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# Local Wisdom of Merapi Slope Village in Ensuring the Availability and Sustainability of Springs in Glagaharjo Village Cangkringan District of Sleman Yogyakarta

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**ABSTRACT.** Water is the essential source of life for the survival of living things. The eruption of Mount Merapi in 2010 threatened the availability and sustainability of springs in Glagaharjo Village, the highest village on the slopes of Mount Merapi. Glagaharjo Village is also a village included in the Disaster-Prone Area (KRB) III of Mount Merapi. The area shows the condition of the well-maintained springs as the only source of clean water, so this condition becomes an interesting thing to study. This study aims to determine aspects of local wisdom in managing springs in Glagaharjo Village due to the vulnerability of the Mount Merapi eruption, which is expressed through their traditions and rites. This research is qualitative exploratory by discussing case studies in the field. The data used are primary data and secondary data. Primary data is from interviews and field observations, while secondary data is obtained from several references and literature. The results of the study show that local wisdom can contribute to increasing community resilience to the availability of springs as a source of clean water in Glagaharjo Village. There are forms of local wisdom in the form of 1) The value of adaptation in the form of behaviour to protect the environment by planting several types of trees that are considered capable of storing water, 2) The socio-cultural value of the community which is shown by the culture of mutual cooperation, 3) The value of environmental balance using springs wisely without exceeding the power of the community, environmental support and capacity, 4) The value of community preservation has been to maintain water with various attitudes and actions to maintain the availability and preserve so that the quality and continuity of clean water sources are maintained amidst the threat of the eruption of Mount Merapi.

**Keywords:** Local wisdom, Availability, Sustainability, Qualitative explorative, Springs.

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## 1. Introduction

Local wisdom is a view of life, knowledge, and various life strategies in the form of activities by local communities in responding to multiple problems in meeting their needs. In a foreign language, local wisdom is conceptualized as local wisdom or local knowledge or local genius (Fajarini (2014: 123). By RI Law No. 32 of 2009 concerning Environmental Protection and Management, Local wisdom is interpreted as noble values that apply in the community's life, which, among other things, are used to protect and manage the environment in a sustainable manner.

Villages can develop sustainable livelihoods by maintaining local wisdom that has been going on for years. Local wisdom in rural areas has various cultural strategies to protect the environment, one of which is maintaining the sustainability and availability of springs that have an essential role in the community's survival. Not only to meet their daily needs, but the Glagaharjo village community can also build a small and

macro-scale economy from springs. It is an asset that can save the population, namely village development from natural resources from Mount Merapi's springs.

The eruption of Mount Merapi in 2010 threatened the availability and sustainability of springs in Glagaharjo Village, the highest village on the slopes of Mount Merapi. Glagaharjo Village is also included in the Disaster-Prone Area (KRB) III of Mount Merapi. Springs are the only primary source of water needed for the life of the people in Glagaharjo Village. Because it is not possible to make dug wells in the hillside area due to the small river condition that is on the side of a cliff, this spring becomes very important for life. Public. Amid the threat of the eruption of Mount Merapi, it shows the condition of the springs that are still well maintained as the only source of clean water, so this condition becomes an interesting thing to study. This study aims to determine aspects of local wisdom in managing springs in Glagaharjo Village due to the vulnerability of the Mount Merapi eruption, which is expressed through their traditions and rites.

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## 2. Materials and Methods

### 2.1 Location

This research is located in Glagaharjo Village, Cangkringan Subdistrict, Sleman Yogyakarta in August 2021. The research method uses exploratory qualitative descriptions by discussing case studies in the field. This research is intended to study intensively the background of the situation that occurred in Glagaharjo Village. So, the data obtained is, of course, the result of an in-depth search on the units of observation and analysis in this study (Verschuren, Piet; Dooreward, 2010).

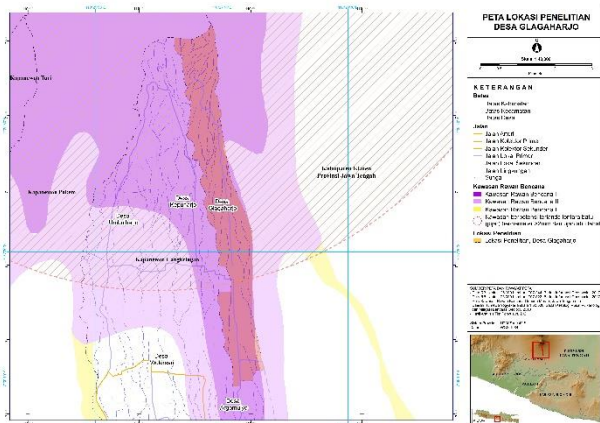


Fig. 1 Study Area

### 2.2 Sampling Method

The data of this study consisted of primary data and secondary data. The data used are primary data and secondary data. Primary data was in the form of interviews and field observations, while secondary data was obtained from several kinds of literature to find out the condition of the study area, local cultural wisdom and demographics. The sampling method in this study used the Purposive Sampling Method (Fradian et al., 2012); (Sekaran, 2000), which states that sampling is limited to certain types of people who can provide the desired information or according to several criteria set by the researcher. The population of respondents in this study is people who use springs and spring administrators.

