FAILURE OF GEOTHERMAL EXPLORATION IN BATURADEN IN A GREEN CRIMINOLOGY PERSPECTIVE

Arif Awaludin
Wijayakusuma University, Indonesia
arifawaludin@unwiku.ac.id

ABSTRACT
Geothermal is one of the renewable energy sources that will contribute to the energy mix in Indonesia. Geothermal exploration is mostly carried out in forest areas in Indonesia. Many problems arise. The failure of geothermal exploration in Baturaden since 2017 has left two unproductive wells. Land clearing, logging and contamination of ground water are part of the destruction caused. A Green Criminology approach is needed to uncover various potential crimes that arise and their prevention. Qualitative analysis is used to help reveal in detail the potential crimes that occurred. A comprehensive policy is needed to tackle environmental crimes in connection with geothermal exploration in Indonesia. The issuance of Law on Environmental Protection and Management Number 32 of 2009, Law Number 21 of 2014 concerning Geothermal and Law Number 18 of 2013 concerning Prevention and Eradication of Forest Destruction needs to be harmonized so that environmental law enforcement policies become more effective and efficient.

Keywords: Geothermal Exploration, Baturaden, Green Criminology

INTRODUCTION
Renewable energy such as: geothermal, river flow, biofuels, solar energy, wind energy and ocean energy are energy obtained through the use of new technologies. Geothermal energy is a source of energy that has the potential to be developed and utilized to meet energy needs. Indonesia, which is currently serious about making geothermal as one of the renewable energy sources that will contribute to the energy mix in Indonesia until 2025.

Geothermal energy is heat energy stored in rocks and fluids contained below the earth's surface. Meanwhile, for its utilization, it is necessary to carry out exploration and exploitation activities in order to transfer the thermal energy of located geothermal sources in order to transfer the thermal energy to the surface in the form of hot steam, hot water, or a mixture of steam and water and other elements contained in geothermal energy. In principle, in geothermal activities, hot water and steam are exploited.

Baturraden Geothermal Power Plant (PLTP) Project, Mt. Slamet, Central Java began in 2010, after the Ministry of Energy and Mineral Resources established the geothermal potential of Baturraden as a Geothermal Working Area (WKP) with a land area of 24,660 Ha (Banyumas, Purbalingga, Tegal, Brebes and Pemalang). The Ministry of Energy and Mineral Resources issued the Decree of the Minister of Energy and Mineral Resources No. 4557 K/30/MEM/2015 which stipulates PT. Sejahtera Alam Energy (SAE) as the holder of the Geothermal Permit (IPB) of WKP Baturraden. Share ownership of PT. SAE consists of 75% STEAG GmbH and PT. Trinergy 25%. PT SAE has obtained a Borrow-to-Use Forest Area Permit from the Ministry of Forestry LHK based on the Exploration Stage of the Borrow-to-Use Forest Area Permit (IPPKH) No. 20/1/IPPKH/PMA/2016 covering an area of...
488.28 ha. In detail, 44 ha in the exploration location in Brebes and 444.28 ha in the Banyumas area.

Geothermal exploration is not an immediate job. Did not rule out the possibility of failure lurking. Likewise, the exploration of the Baturraden Geothermal Power Plant (PLTP) on Mount Slamet which finally shifted to the north, towards Brebes and Tegal Regencies. This was done after the two wells that had been drilled by the project implementer PT Sejahtera Alam Energy (SAE), namely wellpads F and H did not produce geothermal heat as desired. The Baturraden PLTP is targeted to produce 220 MW of electricity and is a national strategic project for Java-Madura-Bali electricity. It is estimated that the operational target in 2022 will not be achieved due to various obstacles.

The discourse on natural resource law in Indonesia, especially mining law, has become an interesting discourse in the context of national development. The mining sector, which has management characteristics of high cost, high risk, and high technology is one of the sectors that is the backbone of Indonesia's development. The management of the mining sector is closely related to foreign investment in Indonesia.

STEAG PE GmbH Germany's largest shareholder PT Sejahtera Alam Energy (SAE) announced that it has sold its entire stake in the company that owns the Geothermal Power Plant (PLTP) project in Baturraden, Central Java. On April 23, 2021, PT Sejahtera Alam Energy stated that the controlling shareholder of the company is Nirwana Suci Abadi. The mentioned company purchased an 89 percent stake in the company from STEAG PE GmbH, Germany.

The failure of exploration in Baturaden leaves many problems. The destruction of nature and the social disruption left behind as well as the changing ownership of company shares raises many questions. Who should be responsible? Are the revegetation activities requested by the Environmental Service (DLH) of Banyumas Regency, Central Java sufficient?. PT SAE revegetated an area of 19 hectares of protected forest which had previously been cleared for exploration activities. In early 2021, the revegetation has reached five hectares. It is targeted that the revegetation will be completed by the end of 2023.

