul as nature-based tourism destination, supported by a sustainable and competitive culture towards a developed, independent and prosperous society.

3. Discussion

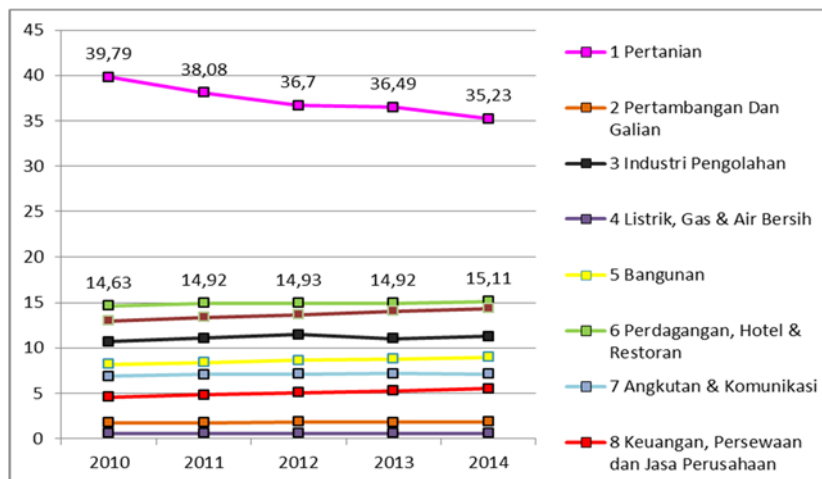
Gunungkidul Regency in Province of Special District Yogyakarta is located in the southern Java Island, Indonesia as seen in Figure 4.

Figure 4. Position of Gunungkidul Regency in Java Island, Indonesia



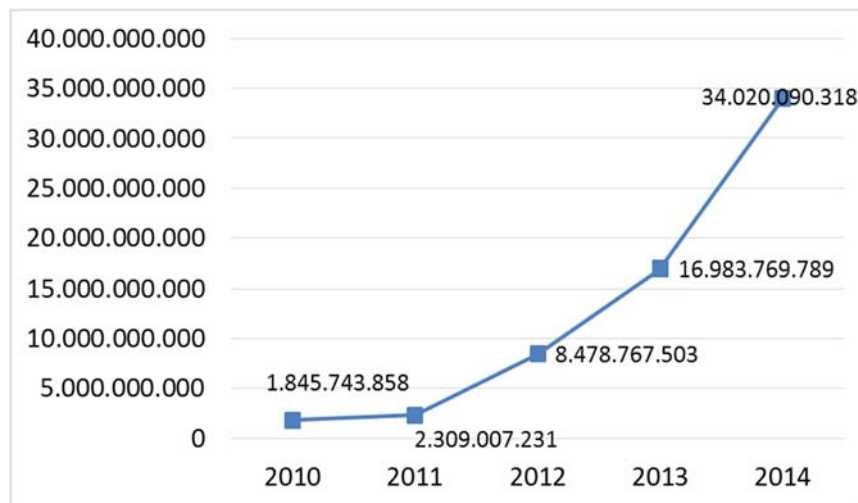
The topography of the Gunungkidul regency is dominated by karsts; some of which contain the natural caves and underground rivers. Most of local revenues of Gunungkidul Regency come from tourism sector. Even, since the last decade, the tourism sector has been becoming one of prioritized sector in Gunungkidul Regency as seen in Figure 5. The increase of the local revenue from the tourism sector in the last 5 years is shown in Figure 6.

Figure 5. Regional Gross Domestic Income based on the Constant Price 2000 according to the business field in Gunungkidul Regency in 2010-2014 (%)



The increase of the contribution of the tourism sector (sub-sector of trade, hotel and restaurant) above shows the high interest of tourists on the existing attraction potential in Gunungkidul Regency. The high natural potential and trend of the increase of the tourist interest towards the existing natural wealth in Gunungkidul Regency need to be responded through the accurate tourism development to optimally and entirely support the development in Gunungkidul Regency.

