

THE IMPACT OF THE EXPANSION OF GUNUNG RINJANI NATIONAL PARK ON LAND CONFLICTS AND FOOD SELF-SUFFICIENCY OF LOCAL COMMUNITIES

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Abstract. This study examines the impacts of the expansion of Mount Rinjani National Park (TNGR) on land conflicts and local food self-sufficiency among communities living in surrounding buffer zones in Lombok Island, Indonesia. The expansion of conservation areas and the redefinition of zoning regulations have altered local land tenure systems, restricted access to productive and subsistence land, and intensified conflicts between conservation authorities and local communities, particularly smallholder farmers and indigenous groups. This research employs a qualitative case study approach, using in-depth interviews, field observations, and document analysis involving community members, customary leaders, TNGR officials, local government representatives, and civil society organizations. The findings reveal that land conflicts manifest in multiple forms, including tenurial disputes, horizontal social conflicts, ecological access conflicts, and economic competition related to tourism development. These conflicts have significantly reduced household food production capacity, weakened food diversification, and increased dependence on market-based food systems, thereby undermining local food self-sufficiency. From a political ecology perspective, the study shows that conservation expansion operates as a form of spatial control that reinforces power asymmetries and marginalizes customary land-use systems. The study concludes that effective conflict resolution requires an integrated governance approach that combines formal legal mechanisms with recognition of customary tenure through participatory and collaborative management. Strengthening conservation partnerships, inclusive dialogue, and equitable benefit-sharing mechanisms is essential to reconcile ecological conservation objectives with sustainable livelihoods and long-term food sovereignty of local communities.

Keywords: conservation expansion; land conflict; food self-sufficiency; political ecology; Mount Rinjani National Park

I. INTRODUCTION

Mount Rinjani National Park (TNGR) is one of the most strategic conservation areas in West Nusa Tenggara Province, Indonesia, due to its significant ecological, hydrological, socio-economic, and cultural functions. With an elevation of 3,726 meters above sea level, Mount Rinjani is the second-highest volcano in Indonesia and serves as an iconic landscape of Lombok Island (Hadiprayitno et al., 2016). Established as a national park in 1997, TNGR covers an area of 41,330 hectares and is managed through a zoning system that includes core, wilderness, utilization, rehabilitation, traditional, special, and religious zones (Balai TNGR, n.d.). This zoning framework reflects a systematic conservation effort aimed at protecting mountain ecosystems while allowing limited utilization for research, education, tourism, and traditional community practices. Internationally, TNGR has been recognized as part of the UNESCO Global Geopark since 2018 and included in the Man and the Biosphere (MAB) network, highlighting its global ecological and geological importance (UNESCO, n.d.).

Beyond its ecological value, TNGR plays a crucial role in supporting the socio-economic systems of Lombok Island. The Rinjani forest complex functions as the main water catchment area, supplying water for irrigation, domestic use, and local industries, thereby underpinning regional food production systems (Astawa, 2004; Sjah & Baldwin, 2014). In addition, nature-based tourism in TNGR has expanded rapidly, with tens of thousands of climbers and non-climbing visitors annually contributing to local incomes through guiding services, portering, and small-scale tourism enterprises (Antara News, 2025). These multiple functions position TNGR as both a conservation landscape and a livelihood space, making sustainable and socially just management essential.

In line with increasing environmental degradation and land-use change, the Indonesian government has promoted policies to strengthen conservation effectiveness through the expansion of national park areas and stricter zoning regulations. The expansion of TNGR is framed as a strategic response to deforestation, biodiversity loss, and declining hydrological functions, and aligns with national conservation policies that emphasize ecosystem integrity and ecoregional

management approaches (Sukara, 2017; KLHK, 2020). From an international perspective, this policy direction is consistent with UNESCO's MAB framework, which promotes conservation models that integrate ecological protection with sustainable development (UNESCO, n.d.). Nevertheless, conservation expansion is not merely an administrative process but represents a profound transformation of land governance with significant social consequences.

Empirical studies in Indonesia indicate that the expansion of protected areas frequently generates land-use conflicts, particularly where conservation boundaries overlap with long-established community-managed lands (Moeliono et al., 2017; Myers et al., 2018). In the TNGR context, communities surrounding the park have historically relied on land for subsistence agriculture, livestock grazing, and the collection of non-timber forest products. When these areas are reclassified into conservation zones with restricted access, tensions emerge between state conservation authorities and local communities. Such conflicts reflect competing claims of legitimacy, where formal state authority confronts customary land-use rights rooted in historical occupation and local knowledge (Li, 2014; Myers et al., 2018).

Land-use conflicts around TNGR are further intensified by broader land-cover changes on Lombok Island. Satellite-based studies show a substantial decline in forest cover between 1990 and 2020, accompanied by the expansion of agricultural land, shrubland, and built-up areas (Purnama & Çoban, 2024). These dynamics increase competition over land resources and reinforce conservation rationales for park expansion, while simultaneously reducing the space available for community-based food production. As a result, local households face heightened vulnerability as their access to productive land diminishes.

