Building Community Acceptance using Public Consultation and Disclosure Plan (PCDP) in Geothermal Power Plant Projects: A Strategy for Inclusive Renewable Energy Transition

Andrian Novita Indahsari[1], Andri Muhammad Affandi[2], Naura Rania Khairunnisa[3], Muhamad Azami Nasri[4], Muhamad Yusril Azra[5], and Muhammad Rauf[6]

[1] andrian.novita@amf.or.id
[2]andri.affandi@amf.or.id
[3]naura.rania@amf.or.id
[4]azaminasri10@amf.or.id
[5]yusril.azra@amf.or.id
[6]muhammad.rauf@mirekel.id

Keywords: Geothermal energy; community acceptance; public consultation; information disclosure

ABSTRACT

Geothermal energy is a strategic renewable resource that plays a pivotal role in achieving Indonesia's Net Zero Emission (NZE) targets as mandated in the National Energy Policy. As a clean and sustainable energy source, geothermal power plant development is central to the country's energy transition agenda. However, in practice, geothermal power plant projects frequently encounter resistance from local communities, largely due to limited understanding of project characteristics and potential environmental impacts. This resistance is often exacerbated by insufficient public outreach from both developers and local authorities during the exploration and exploitation phase. Integrating social considerations from the exploration and exploitation phases is therefore essential for preventing social conflicts and mitigating the risks of community opposition. This paper provides practical guidance for proponents to design mechanisms and manage social risks through the adoption of a Public Consultation and Disclosure Plan (PCDP). Employing a qualitative-descriptive methodology, the study draws on document analysis of national and international standards, literature review, and case studies of PLTP projects facing community responses of public consultation. Findings indicate that community acceptance is closely linked to the establishment of procedural justice, distributional justice, and trust-building. A well-structured and consistently implemented PCDP is identified as a critical instrument for fostering these elements by enabling inclusive stakeholder mapping, transparent information disclosure, participatory decision-making, and accessible grievance mechanisms. The study concludes that integrating the PCDP throughout all stages of project development transforms it from a communication tool into a strategic governance framework. This integration not only mitigates social risks and strengthens project legitimacy but also enhances regulatory compliance, optimizes project timelines, and boosts investor confidence. Ultimately, effective PCDP implementation fosters long-term, mutually beneficial relationships between developers and communities, contributing to a socially inclusive and resilient pathway for Indonesia's geothermal energy development.

1. INTRODUCTION

1.1 Background

The transition toward renewable energy (RE) has emerged as a global priority in addressing the climate crisis through concrete measures, particularly the shift from fossil-fuel-based systems to renewable energy sources. As part of the global agenda, the Government of Indonesia is also accelerating its domestic energy transition to achieve Net Zero Emissions (NZE) by 2060, as outlined in the National Long-term Development Plan (RPJPN) 2025–2045. According to the Directorate General of Renewable Energy, the number of renewable energy power plants in Indonesia has consistently increased since 2017 (Direktorat Jenderal Energi Baru, 2024). One significant pathway for RE development is the expansion of geothermal power plants (*Pembangkit Listrik Tenaga Panas Bumi* or PLTP), which aligns with Indonesia's geographical and resource potential.

Fan and Greco (2018) highlight that Indonesia, located within the Pacific "Ring of Fire," possesses abundant hydrothermal energy resources. Indonesia holds 40% of the world's geothermal energy potential, however, Pambudi and Ulfa (2024) emphasize that the utilization of this potential for renewable energy remains suboptimal. As of 2024, the Ministry of Energy and Mineral Resources (ESDM) has recorded 16 Geothermal Working Areas (*Wilayah Kerja Panas Bumi* or WKP) with 18 active geothermal power plants, contributing 2,638.8 MW of electricity to the national grid, as stated on Direktorat Jenderal Energi Baru (2024). The development of geothermal projects as renewable energy sources supports Indonesia's NZE targets by promoting low-carbon development (*Pembangunan Rendah Karbon* or PRK), including through improved energy efficiency and the accelerated transition toward RE adoption.

Kementerian Perencanaan Pembangunan Nasional/Bappenas (2025) notes that geothermal projects hold significant potential as low-carbon RE sources to meet Indonesia's electricity demand while supporting NZE goals. Geothermal power plant development directly contributes to the achievement of the Sustainable Development Goals (SDGs), particularly Goal 7 on affordable and clean energy and Goal 13 on climate action. The expansion of geothermal power plants is influenced by multiple factors, including resource potential, technological readiness for geothermal development, supportive government policies and regulations, and the availability of technical infrastructure for exploration.

Beyond technical considerations in geothermal exploration, social dimensions play a critical role in project development. The exploration and exploitation phase of geothermal power plant often intersects with local livelihoods and community life, potentially generating social risks. According to World Bank (2017), the World Bank's Environmental and Social Standards (ESS) refers social risks to the combination of the probability of certain hazard occurrences, related to social issues, and the severity of its potential impacts. As described by Pambudi and Ulfa (2024), these risks may include security threats, unequal access to resources and project

benefits, disproportionate project impacts, and risks to cultural heritage. In geothermal project development, such risks often stem from limited public understanding of renewable energy projects, negative community perceptions, concerns over potential impacts, and a lack of communication and transparency from both developers and government agencies. In some cases, misunderstandings between communities and project proponents have escalated into social conflicts, disrupting project implementation.

Community resistance to geothermal projects can arise when negative perceptions are left unaddressed, leading to the belief that geothermal exploration and exploitation may cause environmental damage comparable to that of mining or fossil-fuel projects. Trisiah et al. (2022) report that many communities fear destructive impacts on nature and ecosystems, including flora and fauna in protected forests. Furthermore, economic motives often influence local opposition, particularly when geothermal projects are perceived as threats to existing livelihoods. Ibrohim et al. (2019) note that these perceptions are strongly linked to limited public awareness about geothermal energy, largely due to inadequate outreach, education, and community engagement from both government agencies and project proponents. In several cases, communities were only formally involved during the licensing process, without meaningful participation from the exploration stage through to exploitation.

As explained by Adityatama et al. (2018), resistance from communities can significantly hinder geothermal exploration and exploitation, with opposition most frequently occurring during the exploration phase, a stage that is both financially and operationally critical. To overcome these challenges, systematic and participatory public communication strategies are needed to build long-term community acceptance. One internationally recognized instrument for this purpose is the Public Consultation and Disclosure Plan (PCDP), designed to actively engage both project proponents and affected communities in structured public consultations. Within geothermal project development, PCDP serves not only as a public outreach tool but also as a mechanism to foster social acceptance through transparent information disclosure, participatory consultations, and responsive grievance-handling systems. This paper aims to provide practical insights for project developers in designing mechanisms and managing social risks using PCDP in geothermal projects in Indonesia.

