

Enhancing Vulnerability Assessment Indicators in International Standards and the Urgency of a Contextual Approach: A Case Study of the Semende Tribe

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ABSTRACT

International social safeguard standards have served as a primary reference to ensure that development projects do not marginalize vulnerable groups. In principle, social safeguards play a critical role in preventing marginalization while ensuring the sustainability of development benefits. However, a fundamental question arises as to the extent to which these globally designed frameworks can capture the highly diverse socio-cultural realities at the local level. The objective of this study is to analyze how international social safeguard frameworks identify vulnerable groups in geothermal development projects. This research employs a descriptive qualitative approach to gain an in-depth understanding of the interaction between international social safeguard frameworks and the socio-cultural context of the Semende Tribe in South Sumatra. The findings reveal that international standards have yet to specifically capture local contexts of vulnerability. These standards are generally formulated in a generic manner, stipulating that project owners must identify vulnerable groups differently affected by the project, without providing a specific definition of the forms or variations of vulnerability in a given region. Drawing on the Tunggu Tubang tradition of the Semende Tribe, the study identifies six key dimensions: cultural values, capabilities, ecological-environmental, tenure-legal, socio-gender, and belief systems that are interrelated and shape how indigenous communities respond to development pressures, plural legal systems, and socio-economic dynamics. The study recommends developing contextual vulnerability indicators that integrate cultural values, capabilities, ecological-environmental aspects, tenure-law arrangements, socio-gender relations, and belief systems of the Semende Tribe. This is essential to ensure that development projects in customary areas not only comply with procedural requirements of international and national standards but also respect the substantive local values underpinning social sustainability. These findings are expected to inform policy-making that is more adaptive and sensitive to the diversity of local customs and cultures in Indonesia.

1. INTRODUCTION

International social safeguard standards have become the primary reference for ensuring that project development does not come at the expense of vulnerable groups. International financial institutions such as the Asian Development Bank (ADB), through its Safeguard Policy Statement (SPS) 2009 (Asian Development Bank 2009), the World Bank (WB) with its Environmental and Social Framework (ESF) comprising 10 Environmental and Social Standards (ESS) (World Bank 2016), and the International Finance Corporation (IFC) position these instruments as the foundation of social protection in every development project, particularly in sectors with the potential for broad socio-economic impacts, such as renewable energy.

In principle, social safeguards play a critical role in preventing marginalization while ensuring the sustainability of development benefits. However, a fundamental question arises: to what extent can these globally designed frameworks capture the highly diverse socio-cultural realities at the local level? Does the universal definition of “vulnerable groups” risk oversimplifying or even misinterpreting the social position of certain groups within a community? These questions surfaced during the implementation of the socio-economic and vulnerability assessment (SESVA) conducted by PT Supreme Energy Rantau Dedap (SERD) in collaboration with the Anwar Muhammad Foundation (AMF).

In the context of the Semende Indigenous community, for example, the existence of the Tunggu Tubang system (a customary inheritance mechanism) demonstrates complex social dynamics, particularly in relation to women’s roles. Such realities challenge international safeguard frameworks, which tend to classify women homogeneously as a vulnerable group, without recognizing the capacity and authority they may hold under local social systems.

The development of renewable energy projects, such as geothermal, almost invariably generates interactions between the project and local social systems. If international social safeguard standards fail to accommodate this diversity, the risk of policy misalignment will increase, potentially resulting in interventions that are misaligned with local needs, overlook existing local potentials, and fail to maximize social benefits. Therefore, a critical evaluation is required to ensure that safeguard instruments are not merely normative but are genuinely relevant to the social dynamics on the ground.

Based on this background, the main research question addressed in this article is: “How do international social safeguard frameworks such as ADB SPS, WB ESS, and IFC PS identify vulnerable groups in geothermal development projects?” In line with this research question, the purpose of this article is to analyze how international social safeguard frameworks identify vulnerable groups in geothermal development projects. The findings of this study are expected to provide the following benefits.

