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Implications of Utilizing Protected Forest Areas for Geothermal Business: A Legal Analysis

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Abstract

Introduction to The Problem: Geothermal as an alternative and renewable energy is mostly located in the forest areas, including protected forests, where the use of forest areas for non-forestry activities is very selective and does not change the function of the forest itself. Geothermal and forestry regulations require synchronization regarding the use of protected forest areas so that they do not cause legal conflicts.

Purpose/Objective Study: There are arose problems namely the existence of conflicting norms in regulating the use of protected forest areas for geothermal exploitation, between the Geothermal Law and the Forestry Law in combination with Government Regulation No. 24 of 2010 concerning the Use of Forest Areas and Regulation of the Minister of Environment and Forestry on Leasing of Forest Areas.

Design/Methodology/Approach: This research method was normative research, using a statutory approach equipped with a comparative approach.

Findings: The research finding was the setting of leasing forest areas for geothermal exploitation was contradictory and did not function to carry out the orders of the Forestry Law. The research implication is that the Government together with the Parliament must put into comprehensive special authorities and regulations related to the management and utilization of energy in forest areas so that there is no overlap and legal uncertainty in the use of forest areas.

Paper Type: Research Article

Keywords: Implications; Protected Forest; Geothermal; Business

Introduction

Geothermal is classified as an ideal renewable energy source for electric generator, a substitute to non-renewable energy sources such as coal and petroleum, as well as an alternative besides nuclear energy. Geothermal is basically defined as heat from the



earth and the fluid contained in which a source of heat energy is stored in the surface of the earth's layer / in the earth (Hadimuljono, et al, 2019). Furthermore, according to M. Basuki Hadimuljono, there are at least three advantages of geothermal energy, namely 1) producing relatively small emissions, 2) relatively long-life span of geothermal plants, and 3) relatively small infrastructure costs (Hadimuljono et al., 2019).

Besides the positive aspects of geothermal, there are also negative aspects, such as the location of geothermal energy which is in the mountains, hills and protected forests (Hadimuljono et al., 2019). Geothermal deposits in protected areas are also a disadvantage for geothermal enterprises, as several regulations prohibit the utilization of such deposits (Arias, 2016). Protected forest is one of the types of forest designated by the Government according to the classification stipulated in the Law Number 19 of 2004 regarding the Determination of Government Regulations in Lieu of Law Number 1 of 2004 regarding the Amendments to Law Number 41 of 1999 on Forestry (Forestry Law), in which the utilization is very limited and selective, both for forestry and non-forestry activities.

Geothermal utilization is regulated in the Law Number 21 of 2014 regarding Geothermal Energy (Geothermal Law) in principle, which allows exploitation of geothermal (direct and indirect) in all areas/forest areas, including protected forests. The Forestry Law which is the reference for the other regulations in the forestry sector allows the utilization of protected forests only for forestry activities that do not reduce the main function of the area and do not destruct the environment. Furthermore, Ministerial Regulation of Environment and Forestry (LHK) Number P.7/MENLHK/SETJEN/KUM.1/2/2019 regarding the Amendments to the Ministerial Regulation of Environment and Forestry Number P.27/MENLHK/SETJEN/KUM.1/7/2018 regarding the Leasing Guidelines of Forest Areas provides an exception in the utilization prohibition of protected forest areas by imposing a set of requirements to activities which have inevitable strategic purpose.

Methodology

This research is a normative legal research which could also be interpreted as a literature law research. Meanwhile, the primary legal materials that were used as research materials were Law Number 41 of 1999 concerning Forestry and its amendments, Law Number 21 of 2014 regarding Geothermal (Geothermal Law), Law Number 12 of 2011 regarding the Formation of Laws and Regulations and its amendments, Government Regulation Number 24 of 2010 regarding the Use of Forest Areas and the Ministerial Regulation of Environment and Forestry (LHK) Number P.7/MENLHK/SETJEN/KUM.1/2/2019 regarding the Amendments to the Ministerial Regulation of Environment and Forestry Number P.27/MENLHK/SETJEN/KUM.1/7/2018 on Guidelines for the Leasing of Forest Areas.