1.2 Conceptual Framework

1.2.1 Community Acceptance Theories

This study adopts a theoretical approach to examine the urgency of public consultation in the context of geothermal power plant development. The framework serves as an analytical lens to understand why effective consultation among stakeholders is essential. Concerning consultation and disclosure planning, Wüstenhagen et al. (2007), in his seminal work Social Acceptance of Renewable Energy Innovation: An Introduction to the Concept, underscore the central role of social acceptance in public consultation processes, particularly in renewable energy contexts. However, in practice, many countries have overlooked the integration of social acceptance as a core component of renewable energy policy implementation. As a result, both public-sector stakeholders and private developers often lack the necessary perspective to support meaningful consultation, leading to localized resistance against renewable energy projects.

Wüstenhagen et al. (2007) argue that social involvement is inextricably linked to renewable energy development and that the absence of transparency and public consultation often triggers local opposition. This perspective aligns with the context of this paper, which focuses on geothermal power plant projects.

Figure 1. Dimensions of Social Acceptance. Source: Wüstenhagen et al. (2007)

According to Wüstenhagen et al. (2007), the social acceptance framework consists of three dimensions: socio-political acceptance, community acceptance, and market acceptance.

1. Socio-political Acceptance
   This dimension encompasses societal approval of energy-sector policies and technologies, as well as the acceptance of these policies by policymakers and other stakeholders. In some countries, government support for renewable energy remains limited, despite strong public awareness of the importance of clean technology. Such conditions often reflect the underestimation of social acceptance as a critical factor in energy project development. Implementation challenges are frequently linked to insufficient socio-political acceptance. In the geothermal sector, this dimension includes public, policymaker, and stakeholder acceptance of geothermal energy policies and technologies. Effective policy frameworks that are transparent, systematically sound, and participatory are necessary to foster both community and market acceptance.
2. Community Acceptance
   Community acceptance refers to the willingness of local stakeholders, especially affected residents and local governments, to support siting decisions and renewable energy projects. This dimension is shaped by three core factors: procedural justice

(ensuring fair stakeholder involvement in decision-making), distributional justice (transparent disclosure of how benefits and costs are allocated among parties), and trust (the extent to which communities believe in the credibility of project proponents, the project itself, and the information provided).

3. Market Acceptance
   Market acceptance relates to the willingness of consumers, businesses, and investors to adopt renewable energy products. Consumer demand for renewable electricity can drive the establishment of geothermal power plants in certain areas, with consumers also acting as potential investors. However, project development in proximity to residential areas links market acceptance to community acceptance. Likewise, corporate stakeholders can influence policy design, financial procurement systems, and investor network access in the renewable energy sector.

This paper specifically focuses on community acceptance, as the approval of multiple stakeholder groups, especially host communities, plays a decisive role in determining project feasibility and sustainability. In geothermal project development, community acceptance is a prerequisite for smooth operations and long-term social legitimacy. Without it, unmanaged social risks can lead to resistance. Therefore, this study emphasizes the role of public consultation and information disclosure as critical mechanisms for fostering acceptance of the geothermal project.

1.2.2 Public Consultation and Information Disclosure

1. Public Consultation

Public consultation is a structured mechanism for managing two-way communication between project proponents and the public. According to the International Finance Corporation (IFC) in its guidelines on effective public consultation and disclosure, such engagement actively involves individuals, groups, and organizations as a means to enhance decision-making and build mutual understanding. Public consultation plays a vital role in increasing public awareness of a project's potential benefits and impacts, while facilitating agreements on management and technical approaches to maximize benefits and minimize adverse consequences.

Engaging with the public involves both directly and indirectly affected individuals as well as other stakeholders who have the ability to influence project outcomes, whether positively or negatively. In this context, "public" often refers to stakeholders, including Project-Affected People (PAP) such as individuals and households living near the project site, Indigenous groups, and traditional leaders; project sponsors; public-sector representatives from both local and national governments; organizations such as local, national, and international non-governmental organizations (NGOs), universities and research institutions, religious groups; and private-sector companies and business associations. Stakeholder identification is therefore a critical element of effective public consultation.

In Indonesia, public consultation in renewable energy projects is specifically mandated under national legislation. Law No. 32 of 2009 on Environmental Protection and Management requires transparent and inclusive public participation in preparing the Environmental Protection and Management Plan (*Rencana Perlindungan dan Pengelolaan Lingkungan Hidup*, RPPLH), Environmental Impact Analysis (*Analisis Dampak Lingkungan*, AMDAL), and Strategic Environmental Assessment (*Kajian Lingkungan Hidup Strategis*, KLHS).

Furthermore, Government Regulation No. 22 of 2021 on the Implementation of Environmental Protection and Management details procedures for public consultation, including stakeholder identification and coordination, core aspects of consultation activities, consultation formats and methods, and the recording of public opinions, suggestions, and responses. Participation and consultation are legal obligations for project proponents, as national regulations affirm every citizen's right to a healthy environment, access to environmental information, and the opportunity to participate in environmental governance.

2. Information Disclosure

Information disclosure is an essential component of public consultation, enabling effective participation from all stakeholders, particularly those residing near the project area. The IFC emphasizes that well-informed communities are more capable of understanding the trade-offs between a project's benefits and potential drawbacks, contributing meaningfully to the project, and placing greater trust in the project site.

The World Bank's Environmental and Social Standards (ESS) also treat information disclosure as a key requirement, mandating that project information including potential impacts, be disclosed promptly, in easily accessible locations, and in forms and languages understandable to affected communities and other stakeholders. This ensures they can provide informed input into project design and mitigation measures.

In Indonesia, information disclosure obligations are further reinforced under Law No. 21 of 2014 on Geothermal Energy, which affirms every citizen's right to access information and to report hazards, pollution, or environmental degradation in geothermal project areas.

3. Public Consultation and Disclosure Plan (PCDP)

A Public Consultation and Disclosure Plan (PCDP) is a planning document that serves as a guideline for all public consultation and information disclosure activities throughout the life cycle of a project. It is a "living document" prepared in the early planning stages and periodically updated with activity reports and adjustments based on needs identified through ongoing monitoring and evaluation.

The IFC requires borrowers to prepare a PCDP to ensure meaningful consultation and transparent disclosure by project proponents to stakeholders and the public. The plan must establish technically sound and culturally appropriate approaches to ensure timely provision of adequate information to affected communities and other stakeholders, while offering sufficient opportunities for them to voice their views and concerns. According to IFC (2012), a PCDP should include (1) A brief overview of the project; (2) An

explanation of local consultation and disclosure requirements; (3) Identification of key stakeholder groups; (4) Strategies and schedules for information disclosure and consultation across different project phases; (5) Allocation of resources and responsibilities for public consultation and information disclosure activities; (6) Culturally appropriate grievance mechanisms; and (7) Comprehensive records and documentation of activities.