Figure 6. The Development of Amount of Locally Generated Revenue in Sub-Sector in Gunungkidul Regency in 2010-2014 (Rupiah)



Mulo Karst region is located in Mulo Village, Wonosari District, Gunungkidul Regency (Atmoko, Titisari and Idrus 2018). The village is located approximately 6 km from Wonosari. Administratively, Mulo Village is adjacent to Duwet Village on the north side, adjacent to the Pacarejo Village, Semanu District on the east side, adjacent to Wunung Village on the west side, and adjacent to Kemiri Village, Tanjungsari District on the south side. Entirely, the area of Mulo Village is 694 ha. The land utilization in the village is divided into several designations such as moor/fields, buildings, state forests, and community forests. The land utilization is dominated by dry land used for the agriculture such as cassava, corn, and beans (34%). Meanwhile, the land use for residence or building is quite significant (32%) because the location of the Mulo Village on the main line access of Wonosari-Baron. The rest of the land is more widely used as the People Forestry and Forest State.

One of the tourism potentials in Mulo Village is the beauty of the karst landscape that is the Valley of Mulo Karst. In this area there is a cave called Ngingrong, one of the geosites in the area of Mount Sewu defined as a Global Geopark Network, which is prospective to be developed as a tourist attraction. The area of Mulo Karst Valley is a natural phenomenon formed from the depressive (negative) surface in the karst region that has a quite wide range. In the area of Mulo Karst there are two depressive formations linked by the relatively non-aqueous subsurface flow. In rainy season, specifically, the appearance of the karst in this area is relatively complete and represents the karst region in general (dry valley, caves, lakes, underground lakes, natural bridges). The form or the morphology of this region is in the form of elongated karst valleys and steep cliffs as shown in Figure 7. The valley is the incoming runoff and has turned into a subsurface flow and into the underground river system. This valley is in the depth of 50-150 meters, a width of 30-100 meters, and a length of more than 1 kilometre. The cliffs of the valley in this area are very steep and form a ravine or cliff (cliff) with a slope of 45-90°.

Figure 7. The Valley of Mulo Karst



Caves in the Area of Mulo Karst consist of:

a. Ngingrong Cave (Figure 8), one of geosites in the range of Geopark of Mount Sewu established as the Geopark Global Network. This cave is located in the Southern area of Mulo Karst. It is the entrance of cave. To reach Ngingrong, the visitor must walk around the valley of Mulo Karst and step down the path.

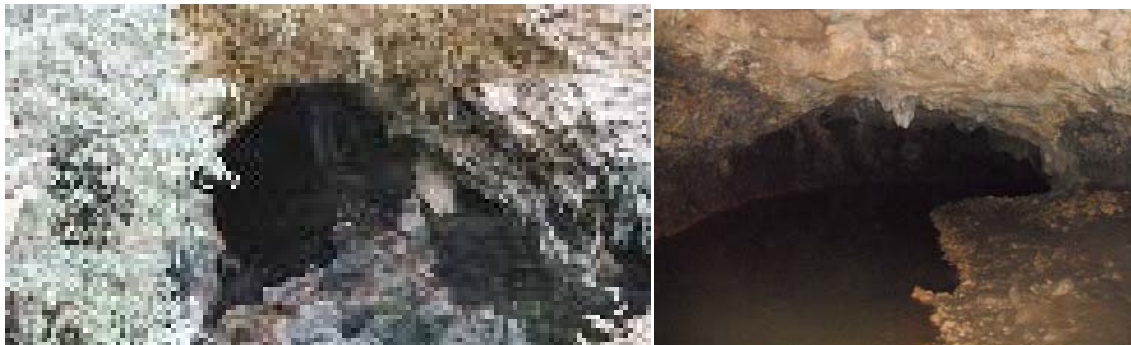
b. Nglengket Cave (Figure 8). It is located in the northern road; meanwhile, Ngingrong Cave is located in the southern. Inside the cave, there is a 3-level lake with the depth of 10 to 40 meters.

c. Tumibo Cave located in the northern of highway. It is rare to be visited.

d. Luweng Mulo, it is located in west-south road. It has the karts valley and it is rare to be visited for those entering it.

