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Local Community Resistance to Geothermal Development in Indonesia

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Abstract

This study seeks to provide a broader perspective on geothermal development in Indonesia, arguing that community rejection of projects is not merely an emotional reaction, but also a call to pay attention to their neglected rights and needs. This study aims to comprehensively understand how implementation practices and local social conditions shape the dynamics of acceptance or rejection of geothermal projects in Indonesia. The researchers used the Systematic Literature Review (SLR) method to examine various scientific sources in a structured and comprehensive manner. Referring to Kitchenham's (2015) guidelines, the SLR was conducted in three main stages: planning, implementation, and reporting. This method was using SCOPUS and Crossreff as the main data sources. results of the study show that resistance to geothermal energy projects in Indonesia is rooted in the view of natural resources as strategic commodities, resulting in centralized and top-down governance. This places the state and corporations as the main actors and marginalizes the participation of local communities. Case studies such as Salingka Gunung Talang, Padarincang, and Waplasit village reveal the socio-ecological irony that projects claimed to be sustainable have led to new poverty, relocation, health vulnerabilities, social disintegration, and the neglect of indigenous peoples' cultural values.

Keywords: *Environmental Justice, Geothermal, Local Communities, Resistance*

Abstrak

Penelitian ini berupaya untuk memberikan perspektif yang lebih luas mengenai pengembangan geotermal di Indonesia, penolakan masyarakat terhadap proyek bukan hanya sekadar reaksi emosional, tetapi juga merupakan panggilan untuk memperhatikan hak dan kebutuhan mereka yang terabaikan. penelitian ini bertujuan untuk memahami secara lebih komprehensif bagaimana praktik implementasi, dan kondisi sosial setempat membentuk dinamika penerimaan maupun penolakan terhadap proyek geotermal di Indonesia. Peneliti memanfaatkan metode Systematic Literature Review (SLR) untuk mengkaji berbagai sumber ilmiah secara terstruktur dan menyeluruh. Mengacu pada panduan Kitchenham (2015), SLR dilakukan melalui tiga tahap utama; perencanaan, pelaksanaan, dan pelaporan. Metode ini dilakukan secara sistematis melalui software Covidence dengan sumber data utama SCOPUS dan Crossreff. Hasil penelitian menunjukkan bahwa resistensi terhadap proyek energi geotermal di Indonesia berakar pada pandangan sumber daya alam sebagai komoditas strategis sehingga tata kelola bersifat sentralistik dan top-down. Menempatkan negara dan korporasi sebagai aktor utama serta meminggirkan partisipasi masyarakat lokal. Studi kasus seperti Salingka Gunung Talang, Padarincang, dan Desa Waplasit memperlihatkan ironi sosial-ekologis bahwa proyek yang diklaim berkelanjutan menimbulkan pemiskinan baru, relokasi, kerentanan kesehatan, disintegrasi sosial, serta pengabaian nilai kultural masyarakat adat.

Kata kunci: Geotermal, Resistensi, Masyarakat Lokal, Keadilan Lingkungan

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Introduction

Energy transition is becoming increasingly urgent in order to create a more sustainable and secure future (Setyono & Kiono, 2021). The International Energy Agency's commitment is reflected in its efforts to build a global carbon-free paradigm and encourage every country to minimize investment in fossil fuels (Prabowo, 2020). The IEA, short for International Energy Agency, has a target of a carbon-free world by 2050 (Azhar & Satriawan, 2018). This is in line with Indonesia, which is beginning to open its eyes, with the government committing to a 29% reduction in emissions by 2030 (IEA, 2024). The commitment to reduce fossil energy began in 2010, when the government started implementing an energy mix system. In principle, energy mix optimizes available energy sources to achieve sustainable energy and economic development (Zafirah, 2020).

First scenario in 2025 after this policy is implemented is a reduction in the use of petroleum from 49.7% in 2010 to 23.7%, followed by natural gas from 20.1% to 19.7%, and coal from 24.5% to 30.7%. The remainder will be met by renewable energy sources, accounting for 25%. The energy mix commitment will continue until the 2050 paradigm of a carbon-free world (Ermawati et al., 2022). Geothermal energy, as heat stored within the earth, is attracting increasing attention as a renewable energy source in the transition to sustainable energy. Geothermal energy can be extracted to generate electricity or meet heating needs (Albab, 2023). Geothermal energy, as a consistent energy source that does not depend on weather conditions, offers a sustainable solution for global energy needs (Ermawati et al., 2022; Fahmi et al., 2022; Isa et al., 2022; Andalucia, 2023).

Indonesian government has high expectations for geothermal energy. Approximately 40% of the world's geothermal energy reserves are located beneath Indonesian soil, and the country is estimated to have the largest geothermal energy reserves in the world after the United States (Anggreta et al., 2022). The development of geothermal energy in Indonesia began during the Dutch colonial era, when geological surveys were conducted and research was carried out on geothermal resources in Indonesia (Fandari, 2014). After independence, Indonesia decided to establish The Volcanological Survey of Indonesia (VSI) as the official center for monitoring and recording volcanic activity. The Kamojang Geothermal Power Plant (PLTP) was developed in 1983 and is located in Bandung Regency, West Java (Amrita & Nugroho, 2019).

