

# Challenges in Implementing Sustainable Forest Management in the Era of Globalization in Indonesia

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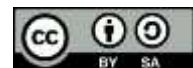
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## ABSTRACT

This study examines the challenges of implementing Sustainable Forest Management (SFM) in Indonesia within the rapidly evolving context of globalization. Using a qualitative literature review of 10 Scopus-indexed articles, the analysis identifies key obstacles that hinder effective and sustainable forest governance. The findings reveal that institutional weaknesses—such as fragmented policies, weak law enforcement, and limited coordination among governmental agencies—remain central barriers. Economic pressures driven by global market demands for timber and agricultural commodities intensify deforestation risks and complicate the alignment between development goals and conservation priorities. Social challenges, including limited community participation, land tenure conflicts, and uneven distribution of benefits, further constrain the success of SFM initiatives. Additionally, environmental degradation, climate change impacts, and insufficient adoption of advanced monitoring technologies continue to undermine forest protection efforts. Global sustainability frameworks and certification schemes, while beneficial, introduce complex requirements that local stakeholders often struggle to meet. This study concludes that addressing SFM challenges in Indonesia requires strengthening institutional capacity, enhancing community empowerment, aligning economic incentives with conservation goals, and integrating advanced technologies to support evidence-based policymaking.

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## 1. INTRODUCTION

Sustainable Forest Management (SFM) has become a central theme in global environmental governance as nations confront the intensifying impacts of climate change, biodiversity loss, and economic pressures linked to natural resource exploitation. Indonesia—home to one of the world's largest tropical forest areas—plays a

critical role in maintaining global ecological stability [1], [2]. Its forests provide essential ecosystem services, including carbon sequestration, watershed regulation, habitat protection, and livelihood support for millions of people. However, the forces of globalization have increased the complexity of sustainably managing these forest resources.

In the era of globalization, Indonesia faces new demands and challenges in forest governance. Global markets increasingly require sustainably sourced forest products, international agreements impose stricter environmental compliance, and transnational actors exert significant influence on national forestry policies [3], [4]. At the same time, global economic competition encourages rapid exploitation of forest resources for timber, agriculture, mining, and infrastructure development. These dynamics create a persistent tension between economic growth aspirations and the need to safeguard ecological integrity.

Despite various policy initiatives—such as the establishment of Forest Management Units (KPH), the expansion of social forestry programs, and participation in global frameworks like REDD+—Indonesia continues to struggle with deforestation, illegal logging, land-use conflicts, and institutional fragmentation. Weak regulatory enforcement, overlapping land-use regulations, limited community empowerment, and inadequate monitoring technologies remain recurring obstacles to the effective application of SFM principles. These challenges illustrate the gap between policy formulation and practical implementation on the ground.

Drawing from a literature review of ten Scopus-indexed academic sources, this study aims to examine the multifaceted challenges Indonesia faces in implementing SFM within a globalized context. By synthesizing insights from existing scholarly work, the study provides a comprehensive understanding of both structural constraints and emerging barriers that hinder sustainable forest governance. The findings offer an evidence-based foundation for strengthening policy interventions, enhancing collaborative governance, and improving the resilience of Indonesia's forest management systems amid global environmental and economic transitions.

## 2. LITERATURE REVIEW

### 2.1 Concept of Sustainable Forest Management (SFM)

Sustainable Forest Management (SFM) refers to the stewardship and use of forest resources in ways that maintain biodiversity, productivity, regeneration capacity, vitality, and ecological functions while fulfilling social, economic, and cultural needs for present and future generations [5], [6]. According to global frameworks such as the Food and Agriculture Organization (FAO) and the International Tropical Timber Organization (ITTO), SFM emphasizes balancing ecological protection with socio-economic benefits. Core principles of SFM include long-term forest health, stakeholder participation, transparency, and adaptive management [7], [8]. In Indonesia, SFM has been adopted as a national strategy to ensure that forest utilization aligns with conservation goals, local community welfare, and long-term ecological sustainability.

### 2.2 Globalization and Its Implications for Forest Governance

Globalization has significantly reshaped environmental policy and natural resource management worldwide. It has increased global interdependence, international trade, and cross-border influence of markets, institutions, and civil society organizations. In the forestry sector, globalization has resulted in expanding global demand for timber, paper, and agricultural commodities like palm oil—driving pressure on forest ecosystems [7], [8], especially in developing countries like Indonesia. At the same time, global environmental regimes such as REDD+, the Paris Agreement, and international certification schemes (e.g., FSC, PEFC) have introduced new expectations and standards for sustainability. Literature suggests that globalization produces both enabling and restricting forces; while it promotes sustainable norms and technology transfer, it also intensifies competition for land resources, contributes to environmental externalities, and challenges the capacity of national institutions to maintain control over forest governance.

