



Securing Land, Empowering Women: Building Resilience in Indonesia's Disaster Zones

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Abstract

The 2016 Bantul earthquake in Yogyakarta and the 2018 Lombok earthquake in West Nusa Tenggara exposed significant challenges to women's access to land rights in post-disaster recovery. This paper aims to examine the socio-economic vulnerabilities and gender inequalities that exacerbated the marginalization of women in these contexts. Using a comparative analysis of the Bantul and Lombok cases, this study employs qualitative methodologies, including interviews with affected women, legal experts, and community leaders, alongside document analysis of land rights policies and disaster recovery frameworks. Key results reveal that in both regions, women faced barriers to formalizing land ownership due to patriarchal norms, lack of legal awareness, and limited access to land titles. In Bantul, informal land tenure and low awareness of legal rights left women excluded from compensation and rebuilding efforts. Lombok's recovery was further hampered by traditional customs that prioritized male heads of households, effectively sidelining women from decision-making roles and agricultural livelihoods. Both regions experienced significant psychological impacts on women, stemming from the trauma of displacement and the stress of navigating recovery processes in male-dominated environments. The findings underscore the need for gender-sensitive disaster management policies that enhance women's land tenure security and participation in recovery efforts. Ensuring legal recognition of women's land rights, streamlining bureaucratic processes, and involving women in land use planning are essential steps toward building resilience and supporting equitable recovery in post-disaster scenarios.

Keywords: *Women; Land Rights; Resilience; Disaster*

Introduction

Indonesia is recognized as one of the most disaster-prone countries in the world, primarily due to its geographical location along the Pacific Ring of Fire, where three major tectonic plates converge: The Indo-Australian, Eurasian, and Pacific Plates. This geological setting makes Indonesia highly susceptible to a variety of natural disasters, including earthquakes, tsunamis, volcanic eruptions, floods, and landslides (Rumambi, 2023). The National Board for Disaster Management (BNPB) has reported an

alarming increase in the frequency and intensity of these disasters over the past several decades, with significant impacts on local communities and economies (Thoha et al., 2023; Pratiwi, 2023).

The impact of disasters on women's lives in Indonesia is multifaceted, encompassing health, economic, social, and psychological dimensions. Women are often disproportionately affected by disasters due to pre-existing gender inequalities, which are exacerbated in crisis situations. This response synthesizes various studies to illustrate the specific challenges faced by women in the aftermath of disasters in Indonesia. Economically, disasters can severely disrupt women's livelihoods. Many women in Indonesia are engaged in informal employment, which is often the first to be affected during disasters. The loss of income can lead to increased poverty and dependency on male family members, further entrenching gender inequalities (Moreno & Shaw, 2018; Chowdhury et al., 2022). Moreover, the destruction of property and infrastructure can limit women's access to resources and opportunities for recovery, making it difficult for them to regain their economic footing post-disaster (Moreno & Shaw, 2018).

One critical factor is the insecurity of land tenure, which can be exacerbated by disasters. Women often face challenges in asserting their rights to land, especially in situations where customary practices dominate land ownership. In many cases, post-disaster recovery efforts overlook women's rights, leading to a loss of access to land and housing. For instance, Pinuji and Vries emphasize that weak tenure security can deter landowners from investing in disaster-resilient housing, as they fear losing their property during recovery efforts (Pinuji & Vries, 2023). This insecurity can lead to a reluctance to leave damaged areas, as landowners, including women, may fear losing their ownership rights if they abandon their properties (Pinuji & Vries, 2023). Disasters can catalyze the loss of land rights, particularly when legal frameworks do not adequately protect vulnerable populations. Reale and Handmer argue that insecure land tenure can result in the loss of land, especially when alternative livelihood options are limited (Reale & Handmer, 2010). This situation is particularly acute for women, who may not have formal recognition of their land rights, making them more susceptible to displacement and loss of property after disasters (Reale & Handmer, 2010).