- For international policymakers, to provide empirical insights that can enrich international social safeguard frameworks, making them more adaptive to local socio-cultural contexts.
- For multilateral financing institutions such as ADB, WB, and IFC, to serve as a reference in the development and adjustment of vulnerability assessment instruments so that social interventions become more relevant and effective.

- c. For academics and researchers, to offer a contextual case study on the limitations of applying global standards within unique socio-cultural environments.
- d. For local communities, to promote recognition and respect for local wisdom in the planning and implementation processes of development projects.

2. METHODOLOGY

This study employs a descriptive qualitative approach to gain an in-depth understanding of the interaction between international social safeguard frameworks and the socio-cultural context of the Semende ethnic community in South Sumatra. The primary focus is on identifying specific forms of vulnerability arising from the Tunggu Tubang tradition and evaluating the extent to which international social protection frameworks such as ADB SPS, WB ESS, and IFC PS can accommodate these conditions.

Data collection was conducted through two main sources. First, a literature review of various secondary sources, including scholarly articles, books, official reports from international institutions, and relevant websites, to understand the theoretical and policy frameworks related to social safeguards. Second, field data obtained from in-depth interviews carried out as part of the Socio-Economic and Vulnerability Assessment (SEVA) with various stakeholders, including community leaders, traditional leaders, and female heirs (Tunggu Tubang).

Data analysis was conducted using thematic analysis with a grounded theory approach to identify categories of vulnerability emerging from the local context. Subsequently, a gap analysis was undertaken by comparing these field findings with the scope and definitions of vulnerable groups as outlined in international social safeguard frameworks. This approach enables a systematic identification of vulnerability aspects that are not yet accommodated by global standards, while also providing policy recommendations to make them more adaptive to local cultural diversity.

3. RESULT AND DISCUSSION

3.1 The Interconnectedness of Geothermal Development with Communities

Geothermal resources are generally located in rural areas, with most potential found within or near forested regions (Geothermal Resources Council [GRC], 2010). This is due to the geological characteristics of geothermal energy, which typically follow volcanic mountain ranges and conservation areas rich in geothermal sources. Such location characteristics create the potential for overlap between project development areas and the living spaces of local communities who have long resided in and depended on the surrounding natural resources. Consequently, geothermal development is not solely a technical matter involving exploration and construction but also requires well-designed social strategies. Furthermore, interaction and engagement with communities around the project become an inseparable element at every stage of development, from planning and construction to operation.

In rural areas located near forests and mountains, communities generally maintain customs, social values, and traditions passed down through generations (Li, 2014). These cultural elements not only serve as behavioral guidelines but also form the foundation of the social structure, such as the role of traditional leaders, kinship systems, and patterns of inter-community relations. They also influence the local economy, including land-use practices, crop-sharing arrangements, and mechanisms for resource distribution. In addition, these traditions regulate collective obligations roles and responsibilities borne by each community member whether through cooperative labor (gotong royong), contributions to customary activities, or participation in ritual ceremonies that strengthen social bonds.

This highly complex socio-cultural context demands that geothermal development projects in such areas go beyond technical planning and environmental assessments. Project developers must adopt social management approaches that are sensitive to local contexts, integrating respect for local wisdom into development strategies. This is not merely an act of cultural respect but also a form of vulnerability mitigation preventing adverse impacts on community well-being, safeguarding the continuity of livelihoods, and avoiding disruption to social structures resulting from the introduction of large-scale industrial activities.

3.2 Definition of Vulnerability According to International Standards

First, the ADB SPS 2009 does not provide a formal definition of technical vulnerability but acknowledges the existence of “disadvantaged or vulnerable” groups, emphasizing the need for specific mitigation measures. The ADB considers vulnerable groups to include those living below the poverty line, landless populations, the elderly, women and children, Indigenous Peoples, and those without legal ownership of land.

