

# Public Participation in Realizing Sustainable Geopark Development: Dieng Geopark Case

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**Abstract**—This research focuses on the role and participation of the public in realizing sustainable Geopark development, which is not only for the Geopark but also for the surrounding communities, especially in Dieng Geopark, Central Java. Qualitative research method was used in this research, with the selection of case study as the data collection method. Semi-structured and in-depth interviews were conducted with key respondents representing the government, Geopark managers, and the community. Quick & Bryson's (2016) concept of public participation was used to see how high the involvement of the community is in the sustainable development of this Geopark by focusing on 5 (five) main principles of public participation, namely inclusiveness, sustainability, contextuality, multi-stakeholder collaboration, and strengthening public capacity. The findings of this study illustrate that the principle of public participation in Dieng Geopark in realizing the sustainable development of Dieng Geopark is quite good as seen from the fulfillment of all aspects of public participation according to Quick & Bryson. Hopefully, the findings of this research can foster public awareness and involvement in realizing the sustainable development of Dieng Geopark.

**Keyword**—Dieng Geopark, public participation, sustainable development

## I. INTRODUCTION

As one of the highlands with volcanic activity originating from the surrounding mountains, the Dieng plateau is an area with distinctive geological, historical, and agricultural characteristics. This uniqueness coupled with the location of the altitude between 2000 to 2590 meters above sea level, makes agriculture, tourism, and geothermal an attraction and one of the main livelihoods of its citizens. Unfortunately, the management of its distinctiveness is still not well implemented. Environmental damage around some tourist attractions can be said to be quite severe. Protected forests around tourist attractions are also very critical. Agricultural activities, especially potatoes, which are quite impulsive around the Dieng plateau, cause excessive use of fertilizers which contribute to the destruction of protected forests and acceleration of erosion, which then causes environmental damage [1].

Alternative livelihoods are needed by the surrounding community so that the needs for life are still fulfilled but do not rule out environmental sustainability [2].

The Geopark concept is then presented as one way out of the problems faced by the community around the Dieng plateau. The concept, which was initiated by the Wonosobo and Banjarnegara local governments and supported by PT Geo Dipa Energi, the Central Java Provincial Government, and academics, means that the Dieng plateau will have high geological value if managed holistically for the purposes of

conservation, education, and tourism-based sustainable economic development [3]. Geopark development applies the principle of development from below, which in addition to involving all stakeholders at the local and regional levels, also emphasizes locality and utilization of local assets or potential in the community, which is commonly called endogenous development. Endogenous development involves the active participation of local communities. The sustainability of economic growth in local communities occurs through transformations initiated by local actors. Not only does this impact the Geopark site sustainably, but it also ensures the sustainability of the local community [4]. With the Geopark, the ordinary activities of the community around the location become attractive tourist attractions for visitors in the geotourism village, which will then have more economic value for the community. The community benefits from their daily activities and gets a fairly high additional income from tourist visits who want to do activities there.

One of the geoparks that has great potential in Indonesia is Dieng Geopark. Located in Central Java, Dieng Geopark is known for its unique volcanic landscape, cultural sites, and biodiversity. Dieng Geopark is a tourist attraction that contributes to the local economy, but also faces various challenges, such as environmental degradation, tourism management that is not yet optimal, and limited community involvement, especially since Dieng Geopark has not been designated as a National Geopark or Global Geopark, making this Geopark has its own challenges related to its management. Although it already has a Management Agency [5], sustainable geopark management requires a strategy that involves a wide range of stakeholders, not only the Management Board, but also participation from local communities [6].

Public participation is an important aspect of environmental management and sustainable development. Public involvement in planning, decision-making, and implementation of development programs can improve policy effectiveness and ensure social and environmental welfare [7]. In the context of Geoparks, public participation can take many forms, such as environmental education, involvement in tourism management, and monitoring of ecosystem sustainability. However, low participation due to lack of access to information, limited community capacity, and lack of space for dialog with the government and managers are often the main obstacles in developing geoparks that actively involve the public. Measurement of public involvement in management is needed.

Sustainable geopark development is in line with the Sustainable Development Goals (SDGs), especially in the

aspects of environmental conservation (SDG 15 – Life on Land), inclusive economy (SDG 8 – Decent Work and Economic Growth), and education and environmental awareness (SDG 4 – Quality Education). Geoparks can be a model of development that supports the balance between the exploitation of natural resources and their conservation [3]. Therefore, SDGs-based management strategies need to be applied in the development of Dieng Geopark, where active community involvement is key to achieving broader sustainability goals.

In the context of Dieng Geopark development, public participation is not only limited to consultation or passive involvement, but should also be directed at empowering the community as the main actor in geopark management. Through a participatory approach, local communities can be given a role in ecosystem conservation, ecotourism development, and the geopark policy decision-making process. Thus, Dieng Geopark not only functions as a tourist attraction, but also as an area that is able to maintain ecological balance and provide sustainable economic benefits for local communities.