Geothermal energy has great potential to improve access to electricity in remote or hard-to-reach areas. By utilizing locally available energy sources, Indonesia can increase the availability of electricity for communities in

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various regions, including those that are not yet covered by the national electricity grid (Fahmi et al., 2022; Mamesah et al., 2020). The following are some areas that have recorded geothermal potential at a number of locations in volcanic areas:

Num	Location	Capacity (Mw)	Potential
1.	Sumatera	13.516	86 sites
2.	Jawa	10.092	71 sites
3.	Bali	296	5 sites
4.	NTT	1.471	22 sites
5.	Kalimantan	115	8 sites
6.	Sulawesi	2.519	55 sites
7.	Maluku	954	26 sites
8.	Papua	75	3 sites

Table 1. Geothermal Potential in Indonesia
Source: (Fandari et al, 2014; Hakim et al., 2022)

Indonesia's electricity ratio, with around 80.38% of households connected to the electricity grid at the end of 2013, means that most of this potential remains unrealized (Indonesia Investment, 2015). In 2024, Indonesia will have geothermal reserves estimated at 23,965.5 MW, or around 40% of the global total. However, only about 11% of Indonesia's geothermal capacity has been utilized (Adi, 2024). One of the challenges that needs to be overcome in fully utilizing the potential of geothermal energy is the rejection or resistance from the community to policies regarding geothermal development (Sari et al., 2024). Resistance arises when the initial capital in development is land use conversion, where the dimension of land conflicts between land rights holders and the government and entrepreneurs tends to change (Wea et al., 2024).

Several studies have been conducted by other researchers. Studies conducted by (Mahendra, 2022; Dinan, 2023; Mahdi, 2024; Agung, 2024; Albab, 2023) trace the utilization of geothermal energy in Indonesia facing various challenges that are often related to resistance from the community. Concerns about the environmental impact of geothermal energy exploration, including potential water pollution, affecting agriculture, or damaging the natural beauty valued by indigenous communities. Furthermore, research (Wulandari, 2021; Siregar, 2023; Nugraha, 2022) on the close relationship between geothermal energy and indigenous peoples explores conflicts related to customary law.

Local researchers focus on aspects of legal protection, state recognition, and the rights of indigenous communities. International studies also show similar patterns. (Higgins et al., 2017) in their research in Texas showed that the absence of social dialogue from the outset led to high resistance and even legal litigation. (Ezeh et al. 2024) highlighted the importance of stakeholder strategies and early communication

to mitigate conflicts in energy projects in Nigeria. The study (Renoth et al., 2023) reviews forms of resistance in energy transition through a systematic review and emphasizes that injustice in distribution and decision-making procedures can trigger resistance.

Based on these various studies, a few research gaps can be identified that form the basis for examining environmental injustice as the root cause of resistance to geothermal project development. Most previous studies still view community resistance as a reaction to environmental impacts or customary law conflicts but have not comprehensively linked it to the concept of environmental injustice, which includes inequality in the distribution of benefits and burdens, access to information, participation, and recognition of local community voices. The research question presented by the author in this study is "How does local community resistance to geothermal energy development reflect the issue of environmental justice in Indonesia?"

This study seeks to provide a broader perspective on geothermal development in Indonesia. Community resistance to projects is not merely an emotional reaction, but also a call to pay attention to their neglected rights and needs. This study aims to gain a more comprehensive understanding of how implementation practices and local social conditions shape the dynamics of acceptance and rejection of geothermal projects in Indonesia.

Methods

Researchers used the Systematic Literature Review (SLR) method to examine various scientific sources in a structured and comprehensive manner. Referring to Kitchenham's (2015) guidelines, SLR was conducted through three main stages: planning, implementation, and reporting. In the planning stage, researchers were asked to develop a review protocol containing the objectives, research questions, literature search strategies, and inclusion and exclusion criteria. This protocol serves as a working guideline to maintain objectivity and reduce bias during the review process.

Kitchenham emphasized transparency in documenting the entire review process and results. The report must include details of the methods used, study selection results, data synthesis, and research limitations. Kitchenham recommends that the reporting of results follow standards such as PRISMA to maintain the completeness and accuracy of information (Kitchenham, 2015). Researchers present the SLR implementation flow as follows.

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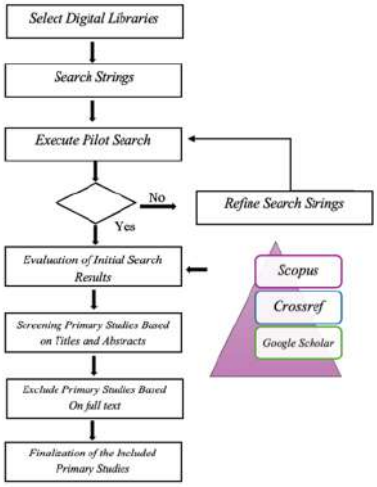
Figure 1. Conducting Stage by Kitchenham



Source: (Kitchenham, 2015)

Figure 1 illustrates the flow of the Systematic Literature Review (SLR) method, which begins with the selection of digital databases (such as Scopus, Crossref, and Google Scholar), the formulation of search keywords, followed by an initial search (pilot search). If the results are not optimal, the keywords are readjusted. After that, the search results are evaluated, filtered based on the title and abstract, followed by selection based on the full content of the article, until a final list of relevant primary studies is obtained for analysis.