The grant granted by the PT SAE Baturraden Geothermal Power Plant (PLTP), Banyumas was rejected by Perum Perhutani. The reason is, the grant given is in the form of a former road to the geothermal well of PLTP. Perhutani suggested that the former route be planted with endemic plants of Mount Slamet. In addition to having a more positive impact on the environment, closing the route will reduce the risk of forest encroachment.

The controversy about the impact of energy extraction has long been a discourse in European countries. A wave of resistance to geothermal extraction has emerged in various parts of the world. The failure of geothermal exploration in Baturaden leaves many problems that need to be resolved immediately. From a criminological perspective, there are at least two problems that arise, namely destruction and prevention of environmental destruction.

**RESEARCH METHOD**

The writing of this paper is based on a methodology that uses a criminology perspective, especially green criminology. This research is a legal research with qualitative research specifications. "Qualitative methodology is a research procedure that produces descriptive data in the form of written or spoken words from people and observed behavior". Qualitative analysis is used based on secondary data obtained from various print and online media information and various related scientific journals.
RESULT AND DISCUSSION

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Moving beyond mainstream criminology’s focus on individual offenders, green criminology also explores state failure in environmental protection and corporate offending and environmentally harmful business practices. Green criminology, it is rather an umbrella term for a criminology concerned with the general neglect of ecological issues within criminology.

According to Lynch, if we were to compare rates of ‘ordinary crime’ to environmental harms and negative impacts, the latter would significantly outweigh the former. He argues that for this reason we need to re-think our categorizations regarding victims: “The definitions of victims and victimization incidents commonly found within criminological literature illustrate the restrictive scope of the traditional criminological gaze and frame of reference. By taking a broader frame of reference, green criminology calls attention to the extensive array of violence humans produce and the large number of victim and victim incidents that escape the attention of orthodox criminological approaches.” Simply put, this kind of perspective argues that a wide range of actions imperil the planet as well as the future of humanity and other species, and these crimes and harms need to be recognised and responded to.

Because green criminology attempts to assess harms that may be of a legal origin, it has been dubbed a strand of radical criminology. that is different to orthodox criminology that largely focuses on violations of the criminal law. In the context of this research, then, it must be remembered that hydraulic fracturing is a legal process in the UK and, therefore, green criminology is a fitting lens from which to view any environmental harms that many emanate from such a process. Lynch and Stretesky define green criminology as “a means for studying problems related to environmental harm and crime, victimization, law, environmental justice, environmental regulation, and moral/ issues as these issues relate to humans, non-human animals, plant species, and so on, and the ecosystem and its components”. Potter defines green criminology as “the analysis of environmental harms from a criminological perspective, or the application of criminological thought to environmental issues.”

According to "green criminology", destruction is conceptualized in relation to humans, the environment in general and non-animal animals. Some other writers, by comparison, tend to focus on different types of harm such as animal abuse or writers who may focus more on air pollution, water and so on. Victims of destruction also include specific natural environments and ecological pockets, as well as non-animal animals. In some cases, criminal law may be appropriate to prevent or punish perpetrators of vandalism, but what about some forms of animal cruelty? In other cases, legislation may rely on civil sanctions rather than criminal sanctions, especially if the victim is a particular environment tied to the local ecology. Various conceptualizations of harm within a “green criminology” framework, typically include references to various types of justice that pertain to humans, non-animals and the environment itself.

Exploration is a preliminary activity that requires no small amount of financing, especially at the exploration drilling stage. Exploration activities involve several
multidisciplinary components in their implementation such as Geology, Geophysics and Geochemistry. Geology plays a role in field activities in the form of geological mapping, Geophysics plays a more role in geophysical surveys. Geochemistry has a role in hydrothermal fluid research. The three studies, namely Geology, Geophysics and Geochemistry, will produce geoscience results which are then combined to produce comprehensive data.

Shale gas is natural gas obtained from shale rock fragments or where natural gas is formed. Shale gas consists mostly of methane which is unconventional natural gas. Shale gas is found in rock layers (shale formation) at depths of more than 1500m. This layer is rich in organic material so that it can be a source of energy. Because it is found in rock layers (shale formation), a special process is needed to extract it, namely the hydraulic fracture or fracking process. This fracking process is carried out by drilling into the earth both vertically and horizontally by using water, granular materials such as proppant sand and other chemicals so that gas escapes through rock pores and flows into production wells. In general, shale gas is obtained by "forcing" the gas out of the rocks in the bowels of the earth through the fracking process.