The development of tourism activities in Mulo Village cannot be separated from the existence of another object that is Ngingrong Cave with its status as the part of the Geopark of Mount Sewu, which has been designated as the Global Geopark Network (GGN) since September 19, 2015. This determination certainly would lead to the big responsibility in terms of its management in accordance with the Geopark development concepts as outlined by UNESCO. This concept integrates the management of geological heritage with the cultural heritage from a region for three main objectives: conservation, education and sustainable development. Thus, the existence of a Geopark not only brings a conservation and economic mission such as a garden that has many attractions, but also it can be a media of education and empowerment of local communities.

Figure 8. Nglengket Cave (left) and Ngingrong Cave (right)



Associated with the establishment of Ngingrong cave as a part of GGN, UNESCO has directed the sustainable use of geodiversity, geoheritage, and bio-cultural diversities for the interest of community and environment surrounding. Responding to these needs, this study was aimed to obtain a formulation of geosite development in Mulo Village, which in relation to the national strategic issue has the urgency on several aspects:

a. Research urgency in the view of environmental aspect includes that:

- Geodiversity and Geoheritage are the non-renewable resources.
- Geodiversity and Geoheritage have a valuable knowledge that is useful for human and environment.
- Geodiversity and Geoheritage are sensitivetowards any disorder and very vulnerable with any anthropogenic activities.
- Biodiversity is the environment wealth that has an absolute role towards the balance of environment

b. Research urgency in the view of sociocultural aspect:

Cultural diversities contain the local wisdom that has great power in development

c. Research urgency in the view of economic aspect:

The potential database of geodiversity, geoheritage, and bio-cultural diversities is the main factor in tourism development in Mulo Village in particular and in Gunungkidul Regency in general in accordance with the Master Plan of the Local Tourism Development of Gunungkidul Regency in the period of 2011-2025 that mandates the local tourism development directed to realize Gunungkidul as the nature-based tourism destination with the support of sustainable, competitive culture towards the advanced, independent and prosperous society.

As stated in Law Number 10/2009, tourism refers to various activities with a support of any facilities and services provided by community, entrepreneurs, Government and local government. The components of tourism include: (Rachmawati 2016): (a) Object and attraction of tourism, also called as the tourism attraction, is in the form of all natural and cultural attraction. The activities that can attract the tourists to come; (b) Amenities, covering the facilities provided by the tourism objects and (c) accessibility: problem in reaching the location of tourism. With a different way, (Liu, Wang, Huang and Chen 2017)stated that the development of an area of tourism destination must fulfil 3 conditions as follows:

a. The area must have "something to see". It means that in that area, there must be a tourism object and tourism attraction that are different from those owned from other area or have a special attraction.

b. The area must provide “something to do”. It means that the area in addition to something to see must provide the recreational facilities that can make the visitors comfortable to stay longer.

c. The area must have “something to buy”. It means that the area must provide any facilities for shopping, particularly gifts.

In line with those directions above, the concept of geotourism as the concept of tourism development needs to fulfil the following points:

a. Geologically based, referring to the object/place/location used as the area of geotourism as a formation of the result of geological process.

Based upon the geological condition, the geosite located in Mulo Village is the natural wealth with the potential of high tourism attraction. As the geological wealth, moreover, being established as the Geopark Global Network, this potential must be protected to make the principle of the conservation will be a strong base in its development. This is in line with the opinion of Hose (1996, 2000) stating that the definition of Geopark can be interpreted through the essence, function and its implementation as the component related to the nature and the life on earth (Poch 2018). The tourism attraction in the geotourism development includes the potential of geodiversity, geoheritage, and bio-cultural diversities. Therefore, the concept of the Geopark has three basic essences:

- Geopark has a meaning as a geological heritage; hence, it needs to be preserved and as a place to apply a strategy of the sustainable economic development conducted through a good and realistic management structure.

- Geopark has an implementation to give an opportunity for the creation of work fields for the local community in terms of obtaining the economic benefit concretely, commonly through the sustainable tourism activities.

