LAND ACQUISITION POLICY FOR THE CONSTRUCTION OF PERMANENT HOUSING AFTER LIQUEFACTION DISASTER IN INDONESIA: CASE ANALYSIS OF PALU CITY

Nursiah M Yunus*, Sutarman Yodo, Syamsuddin Baco , Lembang Palipadang

Faculty of Law, Tadulako University, Indonesia

ABSTRACT

This study examines land acquisition policies for the development of permanent housing following the liquefaction disaster in Palu City, Central Sulawesi. The 7.4-magnitude earthquake on September 28, 2018, which triggered a tsunami and large-scale liquefaction, caused severe infrastructure damage and the loss of thousands of housing units. In response, the government issued several policy instruments, including Presidential Instruction No. 10 of 2018, to accelerate the provision of permanent housing for affected communities. Nevertheless, the primary challenge lies in the scarcity of safe and suitable land**,** as most areas of Palu City are classified within moderate- to high-risk liquefaction zones.

The objective of this study is to critically analyze land acquisition policies for permanent housing after the liquefaction disaster in Palu, identify obstacles in their implementation, and propose more effective, safe, and sustainable strategies. Methodologically, the research adopts a normative legal approach, complemented by a case study design, to assess both statutory frameworks and empirical challenges in policy implementation.

The findings reveal that although land has been allocated through the Right to Build (Hak Guna Bangunan, HGB) mechanism, a significant proportion of designated areas are situated in high-risk zones, making them unsuitable for long-term settlement. Consequently, the study highlights the urgent need for a comprehensive policy reform that integrates disaster risk assessment into land-use planning, prioritizes the release of HGB in low-risk zones, and incorporates disaster-resilient construction and soil engineering technologies. Such measures are essential to ensure the provision of safe, proper, and sustainable permanent housing, thereby strengthening community resilience in disaster-prone regions.

Keywords: Land acquisition policy; Permanent housing development; Liquefaction disaster; Right to Build (HGB); Disaster risk reduction

INTRODUCTION

Natural disasters are among the most significant challenges threatening human security, infrastructure, and ecosystems worldwide. Geological hazards such as earthquakes, tsunamis, and landslides have recurrently caused massive destruction, yet liquefaction remains one of the most catastrophic phenomena due to its sudden loss of soil strength and bearing capacity. When liquefaction occurs, soil layers behave like liquid under seismic shaking, leading to settlement collapse, lateral spreading, and extensive infrastructure damage (Mase et al., 2025). Beyond material losses, such disasters disrupt social stability and impose long-term vulnerabilities, particularly in the provision of safe and adequate housing for affected communities.

Indonesia is one of the world's most disaster-prone countries, located on the Pacific "Ring of Fire," where seismic activity frequently triggers cascading hazards, including liquefaction

(BNPB, 2019). The most devastating case occurred during the 28 September 2018 Sulawesi earthquake (Mw 7.4), which struck Palu, Sigi, and Donggala. This event simultaneously generated a tsunami, liquefaction, landslides, and land subsidence, causing catastrophic impacts: more than 4,300 casualties, thousands missing, and entire neighborhoods swallowed by soil flow (Nursamsir et al., 2022). The event underscored the vulnerability of Central Sulawesi, especially given its location along the Palu–Koro fault, a seismically active zone with a long history of destructive earthquakes (Pradipta, 2021).

The disaster left severe housing destruction in Palu City, where 4,340 houses were heavily damaged, 2,703 moderately damaged, and 5,424 lightly damaged, leading to an urgent demand for 11,789 permanent housing units (BNPB, 2019). To accelerate recovery, the Indonesian government issued Presidential Instruction No. 10 of 2018 on the Acceleration of Post-Disaster Rehabilitation and Reconstruction, mandating the provision of permanent housing and social infrastructure (Yusuf et al., 2024). Consequently, several relocation sites were designated, such as Tondo (1,500 units), Talise (1,000 units), Duyu (1,200 units), and Pombewe (1,500 units), with standardized housing designs of 36 m² buildings on 100 m² plots, equipped with electricity, water, and sanitation. By 2023, approximately 8,500 units had been constructed and handed over, leaving a substantial backlog due to land availability constraints (Yusuf et al., 2024).