The World Bank's ESS further requires that the PCDP incorporate project risk assessment results. While Indonesia's renewable energy policy mandates public participation, information access, and the right to provide input, there is no specific national regulation that explicitly requires the preparation of a PCDP as part of implementing these obligations.

This paper highlights the significance of participatory, transparent, and context-specific public consultation and information disclosure practices. To ensure effectiveness, it is essential to prepare a Public Consultation and Disclosure Plan (PCDP) that aligns with both international standards and national regulations. This study examines the implementation of public consultation and information disclosure in geothermal power plant projects in Indonesia and argues that these practices are crucial for gaining community acceptance, which ultimately affects the long-term sustainability of these projects.

2. METHODOLOGY

2.1 Literature Review

This study utilizes a document review approach to gather secondary data. The document review consists of a systematic analysis of various social and environmental standards, regulatory frameworks, project implementation reports, and scholarly articles related to geothermal power plant projects. These sources are selected from valid and credible references. The process is structured, beginning with document collection, followed by the selection of materials based on their validity and relevance, and concluding with thematic coding analysis to identify patterns of community acceptance, public consultation practices, and information disclosure in geothermal power plant projects. The goal of this document analysis is to describe community acceptance of geothermal power plant projects and the factors that influence this acceptance. It also aims to identify recurring patterns and practices of public consultation and information disclosure throughout the project lifecycle. The findings from this analysis will help develop a comprehensive understanding of the relationship between community acceptance, consultation processes, and information transparency in the development of geothermal power plant projects.

2.2 Descriptive Case Study

This paper adopts a descriptive case study approach. According to Neuman (2014), descriptive research seeks to provide a detailed portrayal of a phenomenon using words or numbers to answer the questions of who, when, where, and how. A descriptive case study delivers in-depth insights into a particular case through categorization and classification derived from literature sources, aiming to develop a detailed and nuanced understanding of the case under investigation. This paper presents multiple case studies and elaborates on the contextual background of the situations examined. Descriptive case studies are instrumental in revealing patterns, relationships, and dynamics of real-world phenomena in a systematic and theoretical manner, particularly in offering a profound understanding of social dynamics within geothermal power plant development. The case analysis in this research is guided by the conceptual framework of community acceptance, which encompasses three key dimensions: procedural justice, distributional justice, and trust. Through this approach, the descriptive case study not only narrates the events but also explicates the underlying social processes that shape public acceptance or resistance toward geothermal power plant project development.

3. PUBLIC PERCEPTION OF GEOTHERMAL POWER PLANT PROJECTS

3.1 Case Study: Public Resistance to Geothermal Power Plant Development

Geothermal power projects in Indonesia, as part of the national renewable energy agenda, play a strategic role in supporting a sustainable energy transition toward NZE. However, as highlighted by Malau et al. (2020), public understanding of geothermal energy remains limited, particularly within rural communities in mountainous regions where geothermal resources are commonly explored and livelihoods are predominantly dependent on natural resources. This lack of awareness regarding the nature, benefits, and potential impacts of geothermal projects shapes local attitudes toward their development. As emphasized byTrisiah et al. (2022), public perception can significantly influence the overall progress and success of geothermal projects. Therefore, the project proponent must proactively manage community perceptions to accelerate project implementation and minimize social risks from local stakeholders.

Pambudi and Ulfa (2024) identified that social risks often arise from concerns related to livelihoods, land tenure, environmental degradation, and potential health impacts. These concerns are frequently expressed through protests, demonstrations, and, in some cases, prolonged social conflicts that can disrupt or halt project development. The absence of participatory approaches during project planning and implementation is a common driver of such resistance. Prominent examples include geothermal exploration sites in Baturraden, Mount Talang, and Mount Lawu, all of which experienced strong community opposition rooted in perceptions of environmental harm and socioeconomic disruption.

The Baturraden geothermal development project exemplifies this dynamic, having faced public rejection due to allegations of deforestation and sedimentation. These issues heightened fears of ecological disaster and potential threats to local livelihoods. Hariyadi (2019) notes that the primary source of opposition was the lack of a shared understanding between communities and the project proponent regarding the objectives and implications of the geothermal initiative. While outreach efforts were undertaken, they were neither continuous nor inclusive of diverse stakeholder groups. In many cases, socialization activities were reduced to just meeting administrative and procedural requirements for project documentation rather than fostering genuine community engagement. This limited approach undermined public enthusiasm and weakened positive sentiment toward the project.

Public outreach should ideally take place throughout all phases of project development to mitigate social risks. However, Dharmawan (2017) reported that in Baturraden, socialization activities only increased after water contamination issues arose, which triggered protests and heightened opposition. Environmental concerns such as deforestation, sedimentation, and river overflow directly

impacted agricultural livelihoods, further eroding public trust. This loss of trust resulted in decreased participation and widespread organized resistance. Faizah et al. (2025) identified four primary drivers of opposition in these contexts: ecological concerns, distrust toward both the project proponent and the government, limited involvement in project planning, and perceived risks to livelihoods.

In Mount Talang, resistance similarly stemmed from fears of adverse environmental and social consequences, compounded by insufficient public access to information regarding geothermal power project plans, processes, and potential impacts. Criticism focused particularly on the exclusion of communities from decision-making processes during the exploration phase. Ningsih & S (2020) observed that the project proponent proceeded with unilateral exploitation without securing early consensus. Cultural conflicts also intensified opposition, as Yolanda et al. (2021) reported that the project site was located on *tanah ulayat* (customary communal land) held in high regard by the local community. Inadequate communication from the project proponent exacerbated tensions, culminating in large-scale protests that hindered project advancement.

Similarly, in Mount Lawu, Ibrohim et al. (2019) report that opposition was driven by a combination of technical, social, and regulatory concerns. Communities feared significant environmental alterations and potential disasters due to the geothermal project, while socially, there were worries about disruptions to agricultural livelihoods. Historical mistrust dating back to an unfulfilled geothermal investment in the 1980s compounded resistance. From a regulatory standpoint, exclusion of communities from the Environmental Impact Assessment (AMDAL) process, along with limited socialization efforts, facilitated the spread of misinformation and reinforced negative perceptions of geothermal projects as environmentally and socially destructive.