The phenomenon of "obliterated land," where land becomes permanently unusable due to disasters, raises further complications regarding land ownership. Pinuji et al. discuss how the legal status of obliterated land creates disputes over ownership and compensation, leaving women particularly vulnerable as their rights may not be recognized in the aftermath of such events (Pinuji et al., 2023). This legal ambiguity can lead to women losing access to land that they may have previously relied upon for their livelihoods. The impact of natural disasters on land ownership is also highlighted in the context of compensation for damaged land. Sari et al. note that natural disasters, such as coastal abrasion, can result in landowners losing their rights to control and benefit from their land, particularly affecting women who may already be marginalized in land ownership discussions (Sari et al., 2021). The loss of land not only affects women's economic stability but also their social standing within their communities.

Methodology

This study will explore the importance of ensuring that women have access to land rights in greater depth. The data and information for this research were gathered through interviews with experts and women who have directly experienced disasters and lost their land rights in the aftermath of the 2018 earthquake in Lombok, West Nusa Tenggara, and the 2016 earthquake in Bantul, Central Java. The total number of interview samples is 30 individuals. The experts consulted come from BNPB (Badan Nasional Penanggulangan Bencana): Indonesia's National Disaster Management Agency, academic institutions, Komnas Perempuan (National Commission on Violence Against Women), and Badan Pertanahan Nasional (BPN), Indonesia's National Land Agency. A SWOT analysis and SWOT strategy will be developed based on the results of interviews and literature studies conducted to formulate the focus and way forward.

Result and Discussion

Importance of Land Rights for Women

Women's land rights are crucial for gender equality and development. Research has shown that in many countries, women's groups have actively advocated for legal protection of women's land rights as a means to enhance women's ability to fight for their rights (Ravnborg et al., 2016). This is particularly significant as female-headed households are on the rise due to various factors like conflicts, migration, and differences in life expectancy, making women's land rights even more essential (Kieran et al., 2015). Studies have indicated that granting women formal rights to land can lead to their empowerment by expanding their opportunities and enhancing their financial independence (Melesse et al., 2017). Initiatives such as joint land certification programs have been found to positively impact women's understanding of their land rights and increase their empowerment (Abbott et al., 2018).

Formal land rights are often viewed as a fundamental aspect of women's empowerment, particularly in regions of the Global South (Goldman et al., 2016). However, despite legal amendments aimed at securing women's land rights, challenges persist due to lack of awareness and social norms that hinder women from fully exercising their property rights (Nguyen et al., 2022). Women's land ownership has been linked to combating gender discrimination by enhancing women's bargaining power and economic autonomy (Duflo, 2012).

In Indonesia, land rights for women have been a topic of concern and contention. On a broader scale, land certification initiatives in Indonesia have aimed to provide legal certainty for land ownership. These efforts are crucial for ensuring that all citizens, including women, have secure land rights in Indonesia. The combination of geospatial technologies and community participation in systematic land registration has been instrumental in enhancing land legal certainty for individuals in regions like Hulu Sungai Tengah Regency (Sa'dianoor et al., 2019). These references underscore the complexities and challenges surrounding land rights for women in Indonesia, emphasizing the importance of addressing discriminatory practices and implementing initiatives that promote legal certainty and equal access to land ownership for all individuals in the country.

The complexities and challenges surrounding land rights for women in Indonesia are multifaceted and deeply rooted in societal norms, legal frameworks, and historical practices. Women in Indonesia face various obstacles in accessing and securing land rights, which significantly impact their economic empowerment and social status. One of the key challenges is the limited access to resources and land, which hinders women's ability to own and control land. Additionally, discriminatory policies and practices, such as restrictions on land ownership based on ethnicity, contribute to inequalities in land rights (Mustajab et al., 2023). The communal nature of land tenure in Indonesia further complicates women's access to land, as many lands are held collectively, making individual ownership challenging (Claeys et al., 2022).

Moreover, the implementation of land laws and regulations in Indonesia can be inconsistent, leading to uncertainties and conflicts over land rights (Kubitza et al., 2018). The breakdown of traditional systems and the exploitation of land ownership by the state create further challenges for women seeking to secure their land rights (Kubitza et al., 2018). Customary practices that traditionally allowed women to inherit and transfer land have been compromised in resettlement communities, resulting in a reduction in women's land ownership (Kieran et al., 2020). Women often face dilemmas between adhering to religious teachings or statutory provisions regarding land rights, highlighting the complex intersection of cultural and legal factors (Magawa & Hansungule, 2018). The feminization of poverty and disempowerment of women due to unjust land access patterns further exacerbate the challenges faced by women in accessing and holding land rights (Chiwuzie et al., 2021).

