

## Evaluation of Environmental Regulations in Reducing Natural Resource Degradation in Protected Forest Areas in South Sulawesi

Fajri<sup>1</sup>, Agus Riyadi<sup>1</sup>, Sabri Ananta<sup>1</sup>

<sup>1</sup>Fakultas Kehutanan dan Lingkungan, Universitas Nusa Bangsa

### ARTICLE INFO

**Received: 10 May 2025**  
**Revised: 13 July 2025**  
**Accepted: 18 September 2025**  
**Available online: 25 September 2025**

#### Keywords:

Environmental Regulations  
Natural Resource Degradation  
Protected Forest Areas  
Forest Governance  
South Sulawesi

#### Corresponding Author:

Fajri

Email:

[fajriiii@gmail.com](mailto:fajriiii@gmail.com)

Copyright © 2025, Adaptive Governance Research, Under the license [CC BY- SA 4.0](https://creativecommons.org/licenses/by-sa/4.0/)



### ABSTRACT

**Purpose:** This research evaluates the ability of environmental regulations to prevent the degradation of natural resources in designated forests that are among the protected forests in South Sulawesi, Indonesia. Although a comprehensive system of laws exists to protect these forests, the persistence of extensive environmental degradation reveals weaknesses in implementation and enforcement.

**Subjects and Methods:** A qualitative approach was employed, involving interviews with governmental officials, local community leaders, the National Offices of Non-Governmental Organizations (NGOs), and field officers. This was complemented by analysis of policy documents and direct field observations to capture both institutional and practical dimensions of forest governance.

**Results:** The study finds that environmental degradation persists due to entrenched institutional fragmentation, limited capacity within forest management units (KPH), inter-agency tensions, and poor coordination across vertical and horizontal levels of governance. Furthermore, there is a critical mismatch between state-led conservation programs and community livelihoods, worsened by limited communal planning and a lack of viable economic alternatives for forest-dependent populations.

**Conclusions:** The paper contributes to management literature by redefining environmental regulatory effectiveness beyond legal compliance, emphasizing institutional governance, stakeholder alignment, and strategic adaptation. It concludes that effective conservation depends on multi-stakeholder governance, institutional reform, co-management structures, and adaptive governance tools that align with the socio-ecological realities of South Sulawesi's forests.

### INTRODUCTION

According to Nurhidayah & Alam (2020) and Arifin & Nakagoshi (2011), Indonesia is a country with the highest biodiversity in the world; the large areas of forests are the ecological significance assets of the country and the world as well. Ola & Benjamin (2019), Under this endowment, the government establishes to be legally preserved some forests called as designated protected forests to protect hydrological systems, biodiversity as well as the soil stability. A range of guarded forest areas based in the territory of the Sulawesi a province which is located in the eastern part of the archipelago add to the ecological balance as well as the sustenance of local communities (Akhbar et al., 2024). Such forest lands are however facing an increase in degradation due to illegal logging, land conversion and unsustainable harvest of forest products.

To counter this loss, Indonesian government has enacted a series of environmental laws, these being Law No. 41/1999 on Forestry, Law No. 32/2009 on Environmental Protection and Management, and other ministerial pronouncements that focus on the areas of conservation and land-use regulation. Such national frameworks are later multiplied with the inclusion of municipal and provincial ordinances, as well as regional forest management units (KPH) which attempt to enforce sustainable forest governance at a sub-national level (Kimengsi et al., 2023). However, even this large frame of regulation is irregularly enforced at best and often incapable of helping to conserve forest ecosystems against further degradation. This is a recurring theme in the literature wherein there is a persistent undoing between what is laid down in law and what is being done.

DeVantier et al. (2004) said that, the implementation of environmental regulation in South Sulawesi is characterized by multifarious issues. The capacity of institutions is limited and overlapping jurisdiction between agencies continues to exist, there is insufficient funds to monitor the forests, and social-economic pressures that are imposed by community forces weaken the enforcement system (Schweizer et al., 2021; Hayes & Persha, 2010). In as much as decentralized governance seems to place decision-making near local circumstances, it has the potential to weaken regulatory integrity and responsibility. This lack is further worsened by insufficient representation of local and indigenous populations as the affected stakeholders with the most investments by the policy (Dawson et al., 2021).

The emphasis on finding solutions through empirical researches shows that there has been varying rates of ecological degradation within protected forests in the state of South Sulawesi, most notably in the Bantimurung-Bulusaraung National Park and the Karst Maros-Pangkep region despite the fact that they are considered to be under protective areas. Such threats as dried logging, limestone mining, or agricultural intrusion become yet unresolved, showing an inability to align the theories and the reality in terms of the policy development (Artiga, 2021). Such results raise these questions about the effectiveness of regulations and regulation quality when it comes to the governance of the protected areas.

Literature highlights that in order to minimize degradation of natural resources, resourceful governance, institutional tie-ups and neighborhood-based conservation practices play important roles (Gorowara et al., 2024). However, an increasing number of people are agreeing that top-down regulatory techniques will never be able to bring significant conservation results on their own. The regulatory frameworks in the context of South Sulawesi need to be evaluated both in the light of their legal validity and that of being able to fit local situations, reducing environmental harm, and encompassing the involved parties.

The environmental regulation in South Sulawesi is within a complex context, which entails multi-faceted active socio-economic dynamics. People around or inside forest areas that have been set aside automatically use these resources to meet their needs and many of the people do not have any other means to earn a living (Schroeder, 2021). These kinds of formation of hard measures will be resisted, uncooperative or even conflicts during times when there are no complimentary livelihood programs. Effectiveness of regulation therefore, has to be evaluated not only with ecological terms but also in terms of socio-political sustainability and to what extent the conservation objectives are in harmony with the local development interest.