## II. LITERATURE REVIEW

Geoparks are areas that have significant geological value and are managed with a holistic approach for the purposes of conservation, education, and local economic development through geotourism [8]. In the context of sustainability, geoparks should consider three main pillars: environmental conservation, community empowerment, and economic growth [9]. This concept is in line with the principles of the Sustainable Development Goals (SDGs), particularly in preserving terrestrial ecosystems (SDG 15) and strengthening community-based economies (SDG 8) [3].

Previous research by Hose [10] emphasized that successful geopark management must integrate local cultural and social aspects in conservation and tourism policies. Another study by ProGEO [11] shows that the success of geoparks is strongly influenced by community involvement in the maintenance of geological sites and the development of local wisdom-based tourism products. In the Indonesian context, research by Raharjo *et al.* [12] on Ciletuh Geopark showed that a community-based approach was able to increase environmental awareness and provide economic benefits through geodiversity-based ecotourism.

Public participation in geopark management is a key element in achieving long-term sustainability. Arnstein [13] in “Ladder of Citizen Participation” divides the level of public participation from the lowest level (manipulation and therapy) to the highest level (partnership and citizen control). This model was later developed by Quick & Bryson (2016) who emphasized that participation should be inclusive, collaborative, and oriented towards mutually agreed solutions, which were then elaborated into the 5 pillars of public participation above.

Several studies related to public participation in sustainable geopark management have been conducted in various locations. Invanni and Zhiddiq [14] in their study of Maros Pangkep National Geopark found that local communities tend to be more actively involved in management if given education and training. The same thing was also found in the research of Ibrahim and Adiputra (2023)

in their study at Ciletuh-Palabuhanratu Geopark, which found that the development of educational-based tourism provides benefits for tourists and local communities [15]. Meanwhile, Simatupang and Purba’s research [16] in the Toba Caldera Geopark, found that the Geopark has not provided economic improvement benefits for the community due to the lack of community knowledge about the Geopark and the lack of community involvement in the conservation and education process in its management. From previous studies, no one has conducted research related to sustainable geopark management as seen from the principle of public participation, especially in Dieng Geopark. So this research will make academic and practical contributions related to sustainable geopark management.

## III. RESEARCH METHOD

A qualitative approach was used in this research. With the aim of gaining a comprehensive view and understanding of public involvement in realizing sustainable Geopark development, a case study method was used. In-depth interviews and analysis based on available secondary data were used to gain a deeper understanding of the experiences, perceptions, and challenges faced by the parties involved in the management of Dieng Geopark (Dieng Geopark Manager, PT Geo Dipa Energi, Wonosobo and Banjarnegara District Governments, Central Java Provincial Government, and the Community). Interviews were conducted using a semi-structured method, allowing for flexibility in exploring topics that arose during the interview as mentioned by Kvale in Sayrs [17].

The research will focus on the application of the principles of public participation put forward by Quick and Bryson in the management of Dieng Geopark, where public participation is based on 5 (five) things, namely inclusiveness, sustainability, contextuality, multi-stakeholder collaboration, and strengthening public capacity.

## IV. RESULT AND DISCUSSION

The 405.04 km area that crosses the administration of Wonosobo Regency (Kejajar, Garung, Watumalang, Wonosobo, and Mojotengah) with a total of 45 villages and Banjarnegara Regency (Batur, Pejawaran, Pagentan, and Wanayasa) with a total of 58 villages has 276,577 people as mentioned in Table 1 with the following details:

Table 1. Population in Dieng Geopark area

No.	Sub-district	District	Population (people)		
			Male	Female	Total
1	Batur	Banjarnegara	21.478	20.146	41.624
2	Pagentan	Banjarnegara	6.978	6.587	13.565
3	Pajawaran	Banjarnegara	23.305	21.710	45.015
4	Wanayasa	Banjarnegara	7.925	7.437	15.362
5	Garung	Wonosobo	30.144	28.153	58.297
6	Kejajar	Wonosobo	24.410	22.775	47.185
7	Mojotengah	Wonosobo	21.736	20.166	41.902
8	Watumalang	Wonosobo	3.428	3.235	6.663
9	Wonosobo	Wonosobo	3.495	3.469	6.964
Total			142.899	133.678	276.577

Source: BPS, 2022.

In addition to having businesses in the agricultural sector, the existence of the Dieng Geopark encourages the surrounding community to have businesses related to tourism support facilities and infrastructure, such as providing

lodging areas, selling souvenirs or souvenirs typical of the surrounding area, transportation services around the tourist area, or tourist guide services. In addition, history and culture are also closely related to the community around Dieng Geopark. The phenomenon of dreadlocks has become a living legend in the surrounding community. It would be a shame if this rich potential is not involved in Geopark management.

The involvement of local communities and indigenous peoples is one of UNESCO's priorities in determining the status of a Geopark as a Global Geopark [8]. Cooperation between stakeholders involved in Geopark management is very important to realize sustainable Geopark development. Based on the results of the analysis of public participation using the criteria determined by Quick and Bryson discussed earlier, the following can be seen:

#### *A. Inclusiveness*

Public participation must involve all community groups, especially groups that are often marginalized, so that the resulting decisions are more representative, fair, and reflect the needs of the entire community. In the management of Dieng Geopark development, the concept of inclusiveness has been applied by involving groups from all walks of life in the Geopark management process. Fig. 1 was documentation when socialization has been carried out in various circles of society.