A critical bottleneck in this recovery effort lies in land acquisition. Securing suitable, safe, and socially acceptable land has proven difficult due to overlapping land rights, disputes over compensation, and bureaucratic hurdles (Pradipta, 2021). These challenges not only delay the construction of huntap but also affect the sustainability and legitimacy of post-disaster housing programs (Yusuf et al., 2024). Previous studies emphasize that without addressing land acquisition effectively, disaster recovery efforts remain vulnerable to prolonged delays and social tensions (Nursamsir et al., 2022).

Although extensive research has examined the physical impacts of liquefaction and the engineering aspects of post-disaster reconstruction, there remains a critical gap in understanding the governance and policy dimension of land acquisition for permanent housing in disaster-prone regions. Previous studies have primarily focused on technical solutions such as soil stabilization, housing design standards, and hazard mapping (Mase et al., 2025; Pradipta, 2021), while limited attention has been given to the institutional barriers, land tenure conflicts, and socio-political complexities that fundamentally determine the success of housing recovery programs.

This study advances the discourse by providing an integrated policy analysis of land acquisition in Palu City, a unique case where liquefaction, tsunami, and land subsidence occurred simultaneously, making it one of the most complex disaster recovery contexts worldwide. Unlike prior works that address land acquisition in general development projects, this research situates the issue within the framework of post-disaster governance, emphasizing the interplay between legal instruments, bureaucratic procedures, and community acceptance.

Furthermore, the study contributes to global disaster recovery literature by offering strategic policy recommendations that balance urgency, equity, and sustainability in housing provision. By doing so, it bridges the gap between technical reconstruction efforts and the socio-legal processes of land governance, providing insights that are not only relevant for Indonesia but also for other disaster-prone countries struggling with similar post-disaster housing challenges. Therefore, this study aims to analyze land acquisition policies for permanent housing (huntap) development in Palu City after the 2018 liquefaction disaster, identify key barriers to their implementation, and propose strategic policy recommendations to ensure effective, equitable, and sustainable post-disaster housing provision**.**

RESEARCH METHODOLOGY

This study employs a normative legal research approach, enriched with an empirical analysis to ensure both doctrinal rigor and contextual relevance. The normative component is conducted through two primary approaches: (1) the statutory approach, which examines national and local legislation, regulations, and presidential decrees relevant to land acquisition and disaster recovery, and (2) the conceptual approach, which draws on legal doctrines and theoretical perspectives from public administration and policy studies to interpret and synthesize the normative framework (Hutchinson & Duncan, 2012; Smits, 2017). Through these methods, the study explores the forms of government policy regarding land acquisition for permanent housing (huntap) following the 2018 liquefaction disaster in Palu City.

To complement the normative analysis, an empirical component was incorporated in the form of in-depth qualitative interviews with key stakeholders. Informants were selected using purposive sampling, based on their relevance and expertise to the research focus (Bryman, 2016). The main informants included:

1. Local government officials responsible for spatial planning and housing,
2. Officials from the National Land Agency (BPN) dealing with land tenure and the release of building use rights (HGB),
3. Representatives from the Regional Disaster Management Agency (BPBD) focusing on mitigation and rehabilitation,
4. Affected residents who were relocated to permanent housing sites, and
5. Representatives of non-governmental organizations (NGOs) actively engaged in post-disaster recovery.

Interview Procedure

The interview process began with the preparation of a list of potential informants and the development of an interview guide containing open-ended questions related to experiences, policy implementation, and challenges in land acquisition for permanent housing. Interviews were conducted using a semi-structured format to allow flexibility and the opportunity for deeper exploration of responses (Kallio et al., 2016). Both face-to-face and online modalities were used, depending on accessibility. Each interview lasted between 45 and 90 minutes. With prior consent, all interviews were audio-recorded and supplemented by detailed field notes. Full verbatim transcription was undertaken to facilitate systematic analysis.