Fracking is a method of extraction that is used to harvest shale gas and is unrelated to geothermal energy production. Fracking involves fluids consisting of water, sand and chemicals being injected at high pressure into rocks containing shale gas to create openings which allow the gas to be released. Geothermal energy is gained by pumping warm water out of reservoirs and passing it through a heat exchanger. It does not involve having to break into geographic formations in the same way that fracking does.

As an energy source, shale gas also has advantages and disadvantages. As an energy source, shale gas is considered cleaner than coal which is considered the dirtiest energy source. Shale gas is also considered to be able to reduce production costs because it is possible that the production of shale gas will trigger a significant decrease in natural gas prices. Large production of shale gas will also help improve energy security and help reduce dependence on expensive fossil fuels, namely oil and coal.

However, on the one hand, shale gas also has drawbacks. Although considered cleaner than coal, shale gas still has significant carbon emissions when compared to other renewable energy sources. The fracking process to obtain shale gas is also considered by some to be harmful to the environment because it requires large amounts of water and the use of chemicals that have the potential to pollute the environment. Environmental and social impacts and risks associated with geothermal power development are complex and significant and the degree to which these risks and impacts vary between geothermal power projects is not well understood.

Law Number 18 of 2013 concerning Prevention and Eradication of Forest Destruction in the preamble to Letter E that forest destruction has become a crime with extraordinary impacts so that in the context of preventing and eradicating effective forest destruction and providing a deterrent effect, a strong legal basis is needed that is able to guarantee effectiveness of law enforcement”.

1. Environmental Destruction

Various conceptualizations of harm within a “green criminology” framework, typically include references to various types of justice that pertain to humans, non-animals and the environment itself. Thus, the conceptualization of environmental destruction can enter into an abstract analytical model that can be used to weigh destruction in relation to humancentric, animalcentric and ecocentric considerations. Central to this model is a
contextual understanding of the relationship between the interests of humans, animals and the environment in specific circumstances.

The major environmental concerns associated with geothermal energy exploration and development includes:

- Physical effects – Fluid withdrawal in natural manifestations, land subsidence, induced seismicity, visual effects/landscape modification, surface water; Noise;
- Thermal pollution (hot liquid and steam release on the surface);
- Chemical pollution (liquid and solid waste disposal, gas emissions) and
- Ecological protection Flora and fauna.

Fracking as a method used in geothermal exploration is much in dispute. Various environmental damages have been documented in various reports and studies, including the Environment America Research & Policy Center report. Fracking by the Numbers. Among them:

1. Fracking Contaminates Water
2. Fracking Consumes Vast Amounts of Water
3. Fracking Causes Air Pollution
4. Fracking Jeopardizes Human Health
5. Fracking Emits Global Warming Pollution
6. Fracking Threatens America’s Natural Heritage

What about the impact of this geothermal exploration on the safety of the Indonesian people? There are at least three important causes of the loss of guarantees for the safety of citizens under the interest of investing in geothermal extraction for electricity generation in Indonesia. First, the involvement and accountability of state/government administrators in ignoring risks, in the process of propagation/disaster occurrence of the geothermal extraction industry for electricity generation, and in creating degradation or decline in social and ecological resilience due to investment.

Second, especially after the end of the Asian economic crisis and the fall of President Suharto, state administrators continued to increase facilities, subsidies and investment guarantees for the geothermal extraction industry for power generation, even to intervene directly as project implementers, project supervisors, project development funders, and investment fund loan commitment makers.

Third, perhaps more accurately called a crime of joint responsibility by state administrators and corporate investors, is guaranteeing the flow of investment in geothermal extraction projects, as well as the insulation of these projects from the veto of citizens in the geothermal extraction work area. The defense of the project from people's rejection so far has been carried out by the use of systematic and planned violence to deal with protests or people's rejection of the project, as well as the creation of a sacred, haunted, sacred image of the geothermal extraction project, in its status as a "national vital object", "national strategic projects", "public interest missionaries" as part of the development of "new and renewable energy", or "promotion of clean and safe energy" as "Indonesia's contribution to climate change mitigation".

Criminalization will punish related industrial activities, such as massive water withdrawals, disposal of poisonous wastewater and drill cuttings, and will disallow the debasement of air quality and contamination of groundwater aquifers and wells.
Criminalization of hydrofracking provides a simple, easy-to-grasp narrative that will empower and unify across the political spectrum, from all walks of life.

Various protests and complaints related to geothermal exploration were seen in Banyumas. News in various media provides reinforcement for various signals of crime that occurred when geothermal exploration activities were carried out on Mount Slamet, Baturaden. Signals of crime as reported by the news media include three things: expression, content and effect. This proves that there has been damage caused by geothermal exploration in Baturaden Banyumas.

