

Community Participation in Local Wisdom-Based Forest Management in Monganpoula Village, North Siberut District, Mentawai Islands Regency

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ABSTRACT: Local wisdom-based forest management represents a vital socio-ecological approach to safeguarding forest ecosystem integrity while preserving the socio-cultural fabric of indigenous communities. This study examines community participation in local wisdom-based forest management in Monganpoula Village, North Siberut District, Mentawai Islands Regency, Indonesia, focusing on the drivers of participation, the operational role of indigenous knowledge, emerging socio-institutional challenges, and government policy synergies. The study employed a qualitative descriptive case study design. Primary data were gathered through semi-structured in-depth interviews, passive participant observation, and archival documentation involving key customary leaders (Sikerei and Sikebbukat Uma), local forest-dependent households, village and sub-district administrators, the Siberut National Park Authority (Balai Taman Nasional Siberut), and non-governmental organizations (Kalaweit and Citra Mandiri Mentawai Foundation). Data validity was ensured through methodological and source triangulation, and analyzed via the iterative interactive model of Miles and Huberman comprising data reduction, data display, and conclusion drawing/verification. The findings reveal that community participation in forest stewardship remains exceptionally robust, sustained by economic reliance on non-timber forest products (NTFPs), traditional ecological knowledge, generational residency, perceived hydrological benefits, and collaborative external partnerships. Local wisdom rooted in Arat Sabulungan, the Uma customary institution, the spiritual role of Sikerei, customary land zoning (Pumonean and Leleu), behavioral taboos (Keraet/Keikei), the Panaki propitiation rituals, and Tulou customary restitution sanctions serve as effective self-regulating instruments against overexploitation. Nonetheless, sustainable stewardship is increasingly challenged by intergenerational value shifts, modernization pressures, ambiguous legal boundaries between state forest estates and customary tenure (tenurial dualism), and incomplete integration into formal village regulations (Perdes). Therefore, forest governance in Monganpoula must transition toward an institutionalized collaborative management (co-management) framework that harmonizes customary jurisprudence with statutory administrative policies to guarantee long-term biocultural conservation and community livelihood resilience.

KEYWORDS: Community Participation, Forest Governance, Local Wisdom, Indigenous Peoples, Arat Sabulungan, Mentawai Islands.

I. INTRODUCTION

Sustainable forest management constitutes a cornerstone of environmental governance and sustainable development in Indonesia (Law No. 37 of 2014). In this socio-ecological landscape, local wisdom serves not only as normative guidance for environmental and social interactions but also as an adaptive mechanism enabling indigenous communities to mitigate environmental changes [19]. Globally, tropical forests fulfill critical ecological, economic, social, and cultural functions essential for human survival and biosphere stability [15], [22]. By regulating hydrological cycles, sequestering carbon emissions, and moderating microclimates, forest ecosystems represent strategic assets amidst accelerating global climate vulnerabilities [30], [40]. Indonesia hosts one of the world's most expansive and biodiverse tropical rainforest biomes across the Sundaland hotspot, functioning as critical habitats for endemic wildlife and supporting ecosystem services that underpin the livelihoods of tens of millions of forest-dwelling and forest-dependent people [32], [61], [67].

Despite their paramount importance, Indonesia's forested landscapes endure severe anthropogenic pressures, including deforestation, land degradation, illegal logging, large-scale agribusiness expansion, and extractive industrial exploitation [26], [68]. These structural disturbances not only undermine biodiversity and ecosystem resilience but also trigger socio-economic

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vulnerabilities, marginalizing indigenous communities whose subsistence and cultural identity are intrinsically tied to forest resources [49], [55]. Historically, centralized, top-down bureaucratic forestry governance has frequently failed to ensure equitable and enduring conservation, highlighting the imperative of active community engagement as primary forest stewards [41], [51].