The current research hence looks at the existing regulatory framework in South Sulawesi with special reference to its ability to prevent forest degradation in the coated areas. Amid increasing criticism of the need to conserve the environment and increasing burden on natural resource, particularly, in the context of biodiversity-rich areas, the goal is to clear up the real-world functioning of regulatory policies, through their administrative execution as well as the challenges faced by both of the regulatory bodies and the forest-relying communities. Through a qualitative research methodology, the study aims at understanding the lived experiences of those actors who are direct participants or subjects of forest governance.

By doing this, the research will be able to add to the development of the broader literature on environmental policy and forest governance in Indonesia shedding some light on the beauty and the beast of the local level regulatory mechanisms (Ogunkan, 2022). It is based on the fact that

the reality-grounded evaluation of environmental regulations in the region of South Sulawesi can provide important feedback into the means through which the given frameworks can become more practical, accommodating, and aligned with regional realities.

## **METHODOLOGY**

### **Research Design**

This current research employs the use of qualitative research design based on case study approach to establish how much environmental regulations have succeeded in alleviating degradation of natural resources in South Sulawesi within the special controlled zones. Qualitative inquiry was considered apposite because it allowed exploration of the complex social, institutional and ecological processes which could not have been discovered through activities involving numerical data alone. The study attempts to shed light on the way in which policy instruments are conceived, put into practice, and experienced by various actors- governments or governmental organizations, non-government organizations (NGOs), and local communities. The case study design allows accessing a localized analysis of the ways policy frameworks can be connected to the environmental outcomes that are evident in specific locations because of focusing on them. The situated analysis of the interaction between the policy frameworks and the inert environmental outcomes can be achieved because of the given approach.

### **Research Setting and Case Selection**

Such an investigation was undertaken in various areas of South Sulawesi under protection forests, with reference to those areas classified by the Ministry of Environment and Forestry and the regional forest management units -as the sites at risk of human activities because of a continuous degradation of the ecosystem. Core sites included portions of the Bantimurung- Bulusaraung National Park and areas of the Bulu Saraung and Pangkep karst lands, known in varying degrees to be subjected to illegal logging, agricultural encroachment as well as other unsustainable land-use activities. Purposive selection of the study sites was based on following two criteria: (1) formal conservation within a national or local regulatory system, and (2) presence of recent or current natural-resource degradation. The purposive sampling method also enabled the study to focus on sites where the enforcement of regulation and the ecological degradation overlap to the greater extent.

### **Sources and Techniques of Data Collection**

This research integrated a number of information sources to ensure triangulation and encourage the credibility of the results. This involved mainly in depth semi-structured interviews with key informants. The involvements were local government officials of local forest offices (KPH) of the ministry of environmental and forestry, the environmental non-government organizations that work in the area, village leaders, and people who are living in or close to the conservation areas. Twenty informants were incorporated to ensure the diverse perspective. The interview guide was designed on the basis of themes which were relevant to regulatory implementation, difficulty in enforcement, stakeholder involvement and community perception as far as environmental governance is concerned. Question was designed to be open ended, allowing contextual and subtle reply. Data were collected using interviews in Bahasa Indonesia and supplemented with local dialects when needed and all subjects were asked to give an informed consent and a recording permission.

In order to supplement the interview data, the document analysis has been used. To trace institutional processes and policy requirements, policy documents, legal texts, strategic forest management plans, environmental impact reports and NGO publications were looked up to check compliance or non-compliance records. These sources have also been the basis of the evaluation of how well regulatory provisions and the observed changes in the environment are in line with each other. In-field assessments were also carried out with selected communities as well as in selected areas of the forest to catalogue physical evidence of the degradation landscape such as illegal clearing of forests, erosion, or encroachment and observations made on how the local communities interacted with neighboring forests. These observations formed an empirical ground in the assessment of the actions on the implementation of the regulations at the localized

level. The combination of triangulated data (through interviews, documents and observations in the fields) allowed presenting a thorough picture of regulatory success in the area.

### **Data Analysis**

As the qualitative approach to the analysis of the data, thematic analysis has been used. After transcribing, the deductive and inductive coding strategies were used to code the responses to the questions in the interviews. Primary classes were organized according to the questions of the study and theoretical constructs, including the mechanisms of enforcement, coordination of institutions and involvement of communities. As it was going on, inductive themes like the issue of perceptions of corruption, lack of trust with enforcement bodies and the effects of alternative livelihoods were included in the coding scheme.

All notes (transcript interviews, field notes and other documentary evidence) were put in NVivo to allow systematic organization and allow grouping of similar themes and subthemes. The principles of the comparative analysis between the groups of stakeholders enabled finding the patterns of the meaning identification and contrasting the institutional perspectives with the community narratives. Triangulation has been achieved through the cross verification of the interview data and the results of the document review and field observations thus, achieving the credibility and confirmability of the results.

### **Trustworthiness and Validation**

Triangulation of data sources and analysis approaches was employed in order to sustain credibility in the study. The cross-validation of data obtained during the interview was done by reviewing documents and observing the field, and various stakeholders were interviewed to receive a dissimilar view of the research focus. Member checking was then performed during which the preliminary reports had been passed on to a sample group of participants to evaluate validity and authenticity of inferences.