2. Crime Prevention

Theoretically, good environmental crime prevention should as far as possible touch the interests of humans, the environment and animals. The basic principles of crime prevention need to be guided by considerations of ecological balance and from a human perspective, ecological citizenship. Thus, human law and human rights must be softened by the recognition that human interests are intimately linked to the well-being of the planet as a whole.

In other words, specific problems require specific types of responses, and a policy made for all issues will not suffice for this task. This applies to the prevention of environmental crime as it applies to other types of crime prevention. This means that in preventing environmental crimes there is a need to cover both place and destruction based on an analysis that goes to the heart of the issue at hand.

The difficulty of preventing and overcoming this type of crime is compounded by the debate over the issue of whether environmental exploitation is a crime or not, or, is just a business consequence, especially in referring to the perpetrators of environmental destruction are corporations and big businessmen. Often they do not feel that they are criminals or have committed an act that can be categorized as a crime.

This type of violation can still be considered a crime, because:

a. Such violations are recognized by law as detrimental to society;

b. Have a valid sanction, which orders the imposition of punishment for the offence;

c. The behavior included in it is generally done intentionally, in the sense that it is not coincidental and occurs consciously by the violator.

For current purposes, the notion of crime prevention refers only to measures that are implemented before a crime or event has occurred, and does not include coercive measures typically associated with traditional law enforcement approaches. Crime prevention, then, is more pre-emptive than reactionary or after something has been done; and it includes a style of intervention that does not believe in the tradition of direct coercion by authority figures.

Hence, it is very important to conduct a preliminary study of the environmental impact, to identify and characterize all the environmental factors, such as biotic as well as the political and economic conditions that the geothermal development can encounter in the future. For this, a professional in the environmental area is necessary.

The Government and Regional Governments have the authority to conduct Preliminary Surveys (including exploration), licensing, fostering and supervising geothermal businesses according to their respective authorities. This aims to obtain data that is used as the basis for determining WKP by the Minister of Energy and Mineral Resources. Furthermore, it is this WKP whose tender process is carried out by the Regional Government. For WKP located in Regency/Municipal locations, it is carried out by Regency/City Government. For
those located between Regency/City areas, it is carried out by the Provincial Government. Furthermore, those located between two provinces are carried out by the Central Government.

The determination of Geothermal WKP as regulated in the Minister of Energy and Mineral Resources Number 11 of 2008 includes the level of investigation and land status. The level of investigation aims to obtain data that is able to delineate the initial description of the geothermal system which includes heat sources, reservoirs (area and depth), enclosed rocks, physical and chemical properties of fluids (temperature and chemical elements) and recharge and discharge areas. Regarding land status (spatial planning and land use) that are outside conservation areas (National Parks) and other prohibited areas according to applicable laws.

In addition to conducting the Preliminary Survey, the government also has the right to assign other parties to conduct the Preliminary Survey. Basically, this Preliminary Survey is the right of the Government, meaning that it can be given to other parties or it can be done alone. Several indications of geothermal resources in several areas have been given to other parties to conduct Preliminary Surveys.

Actually, based on the Preliminary Survey in the form of Geological, Geochemical and Geophysical Surveys, an initial description of the geothermal system can be obtained. Whether it’s about the dimensions of the reservoir, temperature or fluid temperature, etc. This shows that the surface manifestation is a path finder about the existence of the reservoir. That is, the existence of geothermal sources is characterized by several manifestations on its surface. For example, if there is a surface hot spring, it is likely that beneath the surface there is a geothermal source.

The geothermal exploration activities carried out by PT Sejahtera Alam Energi (SAE) in Baturraden received a negative reaction from the people living in Mount Slamet. The geothermal exploration permits owned by PT SAE does not comply with Indonesia’s law of environmental management and protection. The various negative impacts caused by the exploration activities damaged the natural environment of Mount Slamet, threaten the security of the people and harmed the society.

A problem-solving approach to crime prevention demands a certain degree of rigor. Announcement of the nature of the damage is required to accompany site analysis and specific damage. To illustrate how far this might go, we can consider the issue of illegal arrests. Before doing so, it is important to designate arrests, both legal and illegal and associated with a wide range of potentially hazardous activities.

CONCLUSION
Strengthening and enforcement of Law No. 18 of 2013 concerning Prevention and Eradication of Forest Destruction must be strengthened. This can criminalize things such as the use of fracking in geothermal exploration activities. Criminalization of fracking validates the authority of the people to express our life-affirming values by demanding consent from our elected representatives. Criminalization will eliminate the need for a multitude of fracking minutiae, such as setbacks, frack-fluid content, chemical parts per billion and how to classify waste. Criminalization will punish related industrial activities, such as massive water withdrawals, disposal of poisonous wastewater and drill cuttings, and will disallow the debasement of air quality and contamination of groundwater aquifers and wells.

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