Result and Discussion

Discourse on Indonesia's Geothermal Energy Resistance

During the New Order era, Indonesia adopted a developmentalist approach that treated natural resources as strategic commodities to drive national economic growth (Isa et al., 2022). Within this framework, resources such as oil, gas, minerals, forests, and later geothermal energy were positioned primarily as "economic assets" whose contribution to state revenue, industrialization, and political stability had to be optimized (Mazaya, 2022; Hakim et al., 2022). Development operates through a centralised and top-down governance pattern (Zafirah, 2020). The state, through the central bureaucracy and state-owned enterprises (SOEs) as well as conglomerates close to power, is the main actor in the planning, control and utilisation of resources (Prabowo, 2020).

Local communities are positioned as objects of development, not subjects involved in decision-making (Mazaya, 2022). The determination of geothermal working areas, the granting of concessions, and energy project planning are carried out based on technocratic logic and macroeconomic interests. With very limited attention to socio-ecological dynamics at the local level (Nurwahyudin & Harmoko, 2020). The classification of geothermal energy as a strategic sector for national energy security strengthens the political justification for the state to intervene in various regions that are considered to have natural resource potential (Dinan, 2023). Energy security is framed as a national interest that supersedes local interests (Zafirah, 2020). This narrative has two

implications. First, the state's political moral legitimacy to access and alter the ecological landscape is very strong, which creates tension at the local community level (Agung, 2024). Second, all forms of local resistance to geothermal projects are often perceived as obstacles to development or as ignorance of the importance of national energy, rather than being seen as legitimate expressions of concern and claims to the right to living space (Alam et al., 2023).

Geographical and ecological perspectives suggest that areas with geothermal potential are generally located in mountainous regions, forests, and indigenous territories that serve vital ecological and social functions (Hughes & Rogei, 2020). These areas serve as water catchment areas, biodiversity buffers, and food and economic production areas for communities (Lu et al., 2021). For indigenous communities, these areas also have cultural and spiritual dimensions, as forests, springs, mountains, and certain sites are seen as an integral part of their identity (Hall et al., 2015). The space occupied by the state and corporations as “energy project locations” is in fact a complex lifeworld for local communities (Cantor & Knuth, 2019).

State and corporations retain primary control over decision-making, while local communities must adapt to predetermined decisions, with limited room for negotiation (Ezeh et al., 2024). This phenomenon is in line with the concept of green extractivism or green grabbing, where projects that are claimed to be environmentally friendly or green actually become a new vehicle for land and resource control (Higgins et al., 2017). As a result, geothermal projects are no longer understood as technical energy policies, but as structural interventions in the living spaces and ecosystems that have long been managed and interpreted by communities. State claims (through forest areas, conservation areas, and energy concessions), corporate claims (through geothermal exploitation rights), and local community claims (through customary rights, historical control, and traditional management practices) (Muslihudin et al., 2023).

Geothermal development companies backed by scientific legitimacy and government support view land as an economic resource that can be exploited. In contrast, local communities view it as a living space with social, cultural, and spiritual dimensions that cannot be reduced to economic value alone (Ruef et al., 2020). This situation has the potential to cause prolonged conflict and deepen social and ecological injustice, because the groups most affected have the least say in determining the future of their own region. Below, the researchers present the complexity of geothermal resistance in Indonesia as follows:

The principle of *Free, Prior, and Informed Consent* (FPIC) should be the ethical foundation

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of extractive projects, but it is often implemented in a formalistic manner without sufficient substance (Meller et al., 2018). Project socialization was carried out with limited information, technical language that was incomprehensible to the general public, and a very short time frame, which did not give the community the opportunity to truly understand the long-term implications of the geothermal project on their lives. The geothermal conflict in Salingka Gunung Talang, Solok Regency, West Sumatra, is a relevant empirical manifestation that validates the argument that the three stages of geothermal development, namely exploration, exploitation, and modeling, form the backdrop for complex and multidimensional structural conflicts (Yolanda, 2021). Since July 2017, the Salingka Gunung Talang community has expressed its rejection of the planned Geothermal Power Plant (PLTPB) project by PT Hitay Daya Energi. This conflict has continued until 2025, demonstrating a systemic failure in conflict management rooted in problems at every stage of project development.

Geothermal exploration phase is an initiation phase that paradoxically becomes a source of fundamental conflict (Wea et al., 2024). Geological, geochemical, and geophysical surveys conducted to identify geothermal reservoir potential often clash with land tenure interests and the rights of local communities that have inhabited the area for generations (Dinan, 2023). Violations during the exploration phase also trigger conflicts among farmers for several interrelated structural reasons: first, land occupation for exploration activities such as the construction of base camps, access roads, and exploration drilling sites reduces or even eliminates farmers' access to their productive land without fair and adequate compensation. Corporations tend to minimize compensation costs by arguing that the project is still in the study phase and may not necessarily proceed (Utomo et al., 2025). Farmers have already borne the opportunity cost of lost income from land they cannot cultivate (Mahdi, 2024). Farmers' resistance to geothermal projects in Indonesia stems from a combination of ecological, economic, social, and historical factors that shape their perception of risk to the sustainability of their living space.