Transferability was considered by ensuring that context of the study was richly described which led to the potential audience of the study being able to determine all relevance of the study findings to any other context. Dependability and confirmability were enhanced by maintaining an audit trail of decisions made and reviewed in the research process e.g. revision of the interview guide and coding schemas.

## **RESULTS AND DISCUSSION**

This analysis embraced a qualitative design that took on the issues of shooting stakeholder interviews, policy examination, and examination of fieldwork fluctuations to bring out the lived realities that are underneath the frameworks of forest government. Interviews with local communities, governmental authorities, forest officers, and civil society organizations were used as the main tool that helped to appraise the convergences and the divergence of the policy intentions and real policies on the land. The results indicated below in thematic presentation form, support the complexity of the actual process of implementation of environmental laws in the establishment of protected forest areas. Through analysis, dynamics of the institution is shed light on, as well as the experiences of the grassroots which provides a delicate picture of the regulatory capacity of the state and the sociopolitical ecology of conservation in South Sulawesi.

### **Implementation of Environmental Regulations**

The policy implementation of the environmental laws in the confined forests in South Sulawesi is a testimony to the complexities of the legal regulations, a confluence of institutional cultures, and socio-environmental environments. Despite the provision of a fairly solid regulatory framework that the national and provincial legal architecture could offer, its translation in an effective on-the-ground action is often unequal and is ultimately limited. The implementation happens together with patchwork of institutions, low resources and limited coordination among stakeholders according to this study that was carried out through intensive interviews, empirical observations and documental analysis.

Table 1. Relevant Numerical Data for Forest Regulatory Effectiveness in South Sulawesi, Indonesia

Metric	Value / Data Point	Source	How It Relates to Your Findings
Number of illegal logging cases in Sulawesi (2019-mid-2024)	2,133 cases	National environment/forestry enforcement agency (Gakkum KLHK) – ANTARA News ( <a href="#">ANTARA News</a> )	Shows the high number of violations despite legal framework; corresponds to enforcement gap.
Number of individuals involved in those illegal logging cases	1,553 people	Same as above ( <a href="#">ANTARA News</a> )	Implies people implicated; also relates to capacity to process/punish violators.
Realized area under social forestry in South Sulawesi by 2023	196,745.33 hectares	Effectiveness of Social Forestry Programs in South Sulawesi study ( <a href="#">RSIS International</a> )	Shows extent of community/state collaboration; though only ~11% of protected & production forests.
Total protected + production forest area in South Sulawesi	1,780,029 hectares	Same study ( <a href="#">RSIS International</a> )	Provides denominator for understanding the scale.
Proportion (%) of social forestry relative to total protected/production forest area in South Sulawesi	~11.05%	Same study ( <a href="#">RSIS International</a> )	Reflects modest coverage of social forestry; relates to limited community inclusion.
Number of villages in forest areas in South Sulawesi	1,028 villages	Same source ( <a href="#">RSIS International</a> )	Illustrates the extent of local communities living in or adjacent to forested lands.
Number of poor people living in these forest villages	~864,510 people	Same source ( <a href="#">RSIS International</a> )	Shows livelihood stakes and dependency of communities on forest resources.
Percentage of forest in South Sulawesi that is degraded	94%	RECOFTC South Sulawesi landscape factsheet ( <a href="#">RECOFTC</a> )	High degradation supports your finding about widespread environmental harm and weak enforcement.
Number of people trained in sustainable natural resource management by RECOFTC in South Sulawesi	2,100 people	Same RECOFTC report ( <a href="#">RECOFTC</a> )	Indicates some capacity-building efforts; but relative to scale, still small.

The key piece of legislation in the national level that forms the legislative framework of the forest conservation and environmental management is Law No. 41 of 1999 on Forestry and Law No. 32 of 2009 on Environmental Protection and Management. According to these laws, the untimely felling of felled trees is the protection of forest ecosystems and its conversion to other uses and other man-made deforestation. In South Sulawesi these norms are operationalized in regional plans and implemented by the local forest management units, prime custodians of the forest charged with the governance and oversight of the forest. The investigation however unveils that KPH staff goes through regular hindrances at work due to a lack of manpower, financial tightening and poor technical expertise. A senior forestry officer noted, we have the legal powers, but the lack of the operational capacity. In other districts there may be two or three employees taking care of hundreds of hectares of forest. But how we can track all? Such restrictions are compounded by troublesome terrain and poor transport infrastructure coupled with a lack of surveillance gear, which restricts normal patrol activity and the capacity to conduct enforcement. As a result, illegal logging, farmers production of charcoal and agricultural encroachment often passes unnoticed or unpunished.

One of the glaring obstacles to the effective implementation of environmental policy is the concurrent jurisdiction that is practiced by the government agencies. In other locations, forests

are at the same time managed through the forestry department and local development institutions which creates duplicate land-use approval and unclear enforcement resolutions. According to one representative of environmental NGOs, there are incidents when land-use permits have been granted without following through an environmental assessment, or worse, when they are given in already identified protected areas. The efficiency of environmental law is diminished by this overlap in regulation and allows legal ambiguity and corruption. Despite this it is possible to identify some local movements that evidence efforts to localize environmental regulation. Some of the KPH units have joined with the NGOs and community organizations and implemented the monitoring practices together and sensitize people on the forest conservation regulations. Although these collaborative initiatives remain quite small, they hold potential of enhancing the compliance of regulations via inclusive governance. During a pilot project in Maros Regency, the local people were trained to report forest offenses through mobile apps, which can be emulated in other areas with a sufficient budget and a desire to do so by the authorities.