Across various cases, projects that stalled during the exploration stage due to public opposition reveal a consistent pattern: inadequate public understanding and limited participation in geothermal development often heightened community resistance. Key concerns, such as environmental degradation and loss of livelihoods, drive this opposition. Additionally, the lack of meaningful engagement during both exploration and exploitation phases erodes trust between developers and local communities, as well as other stakeholders. As Muslihudin et al. (2022) point out, it is crucial to integrate social considerations from the earliest stages of geothermal project development, as unresolved social conflicts can significantly impede project implementation.

3.2 Implementation of Information Disclosure to the Public in Geothermal Power Plant Projects

The exploration and exploitation phases of geothermal power plant projects are inherently linked to public acceptance. As Wilheminus (2018) highlights, strong community support for geothermal development can generate positive socioeconomic impacts through active participation in the exploration and exploitation phase, while also reducing the “shock effect” often experienced during the construction phase. In the South Solok geothermal power plant development, public engagement was embedded as a structured and continuous process. Anggreta et al. (2022) emphasize that sustained public involvement at every stage of project development is essential to ensuring acceptance, thereby minimizing the risk of resistance or social conflict.

In this case, public outreach regarding the geothermal power plant project was conducted directly by the project proponent to the community, without intervention from local authorities, a factor that helped reduce community tension. Public acceptance was further facilitated by reframing the role of local residents not as passive recipients or merely affected stakeholders, but as active partners in the development process. This participatory framing reduced apprehension over potential negative impacts. Involving subject-matter experts to deliver objective explanations about the environmental and social implications of geothermal development enabled communities to evaluate risks and benefits more accurately. These communication efforts were reinforced by explicit government assurances that the geothermal power plant posed no harm to the public or the environment, collectively strengthening trust between the community and the project proponent.

A similar approach was evident in the Dieng geothermal power plant project. Wibowo et al. (2023) observed a similar approach in the Dieng geothermal power plant project, where community acceptance was fostered through a broad public understanding that geothermal energy constitutes a renewable and environmentally sustainable source of electricity. Engagement with the local community was conducted through Corporate Social Responsibility (CSR) initiatives designed to build trust. As Sulastri et al. (2025) note, CSR programs in geothermal projects play a pivotal role in community engagement by delivering economic benefits, fostering trust, and enhancing social acceptance. In the Patuha and Dieng geothermal power plant projects, CSR activities were strategically implemented to strengthen social capital, including reciprocal relationships, community participation, and trust among both the public and other stakeholders. Additionally, the project proponent established an accessible grievance mechanism via a public website, enabling communities to voice concerns effectively.

Case evidence from multiple geothermal power plant projects demonstrates that well-structured, transparent, and participatory information disclosure serves as a critical enabler for conflict prevention and social acceptance. When implemented from the earliest stages of project planning, effective disclosure through active engagement, open communication, and trust-building among the project proponent, government, and the public becomes not merely an administrative requirement but a foundational element for the sustainable and socially inclusive development of geothermal resources. These findings underscore that information disclosure in geothermal power plant development should not be treated as a mere administrative formality, but as a foundational requirement for fostering genuine community acceptance.

4. DISCUSSION: THE URGENCY OF THE PCDP DOCUMENT FOR BUILDING COMMUNITY ACCEPTANCE

4.1 Analysis of Community Acceptance in Geothermal Power Plant Projects in Indonesia

Case study analyses of geothermal power plant projects in Indonesia reveal that public acceptance is largely supported by participatory and transparent communication from the project proponent to the community. Wüstenhagen et al. (2007) identify three critical factors influencing community acceptance: procedural justice, distributional justice, and trust building. Meeting these three factors can significantly enhance community acceptance and reduce resistance to the project. Table 1 presents an assessment of these factors in six geothermal power plant project sites.

Table 1. Factors that Influence Community Acceptance on Geothermal Project Site

Factors	Site Geothermal					
	Baturraden	**Mount Talang**	**Mount Lawu**	**South Solok**	**Patuha**	**Dieng**
Procedural Justice	Limited, delayed socialization; mostly administrative	Non-inclusive consultation; lack of early-stage involvement; unilateral exploitation	Minimal public involvement in AMDAL; lack of consistent, inclusive consultation	Continuous engagement since early stage; inclusive of all groups; experts involved	Early, inclusive engagement; CSR as dialogue platform	Early, inclusive engagement; CSR as dialogue platform
Distributional Justice	Issues of economic loss & livelihood due to mud spills	Project site located on customary land *(Tanah Ulayat)*	Historical trauma from failed project	Partnership with community, not just as project affected people	CSR linked to local needs	Economic and social benefit sharing
Trust building	Eroded public trust by environmental damage (mud spills) and limited transparency	Low trust due to lack of decision-making inclusion and cultural land issues	Low trust due to past fraud and lack of transparent information	Trust built through partnership approach and transparent communication	Trust built through tangible benefits, transparency, and government guarantees	Trust built through tangible benefits, transparency, and government guarantees

4.1.1 Procedural Justice

Several projects implemented socialization activities that were highly limited in scope and primarily administrative. Inclusive socialization often occurred only after environmental problems emerged during project development. This indicates a lack of comprehensive stakeholder identification efforts by the project proponent. Furthermore, consultations were often non-participatory, inconsistent, and lacked early-stage engagement. Such conditions deprived communities of the opportunity to participate openly and equitably in decision-making, preventing procedural justice from being achieved and often leading to public opposition.

In contrast, projects that succeeded in fostering positive relationships with communities, such as the South Solok, Patuha, and Dieng geothermal power plants, conducted comprehensive stakeholder mapping that included vulnerable groups, indigenous peoples, and other project-affected residents. Public outreach began during the early exploration and exploitation stages, employing culturally sensitive approaches. In Patuha, Corporate Social Responsibility (CSR) programs served as an ongoing dialogue platform for two-way communication. These projects achieved procedural justice by ensuring inclusive stakeholder engagement while considering local cultural contexts.

Monitoring and evaluation of public consultations are critical to ensuring that engagement processes reflect community perceptions and lead to fair outcomes. A well-planned and transparent system with clear indicators, coupled with active stakeholder participation, enables the collection of accurate and contextually relevant data. Through this involvement, communities can express needs, provide feedback, and highlight areas for improvement, particularly in the realm of social responsibility. Such an inclusive approach not only fosters procedural justice by ensuring fair processes but also lays the foundation for distributional justice, where the benefits and burdens of a project are equitably shared between the proponent and the community.

For projects supported by the IFC and World Bank, regular reporting on public consultation processes is mandatory to meet lender standards for monitoring and evaluation systems. However, these reports are generally confidential and not publicly accessible, meaning that monitoring and evaluation documentation for the projects in this study could not be obtained.