Restricted access to land has direct implications for household food self-sufficiency. In rural Indonesian contexts, food self-sufficiency is closely linked to land access, agricultural diversity, and control over local production systems (CIFOR-ICRAF, 2021). Studies show that reduced access to land often leads to lower dietary diversity and increased dependence on external food markets, which can exacerbate food insecurity among low-income households (Jouzi et al., 2020; Nurhasan et al., 2022). In areas surrounding TNGR, limitations on farming and resource use have disrupted traditional food production systems, undermining local capacity to sustain household-level food independence.

Despite the growing body of literature on conservation governance and agrarian conflict, research that explicitly links national park expansion, land conflict, and household food self-sufficiency remains limited, particularly in the context of Lombok Island. Existing studies tend to focus either on conservation policy and forest governance (Moeliono et al., 2017; Myers et al., 2018) or on food security at macro and national scales (Hartatik et al., 2023; Rahman et al., 2025), with less attention to micro-level impacts on communities living adjacent to protected areas. This study seeks to address this gap by examining how the expansion of Mount Rinjani National Park contributes to land-use conflicts and influences household food self-sufficiency in surrounding communities.

By integrating perspectives from political ecology, land tenure analysis, and food security studies, this research aims to provide empirical evidence to support more inclusive and adaptive conservation strategies. Understanding the social impacts of conservation expansion is essential not only for improving conservation effectiveness but also for ensuring that environmental protection does not come at the expense of local livelihoods and food sovereignty.

A. Political Ecology Theory

Political ecology is a multidisciplinary framework that examines the interconnections between society, nature, and power, emphasizing how political, economic, and social structures shape environmental governance and resource management. Emerging in the late twentieth century, this approach critiques conventional ecological perspectives that treat environmental problems as purely biophysical phenomena, arguing instead that issues such as land degradation, deforestation, and ecosystem loss are deeply embedded in social and political inequalities (Blaikie & Brookfield, 1987; Bryant & Bailey, 1997).

Central to political ecology is the analysis of power relations among key actors—namely the state, market, and local communities—in the control and use of natural resources (Peet & Watts, 2004). Conservation policies are often formulated and enforced by the state, while market actors pursue resource exploitation for economic gain, frequently marginalizing local communities whose livelihoods depend directly on land and forest resources (Robbins, 2012). Unequal access to and control over land, forests, and water are therefore identified as primary drivers of environmental conflict and social exclusion (Martínez-Alier, 2002).

Political ecology also critiques conservation approaches that restrict local access to resources without adequately recognizing customary rights and local knowledge. Such policies may exacerbate social inequality and provoke resistance, particularly in contexts where communities have historically managed resources sustainably (Neumann, 2001; Agrawal & Gibson, 1999). In Indonesia, conflicts surrounding national parks and protected areas illustrate how conservation expansion can generate agrarian tensions when state-defined boundaries overlap with community-managed lands (Blaikie, 2003). As such, political ecology provides a critical lens for understanding land conflicts around conservation areas, including Mount Rinjani National Park, by situating them within broader struggles over power, legitimacy, and resource control.

B. Food Sovereignty Theory

Food sovereignty, introduced by La Via Campesina, emphasizes the right of communities to define and control their own food systems, prioritizing local production, equitable access to land, and sustainable resource management. This concept challenges industrial and corporate-driven food systems that often marginalize smallholders, degrade ecosystems, and increase dependence on global markets (Dijk et al., 2021). Rather than focusing solely on food availability, food sovereignty foregrounds issues of rights, justice, and autonomy in food production and distribution.

A core principle of food sovereignty is the strengthening of local food systems through sustainable and agroecological practices. Empirical studies demonstrate that policies supporting local agricultural production can enhance farmers' autonomy, preserve traditional knowledge, and reinforce social cohesion (Hernández-Moreno et al., 2025; Sadarestuwati et al., 2023). In developing country contexts, food sovereignty has been shown to contribute to more resilient and inclusive food systems by reducing vulnerability to market volatility and external shocks.

In Indonesia, food sovereignty remains a critical challenge due to production instability, price fluctuations, and unequal access to productive resources (Jamaludin, 2022). Research highlights the importance of place-based food policies that leverage regional resources and involve local communities, such as in the development of Gayo coffee, to promote equitable livelihoods and sustainable food systems (Mursyidin et al., 2023). Moreover, agroecological approaches and increased participation of women in local food production have been identified as key factors in strengthening household-level food independence (Sadarestuwati et al., 2023; Steckley et al., 2023).

Taken together, political ecology and food sovereignty provide complementary analytical frameworks for examining the impacts of conservation policies on local livelihoods. While political ecology elucidates power asymmetries and land conflicts arising from conservation expansion, food sovereignty highlights the implications of restricted land access for household food independence. Integrating these perspectives allows for a more comprehensive understanding of how conservation governance, land tenure dynamics, and food systems intersect in protected-area contexts such as Mount Rinjani National Park.

II. RESEARCH METHODS

This study adopted a qualitative case study approach to analyze land-use conflicts and their implications for local food security in communities surrounding Mount Rinjani National Park (TNGR), West Nusa Tenggara, Indonesia. A qualitative approach was employed to capture in-depth perspectives, meanings, and socio-cultural contexts related to conservation expansion, land access, and livelihood strategies (Moleong, 2018; Creswell, 2018). The case study design enabled an intensive examination of real-life phenomena where conservation policies and community livelihoods intersect (Robert, 2019).

