

The Refusal of the Local Community to the Plan of Geothermal Electricity Power Plant Project

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ABSTRACT

Mount Lawu is considered a sacred area. This is indicated by several aspects, such as the place of Eyang Lawu, the story of Prabu Brawijaya V, and some places that are considered haunted. The Mount has a large forest area also, covering 52,385 hectares. In 2012, the Ministry of Energy and Mineral Resources planned to build a Geothermal Electricity Power. The project was originally to be undertaken by Pertamina Geothermal Energy (PGE) Company. However, the project has not been realized because it was refused by communities. The problems of this article are as follows. First, is the refusal of communities based on their belief that Mount Lawu is a sacred area, so the project will damage its sacredness? Second, what is the local wisdom behind the belief of communities to preserve the natural environment of Mount Lawu? The research is qualitative. The method of collecting data using desk research. The result shows the project is considered to have the potential to damage the environment, as well as the culture and traditions of the communities. So, the project of Geothermal Electricity Power must be canceled for the conservation of the environment of the Mount Lawu Area.

Keywords: Mount Lawu, Sacred area, Geothermal, Environmental conservation

1. Introduction

Mount Lawu (3,265 m above sea level) is on the border of Central Java Province in the western and East Java Province in the east. Administratively, the western is the area of Karanganyar Regency, while the east side is the areas of Ngawi Regency and Magetan Regency (Setyaningrum, 2023). Based on their religion, inhabitants who live on the slopes of Mount Lawu are heterogeneous. The majority of them are Muslim, but there are a few Hindus, Christians, Catholics, and Buddhists. On the other hand, formally no community adheres to a local religion.

Despite adhering to formal religions, inhabitants on the slopes of Mount Lawu generally have the same belief in the existence of Mount Lawu. For them, Mount Lawu is considered a sacred and sanctified area. It is indicated by several aspects. First, the mount is believed to be a living area of a *danyang* (local god) who controls the mount, which is called "Eyang Lawu" (grandfather Lawu). Second, there is a myth of Prabu Brawijaya V (King Brawijaya V) who *moksa* on the peak of Mount Lawu. Prabu Brawijaya V was the last king of the Majapahit Kingdom, which collapsed in the 15th century. Mount Lawu became the place for Prabu Brawijaya V after the collapse of the Majapahit Kingdom. The myth tells that during his escape, Prabu Brawijaya V built Ceto Temple, Bancolono Hermitage, and Pringgondani Hermitage. After that, He *moksa* (died without leaving his body) on the peak of Mount Lawu. Third, some places are considered haunted, especially for climbers, such as *Pasar Setan* (Satanic Market) and *Bulak Peperangan* (War Area) which are located near the peak of Mount Lawu. Fourth, there are many ancient heritage sites on the slopes of Mount Lawu, which are used for pilgrimages and worship activities, such as Ceto Temple, Sukuh Temple, Kethek Temple, Planggatan Site, and Menggung Site. Fifth, many ritual activities that are carried out by the local community, such as the Labuhan ceremony and mass climbing ritual to the peak of Mount Lawu every the 1st date of Suro month in the Javanese calendar. In 2012, the Ministry of Energy and Mineral Resources had a plan to build a Geothermal Electricity Power Plant on the slopes of Mount Lawu. This plan has been stipulated through the Decree of the Minister of Energy and Mineral Resources Number 2518K/30/MEM/2012 concerning the Determination of Geothermal Mining Work Areas in the Mount Lawu Area, Karanganyar Regency, Sragen Regency, Wonogiri Regency, Central Java Province and Ngawi Regency, Magetan Regency, East Java Province (Suharno. 2015). As a basis for consideration, Mount Lawu has a large potential for geothermal, so it can produce 195 megawatts of electricity. The capacity is large enough to meet the shortage of electricity supply needs, which so far have relied more on coal and fossils for power plants. The project was originally to be undertaken by Pertamina Geothermal Energy (PGE) Company in 2015 (Bramantyo, 2017).

However, the plan to construct a Geothermal Electricity Power Plant has not been realized due to refusal from various elements of the community who live on the slopes of Mount Lawu. The community believes that the project can damage ancient sites and heritage sites, as well as their culture and traditions. In addition, it was considered to have the potential to damage the environment also, especially threatening the availability of water resources which were the source of livelihood and agriculture for the community. Meanwhile, the Ministry of Energy and Mineral Resources considers that the Geothermal Electricity Power Plant is safe and environmentally friendly. The existence of Geothermal Electricity Power Plants was considered renewable energy also and can substitute power plants that rely on fossil and coal which are not renewable, and the supply was running low (Ricky P., 2022).

In this regard, the problems in this article are as follows. First, is the refusal of many elements of communities based on their belief that Mount Lawu is a sacred area, so the project will damage its sacredness? Second, what is the local wisdom behind the belief of communities to preserve the natural environment of the slopes of Mount Lawu? The purpose of this study is to make a decision, will the project of the Geothermal Electricity Power Plant on the slopes of Mount Lawu be realized or canceled? If it is canceled, we must know the reasons behind it. Solely for following the community's belief in the sacredness of Mount Lawu, or for the interest of environmental preservation.

2. Material And Methods

2.1 Axis Mundi as the Sacred Area

Mircea Eliade in the 1950s introduced the concept of *axis mundi*, which means cosmic axis, world axis, world pillar, or world center. This term refers to a mythological concept that represents the "relationship between heaven and earth" or "higher and lower realms". Thus, *axis mundi* is a universal awareness of the metaphysical axis that connects the cosmic between heaven and earth (Eliade, 1991: 48-51). The world axis or world center that represents the higher to the lower realms can be symbolized by various objects in the world, both natural objects (for example: mountains, giant trees, lakes, etc.) and man-made objects (for example: towers, poles, pagodas, temples, etc.). The *axis mundi* symbols can appear in religious and secular contexts (Chevalier & Gheerbrandt, 1996: 173-175).