4.1.2 Distributional Justice

Beyond fair processes, public acceptance of geothermal power plants is influenced by distributional justice to ensure that the social and economic benefits from the project are fairly shared with the community, and that the adverse impacts are proportionately addressed. Negative environmental impacts such as deforestation, water contamination, and loss of livelihoods require the project proponent to provide fair compensation.

In the Baturraden geothermal power plant case, public resistance emerged due to economic losses stemming from upstream river changes caused by exploration activities. This reflects a failure to manage distributional justice, as environmental and economic burdens were borne by the community without compensation. Conversely, in the South Solok project, the community was engaged as a partner rather than merely as project-affected people. This partnership created mutual benefits for both the company and the community, while fostering trust in the project proponent.

Effective implementation of distributional justice serves as a mechanism for building community acceptance by mitigating social risks, addressing inequities in project execution, and supporting harmonized public communication. Social risk mitigation is crucial for identifying potential inequities that could escalate into organized community resistance. Meanwhile, harmonized communication ensures that information about project benefits, risks, and mitigation measures is conveyed inclusively and participatively. Such interventions enable trust to grow organically, forming social capital essential for the long-term sustainability of geothermal power plant projects.

4.1.3 Trust Building

Case studies across multiple geothermal power plant sites underscore the critical role of trust in community acceptance. Trust develops when the community believes that the project proponent has good intentions, adequate competence, consistent information delivery, and goals aligned with community interests. In projects that face resistance, such as Baturraden, Gunung Lawu, and Gunung Talang, public trust was eroded by environmental damage handled without transparency, exclusion from decision-making, historical cases of fraud, and lack of transparent and understandable information.

In contrast, the South Solok, Patuha, and Dieng geothermal projects successfully fostered community trust by positioning the community as development partners, engaging them from the earliest exploration stage, and maintaining open communication adapted to local cultural contexts. Trust was further strengthened through strategic social and stakeholder mapping, inclusive engagement processes, open and accessible grievance mechanisms, responsive social risk mitigation, and participatory monitoring and evaluation systems. Sustained implementation of these approaches ensures harmonized and transparent information disclosure, early identification of potential issues, effective mitigation of social risks, and the systematic integration of community feedback into project decision-making, thereby enabling the establishment and long-term preservation of trust.

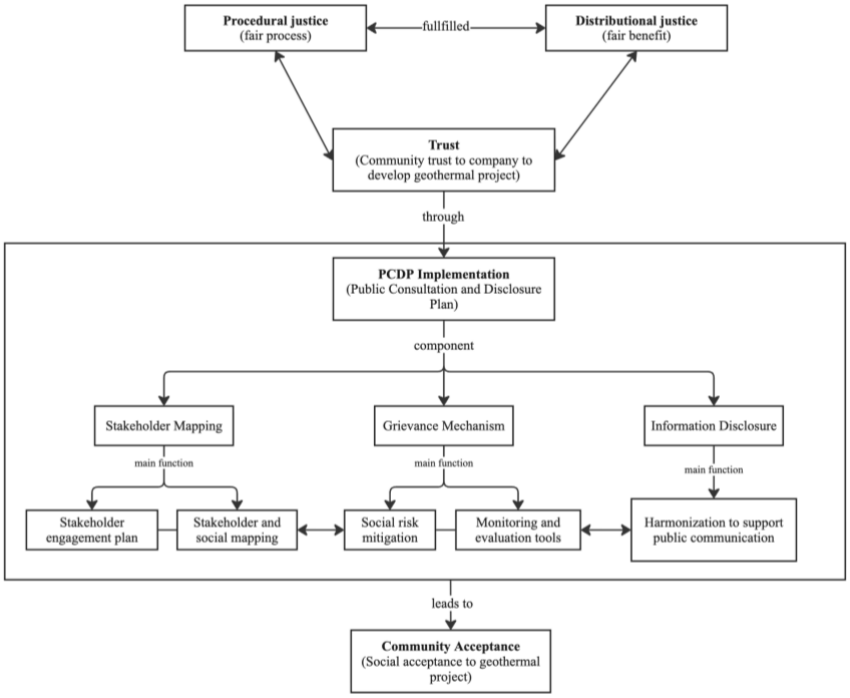

Figure 2. Community Acceptance Strategy in Geothermal Project

Case studies indicate that procedural justice, distributional justice, and trust are critical factors influencing community acceptance. These three elements can be achieved through the implementation of the Public Consultation and Disclosure Plan (PCDP) as a guideline for conducting public communication from the exploration to the exploitation phases of the project. The core components of PCDP implementation include stakeholder mapping, grievance mechanisms, and information disclosure. Fulfillment of these core components can lead to strengthened community acceptance. Figure 1 illustrates the framework of procedural justice and distributional justice as the foundation for building public trust in geothermal power plant development. The trust-building process is operationalized through the PCDP document, which serves as a strategic guide for public engagement throughout the exploration and exploitation phases of the project.

Effective public consultation and information disclosure practices that gain community acceptance require a systematic and practical planning document, as outlined by the PCDP. This document includes guidelines for social mapping, stakeholder engagement strategies, grievance mechanisms, identification and mitigation of social risks, and a monitoring and evaluation system that adhere to both international standards and national regulations while being sensitive to local contexts. By integrating the PCDP into the exploration and exploitation phases of a geothermal power plant project, the project proponent can meet formal requirements while also building the trust necessary for long-term social acceptance of geothermal power plants in Indonesia.

4.2 PCDP Document for Building Community Acceptance

4.2.1 Understanding the PCDP Document

The project proponent of a geothermal power plant holds responsibility not only for the technical and operational aspects of the project but also for ensuring that its implementation achieves social acceptance from the surrounding communities. In this context, the Public Consultation and Disclosure Plan (PCDP) serve as an essential administrative and strategic guideline for conducting public engagement systematically and inclusively. Functioning as both a technical and procedural document, the PCDP provides a structured framework for conducting public consultations and disclosing information to stakeholders. It is considered a “living” document that is continuously updated to reflect changes in data, information, and strategies based on the understanding that social acceptance is not static, but an evolving process that requires ongoing monitoring.

The scope of PCDP implementation extends beyond the initial consultation phase. It also encompasses mechanisms for monitoring the execution of consultation activities, evaluating the effectiveness of public communication, and following up on community feedback. Social monitoring is not merely a regulatory requirement, it is also a means to assess the extent to which the project delivers tangible benefits to local communities. When communities are directly involved in the evaluation process, a reciprocal relationship emerges, fostering a sense of ownership and forming a strong foundation for social acceptance.