### 2.3 Historical Context of Forest Management in Indonesia

Indonesia's forest governance has evolved through several phases, starting from centralized state control during the Suharto era to decentralized forest administration after the Reformasi period. Historically, forests were treated as economic assets aimed at supporting national development, often resulting in large-scale logging concessions, land conversion, and extractive practices [3], [9]. After decentralization, local governments were given more authority, but this shift also created problems such as overlapping regulations, inconsistent enforcement, and increased rent-seeking behavior. Recent reforms introduced Forest Management Units (KPH), promoted social forestry, and strengthened conservation programs. However, literature consistently highlights that despite these initiatives, structural governance issues persist, including weak institutional capacity, unclear jurisdiction, limited monitoring capabilities, and insufficient community involvement.

## 3. RESEARCH METHODS

This study employs a qualitative descriptive design using a systematic literature review approach to synthesize existing scholarly findings on the challenges of implementing Sustainable Forest Management (SFM) in Indonesia within the context of globalization. The qualitative design enables an in-depth interpretation of concepts, patterns, and emerging themes derived from selected academic sources, allowing the analysis to capture nuanced governance issues and structural complexities. The review focuses specifically on how global pressures intersect with national and local forest management dynamics, generating insights grounded in evidence from peer-reviewed studies.

The data for this study were obtained from ten Scopus-indexed journal articles selected through a structured and transparent search process. Inclusion criteria ensured academic rigor and relevance, limiting the selection to articles published between 2014

and 2024, written in English or Indonesian, and directly addressing SFM or Indonesia's forest governance challenges. Studies related to themes such as globalization, forest policy, community participation, environmental sustainability, monitoring technology, REDD+, and certification systems were prioritized. Articles lacking substantive relevance to SFM or focusing solely on non-Indonesian contexts were excluded to maintain analytical precision.

Data collection followed a systematic sequence, beginning with keyword identification using terms such as Sustainable Forest Management, Indonesia, globalization, governance, deforestation, REDD+, certification, and social forestry. An initial database search produced several dozen documents, from which titles and abstracts were screened to narrow the selection to ten highly relevant studies. Each article was read in full, and key information—including authorship, study focus, methodology, principal findings, and linkages to globalization—was extracted using a structured data extraction table. Extracted content was then coded and grouped into major themes such as institutional challenges, socioeconomic pressures, environmental threats, technological gaps, and global market or policy influences.

The analysis employed theme-based content analysis, involving open coding to identify recurring issues, axial coding to cluster related concepts, and selective coding to integrate themes into a coherent explanatory narrative. This approach allowed for pattern identification, cross-study comparisons, and conceptual mapping of how globalization intensifies the challenges of SFM implementation in Indonesia. To enhance credibility, several validity and reliability strategies were applied, including source triangulation across ten Scopus-indexed articles, clear documentation of search and coding procedures, and alignment of identified themes with established theoretical frameworks on SFM and globalization.

## 4. RESULTS AND DISCUSSION

### 4.1 Institutional and Governance Challenges

The literature consistently identifies institutional weakness as one of the most significant barriers to effective Sustainable Forest Management (SFM) in Indonesia. Weak law enforcement remains a core issue, with illegal logging continuing despite extensive regulatory frameworks. Numerous studies emphasize that limited enforcement capacity, corruption, and inconsistent penalties undermine governance effectiveness [10], [11]. These weaknesses are compounded by overlapping policies and fragmented institutional structures, where multiple agencies—across national, provincial, and local levels—hold conflicting mandates, resulting in uncoordinated decision-making and frequent land-use disputes [12]. Decentralization, originally intended to strengthen local governance, has further created uneven SFM implementation due to variations in resources, technical expertise, and commitment among local governments [12], [13].

Collectively, these institutional constraints form systemic barriers that hinder Indonesia's ability to meet global sustainability expectations. Scholars recommend strengthening penalties for illegal activities, improving inter-agency coordination, integrating advanced monitoring technologies, and expanding community-based forest management as strategies to enhance enforcement and governance capacity [11]. Addressing policy overlap and institutional fragmentation through streamlined legal frameworks and more coordinated stakeholder engagement is essential for improving policy coherence. At the same time, decentralization challenges highlight the need for targeted technical assistance, long-term capacity building, and clearer role distribution across government levels to ensure that SFM principles are applied consistently nationwide.