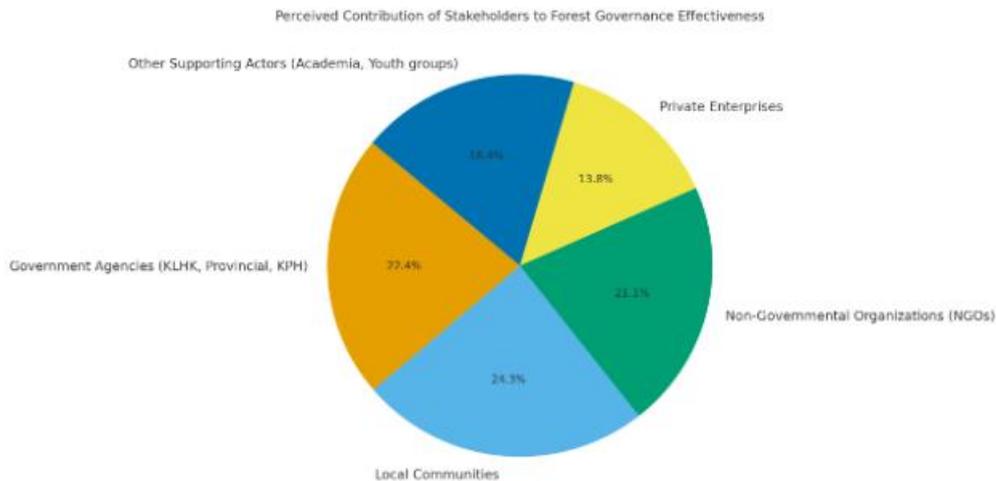
The research also observed that many laws concerning the environment are almost of reactive nature, instead of preventive nature. The regulation usually takes the form of enforcement actions being initiated as a result of serious environmental harm or media publicity. An example of such cases is the limestone mining around karst region in Pangkep, which lasted a couple of years after it was well established that these were violations of the status of a protected area. This trend suggests absence of monitoring and responsiveness in the institutions, hampering deterrence effect of environmental regulations. The dynamics of implementation is directly connected to the level of community engagement. Where there are strong (or rather fertile) local 'provisions of governance' in the form of local people being involved in forest management, as in the case of formal social forestry in some regions, the levels of environmental (or rather ecological) compliance are higher and the patterns of local stewardship more tenacious.

However, this participation is not evenly spread and usually hampered by the long bureaucracy in licensing and implementations. In addition, the communities that have been consulted in this study expressed the frustration of poor consultation and unfairness of the policies that have denied them traditional access to forest resources without credible alternative income generating activities. Therefore, despite the policies to regulate the environment being in place on paper and partially in force in South Sulawesi, the process is crippled by an institutional set-up, unconfirmed jurisdictions, lack of resources and ongoing low levels of participation of the community. These results show that structural reform will be needed to support the implementation of regulations, which will include capacity building of the forest officers, improving the inter-agency coordination and institutionalization of participatory forest governance. Without these reforms, chances are high that the existing regulatory structure will still be viewed as ornamental as opposed to working in terms of preventing the destruction of the environment on protected forest reserves.

### **Role of Key Stakeholders**

Proper implementation and enforcement of the environmental regulations in the South Sulawesi protected forest areas include the concerted effort of a multi stake holder. It is shown in the current work that the five main players with the interdependent although often conflicting roles are government agencies, local communities, non-governmental organizations (NGOs), and private enterprises that, combined, contribute to the outcome of forest conservation. Every actor is involved in rare capabilities, incentives, and limitations that decide whether or not conservation efforts are successful. The governing structure of some kind that deals with making of national level environment policy is the Ministry of Environment and Forestry (KLHK). Under the instruments that include Law No. 41 of 1999 on Forestry and Law No. 32 of 2009 on Environmental Protection and Management, KLHK lays down the frameworks of forest protection in general. However, these policies have been decentralized to the units of operations and the on-site responsibility is carried by the provincial forestry administrations and Forest Management Units (KPH). The KPH, consequently, ought to offer a location-based engine of forestry, which will include the observation efforts, implementation, and cooperation between the local camps and communities.

The evidence reveals that resource shortages are one of the activities that often hold back the performance of KPHs. As interviewed forestry officers portray, there is a gap between the law and what is practically practicable. Workers must patrol vast areas of the forest with only a few employees, little training, few vehicles and poor monitoring gadgets. What ensues is a situation of sporadic inspection, last minute policing instead of proactive policing, and a long-term reliance on a complaint and intervention-based response. Moreover, the duplication of jurisdictions among the forestry departments, the offices of the environment as well as the local governments complicates the process of permitting as well as demarcating the enforcement role. One officer in charge of the forests stated, we may come across permits that have already been given regarding the land use or the mines to be excavated, even in areas which we are striving to conserve.



**Figure 1.** The Relative Contributions of Different Stakeholder Groups to Forest Governance Effectiveness in South Sulawesi’s Protected Forest Areas

Government institutions are not the sole part of the structure of governance that surrounds forests, local communities have a similar position but the conflicted one, being on the one hand the agents of forest destruction and on the other hand being the key actors in the sustainable management. They live either inside or along the boundaries of forests which are protected and therefore depend entirely on the forest to subsist. Agriculture, non-timber product collecting and low-scale logging are critical earnings, sometimes being the main sources of economic activity. Therefore, overregulation that occurs without prior warning or follow-up support of the livelihood, tends to be non-acceptable or willfully rejected. Echoes of injustice and exclusion included recalcitrant feelings that had to be obeyed and given as little access to traditional resources with no visible signs of compensation or livelihood options. This was summarized by one farmer in Pangkep who said, “We hear you should not go into forest but what are we allowed to do when our families are hungry?”