Special attention is directed toward ensuring their participation in consultation processes, improving the living standards of affected vulnerable groups including displaced persons until they meet at least national minimum standards, and providing legal and affordable access to land, resources, or adequate housing. In rural areas, these efforts are realized through the provision of land and resources, while in urban areas they are addressed through the provision of income sources and adequate housing. In addition, the ADB stresses the importance of addressing the specific needs and challenges of vulnerable groups, including women, the poor, and Indigenous Peoples, at every stage of a program or project (Asian Development Bank, 2009).

The ADB SPS (2009) also highlights that projects in rural areas must identify social risks arising from customary practices, asset distribution, and access to land and resources. Therefore, managing local community vulnerabilities in geothermal projects should be carried out comprehensively, integrating customary-based indicators with the applicable social safeguard framework to ensure that social protection is genuinely relevant and effective.

Second, the World Bank (2018a), in its ESS documents, does not provide a technical definition of vulnerability but merely acknowledges the existence of groups in vulnerable conditions, accompanied by critiques that highlight the socio-economic dimensions and resilience capacity of affected groups. The importance of considering local vulnerabilities is also emphasized across

various international social safeguard frameworks. For instance, the World Bank (2018b) ESS 7 on Indigenous Peoples underscores the recognition and protection of Indigenous Peoples and local communities with strong ties to land and natural resources. Meanwhile, IFC (2021), in its Guidance Note 1, views vulnerability as the degree to which a system is unable to cope with the adverse impacts of climate change, which is influenced by the level of exposure, sensitivity, and adaptive capacity.

In the international standards of the ADB, WB, and IFC, each institution holds a distinct perspective, yet they share a common ground in acknowledging the importance of considering the existence of vulnerable groups. Each institution has its own focus and approach, both in providing technical definitions and in determining the target groups considered vulnerable. These differences reflect the policy orientation of each institution ranging from an emphasis on adaptive capacity to climate change, to the protection of vulnerable groups' rights through consultation mechanisms and targeted mitigation measures.

In general, international standards do not necessarily capture local contexts in detail. By nature, these standards are formulated in a generic manner and stipulate that project owners must identify vulnerable groups affected by the project differently, without specifying a particular definition of the forms or variations of vulnerability in a given area. Although all three standards recognize the existence of vulnerable groups and emphasize the importance of their protection, the explanations provided remain broad and not fully detailed.

Definitions of vulnerability within each framework tend to be descriptive without offering clear operational parameters, making their interpretation and implementation highly dependent on the local context and the policies of on-the-ground implementers. This creates the need for adapting and enriching the concept of vulnerability based on local social, cultural, and economic realities, so that efforts to protect vulnerable groups can be more effective and well-targeted.

3.2 Vulnerability Definition Based on Local Context

Vulnerability is not limited to physical and economic aspects but is specifically defined based on the conditions of individuals or communities, including their location and distinctive characteristics, in order to understand vulnerability according to the actual circumstances of the community, as stated in Ahsan and Warner (2014). Furthermore, Adger (2006) emphasizes that vulnerability analysis should not only focus on physical and ecological dimensions but should also incorporate social, cultural, perceptual, and human interaction dimensions to determine the impacts of vulnerability and the resilience of communities in responding to them.

The subjectivity in defining vulnerability, as noted by Kaspersen et al. (2005), lies in the fact that individuals may have different definitions of vulnerability based on their perceptions of its context drawing on both experiential and perceptual dimensions. In a cultural context, this becomes particularly relevant because human perceptions and experiences are shaped by the values, norms, and practices of their community's culture.

Considering the diverse perspectives and dimensions of vulnerability, its identification becomes a critical step in the planning and risk mitigation process, particularly for projects that may affect community livelihoods. The importance of this identification lies in its ability to capture the complexity of on-the-ground realities, including the social, economic, cultural, and environmental factors unique to each community. A locally contextualized understanding enables the development of intervention strategies that are more targeted, inclusive, and sensitive to the values, norms, and adaptive systems of the community thereby minimizing negative impacts while strengthening community resilience against various forms of threats.