The paradigm shift toward Community-Based Forest Management (CBFM) is internationally recognized as a vital prerequisite for achieving ecological sustainability and social justice [2], [31]. CBFM repositions local communities from passive subjects of state regulation to active rights-holders with decision-making authority across planning, resource utilization, ecological monitoring, and conservation [12], [21]. The success of CBFM depends heavily on genuine community participation, as local and indigenous populations possess profound Traditional Ecological Knowledge (TEK) developed over generations regarding landscape characteristics and socio-ecological thresholds [8], [43], [48]. In theoretical terms, participation must transcend mere physical tokenism to embrace substantive empowerment [3], [64]. Under Sherry Arnstein's Ladder of Citizen Participation, meaningful participation is achieved when communities exercise genuine citizen power to shape decisions affecting their territories, reinforcing Elinor Ostrom's (1990) common-pool resource governance principles [39] that sustainable management thrives on bottom-up institutional arrangements and self-enforcing customary norms [16], [27].

In Western Indonesia, the Mentawai Archipelago in West Sumatra Province constitutes a globally recognized priority conservation region characterized by remarkable biotic endemism [65], [69]. For the indigenous Mentawai people, the forest (locally termed *Leleu* or *Sesek*) possesses profound cosmological, ontological, and existential significance anchored in the ancestral belief system known as *Arat Sabulungan* [54], [56]. The forest is revered as an animate socio-spiritual space and the ultimate reservoir of life (*Purimanuaijat*), supplying food, traditional medicinal flora, construction timbers, and the physical-spiritual arena for major ceremonial events such as *Punen* [18], [38]. This ecological cosmology dictates strict customary rules, spatial zoning, and subsistence-oriented extraction, acting as effective checks against overexploitation [52], [62].

Monganpoula Village, situated in North Siberut District, exemplifies an indigenous Mentawai community actively practicing customary wisdom to safeguard forest resources. The community collectively observes customary laws governing the harvesting of Non-Timber Forest Products (NTFPs), strictly prohibits tree felling in sacred or hydrological catchment zones, and enforces traditional restitution penalties (*Tulou*) upon violators [42], [52]. Concurrently, forest governance in Monganpoula operates within an emerging multi-stakeholder arena involving the Village Government, Sub-district Administration, Siberut National Park Authority (BTNS), and non-governmental conservation organizations [1], [60]. Nevertheless, this governance landscape faces acute challenges of legal pluralism, wherein customary Mentawai norms have yet to be fully integrated into formal statutory instruments such as Village Regulations (*Peraturan Desa / Perdes*) or Local Government Enactments (*Perda*) [4], [5]. Consequently, this research investigates the multi-dimensional factors driving community participation, the functional mechanics of *Arat Sabulungan* wisdom, the contemporary socio-institutional challenges, and the requisite collaborative policy pathways (co-management) to sustain forest governance in Monganpoula Village.

II. METHOD

A. Study Location and Temporal Scope

This study was conducted in Monganpoula Village, North Siberut District, Mentawai Islands Regency, West Sumatra Province, Indonesia, between June and July 2026. Geographically, Monganpoula encompasses approximately 4,600 hectares of diverse tropical forest landscape and riverine systems, bordering Malancan Village to the north, Sirilogui Village to the south, Sikabalu Village to the east, and Sotboyak Village to the west. Administratively, the village is organized into three hamlets (*Dusun*): East Hamlet (*Dusun Timur*), South Hamlet (*Dusun Selatan*), and West Hamlet (*Dusun Barat*), with a total recorded population of 1,198 inhabitants [71] primarily engaged in traditional subsistence farming and agroforestry (Figure 1)