The PCDP is therefore more than a communication manual, it is a strategic tool for managing social risks. A systematically and participatorily developed PCDP strengthens trust between the project proponent and the local community, creates a platform for constructive dialogue, reduces the likelihood of social conflict, and supports the long-term sustainability of the project. From this perspective, the key objectives of the PCDP can be summarized as follows:

1. Guaranteeing the right to information and meaningful consultation
   Ensuring that every stakeholder has equal access to project information and the opportunity to provide input through inclusive consultation processes.
2. Managing social risks through participatory approaches
   Enabling the early identification of potential social issues and developing solutions collaboratively with the community to minimize conflict.
3. Building trust in the project
   Facilitating the formation of trust between the community and the project proponent, which serves as the foundation for sustained community acceptance.
4. Fulfilling stakeholder obligations
   Ensuring that all public consultations comply with relevant regulations, international standards, and corporate commitments.
5. Encouraging participation in project-related programs
   Providing structured mechanisms that enable the public to actively engage in social programs associated with the project.

4.2.2 Public Consultation and Disclosure Plan (PCDP) Framework

The development of a PCDP document requires a well-structured and comprehensive framework. Based on the findings from the preceding case study, the proposed framework comprises five interrelated and inseparable components. These components are designed to function cohesively, ensuring that community acceptance of the development project can be effectively achieved.

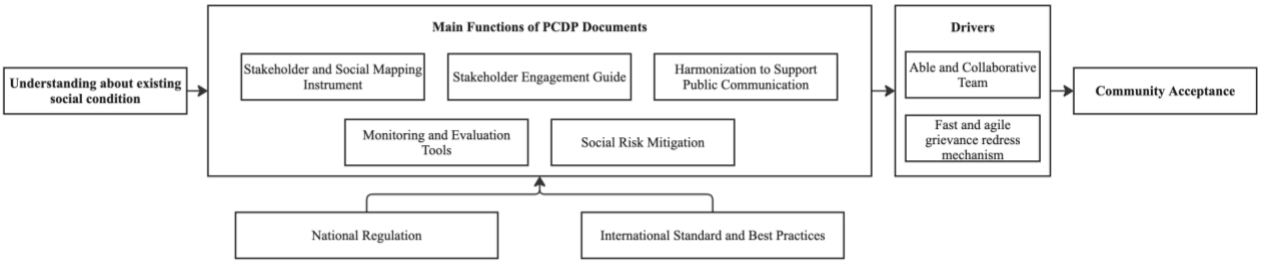

Figure 3. Framework for PCDP Document.

1. Understanding the Existing Social Context

A thorough understanding of the existing social conditions is a fundamental prerequisite for preparing a PCDP. As a technical guideline for implementing public consultation and information disclosure, the PCDP cannot be effectively developed without first examining the social, cultural, economic, and institutional context of communities within the project's area of influence. This social baseline provides insights into local social structures, intergroup relations, potential vulnerabilities, community aspirations, and prevailing perceptions of the project. Such knowledge is critical to designing consultation approaches that are inclusive, responsive, and relevant to local dynamics. Without it, communication and engagement efforts risk being misdirected, potentially triggering resistance or exacerbating existing social tensions.

2. Basis of Design

The PCDP document is developed regarding both national regulations and international standards and best practices. This dual reference ensures that the consultation and disclosure process complies with domestic legal frameworks while aligning with globally acknowledged social and environmental safeguards. National regulations provide legal legitimacy and local context, while international standards such as the World Bank's Environmental and Social Standards (ESS), IFC Performance Standards (PS), and the Asian Development Bank's Safeguard Policy Statement (SPS) offer technical guidance on transparency, inclusive participation, grievance handling, and protection of vulnerable and affected groups. The aim is to establish a systematic, accountable, and high-integrity process throughout all project phases involving the public.

Table 2. National Regulation and International Standard

Internasional Standard	Indonesian National Regulation
IFC PS 1: Assessment & Management of Environmental and Social Risks and Impacts	Law No. 39/1999 on Human Rights

IFC Guidance: Preparation of a Public Consultation and Disclosure Plan	Law No. 32/2009 on Environmental Protection and Management
IFC Stakeholder Engagement Handbook	Law No. 3/2024 (Second Amendment to Law No. 6/2014 on Villages)
ADB Public Communication Policy (PCP).	Minister of Home Affairs Regulation No. 52/2014 on Recognition and Protection of Customary Law Communities
World Bank ESS 10: Stakeholder Engagement & Information Disclosure	Ministry of Environment and Forestry Regulation No. P.26/2018 on Public Engagement Guidelines

3. Main Functions of the PCDP

The Public Consultation and Disclosure Plan (PCDP) serves as a technical guidance document designed to provide all project stakeholders with a clear reference for implementing public communication. Its application is dynamic, allowing adaptation to current social conditions, making the document both flexible and updateable throughout the project lifecycle. The PCDP integrates several key functions to support the successful implementation of public consultation:

(1) Stakeholder and Social Mapping

PCDP implementation aims to identify all parties who have an interest in, may be affected by, or can influence the project. The findings from stakeholder and social mapping form the foundation for designing contextualized and inclusive communication and consultation strategies. This process includes:

a. Identification of primary and secondary stakeholders, including community members, government institutions, private sector actors, and civil society organizations.
b. Analysis of each stakeholder's level of influence and interest.
c. Mapping of vulnerable and marginalized groups (e.g., women, children, the elderly, indigenous peoples, and persons with disabilities) who may require tailored engagement approaches.
d. Assessment of existing social impacts, understanding how specific groups may be directly or indirectly affected by project activities.

(2) Stakeholder Engagement Guide

Clear stakeholder and social mapping provide the basis for developing a stakeholder engagement guide within the framework of public consultation planning. This function focuses on conveying information and fostering mutual understanding between the project proponent and the public. Therefore, it designs engagement strategies aligned with the social and cultural characteristics of the community. The guide includes:

a. Objectives and principles of engagement, such as inclusivity, transparency, and meaningful consultation.
b. Appropriate engagement methods, (e.g., focus group discussions, interviews, open consultations, village dialogues, social media outreach).
c. Frequency and stages of engagement, aligned with project phases (planning, construction, operation).
d. Feedback and documentation procedures to ensure that community voices are heard and acted upon.

This function emphasizes two-way communication and sensitivity to local norms to foster long-term relationships with the community.

(3) Harmonization of Public Communication

Harmonized communication is a key tool for creating shared understanding between the project proponent and stakeholders, preventing misinformation or negative perceptions, and strengthening public acceptance of the project. Effective communication is central to trust-building, so this function ensures that public messages are consistent, transparent, and accessible. It covers:

a. Alignment of project messages and information among the project proponent, local partners, and government.
b. Preparation of communication materials (leaflets, posters, social media, local radio, etc.) adapted to the community's literacy level.
c. Use of local language and visual communication methods where appropriate.
d. Establishment of official communication channels trusted by the community.