- For Geopark, the object of geological heritage and science about geology is shared with publics. The element of geology and the landscape related to the natural environment and cultural aspect.

b. Sustainable – the development and management of geotourism site must be sustainable to maintain its preservation.

c. Geologically informative – it is equipped with the information about the history of the geological formations. It then makes the tourists to understand about the natural process.

d. Locally beneficial, it gives a benefit for community living nearby.

e. Tourist satisfaction, it gives satisfaction for the tourists physically and mentally.

Planning is the process of making decisions about what to do in the future and how to do it. As stated by (Horner, Ozguven, Marcelin and Kocatepe 2018), the planning must consider the today situation realistically and potential factors potential to be developed. (Weaver and Lawton 2017) define a planning as a process with a specific goal to be achieved, mitigate and monitor the changes that might occur purposely to maintain the sustainability of the region and can improve the experience of tourists towards the area or locations. In this case, (Dupre 2019) revealed that if the tourism plan follows the trend of regional planning, then the tourism is not always seen as a major focus on the planning process. Tourism planning includes the following aspects (Han, Liu, Zhao and Gao 2018):

a. Tourist, it needs to be analysed for the characteristics of the tourists that are expected to come;

b. Transportation refers to how the facility of existing transportation either from the original state or the transportation to the tourism objects;

c. Attraction, it is about what is seen, done and bought in the tourism destination;

d. Information and Promotion, the ways of promoting that are done through advertisement or any existing packages.

The initial step of planning that needs to be done is the study on the potential to formulate the accurate development planning in accordance to the existing condition and the direction of policy on local and national policy. For this need, identification on the components of the tourism in the area of Mulo Village is conducted as seen in Table 2.

From the results of the identification, Mulo Village area has a high attraction to be developed as a Geotourism. Social support of communities in tourism development is also quite significant making the assessment on the sociocultural aspects is quite high. It provides a great opportunity for geotourism development, which provides a guarantee for the successful development of this potential as a tourist attraction. It is also consistent with the statement of (Weaver and Lawton 2017) that stakeholder support plays an essential role in the successful development of tourist attraction.

Table 2. The result of the identification of tourism component in Mulo Village, Wonosari District, Gunungkidul Regency

Components	Sub-Components	Identification Results	
Attraction	Resources	Cave	V
		Rocks	V
		Flora	V
		Fauna	V
		Waters	V
		View	V
		Culture	V
	Tourism activities that can be done	Enjoy the natural beauty	V
		Seeing flora and fauna	V
		Cave tubing	
		Cave Exploration	V
		Nature Exploration	V
		Research/Education	V
		Camping	V
	Geosite Cleanness	Free from industrial pollution	V
		Free from waste	
		Free from vandalism	V
	Comfort of Geosite Areas	Clean and fresh air	V
		Free from disturbing odour	V
		Free from noise	V
Free from traffic disturbance		V	
Good service			
Accessibilities	Good road condition	V	
	Close to city centre	V	
	Short travel time	V	
Supporting Facilities and Infrastructure	Lighting	V	
	Communication access	V	
	Car Parks	V	
	Bathroom / Toilet		
	Small restaurant		
	Souvenir shop		
	Rest room	V	
	Worship building		
	First Aids Box		
Community Involvement in management and enterprise of tourism		V	

Based upon the general overview and the profile of geosite in Mulo Village and considering the external factors those are the opportunities and threats, then the SWOT analysis on the Geotourism development can be formulated as follows (Herrera, Carrión and Briones 2018).

a. Strength (S)

- Abundant wealth of geosite
- High geodiversity
- Variety of potentials in other tourism attraction in the surrounding geosite of Ngingrong Cave
- The improved commitment of community to manage the geosite of Ngingrong Cave as a tourist object
- Quite large amount of fund support for the development of geotourism
- The developing promotion of geosite of Ngingrong cave

b. Weakness (W)

- The lack of the public's understanding about the geopark concept
- The efforts of geotourism management is not optimal
- The lack of coordination in geotourism management among stakeholders
- The lack of promotion for geotourism
- The tourism diversification is not developed in response to geodiversity