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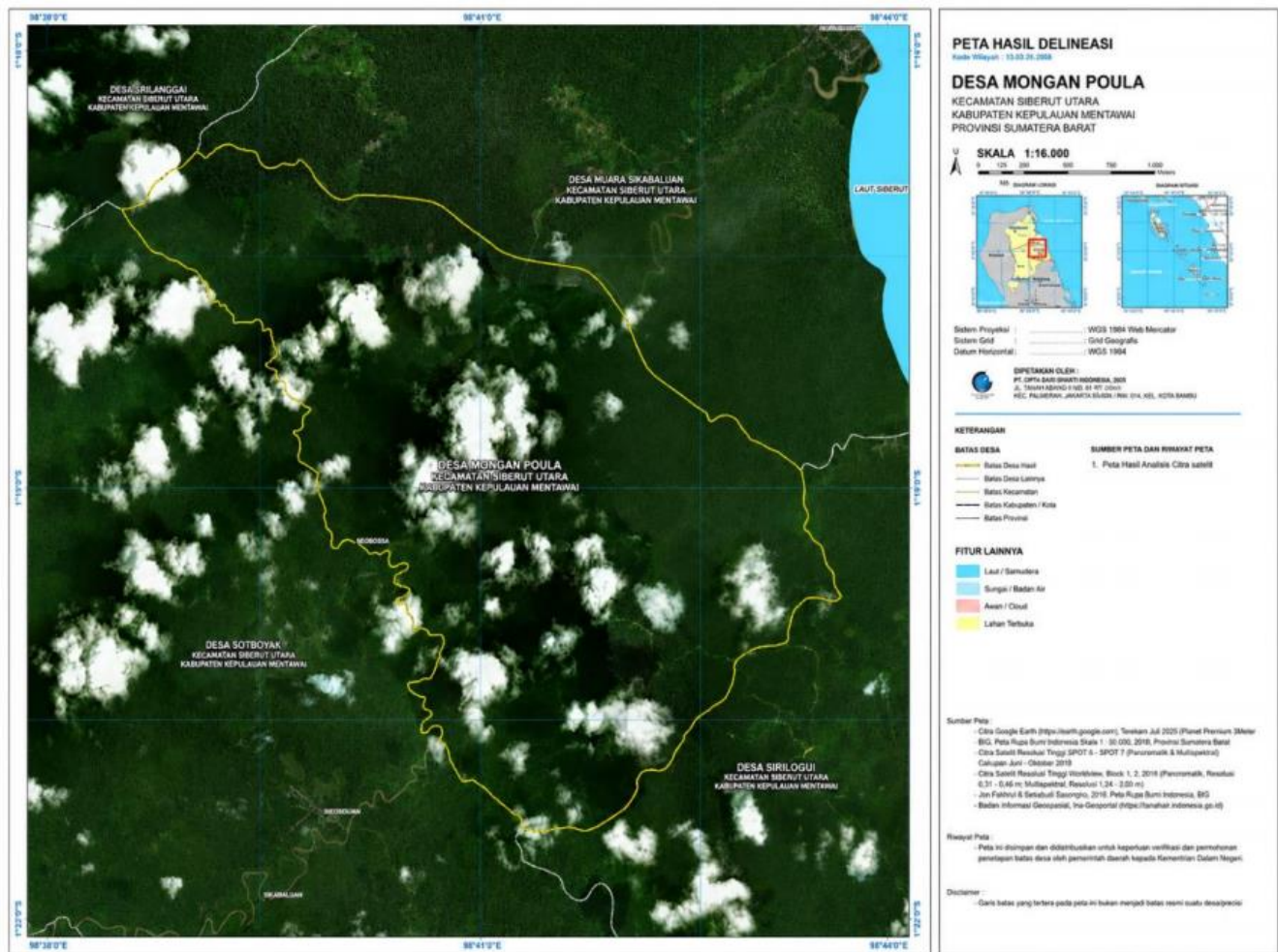


Figure 1. Spatial Delineation and Administrative Map of Monganpoula Village, North Siberut District.

B. Research Design and Approach

The study employed a qualitative descriptive research design utilizing an in-depth case study approach [17]. As Yin (2018) [70] notes, case study designs are uniquely suited to investigating complex, contemporary phenomena within real-world socio-ecological contexts where boundaries between phenomenon and context are fluid. This approach enabled comprehensive investigation of customary forest tenure, Arat Sabulungan rituals, and village governance dynamics in North Siberut [63].

C. Informant Selection and Data Sources

Informants were selected via purposive sampling based on their direct involvement, structural authority, and experiential knowledge regarding customary forest governance. Data sources comprised primary field data (semi-structured interviews, direct passive observations, and field documentation) and secondary data (village development plans, customary records, previous ethnographies, and relevant legal statutes).