Results and Discussion

Natural Resources and the Environment

After the amendment of the 1945 Constitution, the state no longer dominates the control and exertion of natural resources. The state must separate its role as regulator and operator to ease the exploitation of natural resources and the flow of investment while ensuring legal certainty. On the other hand, natural resources which are classified as common property must be preserved in order to remain sustainable so it will not cause losses to the next generation. Natural resource management in Indonesia has been transformed from the control of traditional common property to the domination and ownership by the state (state property) and the private sector (private property), hence the risk of depletion of natural resources and damage to the environment is a necessity. Privatization of natural resource management is considered a requirement for modernization (Sumardjono et al., 2011). By using the measure of economic achievement as a measure of prosperity, the exploitation of natural resources will become one of the foundations for achieving this prosperity. The exploitation concept of natural resources should accommodate two important issues simultaneously, namely economic aspects and natural sustainability. Unfortunately, both aspects have not hitherto been able to run simultaneously.

The diametrically different paradigm regarding the use of natural resources is reflected in two views; they are the Conservative/Malthusian View and the Exploitative/Ricardian View. These two views are contradictory, where in principle the Conservative/Malthusian View believes that natural resources should be used carefully because they are limited in nature and will not be able to support exponential population growth. If there is non-stop exploitation, there will be a situation of natural resources that decrease with diminishing return, which will result in the standard of living falling to a subsistence level (livelihood/living). In the long term, both combinations will result in an economy in a steady state (a state of constant/continuous). Meanwhile, the Exploitative/Ricardian View consists of three views: first, natural resource is reputed as engine of growth, second, the restrictiveness of natural resources exploitation can be replaced with intensification and extensification ways, and third, the scarcity of natural resources in the end will trigger innovation, the discovery of new deposit, and the increase in recycle technology (Selamat, 2018).

In Richard Posner's view as quoted by Takdir Rahmadi, the economic approach to law (analysis economic of law) should be a reference and foundation for law in general, including in the field of environmental law. Furthermore, Stewart and Krier, as quoted by Takdir Rahmadi, also saw that environmental problems stemmed from two things: scarcity and market failure. The economic approach to environmental law uses two assumptions in economics: first, all goods including natural resources are commodities, and second, the value of these commodities can be compared with the value of currency. Thus, the proponents of this theory consider environmental



problems as a form of externality due to the market not including the cost element of the product concerned (market failure) (Rahmadi, 2016).

Environmental destruction due to exploitation of natural resources is a necessity, if a market failure occurs, so the remedy is compensation for natural destruction that must be reserved and used as a cost component in the business of exploiting natural resources. This view is derived from Individualism that guarantees the individual rights, which is the antithesis of the family view adhered to before the amendment of the 1945 Constitution. The state as the regulator is only tasked with ensuring that operators of natural resource utilization allocate the cost component of environmental recovery into their business cost components, which allows environmental damage to be replaced with such environmental recovery cost component. Suppose there is any degradation or quality degradation in this aspect of environmental recovery, the state does not need to intervene nor be responsible as long as the natural resources operator has obeyed its obligation to pay the environmental recovery back up cost.

According to environmental law experts, the concept of environmental law in an economic approach is not entirely appropriate because the environment itself is related to many aspects such as provisions regarding environmental quality standards, environmental carrying capacity, ecology, ecoregions, environmental impacts and other aspects. These externalities make environmental law a functional law, where criminal law, private law and administrative law experts do not necessarily fully understand the concept of environmental law (Akib, 2015). Thus, the environment has its own value which cannot be assessed in material terms, so that each use does not only prioritize economic and growth aspects.