The number of respondents determined using the Slovin formula with an error limit of 15% is used because the population of spring users is 1,435 households. Arikunto (2002) states that an error limit of 15% can be used if the population is more than 100 respondents. The sample size uses the Slovin Formula Determination, namely (Arikunto, 2002):

$$n = \frac{N}{N(e^2)+1} \quad (1)$$

Where:

- $n$  = Number of Respondents
- $N$  = Total number of (KK) who use springs in Sungai Langka Village
- $e$  = Margin/error limit

$$n = \frac{1.435}{1.435(0,15^2) + 1} = 44 \text{ Responden}$$

The results show that 44 respondents, including two people who understand the history of the village and two people who manage the springs. The materials and tools needed in this research are writing instruments, questionnaire sheets, a computer set with ArcMap 10.1 software, and other supporting devices. The research will be carried out using qualitative methods by way of orientation to reading. The authors study literature from various sources, including books, journals, news, local government policies related to springs in the Mount Merapi area. Meanwhile, data associated with the local wisdom of the people in the study locations were collected through in-depth interviews with people who use springs, manage springs, and community leaders in the Mount Merapi area. The results of the interviews were explored. In addition, critical information was obtained from interviews with research informants. A comprehensive picture of the local wisdom values adopted by the people in Glagaharjo Village can be generated from this process.

## 3. Results and Discussion

Glagaharjo Village is part of the administrative area of Cangkringan Subdistrict, Sleman Regency, Yogyakarta, which has an area of 795 Ha. Glagaharjo Village is located at an altitude of 600-1150 meters above sea level. Glagaharjo village is the highest village which is located approximately 4 km below the peak of Mount Merapi and is included in the KRB II area. Some of the natural resources found in Glagaharjo Village include sand, stone, bamboo, and springs. In meeting the water needs of the people of Glagaharjo Village, they only rely on springs called Bebung springs. This is because it is not possible to make dug wells in the hillside area, and the condition of the river is relatively small and is on the side of a ravine, so that this spring becomes very important for people's lives.

The local wisdom of the Glagaharjo Village community towards the existence of springs is a system in the order of social, economic, and cultural life and the environment that lives amid the local community. Local wisdom in Glagaharjo Village has the characteristics of a dynamic mountain village amid the threat of Mount Merapi eruption. The local wisdom of the community towards springs cannot be separated from the tradition that is continuously carried out and preserved by the community to this day. In this study, local wisdom in carrying out community life on the availability and sustainability of springs is explored through various things, namely the level of public education, community perceptions regarding knowledge of the definition of springs, utilization of springs, community attitudes towards the preservation of springs and community traditions towards the existence of springs.

### 3.1 Education Level of Glagaharjo Community

The level of education of respondents in Glagaharjo Village is very diverse, ranging from graduates from elementary school (SD), junior high school (SMP), high school (SMA), Diploma (D3), undergraduate to postgraduate. The results of data collection of respondents regarding the level of education can be seen in Figure 2.

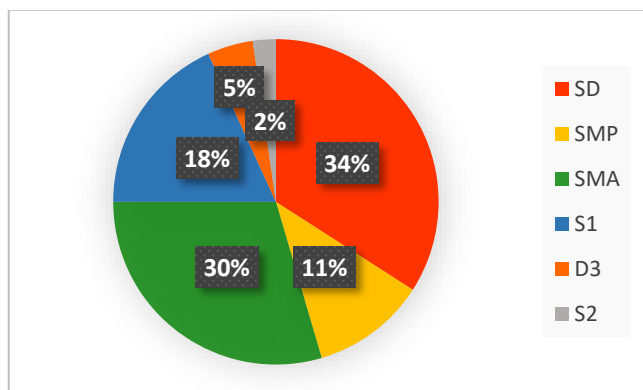


Fig. 2 Diagram of respondents' education level percentage

The education level of respondents is dominated by elementary school graduates as many as 34% or 15 respondents, for junior high school graduates 11%, high school graduates 30%, D3 5%, undergraduate 18%, and masters 2%. According to Sugiarto (2010), most rural communities only have limited education and skills. However, the people of Glagaharjo Village have a reasonably high education level of respondents, when viewed from high school graduates to 66% of those who take master's degrees. Furthermore, according to Noviyanti et al. (2016), knowledge is very closely related to education. Therefore, it is hoped that with a high level of education, the community will have broader knowledge regarding efforts to optimize the management of water resources so that they are continuously available and sustainable.