(4) Monitoring and Evaluation Tools

This function provides mechanisms to assess the effectiveness of consultation and information disclosure. It serves both administrative and strategic purposes to ensure that community engagement is effective, inclusive, and responsive to local conditions. The scope includes:

a. Qualitative and quantitative indicators to measure community participation, understanding of the project, and social perceptions.
b. Periodic reporting systems for internal use and for external stakeholders.
c. Process evaluation (engagement process) and outcome evaluation (level of public acceptance).
d. Feedback loops to enable corrective action based on evaluation results.

A structured monitoring and evaluation system makes the PCDP a dynamic document that evolves according to social dynamics and stakeholder needs. Public engagement by the project proponent can be continuously improved and adapted to real-world conditions.

(5) Social Risk Mitigation

Social risk mitigation is a strategic element of the PCDP, focusing on identifying, preventing, and addressing potential social risks that could hinder project success. This function includes:

a. Early identification of potential conflicts or opposition from individuals, groups, or institutions.
b. Mapping sensitive issues such as land tenure, relocation, economic impacts, or cultural beliefs.
c. Mitigation strategies, including mediation, multi-stakeholder dialogue, and timely, transparent information sharing.
d. Coordination with relevant parties, including local government, community leaders, and local organizations, for joint management.

Social risk mitigation is crucial for addressing social issues during exploration and exploitation phases and serves as a tool for trust-building between the project proponent and the community. Effective mitigation contributes to social acceptance, minimizes conflicts, and ensures participatory and inclusive project implementation.

4. Drivers

Drivers are strategic and operational elements that ensure all primary PCDP functions are implemented effectively, targeted, and adaptive to field dynamics. Without strong and well-organized drivers, functions such as stakeholder mapping, community engagement, public communication, monitoring and evaluation, and social risk mitigation may be suboptimal or stagnate. Two main driver components underpin PCDP implementation:

(1) Capable Collaborative Team

A competent and collaborative team is key to ensuring that PCDP implementation adheres to participatory, inclusive, and responsive principles. Without such a team, functions like the stakeholder engagement guide and communication harmonization would be hindered. This component includes:

a. Technical and social competencies: understanding community engagement approaches, dialogue facilitation, cross-cultural communication, and social safeguards.
b. Cross-sector coordination: ability to collaborate with internal project teams, government, local communities, and civil society organizations.
c. Active field presence: a physically present team strengthens trust-building, captures community aspirations, and responds to social dynamics.

(2) Fast and Agile Grievance Mechanism

A rapid and adaptive grievance mechanism is vital for maintaining good relations between the project and the community. It supports monitoring and evaluation tools and social risk mitigation as an “early warning system” for social risks. This mechanism includes:

a. Simple and accessible procedures, especially for vulnerable groups and grassroots communities.
b. Timely and targeted responses to prevent dissatisfaction and potential conflict.
c. Transparent and accountable documentation and reporting systems.
d. Adaptive capacity for emerging issues or unexpected complaints throughout the project lifecycle.

Drivers are not merely complementary, they are essential to ensure that all technical functions of the PCDP can be operationalized effectively in the field. Without these drivers, PCDP implementation risks losing effectiveness in bridging communication, building trust, and maintaining community acceptance.

5. Building Community Acceptance

Community acceptance is a critical aspect that must be built into geothermal power plant projects. This acceptance involves distributional justice, which ensures that the community has a comprehensive understanding of the project; procedural justice, which engages the community in a participatory manner throughout the project lifecycle; and trust, which strengthens the relationship between the community and the project proponent, thereby supporting the overall success of the project.

Achieving these three factors requires public consultation and information disclosure practices that are transparent, participatory, consistent, and adapted to local contexts. Developing and consistently implementing the PCDP throughout the geothermal power plant project phase serves as an effective strategy. The PCDP functions as an operational guide, providing a structured framework that integrates stakeholder identification, communication strategies, public consultation and information disclosure, social risk assessment and mitigation, as well as dynamic monitoring and evaluation systems that can be continuously updated throughout the project phase from exploration to exploitation.

The PCDP ensures that project practices remain aligned with the actual social conditions on the ground. Furthermore, the effective implementation of the PCDP is supported by a capable project team and responsive grievance mechanisms, ultimately fostering and sustaining community acceptance of the project.

5. CONCLUSION AND RECOMMENDATIONS

Case studies from various geothermal power plant projects across Indonesia demonstrate that technical and operational success is closely linked to the project's ability to achieve social acceptance. The PCDP provides a practical and actionable framework for project proponents to manage social risks and facilitate effective communication. Consistent application of these recommendations has the potential to strengthen constructive, long-term relationships between the project and its stakeholders. This practice aligns with operational geothermal power plant projects that have successfully built strong public relations through transparent, participatory public consultation and timely, relevant information disclosure. In the long term, such an approach not only minimizes potential social conflicts but also fosters community acceptance, which forms a crucial foundation for project sustainability and operational success.

The proponent of a geothermal power plant project holds both technical and operational responsibilities, while simultaneously ensuring that the project achieves social acceptance from the surrounding community. Experiences from several geothermal power plant projects that faced community resistance, often due to public consultation and information disclosure practices that were insufficiently transparent, non-participatory, or inconsistent, highlight the urgent need for structured public engagement. In this context, the Public PCDP emerges as a practical and actionable solution. The PCDP provides comprehensive project information, identifies stakeholders along with their roles, outlines communication strategies tailored to local contexts, and details schedules and resources allocated for public engagement activities. Moreover, the PCDP establishes mechanisms for meaningful consultation, easily accessible information disclosure, and clear, responsive grievance procedures.

By covering social mapping, stakeholder engagement, risk mitigation, and participatory evaluation, the PCDP serves as a fundamental instrument for building social acceptance and supporting transparent and equitable governance. Additionally, it can act as a reference for developing social mapping documents, planning corporate social responsibility programs, and designing project monitoring and evaluation mechanisms. Consistent implementation helps the project proponent ensure compliance with national regulations while adopting international best practices. Accordingly, the following recommendations are proposed for project proponent:

1. Require all renewable energy project proponents, particularly in geothermal, to develop and implement a PCDP in accordance with national regulations and international standards, starting from the early project planning phase through operational stages.
2. Position the PCDP as a strategic guide to ensure fair, inclusive, and participatory community engagement through robust stakeholder engagement practices.
3. Utilize the PCDP as a reference for preparing environmental permitting documents, such as AMDAL, RPPLH, and KLHS, particularly concerning participatory public involvement.
4. Use the PCDP as a foundation for stakeholder engagement analysis and social mapping, enabling developers to design effective and participatory programs and engagement plans that build long-term trust with the community.
5. Ensure the availability of adequate resources and a capable implementation team to consistently execute the PCDP, including technical, social, and public communication skills.
6. Provide an easily accessible and responsive grievance mechanism, supported by proper documentation and measurable follow-ups, to maintain community trust.
7. Conduct participatory monitoring and evaluation of PCDP implementation, with periodic updates based on project developments and the evolving social dynamics on the ground.