The environmental impacts of geothermal exploitation are air pollution (odor) and noise pollution (Ratio et al., 2020). Another problem that arises related to geothermal exploitation is the need for groundwater as technical support, where ground water is an integral part of all geothermal resources (Bloomquist, 1986). In addition, aspects of environmental pollution from geothermal exploitation include: atmospheric emissions, sound/noise, surface water and groundwater instabilities, land subsidence, induced seismicity, visual impact, and waste (Manzella et al., 2018). Luca Tacconia and Muhammad Zahrul Muttaqin explain that deforestation has been projected at 0.82 million hectares (ha) per year between 2021 and 2030. The government aims to reduce this to 0.495 million ha, and bring deforestation down to 0.325 million ha per year with non-existent action requirements. Other action outlined by the government to reduce emissions involve applying principles of sustainable forest management in production forests (i.e. reducing degradation) and plantation forests; rehabilitating 12 million ha of critical land; and restoring two million ha of peatlands (Tacconi & Muttaqin, 2019).

Sean Sloana, et.al. also gave an example, one of which is related to the tropical forest ecosystem in Leuser, Aceh, where the pressure and development challenges faced by the Leuser Ecosystem reflect the ecosystems throughout Indonesia in general. Indonesia is pursuing six major road development corridors to expand and consolidate plantation agriculture (e.g. oil palm), timber extraction, mining and international trade (Sloan et al., 2018).

Forest

The International Union for the Conservation of Nature (IUCN), related to conservation objectives, management and level of protection, divided protected areas into six categories: 1) Strict Nature Reserve and Wilderness Area, 2) National Park, 3) Natural Monument or Feature, 4) Habitat Species Management and Area, 5) Protected Landscape and Seascape and 6) Protected Area with Sustainable Use of Natural Resources (Leberger et al., 2020). Subsequently, forest areas in Indonesia are classified into three basic functions: 1) Forest Conservation to conserve biodiversity and other ecosystem services, such as national parks and nature reserves, 2) Protection Forest to protect core ecosystem services such as hydrological services, prevent erosion and flooding, protect soil fertility, and prevent seawater intrusion; and 3) Production Forest to produce wood products (Putraditama et al., 2019).

Table 1. Definition of Forest Area according to the Forestry Law

Article	Information
Article 26(1)	Utilization of protected forest can be in the form of area utilization, environmental service utilization, and collection of non-timber forest products
Elucidation of Article 26(1)	Utilization of the area can be in the form of mushroom cultivation, animal breeding, and cultivation of medicinal and ornamental plants, while the utilization of environmental services is in the form of utilization for nature tourism, water and beauty/comfort as well as the collection of non-timber forest products such as rattan, honey and fruit
Article 26(1)	The use of protected forests is carried out through the granting of area utilization business permits, environmental service utilization business permits and non-timber forest product collection permits
Elucidation of Article 26(2)	Self-explanatory
Article 38(1)	The use of forest areas for development purposes outside of forestry activities can only be done inside production forest areas and protected forest areas
Article 38(2)	The use of forest areas as referred to in paragraph (1) can be carried out without changing the main function of the forest area

Source: Forestry Law



13 Table 1 provides the definition of a forest area according to the Forestry Law which is a certain area designated and/or stipulated by the government in order to maintain its existence as permanent forest (Article 1 point 3). Meanwhile, 7 Protected Forest is a forest area that has the main function of protecting life support systems to regulate water management, prevent flooding, control erosion, prevent seawater intrusion, and maintain soil fertility (Article 1 point 8). Additionally, Protection Forest is determined by the Government, including two other functional forests, namely Conservation Forest and Production Forest (Article 6(2)).

The use of forest areas is regulated in Part Three of the Forestry Law with the aim of obtaining optimal benefits for the prosperity of the entire community while maintaining its sustainability. Specifically for Protection Forest, it is regulated in Article 26(1) of the Forestry Law which states that the, "Utilization of protected forest can be in the form of area utilization, environmental service utilization, and collection of non-timber forest products." The elucidation of Article 26(1) explains that the utilization of the area can be in the form of mushroom cultivation, animal breeding, and cultivation of medicinal and ornamental plants, while the utilization of environmental services is in the form of utilization for nature tourism, water and beauty/comfort as well as collecting non-timber forest products such as rattan, honey and fruit. Subsequently, Article 26(2) provides that, "The use of protected forests is carried out through the granting of area utilization business permits, environmental service utilization business permits, and non-timber forest product collection permits." The elucidation of Article 26(2) states "self-explanatory".