Deprivation of Farmers' Rights in the Shadow of Renewable Energy

Geothermal development practices in Indonesia often violate or ignore farmers' rights through various mechanisms (Jatnika & Amal, 2023). From the exploration stage, when companies and the government conduct surveys and drilling (Jemadin, 2024). Exploration is carried out without adequate consultation with landowners or farmers, based on the assumption

that permission from local or central government is sufficient to legitimize access to land even though farmers have legal rights to the land (Towijaya & Ubaidillah, 2019). This reflects a normative hierarchy that places national development interests above property rights and community livelihoods.

Violations of farmers' rights during the exploration phase trigger conflicts for several interrelated structural reasons: first, land occupation for exploration activities such as the construction of base camps, access roads, and exploration drilling sites reduces or even eliminates farmers' access to their productive land without fair and adequate compensation. Corporations tend to minimize compensation costs by arguing that the project is still in the study phase and may not necessarily proceed (Utomo et al., 2025). Farmers have already borne the opportunity cost of losing income from land they cannot cultivate (Mahdi, 2024). Farmers' rejection of geothermal projects in Indonesia stems from a combination of ecological, economic, social, and historical factors that shape their perception of risk to the sustainability of their living space.

Main argument for resistance is the concern that geothermal exploration and exploitation activities such as well drilling, fluid injection, and the construction of supporting infrastructure will disrupt water sources, soil, and local ecosystems that form the basis of agricultural production (Sari et al., 2024). This is clearly reflected in the SAPAR and GERAPAS case studies in Padarincang, Banten. The agrarian community rejected the geothermal project because they saw a direct threat to the Cisolong spring and other sources that had irrigated farmers' rice fields and gardens for decades (Jatnika & Amal, 2023). Fears that drilling activities could trigger a decline in water discharge, water quality pollution, and changes in soil structure led residents to view the geothermal project as a serious threat to their livelihoods (Sari et al., 2024).

Resistance mobilized by PETAKA (Pemuda Tani Merdeka) in Batu Belerang Village, South Sulawesi Province, arose from the community's direct experience of geological and hydrological impacts that were considered not to have been communicated transparently by the project (Embas, 2024). During several phases of exploration, residents noted an increase in hot mud, changes in water color, and land damage due to drilling activities. This triggered sentiments that the geothermal project posed ecological risks that were not commensurate with its benefits for the village (Khasmadin & Harmoko, 2021). Farmers of Batu Belerang considered the land they cultivated to be the basis of their family's economy as well as social capital that had been passed down from generation to generation. Vulnerability to agricultural land damage due to

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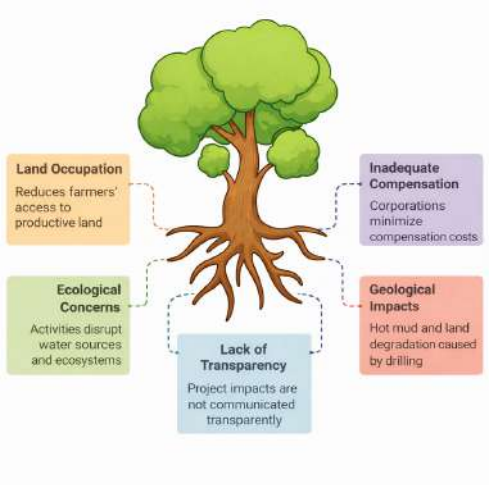
sedimentation, soil cracks, and hot spring waste runoff has prompted the emergence of an organized collective movement to reject the continuation of the project (Fajar, 2024). The following is an illustration presented by researchers regarding the conflict between farmers and geothermal energy, as follows:

Figure 2. Root of Geothermal Conflict vs. Farmers



Source: Illustrated by (Author, 2025).

Farmers' resistance is not merely an emotional rejection and rational response to the potential loss of access to water, land, and ecological security that has long supported the local agrarian system (Utomo et al., 2025; Wulandari & Yulianti, 2025). Geothermal projects are seen as shifting power relations over space, transforming the agrarian landscape into an extractive industrial area that benefits external actors more than local communities (Awaludin, 2023). The dynamics of farmers' resistance to geothermal projects reflect a fundamental conflict between investment-based energy development models and the interests of communities whose livelihoods depend on ecological stability and agrarian sustainability (Totona et al., 2025).

Opposition to the geothermal projects in Padarincang and Batu Belerang continues to be expressed through various forms of collective action, legal advocacy, and the mobilization of solidarity networks among affected communities. Groups such as SAPAR and PETAKA not only rely on demonstrations, but also develop knowledge strategies by documenting damage and engaging academics and civil society organizations to strengthen the legitimacy of their demands. The government is trying to navigate the tension between the agenda of accelerating energy transition and demands for the protection of local communities' living spaces (Hartami et al., 2025). However, the government's response to managing the conflict is often procedural and does not address the root causes of the opposition (Totona et al., 2025).