- c. Opportunity (O)
- The support of Regulation of Minister of ESDM No. 17 of 2012 on the Establishment of Karst Landscape Region
 - The support of Law No. 11 of 2010 on Tourism
 - The support of Law 26 of 2007 on Spatial Planning
 - The Support of Law No. 23 of 2014 on Regional Government in Chapter mining permits
 - The support of Law 11 of 2013 on the Cultural Heritage Objects
 - The support of Regulation of Special District of Yogyakarta No. 1 of 2012 on the Master Plan of Tourism Development in the period of 2012-2015
 - The support of Regulation of Special District of Yogyakarta No. 6 of 2012 on the Conservation of Cultural Heritage and Cultural Sites
 - The support of Local Regulation of Gunungkidul Regency No.5 of 2013 on the Tourism Implementation
 - The area of MountSewu is included in the Global Geopark Network
 - The increasing interest of domestic and foreign tourists
 - The rapid technology developments
- d. Threat (T)
- The high interest of society to mine geosite
 - The lack of supervision and protection of the area around geosite
 - The poor understanding and public awareness towards environmental preservation

From the SWOT analysis above, the strategies of geosite development is formulated as shown in Table 3.

Table 3. Strategy in the Development of Geosite Based Upon SWOT Analysis

Strategy of SO development	Strategy of ST development
a. Identifying the geosite condition b. Documenting and publishing the uniqueness of geosite c. Formulating the plan of the geotourism development synergic with any potential of other tourism attractions by still maintaining the preservation and sustainability of geosite. d. Formulating the model of geotourism management by involving the community e. Using the high technology in geotourism management	a. Improving the understanding and people awareness towards the importance of environment preservation b. Formulating the plan of geosite preservation c. Formulating the plan of recovering the damaged geosite d. Formulating the plan of management and development of tourism area managed integrally.
Strategy of WO Development	Strategy of WT Development
a. Improving the people understanding about the geopark concept b. Formulating the plan of geotourism management in accordance with the geopark concept c. Formulating the model of geotourism management integration d. Formulating the plan of promotion and marketing of geotourism e. Developing the tourism diversification in responding the <i>geodiversity</i> f. Utilizing the high technology in geotourism management	a. Improving the understanding and awareness of people about the importance of environment preservation b. Formulating the plan of geosite preservation c. Developing the tourism diversification in responding the <i>geodiversity</i>

Conclusion

In the Master Plan of Regional Tourism Development in Gunungkidul Regency in the period of 2011-2025, it is stated that the tourism development should be directed to realize Gunungkidul area as a destination for nature-based tourism, supported by a sustainable and competitive culture towards a developed, independent and prosperous society. In the Strategic Plan of the Directorate of Tourism Destination Development in the period of 2012-2014, more specifically it is mentioned that the development of Tourism destinations Geo (Geotourism

Destination) is associated with the formations or geological sites, including geomorphological and landscapes sites as realized through geo-tracking activity and geopark development, geotourism has a goal to understand and obtain explanations and experience the earth beauty and authenticity - all landscapes, landforms, flora and fauna.

Ngingrong cave in the area of Mulo Karst Valley is a part of geosite in Gunungkidul Regency. In the spread of geosite in Gunungkidul Regency, this cave is located in the central area. The Geopark concept of UNESCO offers an opportunity to recognize, protect and develop this world heritage site at the global level. Geopark concept is very close to the paradigm of the unification between science and culture, through the introduction of the important and unique physical state of nature. In addition to open the opportunities for research and education, geopark has a great potential to develop the local economy. The development will create work field and new economic growth. It can be developed into tourist objects and tourism attraction (Geotourism), and can also be developed into a trade and handicraft manufacturing (geoproducts) such as moulded fossils and souvenirs. In the perspective of the potential and direction of tourism development by the Local Government of Gunungkidul particularly related to the destination of natural tourism, it is more appropriate if geotourism area is developed as a environment and culture-based tourist attraction in accordance with the geopark concept -a concept of sustainable tourism development that aims to support the efforts to preserve the environment (nature and culture) and to improve public participation in the management – thus providing education about economic for both community and local government. Based on the above considerations, the direction of the macro development of geotourism can be formulated as follows.