3.2 People's Perceptions of Glagaharjo Village Regarding the Definition of Springs

Perception of the environment is the way individuals understand and accept environmental stimuli they face. The understanding process becomes easier because individuals associate the objects they observe with certain experiences, namely the function of the object and the meaning contained in the object according to individual needs (fisher, bell, & baum, 1984). The knowledge possessed by the community regarding springs must be explored, especially those that are in direct contact with meeting the needs of people's lives. The perception of the Glagaharjo village community regarding the definition of a spring can be seen in Figure 3.

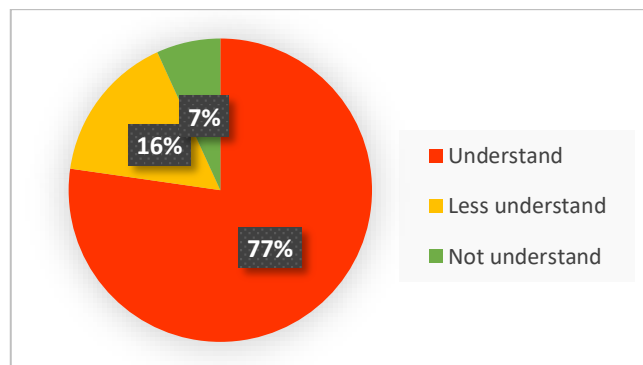


Fig. 3 Percentage diagram of the definition of springs

The perception of the people of Glagaharjo Village regarding the definition of a spring answered understand 77% or 34 of these respondents were quite good where in general

the Glagaharjo community already knew the definition of a spring. The community defines springs as sources of clean water originating from ground water that flows to the ground surface so that it can be used for the necessities of life. Respondents who answered that less understand 16% or 7 respondents and not understand 7% or 3 respondents. Perceptions regarding the definition of this spring can indicate the level of community capacity towards the management and utilization of Glagaharjo springs.

3.3 Utilization of the Glagaharjo Village Community Springs

Human needs for water always increase from time to time, not only because of the increasing number of people who need water, but also because of the increasing intensity and variety of the need for water. On the other hand, the potential for water available in nature can be utilized by humans, but the amount is still there (Daud Silalahi, 2003:11). The use of springs by the community in Glagaharjo Village aims to determine the response of the existence of springs to the availability of springs. The use of springs by the people of Glagaharjo Village can be seen in Figure 4.

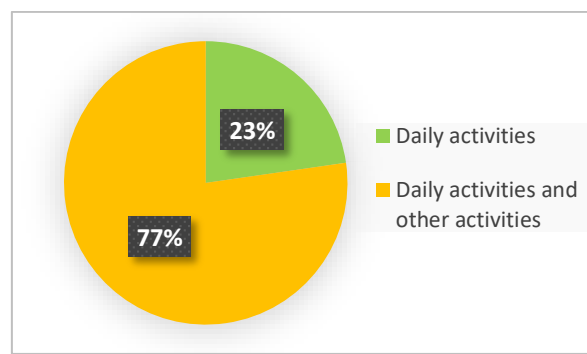


Fig. 4 Diagram of the percentage of spring utilization

The use of springs by the people of Glagaharjo Village for daily activities is 23% or 10 respondents, while for daily activities and other activities as many as 77% or 34 respondents. The use of springs for daily activities is drinking, bathing, washing, latrines, while the use of other activities is animal husbandry, plantation, agriculture, fisheries, or home industry. It can be seen that Glagaharjo springs play an important role in meeting basic needs and other needs in various sectors.

3.4 Attitudes of the Glagaharjo Village Community in the Presence of Springs

Attitude is a person's readiness to respond consistently to a particular object or situation in a positive or negative form as an appreciation of the object. The attitude of the people of Glagaharjo Village towards the existence of the spring shows an attitude that produces a positive response. From the results of the interview, it is known that some people's attitudes towards springs can be seen in Table 1.