Efforts such as re-socialization, revision of AMDAL documents, and formal mediation mechanisms are more often directed at reorganizing administrative processes rather than addressing the information gaps and ecological uncertainties felt by residents

(Brisman & South, 2019). In some cases, the security approach used to respond to community actions has actually deepened mistrust and reinforced the view that geothermal development is top-down and ignores the aspirations of agrarian communities (Wulandari & Yulianti, 2025). The absence of comprehensive social and ecological protection standards, especially for agricultural areas, further emphasizes that conflict management is still far from the principle of ecological justice (Nakzim et al., 2025). The biggest challenge for the government is not only to ensure the smooth flow of renewable energy investment, but also to guarantee that the energy transition process is inclusive, transparent, and does not create new vulnerabilities for communities whose livelihoods depend on the sustainability of land and water.

Ecological Conflicts of Geothermal Projects

Geothermal drilling activities pose a threat to the peace of mind and potentially endanger the health of the community through harmful gas emissions (Suryono, 2024). The tremors, which feel like earthquakes, create constant fear and psychological trauma, especially for children, pregnant women, and the elderly who have been displaced. The deepest irony lies in the fact that projects justified by the narrative of providing energy for regional development are actually destroying the traditional livelihoods of communities that have existed for generations (Nakzim et al., 2025). The forests that have been divided up by companies have destroyed the traditional economic production sites of indigenous peoples, such as distilling eucalyptus oil, which has been their livelihood and shaped the culture of the local indigenous community, given that eucalyptus oil is an endemic plant in the Buru Islands. In the name of "development" and "renewable energy," the local economic system based on the sustainable use of natural resources has been replaced by an extractive model that benefits transnational corporations but impoverishes local communities (Febriano et al., 2024).

Waplasit case reveals a fundamental irony in the discourse on sustainable development in Indonesia. First, environmental conservation, which should protect biodiversity and ecosystems, is actually implemented in ways that destroy the livelihoods of communities that have historically lived in harmony with the environment (Hakim et al., 2022). The indigenous spatial system, called marapu, regulates land use by dividing the area into zones with different functions. Sacred forests are untouchable, while production forests are managed communally with strict rules, along with agricultural land and settlements (Suryono, 2024). This system preserves the environment and ensures equity in access to resources and distribution of benefits. The researchers present

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the following visualization of the problems in Waplasit:

Gambar 3. Waplasit in Geotermal Shadow

Source: Illustrated by (Author, 2025).

Projects promoted as sustainable development actually result in potential poverty and new marginalization for the communities that should be the beneficiaries (Alam et al., 2023). The new settlement location for the Waplasit community faces various economic difficulties due to unproductive land, lack of water for irrigation, and loss of access to forest resources that were previously sources of food, medicine, and building materials (Waas and Balseran, 2024). Many families who were previously able to meet their food needs from their own farms and plantations now have to buy food with money they do not have, resulting in malnutrition, especially among children and the elderly. Social disintegration occurs because the strong communal structure in indigenous communities is disrupted by geographical separation and economic pressures that force people to focus more on individual survival than communal solidarity (Sauni, 2022).

Geothermal development practices from an indigenous perspective are often discredited as superstitions that must be overcome through education or as irrational obstacles to development (Kamana & Vaughan, 2024). In the process of analyzing environmental impacts, cultural and spiritual dimensions are not taken seriously, but are only assessed through rituals or ceremonies performed as formalities to obtain approval from traditional leaders, without any substantive meaning or implications of these cultural values for the design and operation of the project (Sætórsdóttir & Hall, 2019). Even more problematic is that the Indonesian state constitutionally recognizes the existence of indigenous peoples and their rights (Sari, 2024). In practice, however, this recognition has not been translated into the authority for indigenous peoples to reject projects that they deem contrary to their values and culture.

Conclusion

Results of the study show that resistance to geothermal energy projects in Indonesia is rooted in the view of natural resources as strategic commodities, resulting in centralized and top-down governance. This places the state and corporations as the main actors and marginalizes the participation of local communities. Case studies such as Salingka

Gunung Talang, Padarincang, and Waplasit village reveal the socio-ecological irony that projects claimed to be sustainable have led to new poverty, relocation, health vulnerabilities, social disintegration, and the neglect of indigenous peoples' cultural values. This study has several limitations that need to be considered. the Kitchenham-based Systematic Literature Review (SLR) method limits the analysis to secondary data available in academic publications, so that the actual dynamics in the field that are contextual or not formally documented are not fully accommodated. Quality and depth of literature on geothermal conflicts in Indonesia varies, so the mapping of indicators of procedural, geographic, and social environmental justice depends on the availability of relevant studies. Further research is recommended to include empirical approaches through in-depth interviews or participatory observation to capture the direct experiences and narratives of local communities and indigenous peoples affected by geothermal projects

References

Books

Bullard, R. D. (1993). *Environmental justice for all*.

Bullard, R. D. (2008). *Environmental Justice In The 21 St Century.* In environtmental justice resource center.

Kitchenham, B. (2007). *"Guidelines for performing Systematic Literature Reviews in SE", Kitchenham et al Guidelines for performing Systematic Literature Reviews in Software Engineering*.