Table 1. Categorization and Criteria of Research Informants

Informant Category	Targeted Informants	Sample (n)	Capacity and Operational Justification
Customary & Cultural Authorities	Sikerei (Spiritual healer/leader), Rimata / Sikebbukat Uma (Clan leaders), Traditional Elders	3 persons	Comprehensive mastery of Arat Sabulungan cosmologies, sacred forest taboos (Keraet), ritual protocols (Panaki), customary sanctions (Tulou), and ancestral lineage tenure.
Local Forest Community	Traditional farmers, NTFP collectors, women representatives, and customary youth figures	5 persons	Empirical measurement of practical participation across forest planning, harvesting, maintenance, and ecological monitoring.

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Informant Category	Targeted Informants	Sample (n)	Capacity and Operational Justification
Village & Local Government	Village Head of Monganpoula, Village Apparatus, and Village Consultative Body (BPD)	4 persons	Insights into administrative village governance, APBDes budget allocations, and formalization of customary norms into Village Regulations (Perdes).
Park Management & External Partners	Siberut National Park Authority (BTNS Region II), Sub-district Head (Camat), and NGOs (Kalaweit & YCMM)	3 persons	Understanding collaborative forest governance frameworks, legal tenurial convergence, co-management programs, and external technical assistance.

D. Data Collection and Triangulation

Data collection utilized three primary qualitative techniques underpinned by the principle of methodological and data source triangulation: (1) In-depth Semi-Structured Interviews examining community participation levels based on Arnstein's typologies, the vitality of customary conservation rules, and legal pluralism tensions; (2) Passive Participant Observation directly observing community harvesting practices, sacred zoning compliance, reforestation of cleared swiddens (Tinungglu), and ritual propitiations; and (3) Document & Archival Analysis examining boundary delineation maps, village monographs, customary dispute records, and forestry policy decrees.

E. Data Analysis

Data analysis followed the interactive qualitative model of Miles, Huberman, and Saldaña (2014) [35], comprising: (1) Data Reduction through rigorous coding, thematic clustering, and elimination of peripheral data; (2) Data Display through structured analytical narratives and summary comparative matrices; and (3) Conclusion Drawing and Verification through continuous member-checking and triangulation to guarantee rigorous internal validity.

III. RESULT AND DISCUSSION

A. Historical Context and Socio-Tenurial Setting of Monganpoula Village

Etymologically, Monganpoula derives from the indigenous Mentawai terms Mongan Sopak (estuary/river mouth) and Poula (sugar palm / *Arenga pinnata*), denoting the fertile estuary of the Sopak Poula river, located approximately 7 kilometers north of the sub-district administrative center. Historically, this riverine forested basin was within wild sugar palms, ferns, and dense primary rainforest, sustaining traditional livelihood practices such as subsistence agroforestry, hunting, riverine fishing, and tapping of sweet palm sap.

The modern settlement of Monganpoula was formed through state-directed resettlement initiatives in the 1970s. Beginning in 1971 under the regional social welfare resettlement program (Program Kesejahteraan Masyarakat Terasing / PKMT) led by the Padang Pariaman Regency and West Sumatra Provincial Social Services, forest-dwelling clans residing across the Bojakan, Sikalabu, and Bekemen interior zones were relocated to form the resettlement hamlet of Monganpoula. In 1985, Monganpoula was formally designated as a definitive administrative village (Desa).

This resettlement history generated a distinctive socio-spatial tenure dynamic: many resettled clans currently inhabit and farm land held under the customary ancestral title (Ulayat) of host clans whose customary domain extends beyond Monganpoula's formal administrative borders. Conversely, the ancestral Ulayat lands of certain Monganpoula clans lie in neighboring administrative villages. As village elders and the East Hamlet Head note, this dual tenure structure serves as a natural socio-cultural check: formal village development projects cannot proceed without explicit consent from customary landowners, ensuring ancestral forests remain shielded from arbitrary state or commercial encroachment.

B. Determinants of Community Participation in Local Wisdom-Based Forest Governance

Field investigations demonstrate that a synergistic interplay between internal socio-cultural determinants and external institutional drivers governs community participation in forest stewardship.