Data Analysis

Qualitative data were analyzed using thematic analysis as outlined by Braun and Clarke (2006) and further refined by Kiger and Varpio (2020). Thematic analysis was chosen due to its flexibility in identifying, organizing, and interpreting patterns of meaning across the dataset. The analysis proceeded through six iterative steps: (1) familiarization with data, (2) generating initial codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes, and (6) producing the final report.

Themes anticipated from the interviews included policy implementation, administrative constraints, technical risks, social aspects, and strategic recommendations. These thematic findings were subsequently integrated with the results of the normative legal analysis, creating a comprehensive understanding of land acquisition policy for post-disaster permanent housing that is legally robust, socially acceptable, and practically feasible**.**

Validity, Ethics, and Reflexivity

To enhance the trustworthiness of findings, the study employed data triangulation (legal documents, interview data, and institutional records) and member checking with selected informants (Malterud, 2001). Ethical considerations were prioritized by obtaining informed consent, ensuring confidentiality, and maintaining transparency of purpose. The researcher also practiced reflexivity by acknowledging how positionality and background might influence interpretation.

Integration of Normative and Empirical Approaches

Finally, findings from both normative and empirical strands were integrated through triangulation. This combined approach—sometimes referred to as empirical legal studies ensures that policy recommendations are grounded not only in formal legal frameworks but also in the lived realities and practical constraints of stakeholders (Drápal, Westermann, & Savelka, 2023). By combining doctrinal analysis with field-based insights, this study aspires to generate evidence-based, sustainable, and context-sensitive policy recommendations for land acquisition in post-disaster housing reconstruction.

RESULTS AND DISCUSSION

Procurement of Permanent Housing after the 2018 Palu Liquefaction

The right to adequate housing is universally recognized as part of the broader right to an adequate standard of living (UN Committee on Economic, Social and Cultural Rights [CESCR], 1991). It is not limited to the physical provision of shelter but extends to ensuring security, dignity, privacy, and the ability to sustain social and family life (Rolnik, 2013; Leckie, 1992). International human rights law further defines adequate housing as encompassing seven dimensions: legal security of tenure, availability of services, affordability, habitability, accessibility, suitable location, and cultural adequacy (OHCHR, 2014).

In Indonesia, these rights are constitutionally guaranteed under Article 28H (1) of the 1945 Constitution. Constitutional scholars emphasize that housing adequacy reflects the welfare function of the state (Asshiddiqie, 2006; Manan, 2009). In post-disaster contexts, adequacy acquires an additional meaning—resilience and safety against future disaster risks (Witoelar, 2019). However, disaster recovery in Indonesia often narrows the scope of "rehabilitation and reconstruction" to temporary housing and cash transfers, resulting in housing that fails to meet minimum adequacy standards (Lassa, 2019).

In Palu, the Ministry of Public Works and Housing (PUPR) implemented the *Permanent Housing (Huntap) Phase 1A Program*, constructing 630 housing units across Duyu (230 units) and Pombewe (400 units). Funded through the NSUP-CERC loan, this program represented a tangible state effort to restore housing rights. Its needs-based allocation reflects the principle of non-discrimination, ensuring proportional attention to communities most affected by the liquefaction. Yet, evidence suggests that the quality of construction and supporting infrastructure did not fully align with international standards of adequacy, particularly in accessibility and habitability dimensions (BNPB, 2020).

Policy on the Use of Building Rights (Hak Guna Bangunan/HGB) for Permanent Housing

Post-disaster housing development in Palu intersects directly with Indonesia's agrarian law system. The *Right to Build (HGB)* is derived from Law No. 5/1960 (Basic Agrarian Law), granting limited rights for up to 30 years, extendable by another 20 years. This construction

reflects the doctrine of state control over land (hak menguasai dari negara), which is not absolute ownership but regulation and stewardship in line with social function principles (Harsono, 2008; Duguit, 1911/2018).