Kitchenham, B. (2015). *Evidence Based Software Engineering And Systematic Reviews*. A Chapman & Hall Book.

Journal article

Alam, A. S., Nurjaya, N., Taufiq, R., Jatmika, D., Zikri, F., & Lestari, H. S. (2023). *Focus Grup Discussion* Pembangunan Pembangkit Tenaga Listrik Panas Bumi Dalam Memenuhi Kebutuhan Masyarakat Focus Group Discussion On Geothermal Power Plant Development In Meeting Community Needs. *Journal Of EMPOWERMENT*, *4*(1).

Albab, W. (2023). Kajian Terhadap Pembangunan Geotermal Di Pulau Flores Berdasarkan Prespektif Teori Keadilan (John Rawls). *Jurnal Publikasi Ilmu Hukum*, *Vol. 1, No. 4*.

Azhar, M., & Adam Satriawan, D. (2018). Implementasi Kebijakan Energi Baru dan Energi Terbarukan Dalam Rangka Ketahanan Energi Nasional. In *Online Administrative Law & Governance Journal* (Vol. 1).

Ermawati, Y., Yulistia, E., & Zulyanti, F. (2022a). Potensi Panas Bumi sebagai Energi Alternatif dalam Mewujudkan Indonesia Bebas Emisi Karbon Geothermal Potential as An Alternative Energy in Realizing Carbon Emission-Free Indonesia. In *UEEJ-Unbara Environmental Engineering Journal* (Vol. 02).

Fahmi, I., Gunawan Afandi, F., Sasongko, N. A., & Yoesgiantoro, D. (2022a). Peran Teknologi Pada Pembangkit Listrik Tenaga Geothermal Guna

Mendukung Tercapainya Net Zero Emission (NZE). *Jurnal Kewarganegaraan*, *6*(2).

Fandari, A. (2014). Pengembangan Energi Panas Bumi yang Berkelanjutan. *Jurnal Ilmiah Semesta Teknika*, *Vol. 17, No. 1,* 68–82.

Febriano, O., Wagur, N., Ambun, O. F., Tukan, P. B., & Mirsel, R. (2024). Implikasi Sosial-Moral Dari Mekanisme Pengambinghitaman: Studi Kasus Proyek Geotermal Di Indonesia. *Jurnal Penelitian Multidisiplin Terpadu*, *8*(12).

Jatnika, J., & Amal, M. I. (2023). *Tantangan Implementasi Net Zero Emission di Banten: Studi Kasus Pembangunan Geothermal Padarincang* (Vol. 5, Issue 4).

Mazaya, A. (2022). Collaborative Governance Pemanfaatan Energi Panas Bumi Sebagai Sumber Pembangkit Listrik (Studi Kasus Pembangkit Listrik Tenaga Panas Bumi Dieng, Jawa Tengah). *Jurnal Inovasi Penelitian*, *3*.

Mustika P., Anindya Putri, R., & Drajat Pradika, F. (2024). Resistensi Perempuan: Studi Perlawanan Kelompok Perempuan (GERAPAS) Terhadap Pembangunan PLTB Padarincang. In *Journal of Citizenship* (Vol. 3, Issue 1). http://hk-publishing.id/joc

Nakzim, O. :, Siddiq, K., Ade Mulada, D., & Rahman, A. (n.d.). *Penerapan Konsep ESG dalam Regulasi dan Praktik Hukum di Sektor Energi*.

Prabowo, C. (2020). Resentralisasi Dalam Pembagian Kewenangan Pemanfaatan Energi Panas Bumi. http://www.datacon.co.id/Listrik-

Rivaldus, A. K. Sinring. (2024). Konflik Sosial Antara Masyarakat Wae Sanodan Pemerintah Kabupaten Manggarai Barat Provinsi Nusa Tenggara Timur (Studi Kontradiksi PT. Geo Dipa Energi Tambang Panas Bumi Geothermal). *Jurnal Sosial Dan Humaniora*, *2*(1), 1–12.

Salma, Z. (2020). Keunggulan, Tantangan, dan Rekomendasi Kebijakan akan Pengembangan Energi Panas Bumi di Indonesia. *Jurnal Nasional Pengelolaan Energi*, *Volume 2 No 2*, 31–45.

Sari, Y. (2021). Gerakan Perempuan Salingka Gunung Talang dalam Menolak Pembangunan Geothermal di Kabupaten Solok. *Jurnal Tanah Pilih*, *VOL. 1 NO. 1*.

Sauni, H. (2022). Energi Geothermal Dalam Aturan, Masalah Lingkungan Hidup Dan Solusi Penyelesaian Konflik Di Masyarakat (Geothermal Energy In Rules, Environmental Problems And Community Conflict Solutions). *Jurnal Rechtvinding*, *11*(3).