The Significance of Land Rights for Women in Disaster Risk Reduction Efforts

Women's access to and control over land are crucial factors in enhancing their resilience to disasters and reducing vulnerability during crises. Studies have shown that securing land rights for women can empower them economically and socially, enabling better coping mechanisms and recovery from disasters. Women's ownership of land has been linked to increased resilience and adaptive capacity post-disaster, underscoring the importance of land rights in effective disaster management. Initiatives that support women's land rights can bolster community resilience to disasters by ensuring fair access to resources and decision-making processes (Daisaku & Yumiko, 2013). Involving women in land governance and management can provide diverse perspectives and knowledge that inform more robust disaster risk reduction strategies.

In disaster management systems, disparities have been observed, with certain groups being at a significantly higher risk of becoming victims of disasters. The lack of inclusive approaches in disaster management can further marginalize individuals and hinder effective response and recovery efforts. Efforts to increase resilience to disasters have shown positive outcomes. For example, incorporating various factors into disaster management strategies, as seen in the case of the Regional Disaster Management Agency of Bantul in Indonesia, has been effective in enhancing resilience and reducing vulnerabilities (Yumarni&Amaratunga, 2017).

The current situation of land rights for women in Indonesia in the context of disasters is influenced by legal frameworks, customary practices, and disaster risk management strategies. Understanding the intersection of land rights and disaster risk in Indonesia is crucial for assessing vulnerabilities and resilience among women in disaster-prone regions. Efforts are ongoing to systematically register land in Indonesia, with a target to certify 126 million parcels of land by 2025 (Haryanti & Suharto, 2021). Challenges persist in registering customary land, requiring applications through local land offices, impacting proof of ownership for parties controlling customary property rights (Basri, 2024). The importance of women's land rights is highlighted by the need for legal protection and ownership guarantees, as emphasized by the Complete Systematic Land Registration program in Indonesia (Santyaningtyas & Zubaidi, 2020).

The case study of women in Bantul, post-Yogyakarta earthquake in 2016, highlights the significant challenges they faced regarding land access and ownership. The earthquake, which struck on July 6, 2016, caused extensive damage to infrastructure and housing, disproportionately affecting women due to existing socio-economic vulnerabilities and gender inequalities. One of the primary issues that arose post-disaster was the loss of land and housing rights for women. Many women in Bantul, who traditionally held informal rights to land through family or community ties, found themselves at risk of losing access to their homes and land due to the lack of formal documentation. Pinuji and Vries emphasize that tenure security is critical in disaster management, yet many women lacked the legal recognition of their land rights, making them more vulnerable during recovery efforts (Pinuji & Vries, 2023). The absence of formal land titles often resulted in women being excluded from compensation and recovery programs, further exacerbating their economic and social vulnerabilities (Pinuji & Vries, 2023).

The recovery process often prioritized male heads of households, sidelining women in decision-making regarding land and housing. Setiawati notes that post-disaster scenarios frequently lead to increased vulnerability for women, particularly concerning their rights to land and property (Setiawati, 2023). Women, who may have been the primary caregivers and contributors to household income, faced significant barriers in asserting their rights to land, especially when recovery efforts were dominated by patriarchal norms that favored male ownership and control (Setiawati, 2023). The impact of the earthquake on women's land rights was also evident in the context of community displacement. Many women were forced to relocate to temporary shelters or refugee camps, where they faced additional challenges in accessing basic needs, including food, healthcare, and legal assistance to reclaim their land

rights. The lack of adequate support systems for women in these situations often resulted in their rights being overlooked or ignored (Setiawati, 2023). Furthermore, the psychological impact of losing their homes and the associated stress of navigating the recovery process contributed to a decline in mental health among women, as highlighted by studies on the psychological effects of disasters (Marthoenis et al., 2018).