The use of protected forest areas for non-forestry activities is allowed pursuant to Article 38, provided that the main function of the forest areas is not changed. Subsequently, Article 38(3), (4), and (5) provide that the use of protected forest areas for mining purposes is only allowed through the issuance of borrow-use permit issued by the Minister who shall take into account the size and time limits of the usage, as well as the prohibition of using open-pit mining system. In terms of geothermal exploitation, the Forestry Law does not specifically regulate either the licensing aspect or the mechanism aspect of using protected forest areas for geothermal exploitation. Referring to the provisions of Article 38(1) and (2), the first condition in order to allow geothermal exploitation in protected forest areas is not to change the main function of the forest area in question. Meanwhile, if referring to the provisions of Article 38(3), (4) and (5), according to the author's opinion, geothermal does not belong to the mining regime at least because of two factors: first, the regime of the Geothermal Law is different from that of the Minerba Law, and second, the grammatical interpretation of the open mining system refers to the working mechanism of mineral and coal mining. In other words, the provisions of Article 38 of the Forestry Law are not intended to be geothermal specific, but are general in nature to all non-forestry protected forest areas utilization and specifically regulate mineral and coal only.

The distribution and potential of geothermal in Indonesia is very extensive and large. According to Pambudi, it is estimated at 28.910 GW consisting of 312 locations on several Indonesian islands and only around 5.3% of this potential has been used (utilization ratio). Most of these geothermal locations are in forest areas, even Mount Salak geothermal is in the National Park area (Pambudi, 2018). In addition to the Mount Salak area, geothermal energy in Kotamobagu (North Sulawesi) and Iyang-Argopuro are also in forest areas that are potentially prohibited from exploitation, because Kotamobagu is in conservation forest areas and Iyang-Argopuro is in protected forest areas and national parks (Darma, 2016).

Another example of geothermal utilization in Kamojang, West Java, Endes Nurfilmarasa Dachlan explained that exploration and exploitation of geothermal energy requires land clearing for several activities, such as drilling production wells and injection wells, construction of piping systems to drain fluids to power plants, building geothermal electricity power, and construction of access roads. PGE's land clearing, which includes infrastructure development, has led to deforestation in the Kamojang Nature Reserve up to 60.18 ha (8.9%) (Dachlan et al., 2015).

Endes Nurfilmarasa Dachlan further exemplifying the utilization of geothermal energy in Kamojang, West Java that exploration and exploitation of geothermal energy requires land clearing for several activities, such as drilling production wells and injection wells, construction of piping systems to flow liquid to power plants, constructing geothermal power plants, and developing access road. PGE's land clearing, which includes infrastructure development, has led to deforestation of up to 60.18 ha of Kamojang Nature Reserve (8.9%) (Dachlan et al., 2015).

Pambudi et.al., further analyzed that since the enactment of the Geothermal Law, exploration and exploitation of geothermal energy in forest areas is allowed, although there are concerns about the disruption of the natural balance. The enactment of the Geothermal Law ends the geothermal regime which is classified as a mining activity, which also ends the obstacles in the previous regulations especially in relation with the permission to use forest areas, because most geothermal locations are in forest areas.

According to Shu-Yuan Pan, there is a risk of regulatory uncertainty related to overlapping work areas, where it is estimated that around 80% of geothermal reserves in Indonesia are located in protected and conservation forest areas (Pan et al., 2019). This fact also makes policy makers perplexed, where according to Sahide, the fact of legalizing the use of conservation forest areas for indirect geothermal exploitation based on the Geothermal Law and Ministerial Regulation of the Ministry of Environment is still considered contrary to the provisions of Law Number 5 of 1990 regarding Conservation of Natural Resources. In addition, the use of protected forest areas for indirect geothermal exploitation also has the potential of regulatory conflict against the Forestry Law. This fact gives rise to the idea of liberal zoning, where this



idea can open up the possibility of other (local) parties to expand the liberal zoning, especially for timber utilization (logs). If this idea is granted, it is not impossible that forest destruction will be more massive (Sahide et al., 2018).