1. Internal Socio-Cultural Factors

- High Forest Dependency and the Ethic of 'Sarainan Purimanuaijat': The vast majority of households rely directly on NTFPs—such as wild honey, rattan (*Calamus* spp.), sago (*Metroxylon sagu*), bamboo, river fish, and wild game—alongside multi-strata agroforestry. In line with social-ecological dependency theories [34], [58], this reliance fosters a profound commitment to stewardship. Mentawai cosmology frames the forest not as an exploitable commodity, but

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as a living kin partner expressed in the core philosophy: 'Sarainan Purimanuaijat' (treating the forest as a sibling in life; if we fail to maintain friendship with nature, life itself will perish), which is deeply reinforced by the customary axiom: "Mot leleu mot leu purimanuaijat" (when the forest perishes, human life and survival perish as well)" (when the forest perishes, human life and survival perish as well). As affirmed by the Head of Siberut National Park Section II and the Director of the Kalaweit Foundation, this spiritual balance creates deep voluntary compliance with customary harvesting limits, permitting hunting only for sacred rituals and timber extraction strictly for communal clan houses (Uma).

- **Traditional Ecological Knowledge (TEK) vs. Formal Education:** While formal educational attainment in the village is predominantly at the primary and secondary levels, ancestral ecological literacy regarding soil capability, botanical life cycles, and rotational fallow dynamics remains exceptionally rich [47]. Arat Sabulungan provides an ecological blueprint governing forest regenerative cycles, ensuring swiddens are rehabilitated into productive multi-tiered secondary and climax forests.
- **Generational Authority, Residency, and Customary Leadership:** Elders, Rimata (clan heads), and Sikerei who have resided in the area for decades command profound authority over customary decision-making [66]. Their experiential knowledge legitimizes decisions regarding seasonal hunting periods, land-clearing boundaries, and the interpretation of natural indicators, ensuring cultural continuity across generations.
- **The Forest as 'Natural Pharmacy' (Apotek Alami) for Sikerei:** For traditional healers (Sikerei), the primary forest represents an irreplaceable pharmacy. Medicinal remedies derived from fresh roots, bark, and leaves cannot be stored dried for long (losing bioactivity within 48 hours). When harvesting medicinal flora, Sikerei perform the Muoro incantation to respectfully sever the botanical life-force and transfer its vital energy into the ailing patient:
 - "Kualak kai ekeu kina buluk sesek kau le imanene tubumai, kau lek imanene sibakkat agot."
 - (Translation: "We harvest you, leaves of the forest, grant wellness to our bodies, grant true healing to the afflicted patient.")

2. External Institutional Factors

- **Information Access and Collaborative Mentorship:** Strategic partnerships with environmental NGOs (notably Kalaweit and Citra Mandiri Mentawai Foundation) and government agencies have bolstered community capacity regarding legal forest rights and boundary defense [46]. Kalaweit's conservation agreements support customary communities in defending their ancestral forests against commercial logging concessions while maintaining sustainable customary access.
- **Direct Economic Incentives and Hydrological Security:** The tangible flow of ecosystem benefits—including uncontaminated watershed provisioning and commercial trade in sustainable agroforestry yields (such as village jackfruit, langsung, durian, mangosteen, river prawns, and forest honey)—reinforces community vigilance against external encroachment [57]. This conservation awareness is heightened by the village's geographic layout at the confluence of two river tributaries, making undisturbed upstream forest canopy vital to prevent severe downstream flooding, riverbank erosion, and seasonal droughts.

Table 2. Summary Matrix of Determinants Influencing Community Forest Participation

Factor Category & Variable	Key Empirical Parameter	Influence on Community Participation Level
Livelihood & Resource Dependency (Internal)	High economic reliance on NTFPs and subsistence farming	High: Serves as primary catalyst for direct physical protection and monitoring.
Traditional Ecological Knowledge (Internal)	Intergenerational mastery of Uma rules, taboos, and zoning	Very High: Establishes normative foundations for customary compliance and low-impact extraction.
Institutional Support & Mentorship (External)	Capacity building by Kalaweit, YCMM, and Village Government	Moderate to High: Strengthens legal literacy, boundary defense, and collaborative patrol capacity.
Economic & Ecological Incentives (External)	Perceived security of freshwater supply and perennial fruit cash crops	High: Provides tangible incentives linking conservation with household welfare.

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C. The Structural Role of Local Wisdom in Forest Preservation

Traditional forest governance in Monganpoula operates through three integrated institutional pillars: cosmological belief systems, clan governance (Uma), and spatial zoning.