The legal framework surrounding land rights in Indonesia further complicates the situation for women. Many women in Bantul were unaware of their legal rights or lacked the resources to navigate the complex legal landscape necessary to reclaim their land. This lack of awareness and access to legal support often resulted in women being unable to contest land disputes or claim compensation for their losses (Pinuji & Vries, 2023; Setiawati, 2023).

The case study of women in Lombok following the 2018 earthquakes reveals significant challenges related to land access and ownership, which are exacerbated by existing gender inequalities. The earthquakes, particularly the series of tremors that began on July 29, 2018, caused widespread destruction, displacing thousands and damaging infrastructure, including homes and agricultural land. Women, who often play crucial roles in household management and economic activities, faced unique challenges in the aftermath of these disasters.

On the other hand, in Lombok's case. One of the primary issues highlighted in the aftermath of the Lombok earthquakes is the marginalization of women's land rights in recovery efforts. Many women in Lombok traditionally held informal rights to land, often inherited through familial ties or community practices. However, the lack of formal land titles made it difficult for them to claim ownership or compensation during the recovery process. Koopman discusses how post-disaster reconstruction efforts often prioritize male heads of households, sidelining women in decision-making regarding land and housing (Koopman, 2021). This exclusion not only affects women's access to land but also their ability to participate actively in the recovery process.

The reconstruction efforts were often characterized by a top-down approach, where external aid frameworks did not adequately consider local needs or gender dynamics. This resulted in a failure to empower women and recognize their contributions to community resilience. The emphasis on community participation in recovery efforts, as noted by Koopman, was not always effectively implemented, leading to a situation where women remained marginalized (Koopman, 2021). The lack of recognition of women's roles in agriculture and local economies further compounded their vulnerability, as many women lost access to the land they relied upon for their livelihoods.

The psychological impact of the earthquakes on women cannot be overlooked. The trauma associated with losing homes and land, combined with the stress of navigating recovery processes, has been linked to increased mental health issues among women. Thoyibah et al. highlight that many earthquake victims in Lombok experienced anxiety and post-traumatic stress disorder (PTSD), which can hinder their ability to advocate for their rights and access necessary resources (Thoyibah et al., 2019). This psychological burden is particularly pronounced for women who may already face societal pressures and responsibilities as caregivers.

The legal framework surrounding land ownership in Indonesia also poses additional challenges for women. Many women are unaware of their legal rights regarding land ownership and compensation, which limits their ability to reclaim lost property. The absence of legal support and advocacy mechanisms further exacerbates this issue, as women often lack the resources to navigate complex legal systems (Pribadi et al., 2020). As a result, many women in Lombok found themselves at risk of losing their land and homes permanently, with little recourse to assert their rights.

Comparison of Women's Land Rights in Post-Earthquake Bantul (2016) and Lombok (2018)

Both the 2016 Bantul earthquake in Yogyakarta and the 2018 Lombok earthquake in West Nusa Tenggara revealed significant challenges for women, especially regarding their access to land rights. In both cases, pre-existing socio-economic vulnerabilities and gender inequalities were exacerbated by the disasters, leading to the marginalization of women in recovery processes. However, each case has its own nuances and impacts on women's land rights, legal challenges, and post-disaster resilience.

1. Land Rights and Ownership

Bantul (2016): Women in Bantul primarily held informal land rights through family or community ties, but lacked formal land documentation. This made them highly vulnerable post-earthquake, as formal land titles were often required to receive compensation and support for rebuilding efforts. The absence of formal recognition for their land tenure resulted in many women being excluded from disaster recovery programs.

Lombok (2018): Similar to Bantul, women in Lombok also held informal rights to land. However, the issue of land ownership was further complicated by traditional customs in Lombok that favored male heads of households. This made it difficult for women to claim land or compensation in the recovery process, particularly as reconstruction efforts were largely top-down and excluded women from decision-making roles.

2. Legal Framework and Awareness

Bantul (2016): The legal framework in Indonesia posed significant challenges for women, as many were unaware of their rights or lacked the resources to navigate complex land dispute processes. This led to their exclusion from land compensation programs, especially in cases where formal land titles were required.