### 4.2 Economic Pressures and Market-Driven Dynamics

Globalization has intensified economic pressures on Indonesia's forests, as highlighted consistently across the reviewed literature. High global demand for timber, palm oil, and paper—major export commodities—drives rapid land conversion and resource extraction, often compromising ecological sustainability [14], [15]. The expansion of trade in forest-risk commodities has further increased deforestation, biodiversity loss, and carbon emissions [15]. These pressures are compounded by large infrastructure and investment-driven projects that frequently overlap with forested areas and prioritize economic objectives over conservation goals [16]. This conflict between conservation and development is further reinforced by economic analyses showing that land preservation often provides greater long-term value than extractive uses, indicating the need for policies that balance ecological and economic priorities [17].

Low economic incentives for sustainable practices also pose major challenges, especially for forest-dependent communities and small-scale producers who struggle to meet certification requirements due to high compliance costs, limiting their access to premium sustainability-driven markets [18]. Additional barriers such as inadequate infrastructure, limited technical training, and economic pressure from illegal activities further inhibit the adoption of sustainable forest management practices [16]. Without stronger alignment between market incentives and conservation goals, globalization will continue to exert increasing pressure on Indonesia's forest ecosystems, reinforcing the structural tension between economic growth and ecological sustainability.

### 4.3 Community Participation and Social Challenges

Sustainable forest management cannot succeed without meaningful community participation, yet the reviewed literature shows that Indonesia's social forestry programs face persistent challenges

that limit their effectiveness. Communities often lack the technical skills, capital, and market access needed to manage forests sustainably, resulting in limited empowerment and reduced capacity to participate in forest governance [12]. These limitations highlight the need for enhanced technical assistance, targeted capacity building, and stronger market-oriented strategies for community-based forest enterprises [12]. In addition, widespread land tenure disputes between communities, private companies, and government agencies complicate participatory forest management efforts [19]. Unclear boundaries, overlapping claims, and historical disputes continue to intensify conflicts, underscoring the need for clearer policy frameworks and effective conflict resolution mechanisms [20].

The literature also emphasizes that uneven distribution of economic benefits undermines local support for sustainability initiatives, as forest-dependent communities do not always receive fair outcomes from social forestry programs [12], [20]. Ensuring equitable benefit-sharing mechanisms and aligning local practices with global human rights principles are essential for achieving long-term community engagement and sustainable outcomes [20]. Overall, these findings demonstrate that social challenges—ranging from limited empowerment to land-rights conflicts and inequitable benefits—are deeply intertwined with governance issues. Addressing them requires coordinated solutions that combine policy reform, stakeholder collaboration, and continuous capacity building.

#### **4.4 Environmental and Ecological Challenges**

Environmental pressures remain one of the most significant obstacles to achieving Sustainable Forest Management (SFM) in Indonesia. The reviewed literature highlights that deforestation and forest degradation continue at concerning levels, driven primarily by agricultural expansion, mining activities, logging, and recurring forest fires [21], [22]. These fires are often intensified by prolonged dry seasons, contributing to severe

carbon emissions and long-term ecosystem damage [21]. Habitat destruction resulting from these pressures threatens Indonesia's rich biodiversity, including endangered species and key ecosystem functions such as carbon sequestration, water regulation, and soil stability [22]. The decline in biodiversity weakens ecosystem resilience, diminishing the forest's capacity to adapt to environmental changes and recover from disturbances [22].

Climate change further exacerbates these environmental challenges. Rising temperatures, extreme weather events, and prolonged dry seasons hinder natural regeneration processes and increase the frequency and severity of forest fires [22], [23]. Tropical forests—such as those in Indonesia—are particularly sensitive to these climatic shifts, making them highly vulnerable to degradation [24]. To address these pressures, the literature emphasizes the importance of integrating technological innovations such as drones and remote sensing to strengthen monitoring systems [23], alongside community involvement and multi-stakeholder collaboration to enhance ecosystem resilience [21], [25]. Strict regulations, capacity building, and improved environmental governance remain essential for ensuring long-term sustainability and effective forest resource management [25].