In the concept of *axis mundi*, Mircea Eliade divides the world into two parts, namely: the sacred and the profane. The sacred is the opposite of the profane. The sacred and the profane are two models that exist in the world, two existential situations assumed by humans. Both models depend on the different positions that people must conquer the cosmos (Eliade, 1957: 14). One form of the cosmic axis/ *axis mundi* as the center of the world is the cosmic mount. The concept of the cosmic mount exists in many cultures, such as Meru in India, Haraberezaiti in Iran, and even the mythical mount of the lands found in Mesopotamia and

Palestine. Symbols that are also considered the center of cosmology are also found in holy places and temples as replicas of the cosmic mountain (for example Borobudur Temple in Central Java) (Eliade, 1957: 38-41).

The sacred always manifests itself as the reality of "something else" from the usual reality. For this reason, Eliade tries to present the sacred phenomenon with all its complexity, not just being called irrational. Humans become aware of the sacred because of the manifestation of the sacred itself, which is different from the profane. To mark the manifestation of the sacred, the term *hierophany* is used. *Hierophany* as a manifestation of the sacred can be realized with ordinary objects, such as stones or trees. Sacred trees or stones are not worshipped as trees or stones. These objects are worshipped because they are hierophanies. The stone or tree becomes "no longer there", but what exists is sacred, which is called *ganz andere* (something else). These objects are transmuted into supernatural reality. In other words, all forms of objects can express themselves as cosmic sacredness. The cosmos as a whole can become a *hierophany*. Thus, the sacred and the profane are indeed contradictory, but in principle, everything can become a *hierophany*, because all objects in the world are indeed based on the sacred. Every sacred space implies a *hierophany*.

The symbols imply a rich and complex expression of the "gate of heaven". Theophany (manifestation of God) that appears in a consecrated place will open the gate of heaven so that we can communicate with heaven (Mircea Eliade, 1959: 26). The understanding of the profane is the opposite, namely a homogeneous and neutral space. There is no qualitative difference between one place and another, one community group and another. There is no priority given to such a structure. About the boundless expanse of the homogeneity of the profane space, the *hierophany* as a manifestation of the sacred is realized at a definite point, a central axis. When the sacred manifests itself in the *hierophany*, it not only breaks the homogeneity of space but also opens up an absolute reality, which is opposed to the nonreality that exists around it. Thus, the manifestation of the sacred is ontologically found in this world. When the orientation is established, the *hierophany* will reveal the absoluteness of that definite point (Mircea Eliade, 1957: 21-22).

2.2 Myth and Sacred Area

Mount Lawu is considered a sacred area because there are myths surrounding it, such as the story believed by the community that the mountain is the place where Eyang Lawu resides, the place where the last king of the Majapahit Kingdom, Prabu Brawijaya V *moksa*, and there are places that are considered haunted near the peak of Mount Lawu, such as *Pasar Setan* and *Bulak Peperangan*. In addition, on the slopes of this mount, there are many ancient heritage sites (such as Ceto Temple, Sukuh Temple, Kethek Temple, Planggatan Site, and Menggung Site) and many ritual activities that are carried out by the local community (such as the Labuhan ceremony and praying at ancient heritage sites). These myths further strengthen the position of Mount Lawu as a sacred area.

According to Andriani, a myth is an irrational and unreasonable story, which is symbolic, but at the same time sacred. Myths explain unreasonable, but close to the daily life of the community. Myths tell about the origins, spiritual power, changes in the world, and the existence of humans in it (Andriani, 2012). According to Annisa, the myths that developed on Mount Lawu are myths that are identical to taboos and prohibitions that must not be violated, related to the mount as a sacred place. The myths that developed in the community are supported by the existence of several sites and temples on the slopes of Mount Lawu so that the community believes in the existence of heavenly spirits that reside on Mount Lawu. Myths are also used as a form of interaction between humans and the messengers of the Creator (Annisa, 2018: 48).

According to Boedhihartono, people whose lives depend on forests have a worldview that forests have three main functions, namely: conservation functions, protection functions, and production functions. The conservation function is related to the preservation of biodiversity (flora and fauna) and their ecosystems, including related landscapes and landforms/features. The protection function is a life support system that regulates the balance of nature, including regulating water availability, preventing flooding, preventing erosion, preventing seawater intrusion, and supporting soil and land fertility and its surroundings. The production function is to provide products that are beneficial to human life, especially non-timber forest products, such as honey, rattan, tubers, game animals, and others (Boedhihartono, 2009: 67).

Related to Boedhihartono's opinion that forests have three main functions, then in conservation and protection efforts, the community will give rise to the forests as sacred natural sites. According to Soedjito et al., the existence of sacred natural sites has a very important role in preserving biodiversity. The attention of the surrounding community to sacred natural sites can be capital to save the biodiversity found in the forest (Soedjita et al. (eds.) 2009: ix).

2.3 Typology of Mounts, Based on Geological Age

Volcanoes in Indonesia are generally of strato type, which is conical in shape, with a high peak. According to Budiana Setiawan, based on their geological age, Strato type of volcanoes can be divided into three, namely: young volcano, medium volcano, and old volcano. The young volcano is characterized by the following items:

- a. It is an active volcano that erupts at certain periods.
- b. It has a sharp peak because the volcano is still growing. The crater of the volcano releases lava material and pyroclastic rock continuously that is deposited on its crater.
- c. It has a steep slope.