3.3 The Importance of a Local Context-Based Approach to Understanding Vulnerability

A contextual approach is a way of understanding, designing, or implementing an activity by taking into account the specific conditions, situations, and characteristics of the environment or community involved. In this way, decisions and interventions are adapted to the local social, cultural, economic, and geographical context. A contextual approach not only identifies what is to be done but also addresses how interventions should be carried out to ensure they are appropriate and well-targeted.

Various community-based vulnerability assessments applying the Sustainable Livelihood Framework and the IPCC framework have found that generic assumptions often fail to accommodate the local spatial and temporal context as well as multiple stressors, such as diverse economic, social, and cultural impacts across communities (Smith and Diedrich, 2024). This generic nature necessitates a contextual approach at the implementation level, in which project owners and social consultants must translate these general principles into the local socio-cultural reality. This reinforces the notion that without a contextual approach, international standards risk overlooking specific local vulnerabilities that may, in fact, have significant impacts.

Conceptually, vulnerability refers to a condition or situation in which individuals or communities are at risk due to a threat that affects their livelihoods. Based on the sustainable livelihood approach, individuals may experience vulnerability when facing shocks, trends, and seasonalities that impact their livelihood conditions. Adger (2006) defines vulnerability as encompassing conditions of susceptibility to harm, powerlessness, and marginality within both social and physical systems, while also framing it as an analytical strategy for reducing risk. In the context of geothermal development, vulnerabilities may result from a compilation of multiple factors—social, economic, environmental, or cultural, including project-related exposure risks to communities, livelihood vulnerabilities dependent on natural resources, value and cultural systems, and the adaptive capacity of the community.

3.4 Case Study: Vulnerability Aspects in the Semende Customary System

The use of international standards to assess vulnerability has proven insufficient in capturing local aspects, making it necessary to develop specific standards that can comprehensively reflect vulnerability. The context of vulnerability varies greatly depending on the region. In research conducted in areas predominantly inhabited by the Semende ethnic group, there is a unique customary practice that influences the community's social and economic life, known as the Tunggu Tubang tradition.

In Semende customary law, *Tunggu Tubang* refers to a matrilineal inheritance system in which the eldest daughter is automatically designated as the custodian of the family's ancestral property typically consisting of the family house and agricultural land along with its associated social rights and obligations. This tradition originates from the Semende people, primarily found in Muara Enim and Pagar Alam, South Sumatra, and is also maintained among Semende migrant communities in Lampung, Banten, and beyond. Even in migrant settings, the practice generally follows the original pattern, albeit with local variations, with the aim of ensuring the sustainability of the ancestral household, intergenerational kinship continuity through the maternal line, and the safeguarding of ancestral assets from transfer or sale (Manzil et al. 2023).

Although *Tunggu Tubang* status is automatically assigned to the eldest daughter, full rights are granted only after marriage. The holder of this role is expected to reside in her parents' home even after starting her own family. The house functions as a gathering place for relatives, a return point for those living away, and a venue for family ceremonies. The ancestral assets cannot be sold and are passed down through generations as a family legacy. In some cases, the *Tunggu Tubang* is also responsible for supporting elderly parents and other relatives such as siblings and nieces or nephews. However, the assets inherited under this system do not always meet the household's economic needs, meaning that families of *Tunggu Tubang* often face considerable financial demands.

Based on field findings, due to prevailing cultural and moral obligations, several *Tunggu Tubang* were found to bear the responsibility of supporting the livelihoods of other family members, including siblings, parents, and relatives. In such circumstances, the status of *Tunggu Tubang* becomes unavoidable, along with the rights and obligations it entails, leaving no alternative for the *Tunggu Tubang* family but to manage ancestral assets while providing for extended kin. In contrast, for families without *Tunggu Tubang* status, supporting other family members is considered a voluntary choice rather than an obligation. Moreover, *Tunggu Tubang* are required to comply with the authority of *Meraje* (*Meraje* is the maternal uncle (the mother's elder or younger brother) who serves as the head of the family, spokesperson, and decision-maker. In Semende society, this position is highly respected as it carries the responsibility of coordinating the entire *jurai* (lineage group), hence the term *Meraje*, which literally means "King."), meaning that in fulfilling their role they must also adhere to directives from this customary authority, further complicating and rendering the position vulnerable. In assessing potential and vulnerability risks, the practice of *Tunggu Tubang* can be described as follows.

