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Social forestry institutional transformation under the Forest Areas with Special Management (KHDPK) policy

ARY WIDIYANTO[1,4], DODIK RIDHO NURROCHMAT[2,♥], SONI TRISON[2], SUBARUDI[3], FITRI NURFATRIANI[4]

[1]Graduate Program of Forest Management Science, School of Graduates, Institut Pertanian Bogor. Jl. Raya Dramaga, Dramaga, Bogor 16680, West Java, Indonesia

[2]Department of Forest Management Science, Faculty of Forestry and Environment, Institut Pertanian Bogor. Jl. Lingkar Akademik Kampus IPB Dramaga, Bogor 16680, West Java, Indonesia. Tel.: +62-251-8621677, Fax.: +62-251-8621256, ♥email: dnurrochmat@apps.ipb.ac.id

[3]Research Center for Population, National Research and Innovation Agency. Jl. Jendral Gatot Subroto No. 10, South Jakarta 12720, Jakarta, Indonesia

[4]Directorate of Environment, Maritime, Natural Resource and Nuclear Policy, National Research and Innovation Agency. Jl. M.H. Thamrin No. 8 Central Jakarta 10340, Jakarta, Indonesia

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Abstract. *Widiyanto A, Nurrochmat DR, Trison S, Subarudi, Nurfatriani F. 2025. Social forestry institutional transformation under the Forest Area with Special Management (KHDPK) policy. Asian J For 9: 182-195.* Social forestry in Indonesia is entering its third generation, with a focus on livelihoods improvement and enterprise capacity building. In this regard, the Forest Area with Special Management (KHDPK) policy was issued to expand community access to forest management in Java Island by allowing direct involvement without requiring engagement through the state-owned forest enterprise. This shift aims to enhance socio-economic benefits, resolve tenure conflicts, and support forest and land rehabilitation through inclusive governance. This study aims to examine the transformation of social forestry in Java following the issuance of the Forest Area with Special Management (KHDPK) policy. It adopts two complementary approaches: the Institutional Analysis and Development (IAD) framework and Historical Institutionalism (HI). The results show that the institutional transformation of social forestry in KHDPK is to continue and modify the existing social forestry, without replacing it with a new one. Although it is a significant change, KHDPK is not yet at a critical juncture because it is not supported by strong institutional lock-in. Social forestry within KHDPK can be understood as a path modification, not a full disruption, as it does not replace entirely the previous social forestry scheme but rather builds upon and adjusts it. In this context, KHDPK reflects a combination of institutional layering and conversion. These two forms strengthen the argument that KHDPK is not merely a "new policy" but a gradual institutional change that adapts to the current political and social context. Local autonomy and conflict resolution need more attention from the Ministry of Forestry. The policy options that the government can take include strengthening the social forestry institution in KHDPK regarding regulations, increasing collaboration among parties, expanding supporting resources, especially at the site level, and enhancing community capacity.

Keywords: Critical junctures, institutional, path dependency, social forestry, transformation

Abbreviations: KHDPK: *Kawasan Hutan dengan Pengelolaan Khusus*

INTRODUCTION

The forest management paradigm in Indonesia has undergone significant changes over the past few decades, transitioning from a highly centralized, state-controlled system to one that increasingly involves local communities, often termed social forestry (*perhutanan sosial*). Historically, forest management in Indonesia was dominated by the state, which maintained control over vast tracts of forest land and prioritized business entities, including private companies and state-owned enterprises, as primary forest managers (Maryudi and Sahide 2017). This centralized approach largely excluded indigenous and local people, whose livelihoods had traditionally depended on forest resources. As deforestation and land conflicts escalated, it became evident that forest governance needed to become more inclusive and sustainable. This recognition led to a paradigm shift toward community-based forest management approaches that empower local communities to actively participate in decision-making and management processes. By integrating traditional knowledge and practices, these initiatives aim to balance ecological sustainability with the economic needs of forest-dependent populations (Fisher et al. 2019; Sahide et al. 2020).

Forest tenure reform and community forestry have gained prominence globally, particularly since the 1980s, as governments recognize the importance of local communities in forest management. These reforms aim to devolve rights to local communities, acknowledging their traditional use rights and roles in conservation, which have historically been undermined by colonial and postcolonial policies (Banjade et al. 2017; Lélé et al. 2024). The shift has led to over 15% of the world's forest area being managed by local communities, with significant variations in rights and governance structures across different regions (Larson et al. 2010; Banjade et al. 2017). Community forestry initiatives not only enhance local livelihoods but also contribute to biodiversity conservation and the

achievement of Sustainable Development Goals (SDGs) (Kusters et al. 2022). However, the effectiveness of these reforms is contingent upon the clarity of rights, institutional arrangements, and the dynamics between local communities and government agencies (Cronkleton et al. 2010). Conversely, while community forestry presents opportunities for empowerment and sustainable management, challenges remain, such as the potential for conflicts over rights and the need for effective governance structures to ensure equitable benefit distribution among stakeholders.