Fig. 1. Socialization of Dieng Geopark management to the community.

#### *B. Sustainability*

Participation should not be one-time, but should take place throughout the policy cycle, starting from problem identification, policy formulation, policy implementation, to the evaluation of the policy. This is to ensure that the policies made continue to receive input and can be improved over time. In the management of Dieng Geopark development, the principle of sustainability in public participation has also been applied, which is characterized by the application of 3 important principles of sustainability that are upheld by all elements involved in Geopark management.

- 1) Policies related to community development. Understanding that the economy relies on local potential and the ability of the community to develop and be empowered makes Geopark managers formulate policies related to the formation and development of tourist villages, area-based village development, and fostering Farmer Group Associations (Gapoktan) in the Agriculture and Food Security Office.

- 2) Policies related to community and stakeholder care. Such as policies related to facilitating the preparation of village regulations on the environment to increase public awareness of the importance of maintaining and preserving the environment.
- 3) Sustainable community economic development policies based on creative economy. With the development of tourism in the Dieng Geopark Area, it will also stretch the economy of the surrounding community by actively participating in tourism. The formation of tourism awareness groups (Pokdarwis) will be a space for the community to develop the potential that exists in each area.

#### *C. Contextualization*

Participation methods should be tailored to the social, economic, and political conditions of the communities involved. This aims to make the participation mechanism more effective, acceptable to the community, and produce relevant policies. In the context of Dieng Geopark development management, the principle of contextuality has been proven by the realization of participation carried out by each element involved based on their abilities and capabilities. How academics conduct studies on the readiness of the Dieng Geopark, how the Regional Government can provide support for management, how the Management Agency seeks the realization of the Dieng Geopark as a National and Global Geopark, and how the community is ready to help manage the Geopark.

#### *D. Multi-stakeholder Collaboration*

Public participation will be more effective if it involves various parties, including the community, government, private sector, and academia. This aims to produce more comprehensive solutions by utilizing diverse knowledge, expertise, resources, and perspectives. Multi-stakeholder collaboration has been established since the Geopark concept was initiated in 2016. Crossing two regencies, the synergy between the Wonosobo Government and the Banjarnegara Government is very well established. Support from the Central Java Provincial Government, PT Geo Dipa Energi, and academics proved the realization of multi-stakeholder collaboration in the development of the Dieng Geopark. This was marked by the issuance of the Central Java Governor's Decree on the Dieng Geopark Management Agency Number 661.2/29 of 2023 on August 30, 2023. In addition, a partnership network between the Dieng Geopark Management Agency and several communities managed by the surrounding community has also been established. Relationships with the Indonesian Tourist Association, Oemah Wisata, the Indonesian Hotel and Restaurant Association, the Carica Cluster Cooperative, and the Dieng Bersih Community are supporting partners for Dieng Geopark management.

#### *E. Strengthening Public Capacity*

Communities need to be equipped with information, skills, and resources to participate meaningfully. It is intended that the community is not only a recipient of policies, but also has an active role in the decision-making process. In the management of Dieng Geopark development, various kinds of training have been carried out both by the Management

Agency and the relevant Local Government as shown in Fig. 2. Education and Training for the Initial Introduction of Geoparks in Wonosobo organized by the Wonosobo Regency Government. Not only that, training in tour package guidance and wooden batik handicraft guidance is also a training provided by the local government and the Management Agency to the surrounding community to be more empowered.



Fig. 2. Education and training on Geopark introduction in Wonosobo for surrounding communities.

## V. CONCLUSION

The sustainable management of Dieng Geopark relies heavily on the active participation of the community in every stage of its development. By applying the five principles of public participation according to Quick & Bryson (2016)-inclusiveness, sustainability, contextuality, multi-stakeholder collaboration, and strengthening public capacity-Geopark Dieng has shown good steps in environmental conservation, community-based economic development, and strengthening the social capacity of the community.

From a management and public policy perspective, this participation-based approach is a key element in ensuring that geopark management policies are responsive to the needs of local communities while supporting Sustainable Development Goals (SDGs). The synergy between the government, academia, private sector, and local communities needs to be strengthened so that geopark management is not only an instrument of conservation, but also a model of inclusive and sustainable local resource-based development. Through wider public involvement and policies oriented towards community empowerment, Dieng Geopark can become an example of ecotourism-based area management that not only protects the environment but also improves the welfare of the community in a sustainable manner.

## CONFLICT OF INTEREST

The authors declare no conflict of interest.

## AUTHOR CONTRIBUTIONS

MI developed research ideas and concept, and wrote a preliminary script; SK developed methodology and provided research documentation; AS conducted field research, and managed and organized data; all authors discussed research results and findings, and had approved the final version.

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