Table 1. Identification of Potential and Vulnerability of *Tunggu Tubang*

Dimension	Aspects of <i>Tunggu Tubang</i>	Potential Risks and Vulnerabilities
Social and Cultural	Internal family conflicts (disputes over rights/positions); Intergenerational shifts in values; Loss of cultural identity if land is disrupted	Internal family conflicts (disputes over rights/positions); Intergenerational shifts in values; Loss of cultural identity if land is disrupted
Gender	Women as the symbolic center (<i>Tunggu Tubang</i>)	Double burden (domestic, customary, social); Limited access to resources; Customary position not aligned with recognition under formal law
Economic	Ancestral land as family asset; limited ownership rights	Assets are illiquid and difficult to use as economic collateral; Dependence on subsistence farming; Heavy collective responsibility on <i>Tunggu Tubang</i>
Legal & Tenorial	Customary land not always recognized by the state	Overlapping claims between customary law and formal law; Land disputes with development projects; Weak legal standing of indigenous women
Ecological & Environment	Ancestral land as identity and living space	High dependence on natural resources (forest, water); Potential land-use conflicts with development projects
Belief System	Inheritance falls to women, contradicting religious law (Islam)	Loss of customary legitimacy among communities adhering more strictly to religious norms (value shifts); Legal uncertainty in inheritance disputes (misalignment with both formal and religious law)

The table above illustrates that traditions and cultural practices encompass profound social, economic, legal, and ecological meanings, which are inseparable from potential risks that must be thoroughly understood.

First, in the social and cultural dimension, *Tunggu Tubang* functions as the guardian of ancestral land and a symbol of community identity continuity. However, along with intergenerational shifts in values, there emerges the risk of internal family conflicts regarding inheritance rights or positions, as well as the potential loss of cultural identity if ancestral lands are disrupted by external interventions. Such changes may undermine the customary system's role as a social adhesive and guarantor of value continuity.

Second, in terms of gender, women within the *Tunggu Tubang* system hold a strong symbolic position as the central inheritors of land rights. In practice, however, women face a double burden stemming from domestic, customary, and social responsibilities. Limited real access to resources, compounded by the frequent lack of recognition of customary rights in formal law, makes women vulnerable to being symbols without substantive authority in decision-making.

Third, the economic dimension highlights that ancestral land within *Tunggu Tubang* serves as a collective family asset. Yet, its non-liquid nature restricts its function as an economic guarantee. Dependence on subsistence agriculture and the high collective

responsibilities placed upon the *Tunggu Tubang* render the system vulnerable to economic crises. The inalienable nature of customary assets also hinders families from accessing formal financial schemes.

Fourth, in the legal and tenurial dimension, although socially legitimate, *Tunggu Tubang* customary land is often not formally recognized by the state. This creates overlapping claims between customary law and formal law, including potential land disputes with development projects. Furthermore, the legal position of customary women remains weak, meaning that their symbolic rights over ancestral lands are not always protected under formal legal systems.

Next, from the environmental and ecological dimension, *Tunggu Tubang* ancestral land is not merely an economic resource but also constitutes the identity and living space of customary communities. High dependence on natural resources (forests, water, and agricultural land) makes these communities vulnerable to environmental degradation. Land-use conflicts with development projects pose risks to ecological balance and threaten the sustainability of the customary system.

Lastly, in the belief dimension, the majority of the Semende community adheres to Islam, which allocates inheritance predominantly to men. The *Tunggu Tubang* tradition, however, designates women as primary heirs, which conflicts with religious law. This tension can give rise to value conflicts and legal inconsistencies with both religious and formal law, particularly in cases of inheritance disputes or issues concerning ancestral land and property.