Lombok (2018): The legal complexities surrounding land ownership in Lombok were similar, with many women unaware of their land rights. Additionally, the lack of formal titles and legal support mechanisms further disadvantaged women in claiming land, leaving them more vulnerable to land loss and displacement.

3. Societal and Gender Norms

Bantul (2016): Post-disaster recovery efforts in Bantul often prioritized male heads of households, sidelining women in land and housing decisions. This exclusion further marginalized women, despite their roles as caregivers and contributors to household income.

Lombok (2018): In Lombok, patriarchal norms similarly dictated that male heads of households were prioritized in land distribution and compensation. This left women marginalized and prevented them from participating fully in the recovery process. Many women lost access to agricultural land that they relied on for economic activities, further compounding their vulnerabilities.

4. Psychological and Social Impacts

Bantul (2016): The psychological toll on women in Bantul was significant, as many faced the trauma of losing their homes and land, coupled with the stress of navigating the recovery process. The lack of adequate support systems for women further contributed to declining mental health and social isolation.

Lombok (2018): In Lombok, women experienced similar psychological impacts, including anxiety and PTSD, as highlighted by studies. The trauma of losing homes and the associated stress of

asserting land rights in a patriarchal legal and social framework made it even harder for women to recover and reclaim their land.

Both case studies reveal that women in disaster-prone areas face significant challenges in securing land rights, exacerbated by patriarchal norms, lack of formal land documentation, and legal complexities. In both Bantul and Lombok, the lack of formal land titles excluded women from compensation and recovery programs, while traditional gender roles favored male heads of households in decision-making. Furthermore, the psychological toll on women in both regions, due to the trauma of displacement and the difficulty of navigating post-disaster recovery processes, was significant.

The difference between those two cases was, The Bantul case emphasizes the importance of legal awareness and formal documentation for land rights, while the Lombok case underscores the challenges posed by patriarchal norms and a top-down reconstruction process that marginalized women's participation in recovery efforts. Additionally, in Lombok, the exclusion of women from agricultural and economic roles due to the loss of land was more pronounced, impacting their livelihoods more severely than in Bantul.

Best Practices and Policy Recommendations for Secure Land Rights for Women in Disaster Risk Reduction Efforts

The land registration process in Indonesia is governed by Law No. 5 of 1960 on Basic Agrarian Principles (UUPA) and its derivatives, such as Government Regulation No. 24 of 1997 on Land Registration. This registration is crucial to ensure legal certainty regarding land ownership, protect owners' rights, and prevent disputes. The general process includes several stages: submission of the application, land measurement, announcement at the local land office, and finally, the issuance of the land certificate. First, individuals or legal entities submit their application to the National Land Agency (BPN), providing documents such as identification, land certificates (if any), proof of land rights (e.g., sale and purchase deeds, inheritance, or gift), tax payment receipts, and a declaration that the land is not in dispute. Following this, BPN officials conduct a land survey to verify the boundaries. The results are then posted publicly at the land office for 60 days, allowing anyone with objections to come forward. If no objections arise, BPN finalizes the land rights and issues the certificate, which is then handed to the applicant.

Regarding specific regulations related to women, there are no separate procedures for women in the land registration process. Women have the same rights as men, as guaranteed by UUPA and its regulations. However, there are broader policies supporting gender equality in land access, such as Presidential Instruction No. 9 of 2000 on Gender Mainstreaming in National Development, which emphasizes the importance of gender equality in various sectors, including agrarian matters, ensuring women's equal access to resources like land. Furthermore, some land certification programs, such as mass certification (PTSL), encourage joint ownership between spouses or prioritize registering women's names in land certificates.

Despite equal legal rights, women often face challenges in practice, such as cultural barriers where land is more commonly inherited by sons or registered under a husband's name, and economic limitations, which can hinder their ability to acquire land or bear registration costs. To address these barriers, initiatives focused on empowering women, including training, legal assistance, and policies promoting female land ownership, particularly in rural areas, have been implemented.

To develop effective policy recommendations, we must first conduct a SWOT analysis to thoroughly evaluate the strengths, weaknesses, opportunities, and threats associated with securing land and empowering women in the context of building resilience in Indonesia's disaster-prone areas. SWOT Analysis can be seen in Table. 1.