The research was conducted purposively in buffer-zone villages and surrounding areas of TNGR across North Lombok, Central Lombok, and East Lombok Regencies. These locations were selected due to their direct exposure to national park expansion, recurring land-tenure conflicts, and strong dependence on agricultural land for household food security.

Data collection involved semi-structured in-depth interviews, field observations, and document analysis. Key informants included smallholder farmers, indigenous community representatives, customary leaders, officials from the TNGR Authority, local government representatives, and

environmental non-governmental organizations. Interviews explored perceptions of conservation expansion, land-access restrictions, conflict dynamics, and impacts on food availability and livelihood sustainability. Observations focused on land-use practices, agricultural activities, and social interactions, while documentation included policy regulations, zoning maps, official reports, and relevant academic literature.

Data analysis followed the interactive model proposed by Miles, Huberman, and Saldaña (2018), consisting of data condensation, data display, and conclusion drawing. Data were thematically categorized based on political ecology, governance, and food security frameworks to identify patterns and relationships. Data validity was ensured through source and method triangulation by comparing information across multiple informants, techniques, and documents (Hadi, 2016).

III. RESULTS AND DISCUSSION

A. Impacts of TNGR Expansion on Land Access and Spatial Control

The findings indicate that the expansion of Mount Rinjani National Park (TNGR) has significantly altered land access for local communities, particularly smallholder farmers and indigenous groups in buffer-zone villages. The redefinition of park boundaries and conservation zoning has resulted in the reclassification of previously cultivated and customary lands into protected areas, thereby reducing community control over productive spaces. Local informants reported that land they had managed for generations was suddenly designated as conservation zones without adequate consultation, leading to tenure uncertainty and restricted agricultural activities.

Differences between formal state-defined boundaries and locally recognized customary boundaries emerged as a central source of tension. While TNGR authorities justified boundary adjustments based on ecological protection and watershed preservation, communities perceived these changes as spatial exclusion that disregarded historical land-use practices. This divergence reflects asymmetric power relations in spatial governance, where state conservation priorities override local tenure systems.

B. Zoning Policies and the Exclusion of Local Livelihood Practices

The implementation of zoning regulations—particularly the designation of core and wilderness zones—has further constrained community access to agricultural land. Although traditional and utilization zones were formally established to accommodate local activities, field evidence suggests that these zones were limited in scope and insufficient to support subsistence farming needs. Several informants indicated that productive fields were reclassified into restricted zones, forcing them to abandon cultivation or face legal uncertainty.

From the perspective of local communities, zoning operates as a mechanism of exclusion rather than accommodation. In contrast, TNGR officials emphasized ecological vulnerability and tourism pressure as justifications for stricter zoning. Increased visitor numbers and conservation-driven land management have thus intensified

spatial competition between conservation objectives and livelihood sustainability.

C. Livelihood Transformation and Food Security Vulnerability

Reduced land access has directly affected local livelihood systems and household food security. Smallholder farmers reported declining crop yields due to limited cultivation areas, while the loss of fallback or seasonal plots diminished their capacity to cope with climate variability. As a result, many households diversified income sources by shifting to informal labor, small-scale trading, or tourism-related work.

These livelihood shifts were accompanied by a gradual erosion of subsistence-based food systems. Younger community members increasingly disengaged from agriculture, while women expanded home-based economic activities to compensate for declining farm income. This transformation indicates a growing vulnerability in local food security, as dependence on external markets increased and self-produced food supplies decreased.

D. Community Perceptions of Conservation Governance

Community perceptions toward TNGR expansion were predominantly shaped by feelings of exclusion, uncertainty, and unequal enforcement. While most informants expressed support for environmental conservation in principle, they contested conservation practices that restricted access to land without meaningful participation. Monitoring and enforcement mechanisms were often perceived as disproportionately targeting local farmers, while tourism activities were viewed as receiving preferential treatment.

These perceptions contributed to declining trust in conservation governance and reinforced narratives of spatial injustice. The lack of sustained dialogue and participatory boundary-setting processes further intensified tensions between park authorities and surrounding communities.

E. Forms of Land Conflict

The findings reveal that land conflict in the buffer zones of Mount Rinjani National Park (TNGR) manifests in four interrelated forms: tenurial conflict, horizontal social conflict, ecological access conflict, and economic competition related to nature-based tourism.

Tenurial conflict constitutes the most dominant form, primarily arising from discrepancies between state-defined conservation boundaries and locally recognized customary, inherited, and socially legitimized land boundaries. Community members emphasized that land is not merely a productive asset but a historical and cultural inheritance transmitted across generations. When TNGR expansion and zoning reclassified inherited and customary lands as state conservation areas, overlapping claims emerged between legal state authority and informal customary tenure. As one farmer noted, “Ladang itu warisan orang tua saya, tapi waktu pemetaan ulang tiba-tiba dibidang masuk kawasan negara” (WWC/AR-M1, 6 August 2025). Similar tensions were echoed by adat leaders who highlighted the coexistence of “two competing boundaries”—customary and state—within the same spatial landscape (WWC/HG-A1, 18 September 2025). These findings indicate a dual-authority condition in

land governance, where legal tenure overrides historically embedded local tenure systems.