Andalucia, S. & Wibowo, R. (2023). Downhole Monitoring Sumur Geothermal Dengan Metode Pressure Temperature Shut-In Sumur Sr 1#2 Di Pt Pertamina Geothermal Energy Area Lumut Balai. In *JCI Jurnal Cakrawala Ilmiah* (Vol. 3, Issue 4). http://bajangjournal.com/index.php/JCI

Steisi A. (2020). Kajian Pembebasan Lahan Oleh Pt. Pertamina Gheotermal Energy Terhadap Nilai Lahan Di Desa

Tonsewer Selatan Kecamatan Tompaso Barat. *Agri-Sosio Ekonomi Unsrat*, *Volume 16 Nomor 2*, 197–206.

Suryono, A. (2024). Penggunaan Kawasan Hutan Untuk Kepentingan Pengusahaan Panas Bumi Tidak Langsung: Telaah Aliran Hukum Alam. *Jurnal Yustisiabel*, *Volume 8 Nomor 1*.

Journal article with DOI

Abdi, A., Murayama, T., Nishikizawa, S., & Suwanteep, K. (2024). Social acceptance and associated risks of geothermal energy development in East Africa: perspectives from geothermal energy developers. *Clean Energy*, *8*(5), 20–33. https://doi.org/10.1093/ce/zkae051

Anggreta, D. K., Somantri, G. R., & Purwanto, S. A. (2022). Social Acceptance: Mapping the Perspectives of Stakeholder in the Development of Geothermal Power Plants in West Sumatra, Indonesia. *International Journal of Sustainable Development and Planning*, *17*(4), 1053–1065. https://doi.org/10.18280/ijsdp.170402

Cantor, A., & Knuth, S. (2019). Speculations on the postnatural: Restoration, accumulation, and sacrifice at the Salton Sea. *Environment and Planning A*, *51*(2), 527–544. https://doi.org/10.1177/0308518X18796510

Dinan, U. H., & Hidayati, N. (2023). Persepsi Masyarakat Terhadap Eksploitasi Panas Bumi Di Wilayah Kerja Pertambangan Kaldera Rawa Danau. *Jurnal Kommunity Online*, *2*(2), 25–38. https://doi.org/10.15408/jko.v2i2.28278

Dowd, A. M., Boughen, N., Ashworth, P., & Carr-Cornish, S. (2011). Geothermal technology in Australia: Investigating social acceptance. *Energy Policy*, *39*(10), 6301–6307. https://doi.org/10.1016/j.enpol.2011.07.029

Fuentes, I. F., Barich, A., Baisch, C., Bodo, B., Elíasson, O., Falcone, G., Friederichs, G., Gregorio, M. de, Hildebrand, J., Ioannou, A., Medgyes, T., Miklovicz, T., Pérez, P., & Pinto, M. T. (2022). The Crowdthermal Project: Creating Public Acceptance Of Geothermal Energy And Opportunities For Community Financing. *Energies*, *15*(21), 8310. https://doi.org/10.3390/en15218310

Hall, N., Lacey, J., Carr-Cornish, S., & Dowd, A. M. (2015). Social licence to operate: Understanding how a concept has been translated into practice in energy industries. *Journal of Cleaner Production*, *86*, 301–310. https://doi.org/10.1016/j.jclepro.2014.08.020

Hakim, A. Sholihah, F., Ismawati, R., & Nuryunita Dewantari. (2022). Potensi dan Pemanfaatan Energi Panas Bumi di Indonesia. *Indonesian Journal of Conservation*, *11*(2), 71–77. https://doi.org/10.15294/ijc.v11i2.40599

Herawan, S. (2022). Energi Geothermal Dalam Aturan, Masalah Lingkungan Hidup Dan Solusi Penyelesaian Konflik Di Masyarakat (Geothermal Energy In Rules, Environmental Problems And Community Conflict

Solutions). *Jurnal Rechtvinding*, *11*(3). https://doi.org/10.1111/soc4.12650

Higgins, M. E., Burnett, D. B., Kreuter, U., & Haut, R. C. (2017). Pre-development research to understand stakeholder perceptions of energy development in environmentally sensitive areas. *SPE/AAPG/SEG Unconventional Resources Technology Conference 2017*. https://doi.org/10.15530/urtec-2017-2664562

Hughes, L., & Rogei, D. (2020). Feeling the heat: responses to geothermal development in Kenya's Rift Valley. *Journal of Eastern African Studies*, *14*(2), 165–184. https://doi.org/10.1080/17531055.2020.1716292

Ibrohim, A., Prasetyo, R. M., & Rekinagara, I. H. (2019). Understanding Social Acceptance of Geothermal Energy: A Case Study from Mt. Lawu, Indonesia. *IOP Conference Series: Earth and Environmental Science*, *254*(1). https://doi.org/10.1088/1755-1315/254/1/012009

Isa, M., Zulfadhli, Z., Thahul, C. F., & Cesarian, D. P. (2022). Geothermal Distribution Analysis of Geureudong Volcano Based On Satellite Data and Fault Fracture Density (FFD). *Elkawnie*, *7*(2), 354. https://doi.org/10.22373/ekw.v7i2.9728

Kamana, N., & Vaughan, M. (2024). Improving collaboration between native Hawaiians and energy professionals to explore geothermal energy potential in Hawai'i. *Frontiers in Sustainability*, *5*. https://doi.org/10.3389/frsus.2024.1443407