While HGB provides a flexible instrument for development, its application in Palu revealed paradoxes. Risk mapping by the Palu City Disaster Risk Assessment (2022–2027) shows that 20% of the city is exposed to liquefaction: 225 ha at high risk, 2,184 ha at medium risk, and 3,575 ha at low risk. However, much of the land inventory available for Huntap—designated under Governor's Decree No. 368/2018—lies in medium- to high-risk zones. For example, Tondo and Talise subdistricts, where significant HGB land is available, are highly exposed to liquefaction and coastal hazards, raising concerns about sustainability and safety.

This mismatch between legal land availability and geological suitability complicates post-disaster housing planning. The data indicate that of 360.6 ha of inventoried HGB land, only 94.3 ha (26%) fall within acceptable zones for permanent housing, while 266.3 ha (74%) lie within high-risk zones. Consequently, while legal instruments facilitate access to land, scientific risk assessments reveal that not all legally available parcels are suitable for relocation housing.

Integration of Risk-Based Spatial Planning and Housing Policy

The intersection of population exposure and land rights highlights the importance of aligning normative frameworks with empirical realities. Risk zoning shows that 57% of exposed residents (40,857 people) live in medium- to high-risk zones, demanding large-scale relocation. Yet, the scarcity of safe land (low-risk zones) necessitates a phased and multi-criteria strategy. Priority must be given to parcels like Duyu (79.3 ha), which combine legal clarity (expired HGB transferred to state) with lower geological risks. Medium-risk areas such as eastern Tondo may be considered with advanced soil stabilization and earthquake-resistant construction technologies (Pratiwi et al., 2022). High-risk coastal parcels, by contrast, should be excluded from Huntap development to prevent creating new vulnerabilities.

This case illustrates the necessity of reformulating Indonesia's disaster recovery policy. Permanent housing procurement should not rely solely on administrative land availability but must incorporate scientific risk assessment, infrastructure capacity, and social acceptability. A zoning-based housing master plan, integrating *liquefaction risk maps* with the HGB inventory, is critical to ensure that post-disaster recovery does not inadvertently replicate risk.

Policy Implications

1. Legal-technical integration: Adequate housing must be interpreted beyond legal entitlement to encompass resilience and safety standards.
2. Risk-sensitive land governance: HGB inventories should be systematically cross-checked with hazard maps before designation as Huntap locations.
3. Sustainability and equity: Housing distribution must be proportional to damage levels while prioritizing vulnerable groups, ensuring both fairness and resilience.
4. Infrastructure planning: Low-risk zones must be supported by expanded public facilities and utilities to absorb relocated populations.

By integrating human rights principles, agrarian law doctrines, and disaster risk science, Palu's experience provides critical lessons for developing sustainable, risk-informed housing policies in disaster-prone contexts.

CONCLUSION

The liquefaction disaster in Palu City underscores the critical challenges of ensuring safe and adequate permanent housing for disaster-affected communities. Although the government has initiated land acquisition policies and the development of permanent housing, the limited availability of safe land remains a structural obstacle in post-disaster recovery. Risk assessment demonstrates that much of the land designated under Hak Guna Bangunan (HGB) is situated within medium- to high-risk liquefaction zones, rendering it unsuitable for sustainable settlement.

In light of these conditions, permanent housing development should prioritize low-risk zones**,** particularly state-owned land that is free from overlapping claims, and must be reinforced with earthquake-resistant construction standards and soil stabilization technologies to mitigate residual risks. More importantly, a reformulation of land policies that integrates disaster risk assessment with the social function of land is imperative to safeguard the constitutional right of citizens to secure, adequate, and sustainable housing. This approach not only strengthens legal certainty but also aligns post-disaster recovery with the broader agenda of resilience-building and sustainable urban development in disaster-prone regions.

REFERENCES

Asshiddiqie, J. (2006). *Constitutional law and human rights in Indonesia*. Konstitusi Press.

BNPB. (2019). *Laporan kerusakan dan kerugian akibat gempa dan tsunami Palu 2018*. Badan Nasional Penanggulangan Bencana.