Beyond vertical conflict between the state and communities, boundary ambiguity has generated horizontal social conflict among villagers. The redefinition of land status disrupted previously agreed customary boundaries, triggering disputes among neighbors over land claims. Informants described growing suspicion, disputes, and occasional physical confrontations following selective enforcement by TNGR patrols (WWC/AR-M1, 21 August 2025; WWC/JL-M4, 15 October 2025). Media reports corroborate these findings, noting increased intra-community conflict where residents relied on different boundary references—state zoning versus customary demarcations (Media Unram, 9 July 2025).

Ecological conflict further emerged through restricted access to forests, water sources, and non-timber forest products. Activities such as collecting firewood, accessing springs, and gathering forest food—previously integral to local livelihoods—became prohibited under stricter zoning regimes. Women were disproportionately affected, particularly through limited access to water and fuelwood (WWC/SM-M3, 7 September 2025). The loss of forest-based food resources also weakened household food security, as traditional ecological buffers during lean seasons became inaccessible (WWC/HG-A1, 28 October 2025). These conflicts reflect competing interpretations of forest functions: conservation protection versus subsistence-based ecological use.

Economic conflict was evident in the growing competition between local agrarian livelihoods and tourism-oriented land use. Communities perceived that tourism infrastructure—such as hiking routes, glamping facilities, and seaplane projects—encroached upon agricultural land and customary spaces, while economic benefits were largely captured by external operators. Informants reported declining access to farmland alongside limited participation in higher-value tourism roles (WWC/SM-M3, 30 September 2025). Media coverage of community resistance to luxury tourism development in sacred and customary areas further illustrates how tourism commercialization intensified spatial and economic exclusion (detikTravel, 8 August 2025).

1) *Conflict Dynamics and Escalation*

Land conflict around TNGR developed through a gradual escalation process rather than sudden confrontation. Initial stages were characterized by uncertainty and anxiety following unannounced boundary changes and limited socialization (WWC/AR-M1, 11 August 2025). This latent tension escalated as enforcement intensified and rules were applied inconsistently, fostering perceptions of injustice and selective treatment (WWC/SM-M3, 4 September 2025).

As boundaries remained unclear, conflicts expanded horizontally, with villagers disputing land claims among themselves. In later stages, grievances transformed into collective resistance, including organized protests and direct confrontations with TNGR authorities (WWC/HG-A1, 10 October 2025). Peak escalation occurred when enforcement actions—such as land clearing or patrol interventions—

triggered physical altercations, signaling a breakdown of trust and communication (WWC/DP-M7, 19 October 2025).

2) *Community Resistance Strategies*

Community responses to land conflict evolved through layered resistance strategies, including spontaneous protests, collective mobilization, negotiation, and mediation. Early resistance often took the form of immediate protests when access routes or farmlands were abruptly restricted (WWC/AR-M1, 15 August 2025). As conflicts intensified, communities organized collective actions to challenge what they perceived as unjust criminalization of traditional practices (WWC/JL-M4, 27 September 2025).

Negotiation emerged through both formal and informal channels. Village leaders and customary authorities sought dialogue with TNGR officials to advocate for recognition of customary boundaries and participatory remapping (WWC/DP-M7, 3 September 2025). Informal negotiations also occurred during daily encounters with patrol officers, reflecting adaptive strategies to maintain access amid regulatory uncertainty (WWC/SM-M3, 19 October 2025).

Mediation—particularly through adat leaders and local NGOs—played a crucial role in de-escalating tensions. Customary mediators were trusted to bridge communication gaps, while NGOs facilitated multi-actor forums involving communities, TNGR authorities, and village governments (WWC/LS-L2, 22 October 2025). These mechanisms demonstrate that resistance was not solely confrontational but also oriented toward renegotiating governance arrangements.

3) *Drivers of Conflict Escalation*

Three structural factors consistently intensified conflict escalation: strict conservation regulations, intensified surveillance, and rigid restrictions on community activities. New rules limiting traditional farming practices and seasonal land use were perceived as undermining local autonomy and agricultural knowledge (WWC/AR-M1, 18 August 2025). Frequent patrols generated psychological pressure and distrust, reinforcing perceptions of criminalization (WWC/SM-M3, 6 September 2025). Additionally, inflexible spatial restrictions ignored seasonal livelihood cycles, producing direct economic losses and heightened frustration (WWC/DP-M7, 20 October 2025).

Collectively, these drivers transformed conservation governance into a source of structural grievance, where conservation objectives clashed with subsistence needs, social identity, and customary rights.

F. Land Conflict and the Erosion of Local Food Self-Reliance around TNGR

1) *Reduction of Productive and Subsistence Land Access*

The findings demonstrate that land conflict surrounding the Mount Rinjani National Park (TNGR) has substantially reduced local communities' access to productive and subsistence land, which forms the backbone of household food self-reliance. The redefinition of conservation boundaries and zoning enforcement has resulted in the incorporation of previously cultivated family plots,

subsistence gardens, and customary forest areas into restricted zones. Consequently, households experienced a sharp decline in cultivable land, often losing more than half of their traditional plots, which directly curtailed food production capacity (WWC/AR-M1/12 August 2025).