Kong'ani, L. N. S., Wahome, R. G., & Thenya, T. (2021). Variety and management of developmental conflicts: the case of the Olkaria IV geothermal energy project in Kenya. *Conflict, Security and Development*, *21*(6), 781–804. https://doi.org/10.1080/14678802.2021.2000806

Lu, H., Song, H., & McComas, K. (2021). Seeking information about enhanced geothermal systems: The role of fairness, uncertainty, systematic processing, and information engagement intentions. *Renewable Energy*, *169*, 855–864. https://doi.org/10.1016/j.renene.2021.01.031

Mahdi, Z. (n.d.). Perlawanan Masyarakat terhadap Pembangunan Geothermal di Kawasan Dieng Community Resistance to Geothermal Development in the Dieng Area. *Jurnal Ilmiah Magister Administrasi Publik*, *6*(2), 209–224. https://doi.org/10.31289/strukturasi.v6i2.5001

Meller, C., Schill, E., Bremer, J., Kolditz, O., Bleicher, A., Benighaus, C., Chavot, P., Gross, M., Pellizzone, A., Renn, O., Schilling, F., & Kohl, T. (2018). Acceptability of geothermal installations: A geoethical concept for GeoLaB. *Geothermics*, *73*, 133–145. https://doi.org/10.1016/j.geothermics.2017.07.008

Ezeh, M. Adindu Donatus Ogbu, Augusta Heavens Ikevuje, & Emmanuel Paul-Emeka George. (2024). Stakeholder

engagement and influence: Strategies for successful energy projects. *International Journal of Management & Entrepreneurship Research*, *6*(7), 2375–2395. https://doi.org/10.51594/ijmer.v6i7.1330

Muslihudin, M., Santosa, I., Tugiyanti, E., Suyono, Dewi, P. S., & Santoso, J. (2023). The Urgency of Social Aspects in Environmental Assessment: A Case Study of a Sustainable Geothermal Power Plant Development in Banyumas, Indonesia. *Environmental Research, Engineering and Management*, *79*(2), 88–98. https://doi.org/10.5755/j01.erem.79.2.33331

Nurwahyudin, D. S., & Harmoko, U. (2020). Pemanfaatan dan Arah Kebijakan Perencanaan Energi Panas Bumi di Indonesia Sebagai Keberlanjutan Maksimalisasi Energi Baru Terbarukan. *Jurnal Energi Baru Dan Terbarukan*, *1*(3), 111–123. https://doi.org/10.14710/jebt.2020.10032

Nwaiwu, U., Leach, M., Liu, L., & Seymour, V. (2025). Decentralized Geothermal Energy for Electricity Access: Exploring Knowledge and Social Acceptance in Ebonyi State, Nigeria. *Sustainability (Switzerland)*, *17*(12). https://doi.org/10.3390/su17125455

Özen, H. (2025). Smallholder women rising: Intersectional dynamics of resistance to geothermal energy in Western Turkey. *Energy Research and Social Science*, *120*. https://doi.org/10.1016/j.erss.2024.103884

Ruef, F., Stauffacher, M., & Ejderyan, O. (2020). Blind spots of participation: How differently do geothermal energy managers and residents understand participation? *Energy Reports*, *6*, 1950–1962. https://doi.org/10.1016/j.egyr.2020.07.003

Sætórsdóttir, A. D., & Hall, C. M. (2019). Contested development paths and rural communities: Sustainable energy or sustainable tourism in Iceland? *Sustainability (Switzerland)*, *11*(13). https://doi.org/10.3390/su11133642

Sari, N. (2024). Ratio Legis Hak Sipil Dalam Masyarakat Hukum Adat. *UNES Law Review*. https://doi.org/10.31933/unesrev.v6i4

Setyono, A. E., & Kiono, B. F. T. (2021). Dari Energi Fosil Menuju Energi Terbarukan: Potret Kondisi Minyak dan Gas Bumi Indonesia Tahun 2020 – 2050. *Jurnal Energi Baru Dan Terbarukan*, *2*(3), 154–162. https://doi.org/10.14710/jebt.2021.11157

Soltani, M., Kashkooli, F. M., Souri, M., Rafiei, B., Jabarifar, M., Gharali, K., & Nathwani, J. S. (2021). Environmental, economic, and social impacts of geothermal energy systems. *Renewable and Sustainable Energy Reviews*, *140*, 110750. https://doi.org/10.1016/j.rser.2021.110750tomo, S., Siswadi, S., & Christina Sitotrus, A. P. M. (2025). Konflik Agraria, Sustainability dan Sosio-Ekonomi: Partisipasi Petani Sawit Mandiri Terhadap Implementasi ISPO di Kecamatan Terentang Kabupaten Kubu Raya. *Riwayat: Educational Journal of History and Humanities*,

8(4), 7469–7478. https://doi.org/10.24815/jr.v8i4.50430

Wea, A. N., Sayrani, L. P., & Lopo, Y. H. L. (2024). *Kuasa Eksklusi dalam Pembangunan Geothermal di Desa Ulubelu, Kecamatan Golewa, Kabupaten Ngada*. *2*(4), 211–221. https://doi.org/10.61132/sadewa.v2i3.1296