- d. The morphology (formation) of hills and valleys is not too rough, and the ravines are not too deep because of the material of pyroclastic rock and lava from the crater that is slid down and sedimented in rivers that flow in its valley.
- e. The vegetation that grows on its slopes is not too dense, especially on its peak because it is dominated by pyroclastic rocks from lava flows. Meanwhile, the alluvial soil layer, which is to be a medium for the growth of vegetation, is only a little.

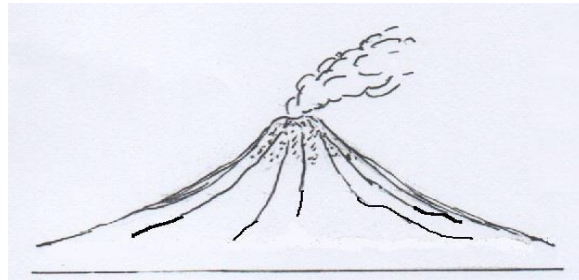


Figure 1. Young Volcano

The Middle Volcano is characterized by the following items:

- a. It is an active volcano that has weakened or a volcano that is no longer active.
- b. It has a blunt peak as a final process of development of the mount crater.
- c. It has a more slippery slope than the young volcano.
- d. The morphology of hills and valleys is rougher due to the erosion process on rivers that flow in their valleys, while the material of pyroclastic rock and lava from the crater of the volcano is getting less sedimented into the rivers.
- e. The soil layer that made up the volcano, which was originally pyroclastic rock and lava, began to turn into fertile alluvial soil. So, the vegetation cover of the volcano is getting dense.

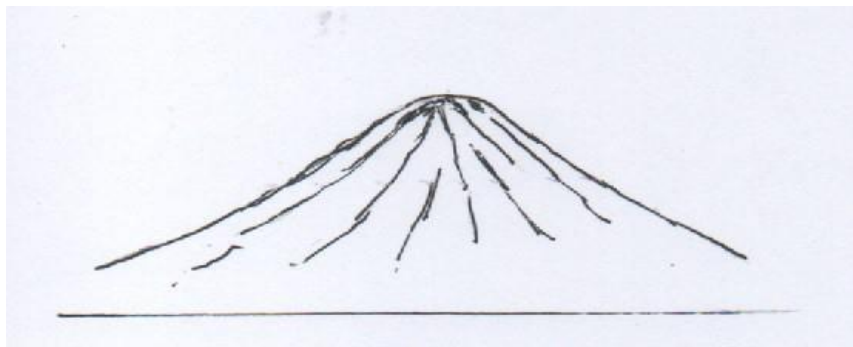


Figure 2. Middle Volcano

Old volcanoes are characterized by the following items:

- a. It is a volcano that is no longer active. The former crater of the volcano had dried up and formed a plain on the peak of the volcano.
- b. It has two or more peaks as a result of the erosion process on the peak of the volcano for thousands of years.
- c. Slopes of the volcano are relatively declivous, because of erosion processes on its peak and sedimentation on its slopes.
- d. The morphology of its hills and valleys are rugged and steep, and deep ravines due to rivers that flow at their valleys erode flow paths in which water passes them and make deeper ravines.
- e. The growing vegetation is getting denser because rock layers that make up the volcano have turned into alluvial soil, which is a good medium for vegetation to grow. The alluvial soil layer and dense vegetation on the slopes of the volcano are also good media for water catching. That is why the slopes of the old volcano have a lot of water reservoirs. The water reservoir comes out as springs, wells, lakes, waterfalls, and fast-flowing rivers (Setiawan, 2017: 12-13).

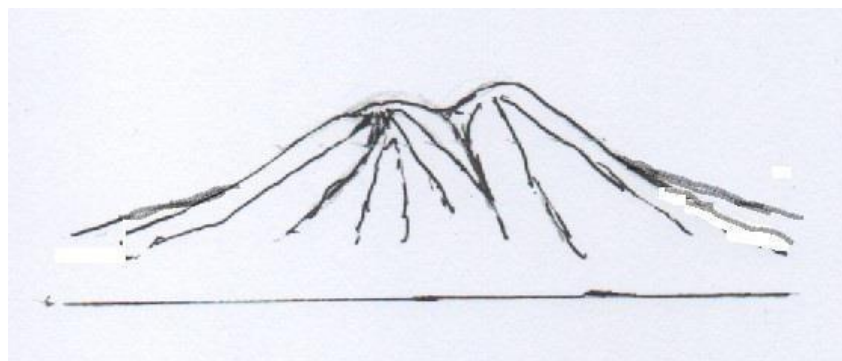


Figure 3. Old Volcano

Table 1. Examples of Typology of Volcano, Based on Geological Age

Young Volcano	Middle Volcano	Ancient Volcano
		
Merapi	Merbabu	Lawu
		
Semeru	Pangrango	Salak

(Table by Setiawan, 2017).

2.4 Method

The type of research is qualitative. The method of research approach is desk research, which collects data and information through examination and analysis of secondary data, both news of mass media, scientific books, relevant scientific journals, and regulations and policies of the government that are related to the use of geothermal energy for the benefit of power plants. The secondary data involve printing and electronic media (Setiawan, 2017). In this case, the library sources are mostly obtained through electronic/ internet media rather than print media, because they are relatively easy to obtain in a short time, but their validity can still be accounted for. In a study that uses a desk research approach, data analysis and interpretation occupy a decisive position in the study. Data analysis is a process of compiling data so that it can be interpreted (Nasution, 1996). According to Sugiyono, data analysis is a process of systematically searching and compiling data obtained from data collection by organizing data into categories, describing it into units, synthesizing, arranging it into patterns, choosing which ones are important and what will be studied, and making conclusions so that they are easily understood by the author and others (Sugiyono, 2008: 335).