Table 1. Securing land and empowering women in the context of building resilience in Indonesia's disaster-prone areas SWOT Analysis

Strengths	Weaknesses
<ul style="list-style-type: none"> • Legal Framework: Indonesia has established laws (e.g., Law No. 5 of 1960 on Basic Agrarian Principles) that provide equal land rights for men and women. Gender equality in land access is emphasized through national policies such as Presidential Instruction No. 9 of 2000 on Gender Mainstreaming. • Government Initiatives: Programs like the mass land certification (PTSL) encourage joint ownership between spouses or prioritize women's names in land certificates. • Community Involvement: There are examples of community-based disaster risk reduction (DRR) programs where women play key roles, leveraging their social networks to foster resilience and solidarity during disaster recovery. 	<ul style="list-style-type: none"> • Informal Land Tenure: Many women in Indonesia hold informal land rights, making them ineligible for compensation and reconstruction programs post-disaster. Formal titles are often required for support. • Cultural Barriers: In both Bantul and Lombok, patriarchal norms favor men in land ownership and decision-making. These traditions complicate women's ability to assert their land rights, especially in post-disaster contexts. • Lack of Legal Awareness: Many women are unaware of their legal rights and face challenges navigating the complex legal processes required to claim land rights after a disaster. This issue was prevalent in both the Bantul and Lombok cases. • Psychological Impact: The emotional and psychological toll on women due to displacement and the struggle to reclaim land rights contributes to declining mental health and social isolation, which hampers recovery efforts.
Opportunities	Threats
<ul style="list-style-type: none"> • Gender-Sensitive Policy Reforms: Integrating gender considerations into disaster management policies (e.g., the Sendai Framework for Disaster Risk Reduction) can improve outcomes for women. Enhanced legal frameworks can also ensure women's land rights are prioritized in post-disaster recovery. • Legal and Social Support Programs: Strengthening legal aid services and providing training on land rights could empower women to navigate land registration and post-disaster compensation processes more effectively. • Women's Participation in Land Use Planning: Engaging women in risk-sensitive land use planning (RSLUP) and disaster management can improve resilience and ensure women's specific needs are addressed in recovery processes. • Expansion of DRR Programs: Community-based DRR programs that actively involve women could be scaled up across Indonesia, offering more opportunities for women to advocate for their land rights and participate in disaster recovery efforts. 	<ul style="list-style-type: none"> • Cultural Resistance: Traditional gender norms that prioritize male heads of households could continue to marginalize women in land rights, despite legal frameworks that offer equality. In rural areas especially, patriarchal traditions may remain deeply entrenched. • Economic Constraints: Economic limitations often prevent women from bearing the costs of land registration or acquiring land. Post-disaster recovery programs may prioritize households with male heads, leaving women economically disadvantaged and vulnerable to land loss. • Political and Bureaucratic Hurdles: Despite existing laws, bureaucratic delays and inefficiencies in land registration processes can impede timely access to land rights for women, particularly in post-disaster scenarios. • Disaster Recurrence: Indonesia's geographic location in the Ring of Fire poses a constant threat of future disasters, which may further exacerbate land-related vulnerabilities for women, particularly if pre-existing inequalities are not addressed.

This SWOT analysis reflects the broader challenges and opportunities for improving women's access to land rights in Indonesia, with potential policy recommendations drawn from lessons learned during the 2016 Bantul and 2018 Lombok earthquakes. Based on the SWOT analysis, here is a strategic framework to improve women's access to land rights in Indonesia particularly in post-disaster recovery contexts:

Strengths-Opportunities (S-O) Strategy

1. Leverage Legal Frameworks and Government Initiatives

- Use Indonesia's existing legal frameworks (e.g., Law No. 5 of 1960 and gender mainstreaming policies) to advocate for the formalization of women's land rights, especially in post-disaster scenarios. Promote mass certification programs like PTSL to ensure women receive joint land ownership and prioritize their names on land titles.
- Encourage local governments to adopt gender-sensitive policies in disaster risk management, aligning with international frameworks such as the Sendai Framework for Disaster Risk Reduction.