3.5 Cultural-Contextual Vulnerability Framework

In addressing localized vulnerabilities, it is crucial to integrate customary values into international safeguard frameworks. Traditions such as *Tunggu Tubang* in South Sumatra, which positions daughters as heirs to ancestral houses, reflect a socially and symbolically rich structure. Yet, such practices may generate vulnerabilities when confronted with shifting economic dynamics, formal legal systems, and rapid development pressures.

Drawing on the Capability Approach (Sen 1990; Nussbaum 2000), vulnerability should not be measured solely by the absence of assets but rather by the limited ability of individuals and communities to transform these assets into well-being. In customary contexts, such capabilities include preserving ancestral houses, managing land, and sustaining cultural identity. Similarly, IUCN's *Indigenous Ecosystem Services Framework* (2018) emphasizes the need to integrate cultural and spiritual values into sustainability assessments.

Furthermore, cultural vulnerability cannot be detached from the issue of legal pluralism, as explained by Benda-Beckmann, where overlapping customary and state legal orders often generate conflicts, particularly over tenure rights and access to land and resources. Gender roles embedded in customary systems also require critical attention, as they may restrict access or impose disproportionate burdens on specific groups, especially women. Taken together, localized cultural vulnerability can be examined through six interrelated dimensions:

1. **Cultural Values:** Local traditions, customs, social practices, and knowledge systems that constitute collective identity become vulnerable when threatened by external interventions such as large-scale development projects. Losses in this dimension extend beyond material aspects, eroding social cohesion and collective identity.
2. **Capabilities and Welfare:** Vulnerability emerges when disruptions to traditional livelihoods weaken community-based welfare systems, diminishing the capacity to maintain cultural practices as survival priorities shift to economic resilience.
3. **Ecological-Environmental Relations:** Local cultures are deeply rooted in ecosystems through both spiritual and practical ties to land, water, and forests. Environmental degradation not only undermines economic resources but also disrupts cultural symbols and practices.
4. **Tenure and Law:** Customary tenure often clashes with formal legal frameworks, creating vulnerabilities related to legal recognition, access rights, and potential marginalization. Women, despite their symbolic roles in customary tenure, frequently remain legally disadvantaged.
5. **Socio-Gender Relations:** Unique gender constructions within local cultures can become sources of vulnerability if overlooked, leading to the exclusion of women, youth, or marginalized groups from consultation and decision-making processes.
6. **Belief Systems:** Faith and spiritual worldviews provide foundational guidance for decision-making and daily life. However, belief systems may come into tension with customary norms or formal law, generating value conflicts and influencing pathways for conflict resolution.