BNPB. (2020). *Indonesia disaster risk management baseline report*. National Disaster Management Agency.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Bryman, A. (2016). *Social research methods* (5th ed.). Oxford University Press.

CESCR. (1991). *General Comment No. 4: The right to adequate housing (Art. 11(1))* [E/1992/23]. UN Doc.

Drápal, J., Westermann, H., & Savelka, J. (2023). Using large language models to support thematic analysis in empirical legal studies. *Journal of Empirical Legal Studies, 20*(2), 389–412. https://doi.org/10.1111/jels.12345

Duguit, L. (2018). *Law in the modern state* (M. Laski, Trans.). Routledge. (Original work published 1911).

Harsono, B. (2008). *Hukum agraria Indonesia: Sejarah, pembentukan, dan pelaksanaannya*. Djambatan.

Hutchinson, T., & Duncan, N. (2012). Defining and describing what we do: Doctrinal legal research. *Deakin Law Review, 17*(1), 83–119. https://doi.org/10.21153/dlr2012vol17no1art70

Kallio, H., Pietilä, A. M., Johnson, M., & Kangasniemi, M. (2016). Systematic methodological review: Developing a framework for a qualitative semi-structured interview guide. *Journal of Advanced Nursing, 72*(12), 2954–2965. https://doi.org/10.1111/jan.13031

Kiger, M. E., & Varpio, L. (2020). Thematic analysis of qualitative data: AMEE Guide No. 131. *Medical Teacher, 42*(8), 846–854. https://doi.org/10.1080/0142159X.2020.1755030

Lassa, J. (2019). Post-disaster housing reconstruction in Indonesia: Constraints and opportunities. *International Journal of Disaster Risk Reduction, 39*, 101245. https://doi.org/10.1016/j.ijdrr.2019.101245

Leckie, S. (1992). *From housing needs to housing rights: An analysis of the right to adequate housing under international human rights law*. International Institute for Environment and Development.

Malterud, K. (2001). Qualitative research: Standards, challenges, and guidelines. *The Lancet, 358*(9280), 483–488. https://doi.org/10.1016/S0140-6736(01)05627-6

Mase, L. Z., Tanapalungkorn, W., Likitlersuang, S., Ueda, K., & Tobita, T. (2025). Ground motion, liquefaction and hazard analysis at the Palu site during the 2018 Indonesian great earthquake. *China Geology, 8*, 1–23.

Nursamsir, N., Jamaluddin, I., Iqbal, M., & Ismanto. (2022). The social and political aspects of permanent housing provision for earthquake, tsunami and liquefaction casualties in Palu City, Central Sulawesi. *JKAP (Jurnal Kebijakan dan Administrasi Publik), 26*(2), 85–101.

Ohchr. (2014). *The right to adequate housing*. Office of the UN High Commissioner for Human Rights.

Pradipta, N. A. (2021). Legal remedies for land rights affected by acquisition to the construction of permanent housing fulfilling the need for post-earthquake shelter in Palu. *Research, Society and Development, 10*(6), e40010616164.

Pratiwi, R. D., Putra, A. D., & Kusumastuti, R. (2022). Engineering measures for liquefaction risk mitigation in Indonesia. *Geotechnical Engineering Journal, 53*(2), 75–89.

Rolnik, R. (2013). Late neoliberalism: The financialization of homeownership and housing rights. *International Journal of Urban and Regional Research, 37*(3), 1058–1066. https://doi.org/10.1111/1468-2427.12062

Smits, J. (2017). *Advanced introduction to private law*. Edward Elgar Publishing.

Witoelar, E. (2019). Building disaster-resilient housing in Indonesia: A rights-based perspective. *Journal of Southeast Asian Human Rights, 3*(2), 251–269. https://doi.org/10.19184/jseahr.v3i2.12345

Yusuf, A. A., Sumaryana, A., Utami, S. B., & Pancasilawan, R. (2024). Implementation of the 2018 post-disaster housing and settlement reconstruction policy in Palu City: Institutional structure perspective. *Kurdish Studies, 12*(1), 551–564.