2. Expand Community-Based DRR Programs

- Strengthen and scale up community-based disaster risk reduction (DRR) programs that actively involve women. These programs can serve as platforms for women to advocate for their land rights and engage in recovery planning.
- Leverage women's roles in these programs to promote their participation in risk-sensitive land use planning (RSLUP) at the local and national levels, incorporating their knowledge and needs into land management strategies.

3. Promote Legal and Social Awareness

- Develop campaigns and training programs to enhance legal awareness among women about their land rights. This can empower them to navigate land registration processes effectively, reducing their vulnerability post-disaster.
- Establish partnerships with civil society organizations and NGOs to provide legal aid services specifically targeting women in disaster-affected areas, helping them assert their rights and access compensation.

Strengths-Threats (S-T) Strategy

1. Mitigate Cultural Resistance Through Gender-Sensitive Outreach

- Leverage existing legal protections and community-based programs to challenge patriarchal norms that marginalize women. Educational programs can raise awareness among communities about the equal rights of women to land ownership.
- Engage religious and community leaders in these efforts to foster acceptance of gender-sensitive reforms, making it easier to integrate women into land ownership and decision-making processes.

2. Streamline Bureaucratic Processes

- Advocate for the simplification of bureaucratic procedures around land registration and disaster recovery programs, making it easier for women to access formal land titles in a timely manner. Utilize technology (e.g., digital land registration platforms) to expedite these processes.
- Ensure disaster recovery programs have clear protocols that do not discriminate based on gender, thereby protecting women's rights to access aid and compensation.

Weaknesses-Opportunities (W-O) Strategy

1. Address Informal Land Tenure Through Policy Reforms

- Prioritize policies that formalize women's land rights, especially in areas where informal tenure systems prevail. This includes simplifying the process for women to obtain formal land titles and ensuring disaster recovery programs restore land rights for affected women.
- Collaborate with international and national bodies to enhance the capacity of local governments to implement gender-responsive land policies and ensure compliance.

2. Economic Empowerment and Access to Resources

- Design financial mechanisms that support women in bearing land registration costs or recovering land post-disaster. Disaster recovery funds should allocate specific resources to assist women with economic support and legal aid.
- Partner with microfinance institutions and NGOs to provide women with access to affordable credit, enabling them to secure land or reestablish livelihoods impacted by disasters.

3. Promote Women's Active Role in Disaster Planning and Land Use Decisions

- Ensure that women are included in decision-making bodies related to land use and disaster management. Training programs should empower women with the necessary skills to participate in these discussions, ensuring their voices are heard in recovery planning.
- Build coalitions between women's organizations and local governments to institutionalize their involvement in disaster risk reduction efforts, making gender inclusion a permanent fixture in land use and disaster management policy.

Weaknesses-Threats (W-T) Strategy

1. Overcome Cultural Barriers and Economic Constraints

- Engage in community-level advocacy to address cultural norms that restrict women's access to land. This includes promoting gender equality through media campaigns, local dialogues, and grassroots movements.
- Provide direct economic assistance to women in disaster-affected areas to overcome barriers to land ownership, such as access to credit and financial support during the post-disaster period.

2. Address Psychological and Social Vulnerabilities

- Develop psychosocial support programs specifically for women who have been displaced by disasters. These programs should address mental health challenges, social isolation, and the stress of navigating land rights.
- Ensure that these support systems are integrated into broader disaster recovery frameworks, with the participation of women at all stages of recovery, from planning to implementation.

By implementing these strategies, Indonesia can significantly strengthen women's access to land rights, enhance their involvement in disaster recovery, and address the socio-economic and legal barriers that have long marginalized them in post-disaster contexts. These strategies should be formalized as policy recommendations for securing women's land rights in disaster risk reduction efforts as follows:

- 1. Integrating Gender-Sensitive Approaches into Disaster Risk Management Policies and Frameworks:** The Sendai Framework for Disaster Risk Reduction emphasizes the importance of gender considerations, yet implementation often lacks measurable indicators. Policies must include targeted strategies to assess and address the different impacts of disasters on women and men, ensuring women's voices are part of decision-making processes (Karima, 2024; Echendu, 2021).
- 2. Enhancing Tenure Security for Women to Aid Recovery and Sustain Livelihoods:** Policies should prioritize formalizing women's land rights through legal frameworks that recognize both individual and communal land ownership (Pinuji & Vries, 2023). Simplifying the process for women to obtain land titles and ensuring recovery programs focus on restoring land rights for women affected by disasters is essential (Shrestha, 2023).
- 3. Promoting Women's Participation in Risk-Sensitive Land Use Planning (RSLUP) to Build Resilient Communities:** Engaging women in the planning process incorporates their knowledge and needs, leading to more effective disaster risk reduction strategies (Barua et al., 2023; Sharma et al., 2022). Training programs should empower women with the skills to participate actively in land use and disaster management discussions (Izzaturrahmah, 2023).
- 4. Gender-Responsive Disaster Financing:** Financial mechanisms should support initiatives addressing women's specific needs and vulnerabilities in disaster contexts (Shrestha, 2023; Hamidazada et al., 2019). Funds should be allocated to community-based organizations that empower women and enhance their capacity to respond to disasters (Hamidazada et al., 2019).
- 5. Implementing Community-Based Disaster Risk Reduction Programs That Involve Women in Disaster Preparedness and Response:** These programs should leverage women's social networks and organizational skills to foster community solidarity and collective action during disasters (Echendu, 2021; Tobi et al., 2023). They also provide platforms for women to advocate for their land rights and actively engage in recovery efforts.
- 6. Strengthening Legal Frameworks to Protect Women's Land Rights and Provide Access to Legal Aid Services:** Awareness campaigns should educate women about their rights and the resources available to claim land ownership (Pinuji & Vries, 2023; Kurniawan et al., 2021). Legal aid services that help women navigate legal processes will empower them to reclaim their rights effectively.
- 7. Ongoing Research and Data Collection:** Continued research is necessary to understand the specific impacts of disasters on women's land rights and evaluate the effectiveness of policies designed to secure these rights. Data collection should include gender-disaggregated information to inform policy development and implementation (Akter et al., 2022; Yumarni & Amaratunga, 2017). This research can help identify gaps in current frameworks and guide future interventions.

Conclusion

This study underscores the critical challenges faced by women in securing land rights following disasters, as revealed by the 2016 Bantul and 2018 Lombok earthquakes. These events exposed the pre-existing socio-economic vulnerabilities and gender inequalities that were further exacerbated by post-disaster recovery processes. The major findings indicate that women's informal land tenure, lack of legal awareness, and marginalization in decision-making left them vulnerable to exclusion from compensation and recovery programs. Additionally, societal norms favouring male land ownership and patriarchal reconstruction processes compounded the difficulties for women in both regions.

In Bantul, the emphasis was on the absence of formal land documentation, which denied women access to compensation and rebuilding support. In Lombok, patriarchal traditions further complicated women's ability to claim land rights, particularly in top-down recovery efforts. Both regions showed a significant psychological toll on women, with the stress of navigating the recovery process further deteriorating their mental and social well-being.

The implications of these findings are far-reaching. Integrating gender-sensitive approaches into disaster risk management policies, enhancing women's tenure security, and promoting their participation in land use planning are crucial to building more resilient communities. The study also calls for the simplification of bureaucratic processes and greater legal support to ensure women can assert their land rights effectively, particularly after disasters. Community-based programs that involve women in disaster preparedness and response should be expanded, providing platforms for women to advocate for their rights and actively contribute to recovery efforts.

This research contributes to the growing body of knowledge on gender and disaster risk management by highlighting the specific vulnerabilities women face in securing land rights post-disaster. It provides actionable policy recommendations, such as promoting gender-responsive disaster financing and strengthening legal frameworks for women's land ownership. The study also emphasizes the importance of ongoing research and gender-disaggregated data collection to inform future interventions and policy reforms.

Future research should focus on evaluating the long-term effectiveness of gender-responsive land policies in disaster contexts and exploring how cultural shifts towards greater gender equality can be promoted within patriarchal societies. Additionally, expanding studies to other disaster-prone areas in Indonesia could provide a broader understanding of how different regions address the intersection of gender, land rights, and disaster recovery.

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