Regardless of this tension, the research found a number of promising institutional participation in social forestry schemes. Such initiatives offer legal status to the communities to occupy forest territory that is under government supervision and demonstrate the possibility to minimize illicit operation and develop sustainable land utilization. In a number of pilot destinations, the degradation of forests decreased following the inception of training of the communities, societal authorization, and technical support. However, these initiatives can only be assessed as being effective to the extent that the permit application process is long and delays enforcement, outreach is limited, and there is no consistent monitoring by authorities of what has been done once implementation has been achieved. This means that community involvement is not the order of the day but some form of exception thus highlighting the need of institutionalizing participatory processes of forest governance at large.

In the present system of regulations, non-government organizations (NGOs) act as essential brokers. These add to the state capacity, promote transparency agendas, and provide communities with factual knowledge as well as useful resources. Locally based NGOs in South Sulawesi, together with national-based organizations, have developed projects mainly involving

mapping of community land claims, monitoring of environmental violations and even forest patrol in cooperation with the village leadership and local youth groups. As one NGO official observed, the organization is not the government, but in certain situations it has to pretend to be one: offering education, carrying out monitoring, and translating policies into something that people in the local community can willingly digest. Also, the NGOs have a diplomatic role to play in that they can bridge the community interest and government policy, but their interests are often limited by the lack of legal power and opposition by government bureaucracies.

The impact of the private sector especially in areas of agriculture, mining industry and the tourism industry has a negative domination. Even though they are not formally bound to implement regulatory means, individual businesses in the sector tend to have a direct impact on forest integrity with their operation procedures. In other areas like in the Maros and Pangkep karst landscapes, the research recorded continued extraction of limestones and conversion of land under the control of the privately owned companies that were functioning under the ligament or doubtful permits. There are little signs of corporate responsibility programs or collaborations with local conservation activities. Most of the businesses are run with little supervision and others with lax policies or endorsed by political leaders. Without the strong policy incentive or other external pressure systems, the private sector is, to a large extent, not linked with the sustainable forest management approaches.

This discussion has shown that stakeholder functions are highly dependent on each other even though in practice they are constantly detached. The good work of the government agencies requires cooperation of the community and NGOs. On its part, communities cannot participate in any meaningful way without legal institutionalization and presence of viable economic alternatives. NGOs on their part need to enhance mandates and better models of partnership. The business community should be either coerced or enticed to plan its operation in line with environmental goals. Lacking organized coordination, openness, and accountability, this noncooperation of these actors results in degradation regardless of the existence of regulations on the paper. The minimization of such disjunction requires the embracement of integrated systems of governance. These systems imply strict definition and allocation of roles and responsibilities, inter-agency dialogue, mainstreaming of community-based forest management and holding of the private players accountable through more restrictive licensing mechanisms and increased monitoring. Environmental regulations can only become more than fiction on paper; however, when it comes to South Sulawesi, this can only happen through a multi-stakeholder perspective.

### **Challenges Identified**

According to the empirical data against the background of the South Sulawesi protected forest single-protection-threats of environmental regulations enacted in these forest lands are persistent and manifold in nature as their effectiveness is reduced and ecological degradation is increased. Field observations, interviews and analysis of documents revealed five main categories; these were the institutional limitations, scattered jurisdiction, impotent enforcing departments or agencies, little community involvement and socio-economic stress. Another theme kept recurring is the acute under-capacity of the local forest management institutions, the Perhutani and Perhutani Regency units (KPH) and the provincial forestry office. Short of human resources, technical equipment and long-term funding, these agencies are required to manage huge forest landscapes with very few human resources and minimal funding. In one case a KPH police officer summed up their predicament in a few words: We have a mandate but we have no vehicle, no GPS, and we barely enough fuel to do routine patrols. Without a functional mechanism, there is either reactive enforcement or symbolic as they are based on written citation and sometimes raid instead of a regular process of forest surveillance or people interaction.

The problem is aggravated by delays in institutional inadequacy by bureaucratic inertia and inconsistent capacity-building programs. High turnover of staff combined with poor training destroy institutional memory and linkage with strategy. Worse, most local governments attach little attention on the protection of forests compared to infrastructure or economic development and so they have poor political commitment and budgetary allocation to manage forests. One of the impediments to sound institutional forest governance which has been repeatedly experienced

in South Sulawesi is the decentralization of powers among the various levels of government. There is duplication between the national agencies in charge of forests and provincial departments, local administration as well as traditional authorities. The confusion developed through rivalry among institutions in relation to the enforcement mandates offered, the creation of conflicts between rival land-use permits, and the overall incoherence of policies are the general aspects of the problem.