3. Result

3.1 Forest in The Area of Mount Lawu

According to the explanation of the *axis mundi*, Mount Lawu is considered a sacred mountain for the surrounding community. In this case, its peak is considered a symbol of the center of the sacred Mount Lawu. Thus, Mount Lawu as a whole, both the peak and its slopes, are considered the *axis mundi* for the surrounding community. As a cosmic center, the area considered sacred is not only the peak but also the slopes. As part of the sacred area of Mount Lawu, the slopes are covered by dense forest, not encroached upon and converted into residential and agricultural areas by the community. Meanwhile, the residential and agricultural areas can be considered as profane or secular areas, so that they can be fully used for human activities. Thus, the

boundary between the forest area and the residential and agricultural areas is considered as the dividing line between the sacred and profane areas.

Based on its physical characteristics, Mount Lawu is categorized as an old volcano. It is indicated that the volcano is not active and has dense vegetation in its forests. On the other side, there are so many endemic vegetations and faunas not found in other mounts, such as blue edelweiss, lawu orchids, and Jalak Lawu (lawu starlings). Mount Lawu also has many water sources on its slopes, such as Sarangan Lake, Madirda Lake, Jumog Waterfall, Grojogan Sewu Waterfall, and others. Mount Lawu is to be upstream of tributaries of *Bengawan Solo* (Solo River), the largest and the longest river in Java Island. Mount Lawu is an old volcano with a large stretch of slopes. The topography of Mount Lawu extends from north to south. The northern topography is conical with the highest peak called Argo Dumilah, while the southern part is very complex, consisting of hills and ravines with the highest peak called Jobolarangan (2,298 m asl). Overall, the forest in Mount Lawu covers an area of more than 15,000 hectares. The area can be increased if it includes forest at lower elevations. The topography of Mount Lawu is very distinctive so that it can condense the wet southeast wind into rainwater. It causes the southern slopes to be fertile relatively with dense vegetation, even in the dry season (Setiawan, 2001). The forest on Mount Lawu has characteristics of a wet tropical forest. The wet tropical forest is divided into three areas, namely: Bukit Dipterokarp Forest area (altitude 300 – 750 m asl), Upper Dipterokarp Forest (750 – 1200 m asl), and Montana Forest (1200-1500 m asl) (Sari, et.al. 2015). The total forest area on the slopes of Mount Lawu reaches 52,385 hectares, consisting of core forest (26,474 hectares), production forest (25,160 hectares), and unproductive forest (7,472 hectares). The local communities and forest security officers protect the forest from damage caused by human activities and disasters because there is a belief that Mount Lawu is a sacred mountain and that its environment cannot be damaged. How the local community treats Mount Lawu as a sacred mount is also demonstrated by efforts to conserve a large forest area on its slopes. The forests on the western slopes are managed by Perum Perhutani Kesatuan Pemangkuan Hutan Surakarta (Indonesia Forest Company, Forest Management Unit Surakarta), while the eastern slopes are managed by Perum Perhutani Kesatuan Pemangkuan Hutan Lawu (Indonesia Forest Company, Forest Management Unit Lawu) (Setiawan, 2001).

3.2 Geothermal Electricity Power Plant: How It Works?

Nowadays, there are more and more efforts to build geothermal power plants as an alternative energy source. The issue of alternative sources of electrical energy is increasingly being discussed because of its vital role in meeting electricity needs, for households, public facilities, and industry. This issue arises because the world's population is increasing, and industrialization is growing rapidly so the supply of electrical energy needs is also increasing. On the other hand, electrical energy resources are very limited, causing an imbalance in electricity supply and demand (Miarsana, 2012: 13).

Geothermal is derived from the word *geo* which means earth, and *thermal* which means heat. So, the definition of geothermal is a source of energy from natural heat that emerges from the earth. Based on Law Number 21 of 2014 concerning Geothermal Energy, it is stated that: geothermal energy is a source of heat energy that is contained in hot water, water vapor, and rocks along with associated minerals and other gases that are genetically inseparable in a system of geothermal (Direktorat Panas Bumi, 2018). Geothermal energy comes from heat energy from the underground of the earth and is generally associated with the existence of a volcano. The hot steam (fluidothermal) that comes out to the earth's surface does not come from magma but from rainwater that seeps into rocks below the ground until it reaches reservoir rocks (the rocks that can store water). Then the rainwater that seeps into the reservoir rocks is heated by magma, which is the main heat source, so that it turns into hot steam (Direktorat Panas Bumi, 2018). As stated before, geothermal energy comes from magma, underground in the earth, and is generally associated with volcanoes, both active and non-active volcanoes. Nevertheless, exploitation of geothermal energy in active volcanoes is considered more dangerous because there are many volcanic activities, such as: eruptions, pyroclastic density flow clouds, lava avalanches, and others. Volcanic activity can endanger workers and the location of the Geothermal Electricity Power Plant. Therefore, in general, non-active volcanoes are more chosen for building Geothermal Electricity Power Plants, compared to active volcanoes. Rainwater that seeps into the reservoir rock then warms up and comes out as hot steam can be analogous to water heated in a kettle, and finally the hot steam escapes from the mouth of the kettle.