Geothermal Enterprises

The islands of Java and Bali have around 60% of the total population in Indonesia, which are around 200 million people. Thus, most of the economic and industrial activities as well as most of the large capacity power plants are concentrated on these two islands. Java and Bali are interconnected by sub-sea cables and all power plants in Java and Bali are connected via 150 & 500 kV transmission lines, forming a Java-Bali grid system. The total installed capacity and peak load of this network system are currently 16,500 MW and 10,300 MW respectively (Akmal, Darnel, & Sugiharto, 2000). Regarding geographic location, geothermal power plants can only be built around tectonic plates where high temperatures from geothermal sources are available near the surface. Developments and improvements in excavation and extraction technology that have been carried out in the development of geothermal power plants from nearby tectonic plates (Fandari, et al., 2014).

Geothermal law according to Salim HS is the entire legal rules governing state authority in the implementation of geothermal activities and the relationship between the state and legal subjects in geothermal utilization. There are four elements in the Geothermal Law, namely (1) the existence of the rule of law, (2) the object regulated, (3) the subject regulated, and (4) the philosophy of its manufacture (HS, 2018). Geothermal exploitation itself is regulated in the Geothermal Law, particularly Article 9 through 55.

The authority to administer Geothermal by the Government is done over Direct and Indirect Utilization (Article 5). Furthermore, it is explained that the Government's authority in administering geothermal energy includes: a) making national policies, b) regulating geothermal, c) granting geothermal permits, d) Granting permits for direct utilization in areas under its authority, e) guidance and supervision, f) management of geological data and information as well as geothermal potential, g) inventory and preparation of a balance sheet of geothermal resources and reserves and h) implementation of geothermal exploration, exploitation and/or utilization, and i) support for research, development and engineering capacity activities (Article 6(1)). The authority of the Government in administering geothermal energy as stipulated in Article 6(1) shall be implemented and/or coordinated by the Minister (Article 6(2)). Indirect utilization is preceded by a determination of the Work Area by the Minister. The working area can be determined on state land, land rights, communal land, water areas, and/or forest areas (Article 16). The Minister himself in the General Provisions is described as the minister in charge of government affairs in the geothermal sector (Article 1 point 16).



At this point, the Geothermal Law overlaps the Forestry Law and makes the geothermal exploitation regulator as the leading sector in determining and using forest areas for geothermal. In fact, the provisions of the Forestry Law clearly state that the leading sector for forest area use is the regulator/agency in the forestry sector, namely the Ministry of Forestry. This is further clarified by the definition of the term. Minister in the General Provisions of the Geothermal Law which explicitly directs the Minister who carries out government affairs in the geothermal sector, not the Minister of Forestry or the Minister who carries out government affairs in the forestry sector.

Furthermore, business entities that carry out geothermal exploitation are required to have a Geothermal License (GL) issued by the Minister. Particularly, in the case that geothermal exploitation activities for indirect use are in a protected forest area, it is mandatory to obtain a lease permit for using a protected forest area from the Minister who administers government affairs in the forestry sector (Article 24(2) letter a point 1). IPB itself has a maximum period of 37 years and can be extended for a maximum of 20 years for each extension (Article 29).

Government Regulation Number 24 of 2010 regarding the Use of Forest Areas allows the use of forest areas in production without changing the main function of the forest (Article 3(1) and (2)). Furthermore, the use of forest areas for development purposes outside forestry activities can only be carried out for activities that have inevitable strategic objective (Article 4(1)), such as generator installation, transmission and electricity distribution, as well as new and renewable energy technologies (Article 4(2) letter c). This provision does not explicitly mention geothermal interests/activities in it.