Beyond formal land loss, access restrictions also operated functionally and psychologically. Seasonal prohibitions, delayed entry permits, and intensive patrols disrupted planting calendars and forced farmers to abandon otherwise fertile land due to fear of criminalization (WWC/SM-M3/2 September 2025; WWC/JL-M4/9 October 2025). These conditions transformed productive land into idle land, significantly weakening local food systems. Importantly, subsistence spaces—small gardens, border plots, and customary forests—were disproportionately affected, resulting in the loss of diverse food sources such as tubers, vegetables, forest leaves, mushrooms, and honey (WWC/HG-A1/4 September 2025).

2) *Declining Household Food Production Capacity*

Restricted land access translated directly into declining household food production. Informants consistently reported reductions of 50–60% in staple crop yields such as maize and upland rice following land reclassification and access uncertainty (WWC/AR-M1/5 August 2025). In rain-fed agricultural systems like those around Rinjani, delayed planting caused by access restrictions often led to partial or complete crop failure, as critical seasonal windows were missed (WWC/SM-M3/30 September 2025).

Moreover, conflict-induced surveillance reduced labor intensity in farming activities. Farmers limited time spent in fields to avoid patrol encounters, resulting in poor crop maintenance, lower yields, and declining productivity (WWC/JL-M4/1 October 2025). The loss of access to water sources located within conservation zones further exacerbated production losses, particularly for horticultural crops, leading to crop mortality and yield instability (WWC/DP-M7/21 October 2025). Collectively, these dynamics indicate that land conflict undermines food production not only through spatial dispossession but also through disruptions to labor, timing, and agro-ecological inputs.

3) *Transformation of Livelihood Strategies and Food Dependence*

As agricultural production declined, households adopted adaptive livelihood strategies that reshaped local food systems. Many households diversified income through seasonal migration, informal labor, tourism-related work, or borrowing land from relatives (WWC/FD-M6/9 August 2025; WWC/LS-M8/10 September 2025). While these strategies provided short-term income, they reduced time and labor available for farming, reinforcing a cycle of declining food production.

Simultaneously, farming strategies shifted from diversified multicropping systems to simplified or single-crop planting due to access uncertainty (WWC/AR-M1/3 August 2025). This shift reduced dietary diversity and increased vulnerability to crop failure. The erosion of subsistence gardens and customary forest access further diminished food diversity, weakening traditional buffer mechanisms that

previously supported households during lean seasons (WWC/HG-A1/5 October 2025).

4) *Increased Market Dependence and Food Vulnerability*

The decline in agricultural output forced households to rely increasingly on market-purchased food. Whereas previous harvests sustained families for up to six months or more, post-conflict production often lasted less than three months (WWC/AR-M1/25 August 2025). This shift heightened household exposure to food price volatility and increased food expenditure burdens, particularly among low-income families (WWC/SM-M3/14 September 2025).

Market dependence significantly destabilized household food access. Rising prices of staple foods such as rice and maize directly constrained consumption levels, leading some households to reduce meal frequency or portion sizes (WWC/LS-M8/2 October 2025). These conditions signal the emergence of chronic food vulnerability, characterized by reduced food quantity, declining dietary quality, and persistent anxiety over food sufficiency (WWC/YP-A4/14 September 2025).

5) *Implications for Food Sovereignty in a Political Ecology Perspective*

From a political ecology perspective, the erosion of food self-reliance around TNGR reflects broader power asymmetries in land governance rather than merely technical conservation challenges. Conservation zoning and enforcement mechanisms centralized decision-making authority over land use, marginalizing local communities from determining when, where, and how food could be produced (WWC/HG-A1/2 August 2025). This loss of control disrupted traditional agricultural rhythms, adaptive flexibility, and culturally embedded food practices (WWC/AR-M1/18 September 2025).

As external regulations increasingly dictated production choices and access conditions, households and communities lost food sovereignty—the ability to define their own food systems based on local knowledge, cultural preferences, and ecological conditions (WWC/RN-A3/21 October 2025). The findings thus reveal that land conflict around TNGR constitutes not only an environmental governance issue but also a form of structural ecological injustice that systematically undermines local food autonomy.

G. Land Conflict Resolution Models to Strengthen Local Food Sovereignty around Mount Rinjani National Park

1) *Integrating Formal Law, Customary Institutions, and Local Ecological Knowledge*

Land conflict resolution around Mount Rinjani National Park (TNGR) requires an integrative governance approach that goes beyond legal-formal mechanisms. For agrarian and customary communities in the Rinjani highlands, land disputes are not merely administrative issues but are deeply embedded in historical land use, social legitimacy, and cultural values. Findings indicate that conflict resolution mechanisms rooted in customary institutions—particularly adat-based deliberation—are perceived as more legitimate

and effective by local communities than technocratic regulations imposed without consultation (WWC/HG-A1/6 August 2025).

However, unresolved dualism between state conservation law and customary governance has become a structural source of conflict. While TNGR regulations prioritize ecological protection through rigid zoning systems, communities continue to rely on customary norms that regulate subsistence farming, mixed cropping, and forest use. The absence of institutional dialogue between these systems has resulted in legal uncertainty and the marginalization of local food producers (WWC/KS-M12/14 September 2025). Integrating customary mediation into formal conflict resolution frameworks is therefore essential to restore trust, stabilize land access, and sustain local food production.