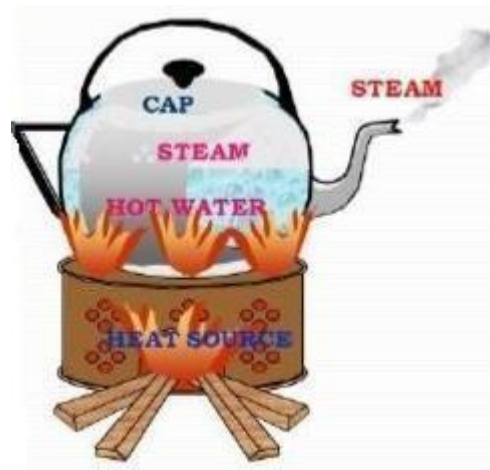


Figure 4. Hot steam of geothermal can be analogous to water heated in a kettle

The fluidothermal that comes out of underground can be used to generate electrical energy by drilling and flowing fluidothermal through special pipes to drive a turbine and rotate a generator to produce electrical energy. Afterward, fluidothermal will be reinjected underground until it reaches reservoir rock through a reinjection well. So, it is reheated again by magma and then released back to drive the generator. This activity aims to maintain the balance of fluids and heat temperature. So, the geothermal system of the geothermal electricity power plant remains sustainable (Direktorat Panas Bumi, 2018).

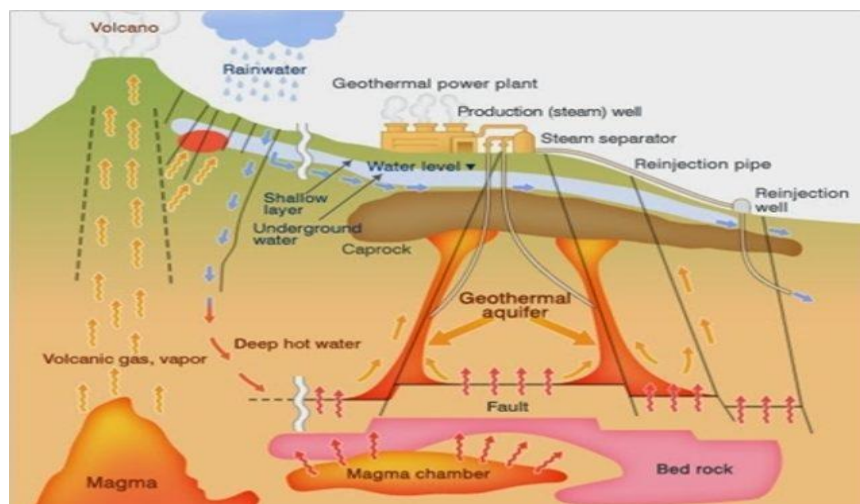


Figure 5. Fluidothermal drives a turbine and rotates a generator to produce electrical energy (Hidayat, 2020).

According to Eko Ady, geothermal energy is a sustainable energy, because the hot steam that comes out from the surface, after being used to drive a turbine, is reinjected to the underground. However, geothermal electricity power plants require that the surface of the environment area above the geothermal source is protected. The green environment and dense vegetation cause rainwater that falls into the ground to be absorbed into the ground and stored in reservoirs. Eko Ady said that the negative impact of geothermal exploration is the possibility that the area around the geothermal electricity power plant will be in drought. It is caused by the water vapor of geothermal that comes from the earth's reservoir coming out to the earth's surface, so there is no water stored causing drought. The drought can last for decades. In addition, on the slopes of Mount Lawu, there are many temples and archaeological sites that are prone to damage due to vibrations of drilling activity. The location for drilling to release geothermal energy is estimated to be in the southwest area of Mount Lawu, where there are many temples and archaeological sites in the area (Radiawati, 2019).

4. Discussion

4.1 Construction Plan of Geothermal Electricity Power Plant on the Slopes of Mount Lawu

The Ministry of Energy and Mineral Resources designated Mount Lawu as a Geothermal Working Area in 2012, through the Decree of Minister of Energy and Mineral Resources Number 1518K/30/MEM/2012 (Sulistiyawan, 2015). Based on the results of the survey, Mount Lawu has a geothermal potential of 195 Megawatts. To follow up the decree, on 1 July 2015, the Ministry of Energy and Mineral Resources announced that it would build a Geothermal Electricity Power Plant in the Mount Lawu Geothermal Working Area. But from their estimated potential reaches 195 Megawatt, the capacity plan that is about to be exploited is only 110 Megawatt (Ayuningtyas, 2018). Pertamina Geothermal Energy (PGE) won the auction and is ready to build a power plant at Mount Lawu Slope. There are two estimated locations for the construction of a geothermal electricity power plant. First, at Mongkrang, Tlogodringo Subvillage, Gondosuli Village, Tawangmangu District, Karanganyar Regency (See Figure 6). Second, near Sapta Tirta Pablengan Hot Spring, Pablengan Village, Matesih District, Karanganyar Regency. Why is Mount Lawu considered to store geothermal energy sources that have the potential to be exploited? Because the characteristic of Mount Lawu is an old volcano that is no longer active, there is no more volcanic activity (example: eruption, hot cloud slide, lava fall, and others) that endanger people or operators of Geothermal Electricity Power Plant. The volcano also has an ideal magma chamber for a geothermal source, with a volumetric of around 300 cubic kilometers. Besides that, volcanic activity of non-active Mount Lawu is ideal for the formation of geothermal systems (Hermawan and Permana, 2018).