REFERENCES

ADB. Public Communications Policy (PCP) of the Asian Development Bank: Disclosure and Exchange of Information. 2011.

Adityatama DW, Purba DP, Kristianto B. Integrated Geothermal Direct Use Facility as an Alternative Approach in Community Engagement at Early Exploration Phase in Indonesia. PROCEEDINGS, 7th ITB International Geothermal Workshop [Internet]. 2018. Available from: https://www.researchgate.net/publication/324017987

Anggreta DK, Somantri GR, Purwanto SA. 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. International Information and Engineering Technology Association; 2022 Jul 1;17(4):1053–65.

Dharmawan L. Ketika proyek energi bersih justru munculkan air keruh di Banyumas. bbc.com. 2017 Oct 18;

Direktorat Jenderal Energi Baru Terbarukan. Laporan Kinerja 2024 DITJEN EBTKE [Internet]. 2024. Available from: https://www.esdm.go.id/assets/media/content/content-laporan-kinerja-ditjen-ebtke-tahun-2024.pdf

Faizah A, Ilma N, Mu'ti Wulandari M, Khalid B, Jati H. SWOT and IFE EFE Analysis in the Development of Geothermal Power Plant in Mount Slamet Area: Ecological and Social Opportunities and Challenges. Journal of Islamic Economic and Business. 2025;6(4):466–78.

Fan K, Greco J. Accelerating Geothermal Development in Indonesia: A Case Study in the Underutilization of Geothermal Energy. Consilience [Internet]. 2018 Feb 13;(19). Available from: https://journals.library.columbia.edu/index.php/consilience/article/view/3895

Hariyadi. Social Acceptance towards Geothermal Energy Development (Study on Geothermal Power Development in Baturraden, Banyumas Regency, Central Java Province). [Jakarta]: Universitas Indonesia; 2019.

Ibrohim A, Prasetyo RM, Rekinagara IH. Understanding Social Acceptance of Geothermal Energy: A Case Study from Mt. Lawu, Indonesia. IOP Conf Ser Earth Environ Sci. Institute of Physics Publishing; 2019.

IFC. Stakeholder Engagement: A Good Practice Handbook for Companies Doing Business in Emerging Markets. IFC; 2007.

IFC. IFC Performance Standards Environmental and Social Sustainability . International Finance Corporation; 2012.

Indonesia PP. Undang-undang (UU) Nomor 32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup. Undang-undang (UU), Undang-undang (UU) No. 32 Tahun 2009 Indonesia; 2009.

Indonesia PP. Undang-undang (UU) Nomor 21 Tahun 2014 tentang Panas Bumi. Undang-undang (UU), Nomor 21 Tahun 2014 tentang Panas Bumi Indonesia; 2014.

Kementerian Perencanaan Pembangunan Nasional/Bappenas. Naskah Kebijakan Strategi dan Penahapan Pembangunan Rendah Karbon dalam RPJPN 2025-2045 Upaya Mencapai Net Zero Emissions. 2025 May [cited 2025 Aug 12]; Available from: https://lcdi-indonesia.id/wp-content/uploads/2025/05/Strategi-dan-Penahapan-Pembangunan-Rendah-Karbon-dalam-RPJPN-2025-2045-Upaya-mencapai-Net-Zero-Emissions.pdf

Malau H, Fajri H, Yuanjaya P, Saputra B, Maani KD. Knowledge of Local Communities Affected by the Development of Geothermal Energy. IOP Conf Ser Earth Environ Sci. 2020 Mar 1;448(1):012112.

Muslihudin M, Adawiyah WR, Hendarto E, Megasari RD, Ramadhan MF. Environmental Constraints in Building Process a Sustainable Geothermal Power Plant on The Slopes of Slamet Mount, Central Java, Indonesia. Evergreen. Joint Journal of Novel Carbon Resource Sciences and Green Asia Strategy; 2022 Jun 1;9(2):300–9.

Neuman WL. Social research method: Qualitative and Quantitative Approaches. Seventh Edition ed. Pearson Education Limited; 2014.

Ningsih NC, S N. Persepsi Masyarakat Nagari Batu Bajanjang Terhadap Rencana Pembangunan Pembangkit Listrik Tenaga Panas Bumi Gunung Talang. Journal of Civic Education.

Pambudi NA, Ulfa DK. The geothermal energy landscape in Indonesia: A comprehensive 2023 update on power generation, policies, risks, phase and the role of education. Renewable and Sustainable Energy Reviews. 2024 Jan;189:114008.

Pemerintah Indonesia. Peraturan Pemerintah (PP) Nomor 22 Tahun 2021 tentang Penyelenggaraan Perlindungan dan Pengelolaan Lingkungan Hidup. Peraturan Pemerintah (PP) , Nomor 22 Tahun 2021 Indonesia; 2021.

Sulastri H, Wijaya AF, Saleh C, Hermawan H. Analysis of Social and Environmental Responsibility (CSR) to Local Communities Based on Social Capital and Triple Bottom Line Approach in Geothermal Working Area, Dieng, Indonesia. European Alliance for Innovation n.o.; 2025.

Trisiah A, de Vries G, de Bruijn H. Framing Geothermal Energy in Indonesia: A Media Analysis in A Country with Huge Potential. Environ Commun. 2022 Oct 3;16(7):993–1001.

Wibowo KM, Hadi S, Pambudi NA. Acceptance analysis of the progress of geothermal energy in Dieng Indonesia. 2023. p. 080004.

World Bank. The World Bank Environmental and Social Framework. 2017.

Wüstenhagen R, Wolsink M, Bürer MJ. Social acceptance of renewable energy innovation: An introduction to the concept. Energy Policy. 2007 May;35(5):2683–91.

Yolanda SM, Anggraini D, Putra IA. Gerakan Perempuan Salingka Gunung Talang dalam Menolak Pembangunan Geothermal di Kabupaten Solok. Jurnal Tanah Pilih. 2021;1.

Peraturan Menteri Dalam Negeri Nomor 52 Tahun 2014 Pedoman Pengakuan dan Perlindungan Masyarakat Hukum Adat. Menteri Dalam Negeri, No 52 Tahun 2014 Indonesia; 2014.