2) *Legal Frameworks and Institutional Bridging Mechanisms*

Indonesia's legal system provides normative space for integrating state and customary governance. Constitutional recognition of indigenous peoples (Article 18B(2) of the 1945 Constitution) and the Village Law (Law No. 6/2014) affirm the legitimacy of customary institutions and rights based on origin. Nevertheless, forestry and conservation regulations—particularly Law No. 41/1999 and national park zoning policies—remain largely conservation-centric and insufficiently participatory.

Social Forestry schemes, particularly Conservation Partnerships under PermenLHK No. P.83/2016, emerge as critical bridging mechanisms. These schemes enable legally recognized community access to land within conservation areas, thereby reducing tenure insecurity while maintaining ecological safeguards. Empirical findings suggest that when such schemes are aligned with customary institutions, they contribute to more equitable land governance and strengthen the foundations of household food sovereignty.

3) *Strengthening the Legitimacy of Customary Land-Use Spaces*

Customary land-use spaces function as the core of local food systems, supporting subsistence farming, crop diversity, and ecological resilience. When these spaces are excluded from conservation governance, communities experience dispossession that directly undermines food self-reliance (WWC/HG-A1/15 August 2025). The loss of customary plots translates into reduced household food production and increased dependence on market food sources (WWC/MT-M9/29 September 2025).

From a political ecology perspective, this process reflects conservation-driven dispossession, where formal legality overrides historical and moral legitimacy. Strengthening the recognition of customary land-use spaces—through zoning adjustments, partnership agreements, or village-level regulations—restores community control over food-producing landscapes and mitigates structural food vulnerability.

4) *Recognition of Local Land Management Practices*

Local land management practices around TNGR are grounded in agroecological knowledge developed over

generations. Practices such as rotational farming, mixed cropping, and controlled forest use contribute to soil fertility, biodiversity conservation, and food security (WWC/HG-A1/17 August 2025; WWC/SP-M13/3 October 2025). Despite their ecological value, these practices are often categorized as illegal under rigid conservation frameworks.

Legal recognition of such practices—enabled through village authority, social forestry schemes, and conservation partnerships—allows local knowledge to be institutionalized within formal governance systems. This integration enhances ecological sustainability while reinforcing household food sovereignty, aligning conservation goals with subsistence needs.

5) *Political Ecology-Based Conflict Resolution Model*

Applying a political ecology framework reveals that land conflict around TNGR is fundamentally shaped by unequal power relations over land access and control. State-dominated conservation governance has constrained local decision-making authority, resulting in reduced access to food-producing land. Conflict resolution, therefore, must focus on redistributing access and authority rather than merely enforcing compliance.

Collaborative governance models—such as co-management, participatory zoning, and multi-actor forums—represent viable pathways toward equitable land governance. These models allow communities, conservation authorities, and local governments to jointly determine land-use boundaries, farming calendars, and monitoring mechanisms. Such arrangements stabilize food production systems while maintaining conservation objectives.

6) *Co-Management Schemes for Sustainable Food Production*

Co-management schemes provide legal certainty and institutional space for communities to continue food production within conservation landscapes. By formalizing access to customary plots and agroforestry systems through conservation partnerships, households regain the ability to plan cropping cycles, diversify food sources, and reduce dependency on external markets. Joint monitoring mechanisms further reduce conflict by enhancing transparency and shared responsibility.

From a food sovereignty perspective, co-management secures stable access to productive land, supports agroecological practices, and reinforces local control over food systems. Politically, it functions as a redistributive mechanism that corrects tenure inequalities embedded in conservation governance.

7) *Policy Implications*

Policy reform aimed at strengthening food sovereignty and preventing land conflict around TNGR should prioritize participatory zoning, formal recognition of customary land rights, and the expansion of social forestry programs. Permanent multi-actor forums are essential to mediate interests and prevent conflict escalation. Strengthening village-level governance and integrating customary regulations into formal conservation frameworks further enhance policy legitimacy and implementation effectiveness.

Collectively, these measures reposition conservation not as a mechanism of exclusion, but as a collaborative process that safeguards ecosystems while sustaining local food systems. By aligning political ecology principles with food sovereignty objectives, land conflict resolution can simultaneously advance ecological protection and social justice.

H. Impacts of TNGR Expansion on Local Tourism

The findings indicate that the expansion of Mount Rinjani National Park (TNGR) has contributed to the growth of nature-based tourism, particularly trekking, ecotourism activities, and the development of supporting facilities such as hiking trails, basecamps, and small-scale accommodations. The increasing number of visitors has created new economic opportunities for communities in buffer-zone villages, especially through employment as porters, local guides, small homestay operators, and informal transportation service providers.

However, field evidence reveals that the economic benefits generated by tourism are unevenly distributed. Local community involvement is largely limited to low-income and informal positions, while key aspects of tourism governance—such as destination management, pricing systems, and infrastructure investment—are predominantly controlled by external actors and the national park authority. Several informants reported that tourism infrastructure development has encroached upon land previously used for agriculture or customary purposes, thereby reducing space for local food production.