As a Geothermal Electricity Power Plant, the presence of hot steam is sustainable, as long as the environmental conditions above the ground of the geothermal source are maintained. If rainwater is absorbed into the ground continuously, the volume of water in the reservoir will exist. Water in the reservoir will be heated by magma from the heated stone, so it becomes hot steam. If there is no contaminated water in the reservoir, there will be no geothermal. So the investor of the Geothermal Electricity Power Plant has to be active in maintaining the environment to keep it beautiful, not polluted, and damaged (Radiawati, 2019).

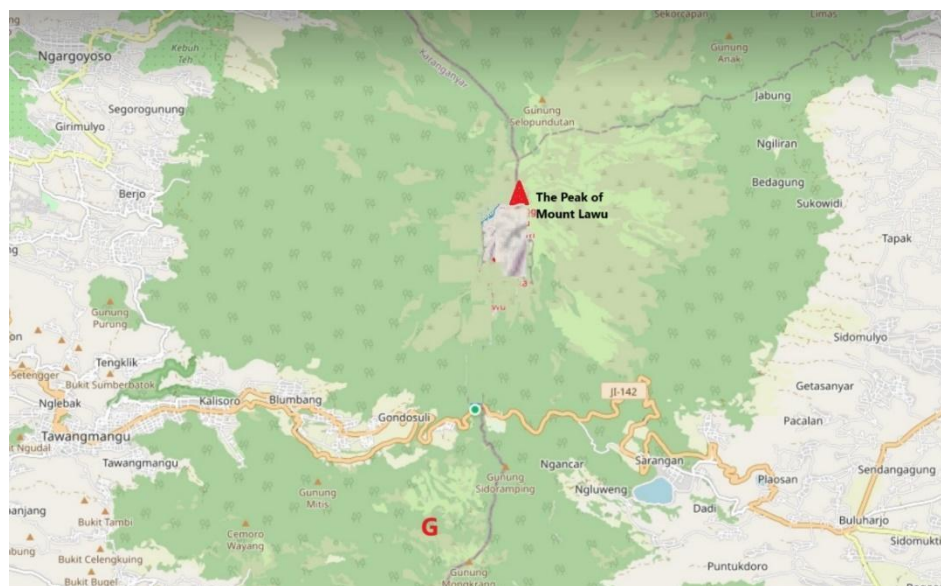


Figure 6. The forest area of Mount Lawu and estimated location of geothermal power plant development at Gondosuli Villages (symbol G in the Figure) (Source of map: mypacer.com., 2020).

Why does a Geothermal Electricity Power Plant have to be built in a high place on a mountainside? According to Teguh Hariyanto and Farrel Narendra Robawa, there is a correlation between ground level and reservoir temperature. The lower the ground level, the lower the reservoir temperature. Otherwise, the higher the ground level, the higher the reservoir temperature. It can happen because the higher ground level is closer to the peak of Mount Lawu. The distance to the magma flow inside the body of Mount Lawu is affecting the rising of a reservoir in an area near the peak of Mount Lawu (Hariyanto and Robawa, 2016: 41). To catch the hot steam from inside the ground in large volumes, a Geothermal Electricity Power Plant must be built in the forest area that is close to the peak of Mount Lawu. The existence of the forests is needed for the amount of rainwater that is stored by flora of the forest, then seeps under the ground and is heated by the reservoir in large volumes.

But in the end, the construction plan of the Geothermal Electricity Power Plant on the slopes of Mount Lawu has faced refusal from various elements of communities. The government's plan to explore geothermal energy on Mount Lawu has been

refused by communities. One of them is *Sahabat Pecinta Gunung Lawu* (the Friends Lovers of Mount Lawu community). They consider that the construction of the Geothermal Power Plant will threaten the water supply, religious wealth, and culture of the Mount Lawu community (Saputra, 2017). In 2018 the Government of Karanganyar Regency issued a letter of refusal to the construction plan of a geothermal electricity power plant. So, the project was postponed until an undetermined time limit. In Geothermal Electricity Power Plants, the presence of hot steam is sustainable, provided that environmental conditions on the surface ground above the geothermal source are maintained. If rainwater is absorbed into the soil continuously, then the water in the reservoir will always be available. It will be heated by magma through the propagation of hot rock and becomes hot steam. So, if there is no contaminated water in it, then there can be no geothermal energy.

4.2 A Geothermal Electricity Power Plant that Potentially Damaging Nature Conservation

On 1 July 2015 the Ministry of Energy and Mineral Resources announced that to fulfill electricity needs, they plan to build a Geothermal Electricity Power Plant at the Geothermal Working Area of Mount Lawu. It reaches 60.03 hectares. So, it will be enough to destroy the area of conservation forest. The destroyed forest area will affect drought that can last for decades. The following effects are floods and landslides. It will make the plan of PGE cause a demonstration for refusal from countless people, both non-government organizations and leaders of the community. The Government of Karanganyar Regency also refused the Geothermal Electricity Power Plant with the reason that it will destroy sources, increase potential of landslides, and destroy the area of conservation forest. So, there will be a conflict of interest between the utilization of natural resources with environmental conservation activities and community cosmological values, that Mount Lawu is very sacred by people because of its magical power (Abida, 2017). In 2018 The Government of Karanganyar Regency issued a refusal letter for the project of Geothermal Electricity Power Plant. So, the project was delayed indefinitely. If many petitioners' express disagreement or refusal, the project of the Geothermal Electricity Power Plant will be stopped or moved to another place (Radiawati, 2019). Moreover, Law Number 21 of 2014 concerning Geothermal Energy, Article 24 states that geothermal utilization in production and protection of forest areas is to using permits. In addition, geothermal utilization in conservation forest areas is through utilization permits of environmental services.