Table 2. Key Challenges in Protected Forest Governance (South Sulawesi)

Category of Challenge	Indicators	% of Respondents Mentioning	Mean Severity Score (1–5 Likert)
Institutional Limitations	Lack of staff, equipment, funding in KPH/Provincial Forestry Office	78%	4.5
Scattered Jurisdiction	Overlap between national, provincial, local, and traditional authorities	65%	4.1
Weak Enforcement Capacity	Reactive enforcement, selective punishment, intimidation of rangers	72%	4.3
Low Community Involvement	Limited participation in decision-making, bureaucratic barriers in social forestry	68%	4.0
Socio-Economic Stress	Poverty, subsistence farming, fuelwood dependence, lack of alternative livelihoods	81%	4.6

This fragmentation is shown in particular cases. In some occasions, a section of protected areas has been partly given out through permits of extractive or plantations by different departments. As a member of staff of one of the NGOs articulated, in some instances, the environmental office is oblivious that the land has already been awarded the use of the same to a certain individual by the investment office, yet it falls within a conservation area. This disjoint causes a loss of stakeholder confidence and a reduced manifest legal power of the conservation-based law. South Sulawesi mechanisms of enforcement involving environmental protection are usually weak, inconsistent and in some cases politically biased. The stakeholders' interviews indicated that illegitimate logging, mining, and land encroachment activities are often carried out without any interference which can be explained, in part, to the inconsistent sanctions or discriminative types of enforcement. The respondents showed frustration with the fact that violations are accepted until there is pressure to make action by the population or the media.

Furthermore, the punishment of offences is hardly applied with full legal force and the process of punishment of offenders, particularly those ones who possess political or economic power, is also not frequent. The issue of selective enforcement influences the validity of the environmental rules and gives an assurance to the local people that enforcement is not a must. Various forest rangers also made reports of intimidation or threats in trying to interfere with the illegal activities thus further discouraging strict actions. Regulatory frameworks reflect the necessity to entail the participation of communities, but it is empirically observed that there is a lack of initiatives that can incorporate the local populations into the governance of forests in an effective manner. Many groups living within, or at the periphery of mentioned areas of protection have felt marginalized by decision-making hierarchies in spite of the fact that they depend on the forest resources in a daily subsistence. In some cases, locals were kept in dark about the regulatory processes involved in the forests that they relied on and they could not understand exactly where the boundaries of the protected areas were.

Social engagement activities like (social forestry) have shown to have significant results when realized as a community-based program but they have limited access geographically. The so-called bureaucratic system of receiving permits with their expensive and lengthy procedures on the one hand, and the lack of institutional support on the other hand are considered pathways creating obstacles to local people engaging in accredited forestry practices. We have already

applied to obtain community forest status three years ago as one of the village leaders put it. We are yet to be approved. The lack of substantive inclusion creates the feeling of regulation as the imposition on the bottom or the top-down restraint but not a shared responsibility, which increases conflict and creates a non-compliant attitude. There has always been a constant impediment to good regulation in socio-economic environment, prevailing in most communities that border on forests. High levels of poverty; lack of alternative sources of livelihoods; and inadequate access in terms of education and markets compel the local communities to use forest exploitation as a means of survival. Subsistence agriculture, fuelwood and small-scale logging are more often than not seen as the actual necessity of a community rather than as a criminal activity.

Simultaneous development projects (alternative income plans, agricultural intensification, ecotourism etc.) are imperative complements to enforcement methods of particle. Restrictive measures are faced with ethical and practical dilemmas without similar development interventions. Forest officers admit this dilemma and one remarked, “How can we ask people to quit cutting trees when they do not have enough to eat? This is something that can be resolved only with regulation.” Such socio-economic pressures put a strain on the balance between conservation goals and the local development needs, especially where there is not a long-term tying of policies between environmental and economic planning. The current discussion shows that the framework of South Sulawesi laws protecting its forests is undermined by a cluster of structural, institutional, and socio-cultural constraints. Despite the available legal framework being sufficient, their operationalization is characterized by diminution brought about by inadequate capacity, vested powers, enforcement procedures, poor integration with the community, and long-lasting economic susceptibility.

These inaccessibilities are mutually dependent and, therefore, create a blanket of governance deficiency that allows continuous degradation of natural resources regardless of the legal safeguards controlling it. Successful remediation is surely beyond the reach of technical changes but it requires a paradigm shift towards participatory, integrated, and development-sensitive environmental regimes. Towards this direction, improving the functions of government institutions, the extension of inter-agency coordination, reinforcing the community-based forest programs and developing the poverty-alleviating strategies should be made key components of an all-overarching strategy that will see to it that environmental-regulations are not only proclaimed but also universally respected, effective and durable.

## **Discussion**

The current research explains one of the main paradoxes in forest governance: formidable legal mechanisms are structurally established but not interestingly effective in the context of degrading resources. This observation is not only the result of the local processes but also a contribution to the general management theory that confirms the futility of individual regulatory tools without being accompanied by flexible institutional design and the alignment of stakeholders. It has been consistent with recent analysis globally based on regression discontinuity designed to prove that in fact protected areas in Indonesia have comparatively little effect to reduce deforestation i.e., approximately 30 % (e.g., see global study on the effectiveness of the protection of forests). With this, in the management disciplines centered on regulatory efficacy, this paper notes that what is required of performance metrics is the capacity, coordination, and contextual fit of regulatory agencies: not only the legal text. The research plays a testimonial of the imperativeness of institutional competency and funding in the imposition of environmental rules. These issues in the KPH (Forest Management Units) in South Sulawesi reflect the reported weaknesses elsewhere in Indonesian provinces, where an inadequate budget, resources, insufficient training, and staff shortages continue to hamper enforcement (Wulandari, 2021). This concurs with a result in an assessment of protected area management, i.e., the METT evaluations of Indonesia, where the management authority has to be well provisioned in order to show improvement in management—either with regard to area covered, or the amount of money it receives per unit of territory (Guardians of the METT study). This confirms the fact that resource allocation and the design of the operations are powerful strategic enablers—not footnotes in effectiveness of governance, to management scholars.