#### **4.5 Role of Global Standards and International Mechanisms**

Globalization has introduced international frameworks such as FSC, PEFC, and REDD+ to strengthen sustainable forest governance, yet each system faces substantial challenges in the Indonesian context. Certification schemes like FSC and PEFC require strict compliance, including detailed technical documentation and continuous monitoring, which can be particularly burdensome for small-scale producers with limited resources [26]. The high complexity and financial costs of certification often exclude smallholders, reducing the intended environmental and social benefits of these schemes [26]. REDD+, which provides financial incentives to reduce emissions from deforestation, also encounters significant

implementation issues related to monitoring, benefit-sharing mechanisms, transparency, and stakeholder coordination [27]. Furthermore, disagreements over how forests should be valued environmentally and socially complicate the operationalization of REDD+ incentives [28].

Global policy pressures add another layer of complexity to national forest governance. International expectations for sustainability often conflict with Indonesia's development priorities, creating governance dilemmas for policymakers seeking to balance economic growth with conservation goals [28]. Although integrating forests into international climate regimes is viewed as a potential pathway for enhanced sustainability, conflicting interests and values among global and domestic actors continue to impede coordinated action [29]. These findings suggest that while international mechanisms offer valuable opportunities for improving forest governance, their effectiveness depends on adapting policies to local capacities, socio-political dynamics, and the needs of small-scale forest users.

#### **4.6 Technological and Monitoring Gaps**

Although technological advancements such as satellite monitoring, GIS mapping, and drones offer substantial potential for strengthening forest surveillance, the literature highlights several persistent gaps in technological adoption. Unequal technological capability across regions remains a major barrier, as remote areas often lack access to digital tools and trained personnel capable of operating them effectively. Limited integration of monitoring databases across government agencies further fragments information flows, hindering real-time decision-making and coordinated planning. In addition, the high cost of acquiring, maintaining, and scaling modern technologies restricts adoption by local forestry units operating under budget constraints. These barriers underscore the urgent need for greater investment in technological infrastructure, improved inter-agency data integration, and long-term

capacity-building programs to support effective monitoring.

A synthesis of the reviewed literature reveals that Indonesia's challenges in implementing Sustainable Forest Management (SFM) are multidimensional, shaped by the interaction of governance weaknesses, economic pressures, socio-cultural constraints, environmental degradation, and global policy expectations. Globalization functions both as a catalyst—by promoting international cooperation, raising sustainability standards, and increasing global awareness—and as a constraint, intensifying market pressures, accelerating land competition, and imposing regulatory requirements that often exceed local institutional capacities. To address these interconnected issues, scholars recommend strengthening governance and institutional coordination, empowering communities and securing equitable land rights, aligning economic incentives with environmental objectives, adopting advanced monitoring technologies, and developing adaptive policies capable of responding to global shifts. Through these integrated strategies, Indonesia can enhance the long-term effectiveness of SFM in the era of globalization.

#### **5. CONCLUSION**

The review of 10 Scopus-indexed studies reveals that Indonesia's efforts to implement Sustainable Forest Management face a combination of institutional, economic, social, environmental, and technological challenges, many of which are intensified by globalization. Institutional fragmentation, weak enforcement, and overlapping land-use policies create obstacles to coherent forest governance. Global market pressures for timber, palm oil, and other commodities continue to drive deforestation and complicate the balance between economic growth and ecological sustainability. Social challenges—such as limited community involvement, land tenure disputes, and unequal benefit-sharing—further hinder the adoption of sustainable practices. Environmental threats, including biodiversity

loss, forest degradation, and climate change, place additional strain on forest ecosystems. Moreover, the slow adoption of technological tools limits the capacity for accurate monitoring and timely decision-making.

At the same time, globalization brings opportunities through international sustainability standards, environmental agreements, and financial mechanisms such as REDD+. However, these global frameworks must be adapted to local capabilities and governance contexts to ensure effective implementation.

To overcome these challenges, Indonesia must strengthen multi-level governance systems, enhance institutional

coordination, and invest in human and technological capacity-building. Empowering local communities through clearer land rights, improved access to resources, and inclusive decision-making is essential. Aligning economic incentives with conservation goals—such as through sustainable certification, green financing, and community-based forest enterprises—can create long-term sustainability. Ultimately, achieving Sustainable Forest Management in Indonesia requires a holistic, adaptive, and collaborative approach that integrates global sustainability demands with local socio-economic realities and ecological priorities.

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