Additionally, there is one particular regulation which becomes the legal basis for legalizing geothermal exploitation in protected forest areas, which is the Ministerial Regulation of Environment and Forestry (LHK) Number P.7/MENLHK/SETJEN/KUM.1/2/2019 regarding the Amendments to the Ministerial Regulation of Environment and Forestry Number P.27/MENLHK/SETJEN/KUM.1/7/2018 on Guidelines for Leasing Forest Areas (Ministerial Regulation of LHK). According to this Ministerial Regulation of LHK, Lease Forest Areas Permit, hereinafter abbreviated as IPPKH, is a permit granted to use forest areas for development purposes outside forestry without changing the function and designation of forest areas (Article 1 point 15). The use of forest areas can only be permitted in two types of forest: Production Forest Areas, and/or Protected Forest Areas, with the emphasis that such use is carried out without changing the main function of the forest area by taking into account certain area boundaries and a certain period of time as well as environmental preservation (Article 3). Furthermore, the utilization of forest areas for development purposes outside of forestry activities can only be carried out for activities that have inevitable strategic objective (Article 4(1)), such as geothermal (Article 4(2)c).



Therefore, although the Forestry Law prohibits the use of protected forest areas for activities other than those stipulated in Article 26 of the Forestry Law, according to the Geothermal Law, Government Regulation number 24 of 2010 regarding the Use of Forest Areas (in certain interpretations) and the Ministerial Regulation of LHK, the use of protected forest areas for non-forestry development purposes can be justified as long as it has inevitable strategic objective. Only the Minister of Environment and Forestry explicitly mentions the term geothermal in its regulations. However, in the Indonesian hierarchy of laws, such ministerial regulation does not have a strong legislative support base because it is only issued by a Ministry/Agency and is prone to horizontal collisions with other Ministries/Agencies.

Formation of laws and regulations

Normatively, the mechanism for the formation of statutory regulations is regulated in the provisions of Law Number 12 of 2011 regarding Legislation Formation and its amendments. The law stipulates the principles, content, functions and techniques of drafting legislation, including statutory regulations in the form of Government Regulations. In particular, it is explained that Ministerial Regulation is a statutory regulation form that is included in the hierarchy of laws.

According to Hans Nawiasky as quoted by Ahmad Redi, there are four groups of legal norms, namely the fundamental norms of the state (*staatsfundamentalnorm*), the basic rules of the state (*staatsgrundgesetz*), the norms of formal laws (*formell gesetz*), and the implementing regulations & autonomous rules (*verordnung* and *autonome satzung*) (Redi, 2014). Moreover, Ahmad Redi qualifies the Ministerial Regulation as the fourth legal norm that comes from the delegation and also the attribution authorities. The delegation authority in general is the delegation of the authority to form laws and regulations that is carried out by higher to lower laws, either explicitly or not. Meanwhile, the characteristic of attribution authority is inherent in nature, where functionally the Ministerial Regulation functions to carry out orders of a higher level of legislation or to exercise authority.

In August, the Indonesian Parliament passed Law Number 21 of 2014 regarding Geothermal Energy (Geothermal Law) which allows exploitation of conservation forests (Dutu, 2016). In other words, the legal protection for the use of conservation forest areas and also protected forests comes from the Geothermal Law, instead of being based on the Forestry Law. This is understandable considering that the Forestry Law clearly and strictly prohibits the use of conservation and protection forest areas. Tragically, it is the Geothermal Law that is the leading sector in regulating the use of forest areas.

The regulation of natural resources and land identity in all regions of Indonesia, which is the Law Number 4 of 2011 regarding Geospatial Information, has actually given the authority to the Geospatial Information Agency (BIG) to unify this information, but in fact the horizontal division is constrained by sectoral egos/claims of each institution

(Erbaugh & Nurrochmat, 2019). In line with Brazil's experience in making the Brazil Forest Code (BFC), they also utilize geospatial information (Hissa et al., 2019). Indonesia ideally needs a one-map policy that integrates all interests and uses of forests (Wibowo & Giessen, 2015).