The finding shows that the integrated governance structures should be established to deal with overlapping authority and policy incoherence. The complications of territorial overlap in South Sulawesi between the spheres of forestry, investment and local governments repeat themselves in all Indonesia, where the decentralization reforms of 2014 enshrined the disintegrations and not the synergies between the respective fields (Yuliani et al., 2023). The management theory on institutional design positively affirms that Redundancy eliminates accountability and induces the decrease of effectiveness. The implication is read clearly, to better the regulatory effect, networking needs to change the governance paradigm of overlaying vertical chains to horizontal coordination. The findings indicate the unexploited possibilities of community-based social forestry as a combination mechanism between regulation and local ownership. These pilot social forestry site performance gains can be generalized to bigger national patterns: the Indonesian social forestry expansion, which currently protects more than 11% of the state forest area through legal access, livelihood incentives, and participatory design, demonstrates that, when these factors are unified, communities can produce quantifiable conservation results on social forestry sites (Maryudi et al., 2022). Forest certification literature also strengthens the fact that integrating community participation/empowerment and regulatory compliance and credible third-party oversight increases both ecological and economic resiliencies (Zhou & Makwara, 2024). These inter-disciplinary perspectives identify one such strategic management principle that power needs to be decentralized including all accountability and sharing of the fruits.

The extended field of governance of the protected areas implies a paradigm transition toward co-management schemes (instead of enforcement) with an empowerment of local practices, monitoring, and participation in the regulation. Across the globe co-managed approaches involving community-based conservation co-existing and intersecting with state agencies yield better sustainable results as there is integration of socio-economic rewards along with conservation of biodiversity (UNDP/equator case reviews). Such trends can also be observed in comparative settings, such as the Philippines, where community-based forest management was effective when it was supported by a comprehensive policy and tenure security, as well as failed when considered as project-based (Reyes et al., 2024). Market dynamics and global flows should not be ignored in implementation of regulations (Gaveau et al., 2022). The recent deforestation in Indonesia due to biomass and palm-oil crops that continues despite the moratoriums demonstrate the extent to which regulatory control can be taken over by economic reasons of production as well as by lax enforcement (AP/Reuters global forest coverage stories). This highlights the fact that the activities of environmental control should be integrated with cross-sector policy-making-involving trade policy, energy policy, and systems of certification-to the management disciplines.

The evidence provided in the paper supports the management implication that measurement designs should have the ability to capture institutional efficiency, stakeholder participation, and compliance trends other than the legal coverage (Modell, 2022). The time profile story of improvement in METT of Indonesia depicts that tracking management effectiveness acts in favor of a larger base management authority and resources; the park status alone is not adequately sufficient. This adds to the argument that performance management in conservation needs tools that cover operations, budgets, coordination, and outcomes, which management science needs to interlink further. The research contributes to the standing criticism of the state-only approaches to conservation that does not involve women and the marginalized actors (Weissbrodt et al., 2024). The achievements of women-based ranger units in Aceh prove that participatory monitoring, especially in a form of inclusiveness, cut down deforestation as well as empowers the community (AP story on women rangers).

Gender and inclusion-devoid management run the risk of becoming illegitimate and ineffective. This is direct to policy change in South Sulawesi, where the on-going programs had yet to explore the power of women forest guardianship. The emerging truth of this case study and national literature leads to a larger assertion: the regulation of environment needs to be thought of as the dynamic multi-level managerial system rather than a fixed legal text (Lehmann, 2024). Regulatory affairs should incorporate institutional capacity building, inter-agency networks, ownership systems within the communities, responsibility by the privates and participatory design. In management studies, the paper proposes the idea that the envisioning of high-

performing environmental regulation is best considered as transdisciplinary governance architecture, which is claimed to integrate the activities of the government, non-profit, and community stakeholders into a common belief in resource management (Nacchiero et al., 2024).

## CONCLUSION

The paper has discussed the performance of the environmental regulation in touring the degradation of natural resources within the safeguarded forests, South Sulawesi. The results indicate a central discordance of policy and practice mainly because of unenlightened governance, inadequate institutional strength and mis coordinated stakeholders. Regulations that are well-designed on paper do not work unless they are implemented properly and linked with the community. Social forestry schemes have potential to reconcile conservation and local requirements and are spotty. The research highlights that the transition in the models should no longer be enforcements-based, but participatory, and co-managed. Enhancement of the ability of Forest Management Units (KPH), elucidation of the relationship between agencies, making multi-level governance and multi-level governance are critical to successful long-term objectives of conservation.