1. Cosmological Ontology under Arat Sabulungan:

Under Arat Sabulungan, every animate and inanimate entity in nature possesses a spirit (Ketcat). Spirits are bifurcated into Ketcat Sikatai (malevolent wandering spirits resulting from taboo transgressions / Takmasuruk) and Ketcat Simaeru (benevolent ancestral guardian spirits / Sapunuteteu). Severe taboos include eating while walking in the forest (Indakam menung indaankam mukom kaleleu), urinating without proper customary courtesy (Usubui kasesek takmusibla), uttering profanities (Mugerei nganga sitaimaeru), committing adultery in the wilderness (Masigalai sikatai kasinanalep sirimanua), and exhibiting greed toward forest resources (Abeu mata kagalaijet samba kakokomen).

Consequently, major activities such as clearing swiddens (Mutinungglu), felling trees for traditional dugout canoes (Masibau abak), or harvesting timber for clan houses (Masigaba galaijet uma) mandate the Panaki propitiation ritual. Panaki serves as a spiritual transaction requesting permission and protection from Sapunuteteu using ritual offerings: a red cloth scrap (Laka), tobacco (Ubek), an unblemished rooster (Gougou simalaingi bulu), and a ceremonial axe (Oggut):

“Ku’ilak kai abak mai bak ibara sipasisaila kai sateteunu pasaki ita nenek kakam ubek mui, nenek kakam lalambumui simaeru, kuake nenek kakam sateteu liamui manuk simabili bulu, nek oggut mui kau imanene tubu mai sateteunu bak i’sailagi kai, bak i’bara paorak-orak kau i’belek loingak mai sipulelek.”

(Translation: "We fell this timber to construct our canoe; protect us from misfortune, ancestral guardians. Here is your tobacco, your fine cloth, and unblemished rooster. We present our axe so our bodies remain safe and sound, granting our canoe swift and peaceful journeys.")

Furthermore, customary ecological calendars regulate timber felling times; harvesting during the full moon (Laggok Sabeu) is strictly forbidden, as timber felled during this lunar cycle is traditionally recognized as fragile and prone to rapid cracking. Crucially, following timber felling, the tree trunk must not be left barren. A replacement sapling must immediately be planted at the stump accompanied by the full reconciliatory incantation: “Siliim kina loingak bak i’pusala simagereem bak ima belek bagam kuilak kai ekeu pakeijenmai lek nek indaan mincak siliim” (Translation: "Forgive us, spirit of the fallen tree, do not hold anger or sorrow against us; we harvest you solely for our vital communal needs, may harmony and peace remain between us.")

Furthermore, slash-and-burn practices are strictly prohibited because burning is believed to incinerate the dwelling of ancestral spirits. Cleared swiddens must be enriched with commercial fruit trees (durian, jackfruit, langsung, rambutan) and valuable hardwoods (Elagat, Katuka, Menegat, Ali bakbak), enforcing the customary axiom: 'any cleared primary forest must ultimately be restored into productive climax forest'.

2. Customary Governance by the Uma Institution:

The Uma (patrilineal clan house and council) functions as the supreme customary legislative and judicial body. Led by the Rimata (clan chief) and advised by the Sikebbukat Uma (elders) and Sikerei, the Uma establishes territorial demarcations, arbitrates tenurial disputes, and enforces customary restitution fines (Tulou—payable in pigs, sago parcels, or brass gongs) against illegal loggers or violators of sacred sites [28].

3. Customary Spatial Zoning (Pumonean vs. Leleu Keraet):

The landscape is partitioned into Pumonean (settlement, agricultural swiddens, and agroforestry gardens) and Leleu / Leleu Keraet (dense, sacred primary rainforests covering steep ridges and headwaters). In Leleu Keraet, all commercial felling is strictly banned, ensuring absolute protection of watershed hydrology and microclimate stability [53].