Meanwhile, PGE confesses that the project of geothermal in Mount Lawu is hard to realize because there are many heritage sites. Allegedly the alternative location of the project Geothermal Electricity Power Plant is in Mongkrang, on top of Tlogodringo Subvillage, Gondosuli Village, Tawangmangu District, Karanganyar Regency. Residents there refuse the project because the location has many heritage sites that can be lost or damaged. Another location that is estimated to be an alternative is hot water bathing in Pablengan (Kurniawan, 2017). Other places that are also estimated for the project of Geothermal Electricity Power Plant are some villages in Tawangmangu District and Matesih District, because there are locations of hot water bathing, namely Cumpleng and Sapta Tirta Pablengan. All of the hot water bathings are chosen because drilling activity will find the shortest coordinate and most efficient, from ground level to the geothermal source (Prayitno, 2017).

4.3 The Relationship between Mount in the Worldview of Javanese and Conservation of Protected Forest Areas

Mount Lawu is known as one of the most sacred mounts in Java Island. People believe there is a supernatural being *mbaurekso* (the lord of the mount), that is called Eyang Lawu. There is also a story of Prabu Brawijaya (King Brawijaya) who *moksa* on the peak of Mount Lawu. Prabu Brawijaya also passes down many heritage sites, like Bancolono Hermitage, Pringgondani Hermitage, and Ceto Temple. Besides them, there are other ancient heritage sites, such as Sukuh Temple, Kethak Temple, Planggatan Site, and Menggung Site. As a fertile area for agriculture, the slopes of Mount Lawu are already filled with residential areas, but behind the residential areas are generally still dense forests that are preserved. These forests are part of the protected forest of Mount Lawu. The community does not encroach on the forest and turns it into residential areas or agricultural land. The existence of forests behind the residential areas is to the concept of *axis mundi*, namely the belief that there are different dimensions, such as heaven and hell, sacred and profane, and upper and lower realms. Both concepts are connected to the cosmic center media, sacred areas, and profane areas. The existence of a forest area between the residential areas and the peak of Mount Lawu as the cosmic center is also considered a sacred area, which should not be disturbed by profane human activities. The area is a protected forest that surrounds the slopes of Mount Lawu. Because it is considered a sacred area, the existence of the forest behind the residential areas remains sustainable. Thus, the community's belief system about the *axis mundi* between residential areas and the peak of Mount Lawu contributes to the preservation of forests on the slopes of the mount.

Furthermore, as conveyed by Annisa, the myths that develop in the community on the slopes of Mount Lawu are identical to taboos and prohibitions that must not be violated. The goal is to maintain Mount Lawu as a place that is considered sacred. (Annisa, 2018: 48). To maintain the sanctity of Mount Lawu, the community developed a prohibition on encroaching on the forest area on Mount Lawu. This is what causes Mount Lawu to have a large forest area, reaching 52,385 hectares, consisting of 26,474 hectares of core forest, 25,160 hectares of production forest, and 7,472 hectares of unproductive forest (Setiawan, 2001).

The myths about the most sacred mount also have been proven with many mystical stories experienced by climbers of Mount Lawu, such as: meeting *Jalak Lawu* (lawu starlings), which is an endemic bird of Mount Lawu; meeting mysterious climbers who are looking for a way out when they are trapped in forest fires, and so on., and other. The interesting thing is, that even

though it is considered a haunted mount, Mount Lawu remains a favorite mount for climbers because of the beautiful scenery from its peak. In addition, climbing terrain is relatively easy and suitable for beginner climbers. Even so, the climbers must not violate the taboos that have been set also (Annisa, 2018: 46). According to Endraswara, myths usually talk about believing in prohibitions and rules that must not be violated by people, that can indirectly control morals that exist in the community (Endraswara, 2013). As a sacred mountain, Mount Lawu also has many temples for worshiping on its slopes which are oriented to the peak of the mount, like Sukuh Temple, Ceto Temple, Kethek Temple, Menggung Site, and Planggatan Site. For Balinese and Javanese, peaks of mounts are considered sacred areas and a place for *sthana* (reside) of gods and ancestral spirits that maintain a human living and bestow prosperity on humans. It is indicated by many constructions for worship places that are oriented to the peak of the mount, such as *punden berundak* (stepped pyramid) and sites (Stuart-Fox, 2010: 1).

According to I G. P. Suryadarma the existence of sacred areas that are sanctified by their society are almost evenly distributed among various ethnic groups in Indonesia. That is a form of human recognition for their environment. The existence of the environment greatly affects a group of people. For them, there are immeasurable values and magical values behind natural phenomena. The understanding of sacred areas that are sanctified by a group of people finally gradually manifests in various artifacts that are sacred with various taboos. The sanctified pattern of an area that is considered sacred can be strengthened as an effort to protect the diversity of species and habitats in it and used as a background system of norms and strengthen formal rules (Suryadarma, 2009:44). According to Suryadarma, efforts to protect biodiversity and their norms system are manifested in form of mythologies, such as *maung*, *gembong*, *kyai*, and others, for the forest guardian (Suryadarma, 2009: 45). In this case, mythological stories that place Mount Lawu as a mystical and haunted mount are part of the efforts to protect its biodiversity.