## REFERENCES

- Akhbar, A., Naharuddin, N., Arianingsih, I., Misrah, M., & Akhbar, R. K. (2024). Spatial model of forest area utilization in integration of production forest functions, Central Sulawesi, Indonesia. *Agriculture and Natural Resources*, 58(1), 1-12.
- Arifin, H. S., & Nakagoshi, N. (2011). Landscape ecology and urban biodiversity in tropical Indonesian cities. *Landscape and ecological engineering*, 7(1), 33-43. <https://doi.org/10.1007/s11355-010-0145-9>
- Artiga-Purcell, J. A. (2021). *Contesting extractivism: gold, water and power in El Salvador*. University of California, Santa Cruz.
- Dawson, N. M., Coolsaet, B., Sterling, E. J., Loveridge, R., Gross-Camp, N. D., Wongbusarakum, S., ... & Rosado-May, F. J. (2021). The role of Indigenous peoples and local communities in effective and equitable conservation. *Ecology and society*, 26(3), 19. <https://doi.org/10.5751/ES-12625-260319>
- DeVantier, L., Alcalá, A., & Wilkinson, C. (2004). The Sulu-Sulawesi Sea: environmental and socioeconomic status, future prognosis and ameliorative policy options. *AMBIO: A Journal of the Human Environment*, 33(1), 88-97. <https://doi.org/10.1579/0044-7447-33.1.88>
- Gaveau, D. L., Locatelli, B., Salim, M. A., Husnayaen, Manurung, T., Descals, A., ... & Sheil, D. (2022). Slowing deforestation in Indonesia follows declining oil palm expansion and lower oil prices. *PloS one*, 17(3), e0266178. <https://doi.org/10.1371/journal.pone.0266178>
- Gorowara, N., Yadav, S., & Kumar, V. (2024). Sustainable future: Government initiatives in the adoption of emerging sustainable technologies by startups in india. In *Fostering innovation in venture capital and startup ecosystems* (pp. 286-305). IGI Global Scientific Publishing.
- Hayes, T., & Persha, L. (2010). Nesting local forestry initiatives: Revisiting community forest management in a REDD+ world. *Forest Policy and Economics*, 12(8), 545-553. <https://doi.org/10.1016/j.forpol.2010.07.003>
- Kimengsi, J. N., Owusu, R., Charmakar, S., Manu, G., & Giessen, L. (2023). A global systematic review of forest management institutions: towards a new research agenda. *Landscape ecology*, 38(2), 307-326. <https://doi.org/10.1007/s10980-022-01577-8>
- Lehmann, T. (2024). Exploring institutional dynamics in a multi-level analysis in Southeast Europe. *Post-Communist Economies*, 36(7), 852-880. <https://doi.org/10.1080/14631377.2024.2378622>
- Maryudi, A., Sahide, M. A. K., Daulay, M. H., Yuniati, D., Syafitri, W., Sadiyo, S., & Fisher, M. R. (2022). Holding social forestry hostage in Indonesia: Contested bureaucracy mandates

- and potential escape pathways. *Environmental Science & Policy*, 128, 142-153. <https://doi.org/10.1016/j.envsci.2021.11.013>
- Modell, S. (2022). New developments in institutional research on performance measurement and management in the public sector. *Journal of Public Budgeting, Accounting & Financial Management*, 34(3), 353-369. <https://doi.org/10.1108/JPBAFM-04-2021-0070>
- Nacchiero, R., Massari, G. F., & Giannoccaro, I. (2024). Supply chain transformative capabilities and their microfoundations for circular economy transition: A qualitative study in Made in Italy sectors. *Business Strategy and the Environment*, 33(8), 8695-8715. <https://doi.org/10.1002/bse.3939>
- Nurhidayah, L., & Alam, S. (2020). The forest and its biodiversity: Assessing the adequacy of biodiversity protection laws in Indonesia. *Asia Pacific Journal of Environmental Law*, 23(2), 178-201. <https://doi.org/10.4337/apjel.2020.02.04>
- Ogunkan, D. V. (2022). Achieving sustainable environmental governance in Nigeria: A review for policy consideration. *Urban Governance*, 2(1), 212-220. <https://doi.org/10.1016/j.ugj.2022.04.004>
- Ola, O., & Benjamin, E. (2019). Preserving biodiversity and ecosystem services in West African forest, watersheds, and wetlands: a review of incentives. *Forests*, 10(6), 479. <https://doi.org/10.3390/f10060479>
- Reyes, M. C., Flores, J., & Fernandez, C. (2024). Community-Based Forest Management: Challenges and Opportunities in Tropical Asia. *Journal of Selvicoltura Asean*, 1(5), 218-228. <https://doi.org/10.70177/jsa.v1i5.1668>
- Schroeder, H. W. (2021). Ecology of the heart: Understanding how people experience natural environments. In *Natural Resource Management* (pp. 13-27). Routledge.
- Schweizer, D., van Kuijk, M., & Ghazoul, J. (2021). Perceptions from non-governmental actors on forest and landscape restoration, challenges and strategies for successful implementation across Asia, Africa and Latin America. *Journal of Environmental Management*, 286, 112251. <https://doi.org/10.1016/j.jenvman.2021.112251>
- Weissbrodt, R., Caroly, S., Piseiro, J. M., Ravel, L., & Bodin, X. (2024). Roles and activities of local stakeholders facing Alpine permafrost warming: a comparative exploratory analysis of three contexts and networks of actors. *Climate risk management*, 44, 100591. <https://doi.org/10.1016/j.crm.2024.100591>
- Wulandari, C. (2021). Identifying climate change adaptation efforts in the batutege forest management unit, Indonesia. *Forest and Society*, 5(1), 48-59.
- Yuliani, E. L., Moeliono, M., Labarani, A., Fisher, M. R., Tias, P. A., & Sunderland, T. (2023). Relational values of forests: Value-conflicts between local communities and external programmes in Sulawesi. *People and Nature*, 5(6), 1822-1838. <https://doi.org/10.1002/pan3.10389>
- Zhou, Z., & Makwara, T. (2024). Challenges facing community-based tourism resuscitation at Zimbabwe cultural tourism centre, Zimbabwe: grass-root perspectives. *SN Social Sciences*, 4(8), 149. <https://doi.org/10.1007/s43545-024-00952-3>