**Table 1**  
Community attitudes towards the existence of springs

No	Public Attitude
1	Not cutting down trees carelessly
2	Planting tree seedlings of perennials periodically in the spring area
3	Protecting forests on Mount Merapi
4	Make the best use of water
5	Routine maintenance of springs and regular checks of springs
6	Keeping the environment clean around the springs
7	Do not mine sand in the spring area of Mount Merapi

Attitudes are very influential in human life and determine behaviour. Various positive attitudes of the people of Glagaharjo Village towards the existence of springs can maintain the availability and sustainability of the springs. The people of Glaharajo not only use water, but the community has taken a form of management of the springs.

### 3.5 Glagaharjo Village Community Traditions

Traditions in the anthropological dictionary are magical-religious habits from the life of an indigenous population which include cultural values, norms, laws and rules that are interrelated, and then become a system or regulation. Which is already established and includes all conceptions of the cultural system of a culture to regulate social action (Ariyono and Aminuddin, 1985). Glagaharjo people apply traditional ways of life in rural areas that have been carried out for generations as one of the traditional characteristics of Javanese society. The tradition that has been carried out by the Glagaharjo village community regarding the existence of springs can be seen in table 2.

**Table 2**  
Local Wisdom

Activity	Execution time
Mutual cooperation	2 weeks - once a month
Cleaning the Springs (Dandan Kali)	1 Muharram or 1 Suro
Eating together (Bancakan)	1 Muharram or 1 Suro
Send Prayer (Kenduren)	1 Muharram or 1 Suro
Waiting at the spring (Tirakatan)	1 Muharram or 1 Suro

The people of Glagaharjo as a traditional society are very familiar with the surrounding environment, which is part of the natural ecosystem and has coexisted with the existence of springs in harmony. The tradition that is carried out is a form of gratitude for the existence of the spring which has been useful in meeting the needs of the Glagaharjo Community.

Local wisdom is all forms of knowledge, belief, understanding or insight as well as customs or ethics that guide human behaviour in life in an ecological community (Suhartini, 2009). Environmental wisdom is the key word to form a balance of life that is wise to the environment. Elevating the values of local wisdom in realizing the availability and sustainability of springs is the 6th goal of Sustainable Development, namely ensuring the availability of clean water. Local wisdom that has been implemented can shape the order of political, social and cultural life, as well as the environment that the Glagaharjo community has carried out from the past until now. There are forms of local wisdom in the form of

adaptation values, socio-cultural values, environmental balance values, and sustainability values.

Adaptation value is in the form of behaviour to protect the environment by planting several types of trees that are considered capable of storing water such as *Acacia decurrens*, *Muntingia calabura*, *Gayam*, *Puspa*, and other plants. The community planted trees in the forest area around the Bebung spring in Glagaharjo Village, Gangkringan together with the Mount Merapi National Park. In the midst of the threat of an eruption of Mount Merapi which can cause the death of vegetation in the forest due to the material released during the eruption. The people of Glagaharjo Village are aware of the trees in the forest area that function as a rainwater catchment area which will then come out as water sources. Forest areas affect the potential of springs so that they can function optimally to be used by the surrounding community as a means of meeting their daily needs.

The value of local socio-cultural wisdom of the Glagaharjo Village community towards Bebung springs is shown to have a culture of mutual cooperation. The gotong royong community is a characteristic of the Javanese tradition. In the eyes of the people of Glagaharjo, gotong royong is an indispensable social solidarity and as the meaning of mutual harmony among citizens. This mutual cooperation shows that the people of Glagaharjo jointly maintain the spring and use it with the same taste and need. In addition, there are cultural traditions such as cleaning the spring (makeup), eating together (bancakan), sending prayers (kenduren), and waiting at the spring (tirakatan) which are held every 1 Muharram or 1 Suro. The traditional ceremonial tradition that is carried out is as a form of gratitude for the grace given by God in the form of abundant natural wealth, especially springs that can be utilized by the community.



**Fig. 5** Gotong Royong in Glagaharjo Village



Fig. 6 Bancakan and Kenduren

The value of local wisdom on environmental balance in Glagaharjo Village is to use springs wisely without exceeding the carrying capacity and capacity of the environment. Air Bebung is managed independently by the community, especially in Glagaharjo Village to meet their daily needs. The community utilizes the Bebung spring by using an iron pipe with a diameter of 20 cm to channel water from the spring to the main village reservoir which is then channeled through the hamlet holding tanks before being channeled back to each tub in their respective homes. In utilizing water, the people of Glagaharjo use a water meter. This water supply can limit the people of Glagaharjo Village from using water as needed. If people use water unwisely and only waste water, the water meter will show a large number and people will have to pay for more water.