Mount Lawu is one of the mounts that is sacred to people around it because it's an old volcano. As an old volcano, the mount has much dense forest vegetation because the rock layers that form the mount have turned into alluvial soil, which is a good medium for growing vegetation. The alluvial soil layer and the dense vegetation in the body of the mount are also good media for water catchment. Indication as an old volcano is also shown with vegetation and endemic fauna at Mount Lawu, which are not found in other mounts, such as blue edelweiss, lawu orchid, and *jalak Lawu* (Lawu starlings). The phenomenon above causes slopes of Mount Lawu to have many water pouches that come out in the form of springs, lakes, waterfalls, and rivers. That is why agriculture and plantations on the slopes of Mount Lawu are more fertile than on other mounts' slopes. The abundance of water also causes inhabitants on the slopes of the mount never to have drought experience in the dry season. As a form of reciprocity of community towards the fertility of the soil provided by Mount Lawu, then naturally people have an instinct to respect the mount by placing it as the sacred mounts. The instinct to respect the mount is not differentiated by religious backgrounds that are embraced by the community. Jatmiko Wicaksono states that besides water sources for inhabitants, Mount Lawu also has flora and fauna that must be preserved. Protection of the area of Mount Lawu is aimed at maintaining the sustainability and stability of the ecosystem and the sustainability of natural functions (Bramantyo, 2017). So, as a sacred mountain, there should be no activity that can damage the sustainability of the forest in Mount Lawu. In this case, the project of the Geothermal Electricity Power Plant is considered to have the potential to damage the sustainability of the forest in the Mount Lawu area, thus the people refused the project.

4.4 The Refusal of Geothermal Electricity Power Plants in Other Places

The refusal of the Geothermal Electricity Power Plant has not only occurred in people on the slopes of Mount Lawu, but also in several other areas. The Bedugul Project of Geothermal Electricity Power Plant in Bali for example. That project has been started since 1974. Geothermal energy in Bedugul is estimated to generate 414 Megawatt of electricity. However, the project was never built and finally it has not been worked on since 2005. It was caused by people around Bedugul having already refused since 1997, arguing that the project was built in a sacred area by the community, even by Balinese in general (Gumelar, 2016). The refusal that was made by the community around Bedugul was supported by the Governor of Bali Province. It was conveyed after a technical and socio-cultural study was carried out. Technically, geothermal exploration in Bedugul did not generate a large volume of geothermal as expected, and its construction would destroy 4 hectares of conservation forest. From a socio-cultural perspective, the Bedugul area is considered a sacred area with 30 temples around its location (Detik Finance. 2011). In 2010 the Ministry of Energy and Mineral Resources stated Mount Slamet area as a location for the Mining Project by Decree of Minister of Energy and Mineral Resources Number 1557K/30/MEM/2019, with its geothermal working area reaching 24.000 hectares. However, the project of the Geothermal Electricity Power Plant in Banyumas, on the southern slopes of Mount Slamet, Central Java Province, also received refusal from inhabitants. The project is estimated to use 600 hectares for infrastructure construction, most of which are conservation forest areas. It will cause deforestation of conservation forests, which potentially causes big disasters such as flooding and landslides (Indoprogress, 2017).

5. Conclusion

Mount Lawu is considered a sacred area because there are myths surrounding it, such as the story believed by the community that the mount is the place where Eyang Lawu resides, the place where the last king of the Majapahit Kingdom, Prabu

Brawijaya V *moksa*, and there are places that are considered haunted near the peak of Mount Lawu, such as *Pasar Setan* and *Bulak Peperangan*. In addition, on the slopes of this mount, there are many ancient heritage sites (such as Ceto Temple, Sukuh Temple, Kethak Temple, Planggatan Site, and Menggung Site) and many ritual activities that are carried out by the local community (such as the Labuhan ceremony and praying at ancient heritage sites).

In 2012, the Ministry of Energy and Mineral Resources had a plan to build a Geothermal Electricity Power Plant on the slopes of Mount Lawu. This plan has been stipulated through the Decree of the Minister of Energy and Mineral Resources Number 2518K/30/MEM/2012. As a basis for consideration, Mount Lawu has a large potential for geothermal, so it can produce 195 megawatts of electricity. However, the Geothermal Electricity Power Plant project on the slopes of Mount Lawu was refused by communities because it would be built in an area of conservation forest, on the slopes of the mount which is considered a sacred mount by the people. People believe that Mount Lawu is the residence of some spirit who *mbaurekso* the mount that is called Eyang Lawu. In addition, there are mythological stories, such as *moksa* occurrence of Prabu Brawijaya on top of Mount Lawu, the presence of *Pasar Setan* and *Bulak Peperangan* in route for climbing, and others.

However, morphologically Mount Lawu belongs to the category of an old volcano that is no longer active. So, it has forest vegetation that is tightly closed and stores large amounts of water source. It causes the soil on the slopes of Mount Lawu to be very fertile and agricultural products (especially vegetables and flowers) to be abundant, thereby increasing the welfare of the community. Thus, behind its assumption as a sacred mount, there is local wisdom to preserve nature on the slopes of Mount Lawu. So, the survival of the community is maintained. The technology that is developing currently requires that a Geothermal Electricity Power Plant must be built in a conservation area on the slopes of a volcano. So, the volume of geothermal which escapes from the ground is significant enough to drive the turbine. However, it will damage the forest and disrupt the ecosystem in it directly. As a result, it will cause drought (especially during the dry season) which is detrimental to inhabitants who generally work as farmers, as well as floods and landslides during the rainy season. Therefore, the construction of the Geothermal Electricity Power Plant cannot be carried out on the slopes of Mount Lawu. If the Ministry of Energy and Mineral Resources still wants the construction of the Geothermal Electricity Power Plant on the slopes of Mount Lawu to be continued, then the construction must be on a lower plain and far away from the peak of Mount Lawu. So, it is not to damage the conservation forest on the slopes of Mount Lawu.

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