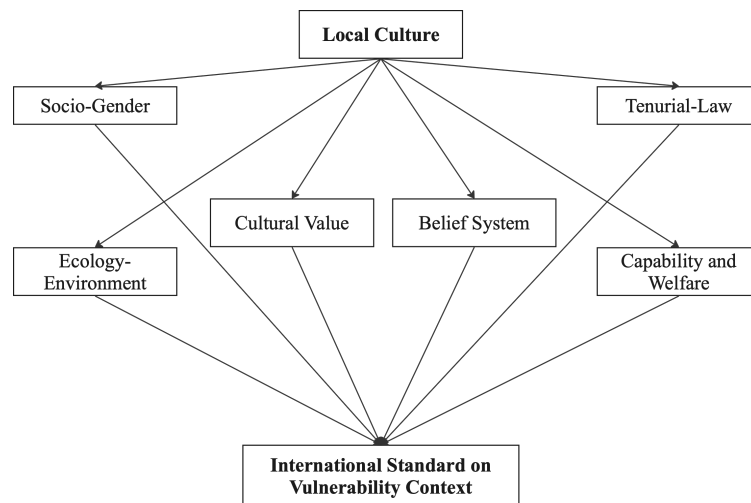


Figure 1. Cultural-Contextual Vulnerability

These six dimensions not only help in understanding vulnerabilities arising from customary contexts but also serve as an essential framework to ensure that international safeguard instruments such as the ADB SPS, WB ESS, and IFC PS can be operationalized in a more sensitive and targeted manner. By examining cultural-contextual vulnerabilities in a multidimensional way—spanning cultural values, capabilities, ecology, tenure-law, and gender relations development interventions move beyond merely technical or physical aspects and are instead able to address layered root causes. This approach strengthens the principle of safeguards so that they genuinely protect indigenous communities from the risks of identity erosion, ecological degradation, and structural injustice, while also opening pathways for legal recognition, equitable participation, and the sustainable use of cultural assets. Thus, safeguard instruments function not only as tools for risk mitigation but also as mechanisms of social transformation that uphold the continuity of identity and the well-being of indigenous communities. Based on this framework, the application of the vulnerability context to the case of the Tunggu Tubang tradition can be elaborated as follows.

Table 2. Cultural-Contextual Vulnerability

Dimension	Focus	Indicators of Cultural-Contextual Vulnerability	Potential Local Vulnerabilities
Cultural Values	Heritage, identity, symbolism	Customary land ownership, inheritance mechanisms, integrity of adat institutions	Loss of traditional practices (Tunggu Tubang), erosion of identity
Capabilities and Welfare	Access, opportunities, resilience	Access to education, economy, capital; social support	Inability to utilize inherited land for livelihood
Ecological-Environment	Relationship with nature as heritage and resource	Subsistence dependence, land use, risk of ecological degradation	Degradation of customary land, loss of ecological function
Tenurial-Law	Formal and legal recognition of adat	Legal validity of customary ownership, conflict resolution practices, legal protection	Ownership conflicts between customary law and state law
Socio-Gender	Gender roles and equality within customary structures	Double burden of women, decision-making access, legal representation	Women as symbolic rights-holders yet excluded from decision-making
Belief Systems	Beliefs guiding decision-making and principles of life	Contradictions between Tunggu Tubang tradition and prevailing belief systems, dispute settlement mechanisms	Loss of adat legitimacy due to religious shifts; uncertainty in inheritance dispute resolution

The six-dimensional framework demonstrates that cultural vulnerability does not merely stem from economic factors but rather emerges from the complex interplay between customary values, ecology, legal frameworks, and socio-gender relations.

1. **Cultural Values:** Collective identity within customary communities is deeply rooted in symbols and inheritance mechanisms, as reflected in the *Tunggu Tubang* tradition which designates women as heirs to the ancestral house. However, when this practice is no longer sustained or challenged by formal systems, its symbolic meaning diminishes. The erosion of such practices not only weakens cultural values but also undermines social cohesion within the community.
2. **Capabilities and Welfare:** Access to education, economic opportunities, and capital is critical to sustaining cultural values. Yet, the inability to utilize inherited land for livelihood illustrates a form of "capability vulnerability," where symbolic assets exist but cannot be transformed into tangible well-being. In such cases, ancestral land becomes a *locked asset*, unless the community possesses the capacity and support to manage it productively.
3. **Ecological-Environment:** The spiritual and subsistence-based relationship between communities and their natural environment generates compounded vulnerabilities when ecological degradation occurs. Beyond the loss of economic resources, environmental damage also erodes cultural practices rooted in nature, such as agricultural rituals, sacred forests, or customary

water sources. Thus, ecological degradation undermines both material assets and the cultural meaning embedded within landscapes.