The environmental and natural resource legal approach in the modern era should have key elements in the form of public participation, transparency and environmental impact assessment based on case studies (Borgström, 2018). Forestry policies related to the use of forest areas can be improved by considering sustainable development goals and involving the public to reduce environmental risks (Sasanifar et al., 2019). One of the needs in regulating conservation forest is the need for an integrated environmental policy for the forestry sector (Sandström et al., 2020).

The regulatory model in New Zealand related to the forestry aspect classifies forestry as a large part of the authority of the Primary Industry Ministry together with agriculture and fisheries, where the approach in this formula is more on the economic aspect so that from the forester's (forestry expert) point of view this situation will more or less harm the forestry aspect (Roche, 2017). Myanmar in the framework of Forest Law Enforcement, Governance and Trade (FLEGT) also conducts a review of the forestry sector where they involve non-governmental organizations (NGOs) and communities (the public), especially related to the management of forest use for non-forestry activities, ecosystem services and conservation (Springate-Baginski et al., 2014). Likewise with Russia and Ukraine in regulating the use of non-wood forest products, they create a legal framework even though they encounter complex, overlapping and unclear situations (Stryamets et al., 2020). Greece has legislation known as the Land Characterization Act (CA) issued by the Greek Forest Service (GFS) which contains several relevant parameters such as legal, environmental and ecological aspects to help determine the characteristics of an area called "e-praxis" (Athanasiadis & Andreopoulou, 2019). The experiences of France, Germany, the Netherlands and Sweden show that there is a double shift in forestry policies related to the demands for pressure to integrate biodiversity conservation, bio-energy use and climate change (Sotirov & Storch, 2018). Today, the demand to make forestry policies that absorb biodiversity conservation is a necessity.

In several European countries such as Croatia, Cyprus, France, Greece, Italy, Latvia, Lithuania, Poland, Portugal, Serbia, Slovenia, Spain, Sweden and Turkey, there are differences in legal frameworks in regulating shallow geothermal exploitation, including the regulation of groundwater, waste, and temperature, where among these countries only Sweden has completely carried out a comprehensive arrangement that implements multiple aspects of the environment into the legislative scheme (Tsagarakis et al., 2020). The Philippines recognizes the Advocacy Coalition Framework (ACF) to create and regulate policies on forestry, where the coalition consists of three important aspects, namely: Social, Environmental and Economic (Villamor, 2006).



Conclusion

The regulatory overlap between the Forestry Law and the Geothermal Law regimes regarding the use of protected forest areas for indirect geothermal utilization should not have occurred if the regulation on the use of protected forest areas for certain strategic purposes were based on regulations that were discussed comprehensively and had involved many public elements.

If the exception in regulating the use of protected forest area is based on the Geothermal Law made by the structure within the regime and organization of the Forestry Law, then the regulation will look peculiar. In addition, the exception in regulating the use of protected forest area originating from a ministerial regulation will negate the legislative function which is the authority of the House of Representatives (DPR). If the exception to the regulation on the use of protected forest area were discussed in the DPR, then the regulation in question would have had strong legitimacy, although with the risk of intense discussion and political decision making.

Apart from that, another important issue is the need for a single and integrated map policy led by an official at the ministerial level or coordinating minister who is directly led by the president to avoid overlapping in the regulation and utilization of land and areas throughout Indonesia. In the future, it is hoped that there will be no more sectoral egos/claims coming from certain ministries/agencies. In addition, it is also hoped that there will be a strong decision that comes from public officials who have strong political legitimacy with the expectation that it will ensure legal certainty, especially in the investment of geothermal in forest areas.

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Declarations

Author contribution : Author 1: initiated the research ideas, instrument construction, data collection, analysis, and draft writing; Author 2: revised the research ideas, literature review, data presentation and analysis, and the final draft; Author 3,4,5: literature review, data collection, data presentation, data analysis, and final draft.

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