Tourism development has also emerged as a new source of conflict in the context of TNGR expansion. Restrictions on access to traditional routes, customary forest areas, and community-managed spaces—justified under conservation and tourism safety regulations—have intensified tensions between conservation objectives and local livelihood sustainability. These findings suggest that although tourism has expanded quantitatively, its qualitative contribution to improving local welfare remains limited and, in some cases, exacerbates social and spatial inequalities.

I. Economic Impacts of TNGR Expansion on Local Households

The expansion of TNGR and the enforcement of stricter conservation zoning have significantly affected the economic conditions of local households. The loss of access to agricultural land, mixed gardens, and subsistence spaces has led to declining farm-based incomes, which previously constituted the primary livelihood source for many communities. Numerous households reported losing productive land or facing restricted and uncertain access, resulting in reduced agricultural output and income instability.

In response, households adopted adaptive livelihood strategies by shifting toward non-agricultural income sources, including informal labor, seasonal employment in the tourism sector, small-scale trading, and labor migration. While these strategies provided short-term income, the findings indicate that tourism-related earnings are highly unstable, seasonal, and dependent on fluctuations in visitor numbers. Consequently, household economic vulnerability increased,

particularly during periods of low tourist arrivals or external shocks.

At the same time, declining subsistence food production intensified household dependence on market-based food systems. Increased food expenditures, combined with rising living costs in tourism-oriented areas, placed additional pressure on low-income households. Overall, the findings demonstrate that TNGR expansion has generated economic trade-offs: while conservation and tourism activities have expanded, the economic stability and livelihood resilience of local households have weakened.

A. Impacts of TNGR Expansion Policies on Local Land

Access

The findings demonstrate that the expansion of Mount Rinjani National Park (TNGR) and the redefinition of conservation zoning have substantially restricted local communities' access to agricultural land, mixed gardens, and traditional cultivation areas. The reclassification of community-managed land into core and wilderness zones has produced territorial exclusion, limiting residents' ability to reside on, cultivate, and utilize land for subsistence food production. From a Political Ecology perspective, conservation zoning represents not merely a technical spatial intervention but a political process that reshapes power relations between the state and local communities (Blaikie & Brookfield, 1987; Robbins, 2012).

Through legal instruments such as Law No. 5/1990, the state represented by TNGR authorities asserts formal territorial control, while local communities rely on historical use, customary norms, and long-standing ecological knowledge to legitimize their land claims (Li, 2014). When state legality supersedes local legitimacy, unequal access to land emerges as a structural source of tenure conflict. This finding aligns with evidence from Lombok indicating increasing pressure on agricultural land resulting from conservation policies and land-cover change (Purnama & Çoban, 2024).

Restricted land access has direct implications for local food systems. The loss of productive space undermines all four pillars of food security—availability, access, stability, and utilization—by reducing local food production, increasing market dependency, and limiting dietary diversity (FAO, 2020; Bricas et al., 2019). Consequently, conservation policies that neglect the subsistence function of land contribute to declining food security among upland communities.

The tension between conservation and local livelihoods in TNGR reflects a broader global pattern of exclusionary conservation, where local practices are framed as environmental threats (Adams & Hutton, 2018; Oldekop et al., 2019). However, numerous studies demonstrate that traditional agroforestry and shifting cultivation systems often align with mountain ecology and biodiversity conservation (Peluso, 1992; Gadgil et al., 2020; Dharmawan et al., 2020). From a Political Ecology standpoint, this tension represents an epistemological conflict between local ecological knowledge and rigid conservation paradigms, wherein the state monopolizes definitions of sustainability.

B. Forms, Dynamics, and Actors in Land Conflict

The dominant form of conflict in TNGR is tenure conflict, particularly related to boundary claims, inherited land, and customary territories historically managed by local communities prior to conservation zoning. Political Ecology conceptualizes such conflicts as struggles over legitimacy in defining rights to space (Bryant & Bailey, 1997; Robbins, 2012). The misalignment between state-imposed boundaries and culturally recognized territorial limits has made conflict unavoidable, as observed in Sembalun, Sajang, and Jurang Koak (Radar Lombok, 2017; *Republika*, 2015).

Beyond vertical conflict between the state and communities, the study identifies horizontal conflicts among residents arising from blurred land boundaries following zoning changes. Previously agreed-upon local arrangements lost their legitimacy once formal conservation boundaries were imposed, leading to competing claims and social tension. This condition reflects what Myers et al. (2018) describe as competitions of legitimacy, whereby conservation interventions disrupt internal social cohesion within communities.

Ecological conflicts have also intensified due to restricted access to water sources, grazing areas, firewood, and medicinal plants. In Political Ecology terms, this constitutes environmental dispossession, wherein state policies sever communities from ecological resources that sustain their livelihoods (Peet & Watts, 2004). Such restrictions increase reliance on external inputs and deepen structural inequalities between conservation authorities and traditional resource users (Sadikin et al., 2021).

Furthermore, the expansion of nature-based tourism has introduced economic conflicts related to access to hiking routes, basecamp management, and benefit distribution. Consistent with global findings, conservation areas with high tourism value often generate new forms of competition among local actors (Dharmawan et al., 2020; Sudarmaji et al., 2021). Thus, land conflict in TNGR is multidimensional, encompassing agrarian, ecological, social, and economic dimensions.