4. **Tenurial-Legal:** Legal pluralism creates structural fragility. When customary land ownership is not formally recognized, or when inheritance mechanisms conflict with state law, communities risk losing legitimacy over their assets. Agrarian disputes and conflicts over ancestral land frequently arise from the absence of integration between customary and state legal frameworks. This reveals that vulnerability is not only economic but also legal and institutional.
5. **Socio-Gender:** A paradox emerges in gender relations. Although women symbolically inherit ancestral property, their roles in decision-making remain limited. This creates a double vulnerability: women carry the responsibility of safeguarding heritage while lacking formal representation to defend their rights. Consequently, cultural vulnerability is inseparable from power dynamics embedded in both customary and formal systems.
6. **Belief Systems:** Another paradox is found in this dimension, where the *Tunggu Tubang* tradition prioritizes women as heirs, yet this custom clashes with Islamic inheritance law that generally favors male heirs. Given that the majority of Semende people adhere to Islam, this tension risks undermining the legitimacy of adat practices. Inconsistencies between customary law, religious law, and state law further weaken certainty in inheritance dispute resolution.

4. CONCLUSION

Based on the analysis, this study concludes that, in general, international standards have yet to capture local contexts in the aspect of vulnerability with sufficient specificity. These standards are formulated in a generic manner, requiring project owners to identify vulnerable groups that may be differently affected by a project, but without providing a clear definition of the forms or variations of vulnerability within a particular region. This gap necessitates adjustments and enrichment of the vulnerability concept based on local social, cultural, and economic realities, so that protection measures for vulnerable groups can be more effective and accurately targeted.

The vulnerability aspects of communities affected by project development must be comprehensively assessed prior to any intervention. Moreover, geothermal development is closely intertwined with both nature and society. Therefore, in identifying vulnerabilities, local context must be recognized as a distinct form of vulnerability. This calls for contextualization and recognition that local contexts, such as the *Tunggu Tubang* system cannot simply be altered to fit international standards. Consequently, there is a need for specific provisions within international standards to address local contexts as part of the vulnerable group category.

The findings on *Tunggu Tubang* within the Semende customary system illustrate the critical importance of understanding local contexts. The Semende tradition holds unique and specific characteristics, with *Tunggu Tubang* embodying cultural, social, gender, ecological, legal, and belief-system dimensions, while also containing inherent vulnerabilities. Cultural values and collective identity face erosion if the inheritance mechanism is no longer upheld. Limited capabilities can render ancestral land a “locked asset” that fails to sustain community welfare. Ecological degradation compounds vulnerability, not only diminishing economic resources but also eroding cultural meaning. Legal pluralism and misalignment with formal or religious law can lead to disputes and undermine the legitimacy of customary law. From a gender perspective, women hold symbolic rights as heirs yet face limited representation in decision-making, often bearing a double burden. Thus, *Tunggu Tubang* presents a paradox: it safeguards identity and community continuity while remaining susceptible to conflicts of values, structures, and ecology.

To address such complexity, this study proposes a framework for comprehensively capturing cultural vulnerabilities by integrating customary values into international safeguard standards. This framework highlights six interrelated dimensions cultural values, capabilities, ecological-environmental aspects, tenure-law, socio-gender relations, and belief systems that shape how indigenous communities navigate development pressures, legal pluralism, and socio-economic dynamics. Such a multidimensional approach can strengthen international safeguard instruments, enabling them to function not only as risk mitigation tools but also as transformative mechanisms that protect identity, reinforce social cohesion, and ensure the sustainable well-being of indigenous communities.

5. RECOMMENDATION

This study recommends the development of contextual vulnerability indicators that integrate cultural values, capabilities, ecological-environmental factors, tenure-legal aspects, socio-gender dimensions, and belief systems, all of which are interrelated in shaping how Indigenous communities respond to development pressures, legal pluralism, and socio-economic dynamics, particularly in the case of the Semende people. This approach underscores the importance of following up on the formal recognition of customary law while ensuring that development projects in or near customary territories not only comply with the procedural requirements set by international and national standards but also respect the substantive local values that underpin social sustainability. Given the diversity of customary systems in Indonesia, the findings of this study are expected to guide policymakers, developers, and other stakeholders in designing interventions that are adaptive, culturally sensitive, and respectful of different traditions as part of an inclusive and sustainable development strategy.

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