D. Socio-Ecological and Institutional Challenges to Forest Governance

Despite strong customary resilience, forest governance in Monganpoula confronts six critical contemporary challenges:

1. Intergenerational Erosion of Customary Values: Out-migration of youth for urban education has weakened oral transmission of Arat Sabulungan cosmologies, resulting in diminished customary compliance upon their return.
2. Modernization and Cultural Secularization: Pragmatic modern lifestyles have led certain community members to bypass Musibla permission rituals, viewing traditional propitiation protocols as obsolete.
3. Tenurial Dualism and Legal Uncertainty: The discrepancy between unwritten ancestral ulayat boundaries and formal state forest estate designations creates tenurial vulnerability against outside industrial claims.
4. Escalating Economic Pressures: Rising cash-income demands for education and consumer goods exert pressure to intensify timber extraction or yield to external logging overtures.

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5. Discontinuous Institutional Mentorship: External government and NGO conservation assistance remains project-dependent and lacks long-term operational permanence.
6. Vulnerability of Ethnobotanical Knowledge: The specialized botanical repository maintained by senior Sikerei faces extinction due to the scarcity of youth undergoing traditional Sikerei apprenticeships.

E. Policy Synergies and Collaborative Governance (Co-Management) Framework

Effective forest preservation in Monganpoula requires multi-level governance convergence between customary authorities and statutory administrative institutions:

1. Village Level (Pemerintah Desa): Village governance must enact Village Regulations (Perdes) that formally codify Uma zoning, taboo zones (Leleu Keraet), and Tulou sanctions into village administrative law. Furthermore, Village Revenue and Expenditure Budgets (APBDes) should fund participatory boundary mapping, joint community patrols, and NTFP processing enterprises.
2. Sub-district Level (Pemerintah Kecamatan): The North Siberut District administration acts as an essential intermediary, facilitating inter-village customary conflict resolution and advancing community forestry proposals into the Sub-district Development Planning Deliberation (Musrenbang Kecamatan).
3. Regency Level (Pemerintah Daerah) & Constitutional Relevance: At the regency level, operationalization of Mentawai Islands Regional Regulation (Perda) No. 11 of 2017 concerning the Recognition and Protection of Indigenous Peoples is vital. Aligned with the landmark Constitutional Court Decision No. 35/PUU-X/2012—which established that customary forests are not state forests—the regional government must formally decree Monganpoula's ancestral lands (Hutan Adat) to ensure definitive statutory tenure.
4. Synthesis: Co-Management Architecture: Rather than displacing customary law with statutory bureaucracy, the state must institutionalize a Collaborative Management (Co-management) architecture. In this model, indigenous Uma institutions retain primary authority over daily stewardship and customary enforcement, while state agencies provide formal tenure recognition, technical capacity, and legal defense.

IV. CONCLUSIONS

Community participation in forest governance in Monganpoula Village remains exceptionally robust, encompassing customary deliberations, ulayat boundary enforcement, selective timber extraction, and mandatory fallow replanting. This high level of participation is driven by a synergistic interplay between internal socio-cultural drivers—such as high economic reliance on non-timber forest products (NTFPs), profound Traditional Ecological Knowledge, elder leadership, and the 'Sarainan Purimanuaijat' kinship ethic—and external institutional support comprising capacity-building initiatives from NGOs, collaborative conservation partnerships with the Siberut National Park Authority, and shared hydrological security needs.

Furthermore, customary wisdom rooted in Arat Sabulungan, Uma clan governance, Sikerei spiritual healing practices, traditional zoning (Pumonean and Leleu Keraet), and Tulou restitution sanctions constitutes a highly sophisticated, self-enforcing socio-ecological regulatory framework. For the Monganpoula community, the forest embodies a holistic socio-cultural, medicinal, and spiritual life-support system (Purimanuaijat), making environmental conservation an existential imperative inextricably linked to cultural survival. However, long-term stewardship faces critical vulnerabilities arising from the intergenerational erosion of customary knowledge, modernization pressures, tenurial dualism between customary claims and state forest estates, growing cash-income demands, and project-dependent external mentorship.

To address these challenges, sustainable forest governance in Monganpoula must shift from top-down bureaucratic control to an institutionalized Collaborative Management (Co-management) framework. Such a framework must formally anchor and harmonize customary norms within administrative Village Regulations (Perdes) and Regency Decrees, thereby securing legal tenure, preserving traditional ethnobotanical wisdom, and safeguarding biocultural diversity across the Mentawai Archipelago.

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