C. Implications of Land Conflict for Local Food

Sovereignty

Land conflict in TNGR has significantly reduced community access to productive land, directly weakening household-level food availability. Within the food security framework, this condition undermines both availability and access, particularly for smallholder farmers dependent on subsistence and semi-subsistence systems (FAO, 2020; Maxson et al., 2021). Declining local production has increased reliance on market-based food systems, heightening vulnerability to price volatility and supply disruptions (CIFOR-ICRAF, 2021).

Restrictions on access to subsistence land and forest resources have further reduced household food diversification, with long-term consequences for nutritional quality, especially among women and low-income households (Ruel et al., 2017; Haddad et al., 2016). Adaptive strategies such as labor migration and shifts to non-agricultural employment often weaken, rather than

strengthen, local food systems by reducing agricultural labor and ecological knowledge transmission (Li, 2014; Touch et al., 2024).

The findings on tourism and household economic impacts further reinforce the political ecology perspective adopted in this study. Although the expansion of TNGR has promoted nature-based tourism as a conservation-compatible development pathway, the unequal distribution of tourism benefits reflects persistent power asymmetries between conservation authorities, external economic actors, and local communities. Tourism-related livelihoods have not functioned as a stable substitute for agrarian livelihoods, as most local involvement remains informal, low-paid, and highly seasonal. Consequently, households that have lost access to productive land face increased economic vulnerability rather than livelihood security.

From a food sovereignty perspective, the shift from subsistence-based agriculture to market-dependent and tourism-oriented livelihoods undermines community autonomy over food systems. Increased reliance on purchased food, combined with unstable income from tourism, weakens household resilience and exposes communities to price volatility and external shocks. These dynamics demonstrate that conservation-driven tourism does not automatically enhance local welfare or food sovereignty unless accompanied by inclusive governance mechanisms, secure land access, and equitable benefit-sharing arrangements.

More broadly, land conflict undermines food sovereignty by eroding communities' autonomy over food production systems. When conservation zoning restricts land-use decision-making without meaningful participation, communities lose control over crop choices, planting cycles, and agroforestry practices. Political Ecology literature frames this condition as a loss of autonomy, where communities are marginalized as subjects of spatial governance (Escobar, 1996; Bryant & Bailey, 2020).

D. Conflict Resolution Models to Strengthen Food Sovereignty

The findings indicate that resolving land conflict in TNGR is a prerequisite for restoring local food sovereignty. Legalistic approaches alone are insufficient, as many community claims are rooted in customary tenure and historical land use (Peluso, 1992; Li, 2014). National legal frameworks—including Article 18B(2) of the Indonesian Constitution, the Village Law (2014), and the Social Forestry scheme (Regulation P.83/2016)—provide opportunities to integrate formal and customary governance systems.

A viable resolution model is collaborative governance, which involves TNGR authorities, local governments, customary institutions, civil society organizations, and tourism actors in shared decision-making processes (López-Bao et al., 2020). Collaborative arrangements enable participatory zoning, conservation partnerships, and institutionalized mediation, reducing conflict while maintaining ecological objectives.

Co-management schemes allow communities to regain regulated access to food-producing land within conservation areas. Evidence suggests that such arrangements reduce conflict and enhance community-based conservation

outcomes (Maryudi et al., 2012; Moeliono et al., 2017). Equally important is the recognition of local agroecological knowledge, which contributes to sustainable land management and resilient food systems (Gadgil et al., 2020; UNESCO, 2018).

Overall, effective conflict resolution in TNGR must rest on four interconnected foundations: (1) recognition of customary territories and secure land access, (2) collaborative and participatory governance, (3) integration of local and scientific knowledge systems, and (4) equitable redistribution of tourism benefits to support local food systems. These principles align with Political Ecology's emphasis on ecological justice and the FAO's food security framework, offering a pathway toward sustainable conservation and strengthened food sovereignty for communities surrounding TNGR.

IV. CONCLUSIONS

This study demonstrates that the expansion of Mount Rinjani National Park (TNGR) has significantly reshaped local land tenure systems and spatial access, generating complex land conflicts and undermining community food self-reliance, particularly among smallholder farmers and indigenous groups. The reclassification of cultivated and customary lands into core and wilderness zones has reduced legal and physical access to productive and subsistence spaces, producing spatial exclusion and reinforcing asymmetric power relations between conservation authorities and local communities. Land conflicts in the TNGR area manifest in multiple forms, including tenure disputes, social conflicts arising from overlapping claims, ecological conflicts related to restricted access to natural resources, and economic conflicts linked to competition over tourism benefits, involving diverse actors with competing interests and limited mechanisms for effective dialogue. These conflicts have weakened household food systems by reducing local food production, narrowing dietary diversity, increasing dependence on market-based food sources, and heightening vulnerability to food insecurity. The study concludes that resolving land conflict and strengthening food self-reliance require an integrated approach that combines formal legal frameworks with the recognition of customary tenure through participatory and collaborative governance. A viable resolution model should prioritize secure community access to productive land, inclusive dialogue and mediation, shared management of food-producing spaces, and equitable distribution of conservation-related economic benefits, thereby enabling conservation objectives to be achieved alongside sustainable livelihoods and long-term food resilience.

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