Fig. 7 Water reservoir in Kalitengah Lor hamlet



Fig. 8 Glagaharjo residents' water meter

The value of local wisdom on the sustainability of Bebung springs in Glagaharjo Village is that the community has made various efforts to keep the environment sustainable. The community has taken care of the springs with various attitudes and actions, namely: 1) not cutting trees indiscriminately in the forest area, 2) planting tree seedlings of perennials in the Bebung spring area, 3) protecting the forests in the Mount Merapi area, 4) utilizing and use water as well as possible, 5) maintain springs regularly and check Bebung springs regularly, 6) keep the environment clean around Bebung springs, and 7) refrain from mining sand in the Bebung springs area. The value of sustainability that has been carried out by the people of Glagaharjo Village makes Bebung springs available in a sustainable manner.

This form of local wisdom has the function of maintaining the availability and sustainability of springs so that the quantity, quality, and continuity of clean water sources are maintained amidst the threat of the risk of the eruption of Mount Merapi. The various local wisdoms basically aim to realize sustainable management of spring resources and to realize the ideals of people's prosperity. The management of water resources in Indonesia is very important because it puts the prosperity of the people at risk. The ideal desire for sustainable resource management is a balance of harmony and harmony in management to improve the welfare of the people of Glagaharjo. This is a thought that needs to be solved, especially in the midst of the threat of a volcanic eruption to the springs in Glagaharjo Village. Involvement between the government and the community is needed to work together to maintain the availability and sustainability of water sources to achieve sustainable development at the village level.

Sustainable development at the village level becomes a process in which the efforts or potentials of the community are integrated with the resources of the government to improve social and cultural economic conditions and integrate the community in the context of national life and empower them to be able to contribute economically to achieve progress at the national level. Various applications that can be carried out by the government together with the village, one of which is by increasing local wisdom that has been carried out by the community for generations and supporting village communities in maintaining the availability and sustainability of springs.

#### 4. Conclusion

The results of the study show that local wisdom can contribute to increasing community resilience to the availability of springs as a source of clean water in Glagaharjo Village. There are forms of local wisdom in the form of 1) The value of adaptation in the form of behavior to protect the environment by planting several types of trees that are considered capable of storing water, 2) The socio-cultural value of the community which is shown by the culture of mutual cooperation, 3) The value of environmental balance using springs wisely without exceeding the power of the community. environmental support and capacity, 4) The value of community preservation has been to maintain water with various attitudes and actions to maintain the availability and preserve so that the quality and continuity of clean water sources are maintained amidst the threat of the eruption of Mount Merapi.

**References**

- Arikunto, S. 2002. *Prosedur Penelitian Suatu Pendekatan Praktik*. Rineka cipta. Jakarta. 342 hlm.
- Ariyono dan Aminuddin Sinegar. 1985. *Kamus Antropologi*. Akademika Pressindo. Jakarta
- Fajarini, U. 2014. *Peranan Kearifan Lokal Dalam Pendidikan Karakter*. Universitas Islam Negeri ( UIN). Jakarta.hal:123-125.
- Fisher, J. D., Bell, P. A. & Baum, A. (1984). *Environmental psychology*. 2nd ed. Holt, Rinehart and Winston. New York
- M. Daud Silalahi. 2003. *Pengaturan Hukum Sumber Daya Air Dan Pengelolaan Lingkungan Hidup Di Indonesia*. Alumni. Bandung
- Noviyanti, R., Wulandari, C dan Qurniati, R. 2016. *Kompetensi Sumberdaya Manusia Pada Kesatuan Pengelolaan Hutan Produksi Di Lampung*. *J. Sylva Lestari*. 4 (1): 11—20.
- Sekaran, U. 2000. *Research Methods For Business: A Skill-Building Approach*. Buku. Jhon Willey & Sons, Inc. New York . 463 hlm.
- Sugiarto, 2010. *Distribusi Ketenagakerjaan dan Tingkat Kesejahteraan Petani di Pedesaan Agroekosistem Lahan Kering Berbasis Komoditas Palawija*. *J.Pertanian Terapan*, 11 (1): 1-14.
- Suhartini. 2009. *Kajian Kearifan Lokal Masyarakat dalam Pengelolaan Sumber Daya Alam*. Yogyakarta: Universitas Negeri Yogyakarta. 15 Mei 2009: 206-218
- Verschuren, Piet; Dooreward, H. (2010). *Research Strategies*. In *Designing a Research Project* (pp.155–186). The Hague: Eleven International Publishing