a. Offering experience and education to tourists to broaden the understanding and appreciation of the tourism destination. Education is provided through an understanding of how important the environmental conservation is. This can be done by presenting the nature and the environment as an original, beautiful and sustainable tourism attraction. The experience, meanwhile, is offered through the creative tourism activities supported by excellent service.

b. Minimizing the negative impacts that could impair the environment and cultural characteristics of the visited areas. This can be done by the tourism planning that does not damage the environment and keep the environment in the development of its attractions.

c. Involving the community in the management and implementation of tourism activities. In Mulo village, the community has been engaged as the active participants in tourism management. Hence, community participation in the development of further travel is not something new.

d. Offering the economic benefits particularly for the local communities. For this, the geotourism activities should be profitable. Community involvement as active agents in tourism activities is evidence that the development of tourism activities in this village can provide the economic benefits in social welfare concretely.

e. Being Continual and Sustainable. This should be a central concern in the further development of Geotourism activities and facilities in Gunungkidul Regency.

From the above description, the Geotourism development should need to consider five (5) basic principles, namely:

a. Preservation

The sustainability principle in Geotourism refers to the activities of geotourism conducted by not emerging any damage and pollution in the environment and local culture. One of the ways in applying this principle is to use the energy efficient local resources as managed by the local community. Not only the public, but tourists must also respect and participate in culture and nature conservation in the areas they are visiting.

b. Education

Tourism activities undertaken should provide an educational element. This can be done in several ways such as by providing interesting information such as names and benefits of plants and animals around the tourism areas, the foliage used for medicine or in daily life, or the beliefs and customs of local communities. Educational activities for tourists will encourage the efforts of preservation of nature and culture. This activity can be supported by tools such as brochures, leaflets, booklets or information boards.

c. Tourism

Tourism is an activity that contains an entertaining element with a variety of tourist motivation to visit a location. Geotourism also must contain this element. Therefore, the products and services in tourism must also provide an entertaining element to be worth selling and accepted by the market.

d. Economy

Ecotourism also opens up some economic opportunities for people - even if the tourism travel is conducted using local resources such as transport, accommodation and guide services. Geotourism must

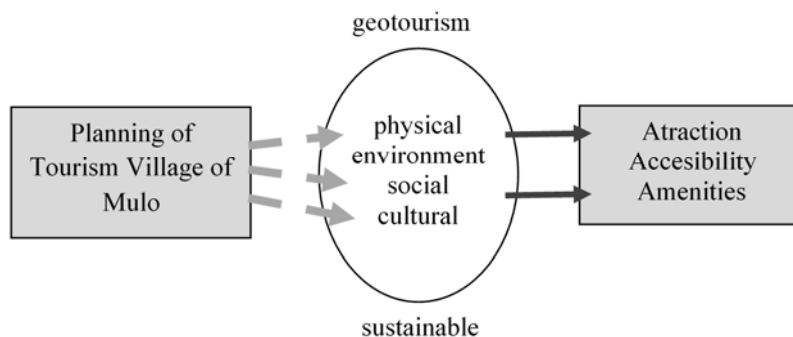
provide income and profit so that it can continue to be sustainable. To realize it, the important thing to do is to provide services and the best travel products and quality. To be able to provide services and products quality tourism, it would be better if the income from tourism is not only used for conservation at the local level but also for helping the development of local communities' knowledge, for example by developing capacity through training for increasing the types of businesses/attractions as presented at the village.

e. Participation of local communities

Community participation will emerge when the nature/culture can provide benefits directly or indirectly to the community. To provide the benefits, then the nature/culture should be managed and maintained. Community participation is important for the success of geotourism in a tourism destination. Participation in tourism activities will provide direct benefits for us, both for the natural preservation the economy.

The directions above become the consideration in formulating the geotourism development concept in accordance with the geopark concept. Based on this concept, the geotourism development should include the physical aspects of environment, social, and culture as shown in Figure 9.

Figure 9. Macro Concept of Geotourism Development



The environment, social and culture-based tourist is a tourism activity conducted in the natural places and contributes to the natural conservation and improves the welfare of local communities. The development of this concept directly can give an access to everyone to see, learn, and enjoy the experience of nature, intellectual and cultural local community as it is more focused on three main points: (a) Continuity of nature (preservation) or ecology, (b) Providing economic benefits, and (c) It is acceptable in social life.

Acknowledgements

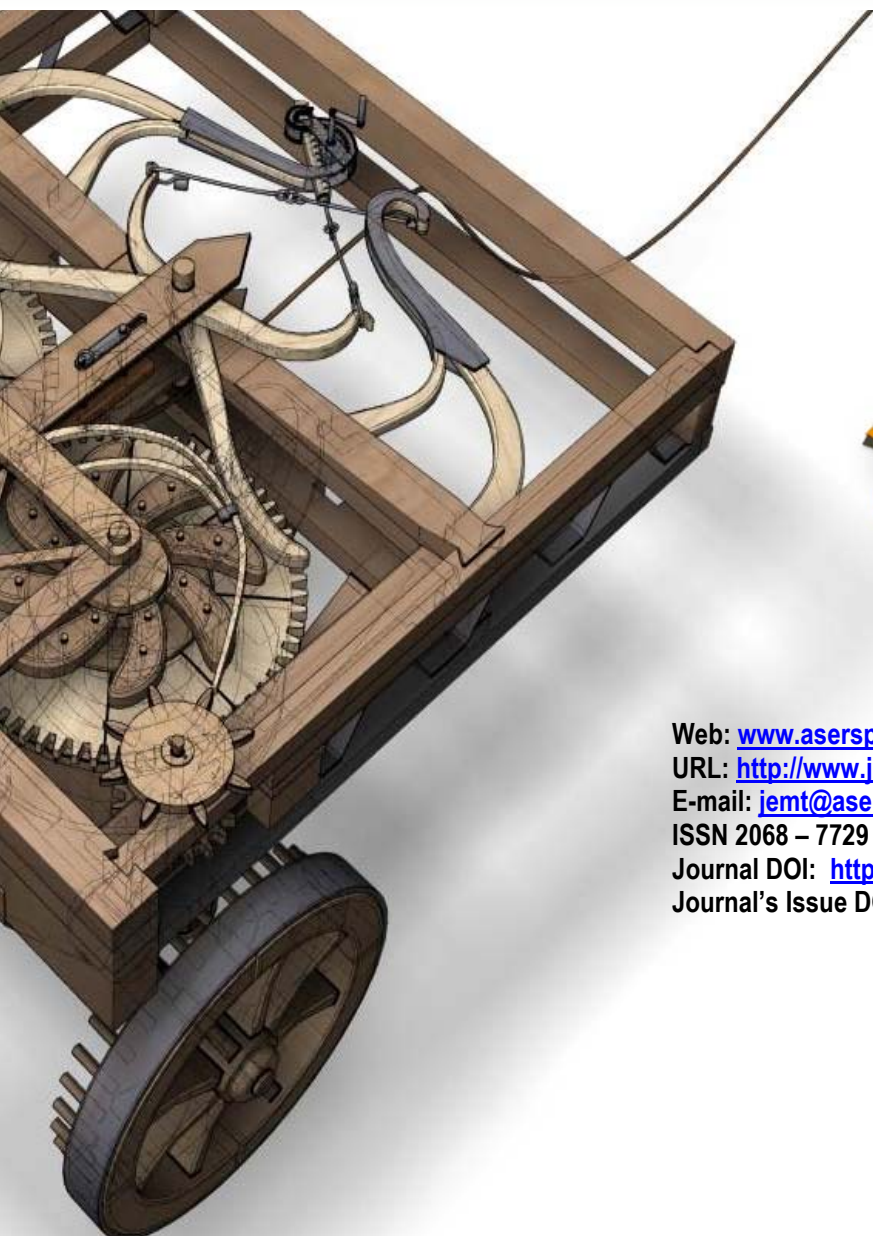
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