Although Indonesia's social forestry (SF) is ambitiously framed as a triple-win strategy for poverty alleviation, economic development, and environmental conservation, there is a critical gap between its theoretical objectives and the reality on the ground. A core issue of this research is that social forestry implementation often prioritizes administrative targets and land allocation over the fundamental processes necessary for its success. Devolution of management authority is often incomplete or symbolic. Communities are granted access and management rights, but often within a restrictive, top-down regulatory framework that limits their ability to make meaningful and context-specific decisions regarding forest use, product extraction, and market engagement. This creates a gap between legal rights and functional empowerment (Fisher et al. 2018; Sahide et al. 2020). Furthermore, SF programs often emphasize forest conservation by limiting agricultural expansion and commercial extraction. However, these programs simultaneously fail to provide robust, economically viable, and scalable alternative livelihood options. This places local communities in a vulnerable position: they bear the opportunity costs of conservation without receiving commensurate economic benefits, potentially undermining social and environmental objectives (Sunderlin et al. 2000; Maryudi et al. 2022).

Moreover, environmental initiatives overlap with the mandates of various ministries (Environment and Forestry, Agrarian Affairs and Spatial Planning, Village Affairs, etc.), leading to regulatory conflicts, bureaucratic hurdles, and unclear tenure. Furthermore, local communities, often with limited organizational and technical capacity, are expected to negotiate and report to these powerful state institutions, creating significant power imbalances that hinder effective and equitable governance (Myers et al. 2017; Erbaugh 2019). SF implementation in Indonesia has been complex and uneven, with lingering issues of tenurial conflict, ecological degradation, and institutional rigidity (Erbaugh 2019; Fisher et al. 2019). Recent policies, notably the Forest Area with Special Management (*Kawasan Hutan dengan Pengelolaan Khusus*, KHDPK), introduced under Ministerial Decree No. 287/2022 and further regulated by Ministerial Regulation No. 4/2023, seek to address these challenges by redistributing authority over 1.1 million hectares of Java's forests from the state-owned enterprise Perum Perhutani to the Ministry of Environment and Forestry (now the Ministry of Forestry), with a strong emphasis on social forestry schemes.

Despite the transformative ambitions of KHDPK, it remains unclear whether this policy constitutes a substantive institutional transformation or merely a continuation of earlier practices under new labels. Prior research on social forestry in Indonesia has predominantly focused on livelihood outcomes and programmatic challenges (Sahide et al. 2020; Gunawan et al. 2022), with limited attention to the institutional dynamics and historical path dependencies that shape forest governance. Furthermore, the extent to which KHDPK represents a critical juncture in Indonesia's forest governance trajectory—or instead reflects incremental, path-dependent change—has yet to be systematically analyzed.

Addressing this research problem is of urgent policy relevance because the Indonesian government has committed to allocating 12.7 million hectares of forest to social forestry schemes. Rigorous research that moves beyond counting hectares allocated to analyzing what works, for whom, and under what conditions is critical for evidence-based policymaking. It can identify bottlenecks and success factors, ensuring public funds yield tangible returns in poverty reduction and forest health (World Bank 2019; Ministry of Environment and Forestry 2021). This study seeks to fill this gap by examining the institutional transformation of social forestry in Java under the KHDPK framework. Drawing on Ostrom's Institutional Analysis and Development (IAD) framework and Historical Institutionalism, this research analyzes how KHDPK reconfigures actor networks, redistributes authority, and alters governance arrangements. Specifically, the study investigates: (i) how institutional arrangements under KHDPK policy differ from previous social forestry schemes, (ii) whether these changes reflect institutional layering, conversion, or displacement (Mahoney and Thelen 2010), and (iii) to what extent KHDPK meets the criteria of a critical juncture (Mahoney 2000; Pierson 2000). By integrating these theoretical lenses, the study contributes to debates on institutional change in environmental governance and provides insights into designing more adaptive and equitable forest policies in Indonesia.

MATERIALS AND METHODS

Study period and area

Data collection was carried out in April-August 2024 and conducted in stages from the national and regional levels (i.e., West Java Province, Indonesia) to the local levels (i.e., Ciamis Forest Management Unit (*Kesatuan Pemangkuan Hutan*/KPH), Perum Perhutani). The selection of West Java Province and Ciamis Forest Management Unit was due to diverse ecosystems ranging from beaches to mountains, the large extent of degraded lands, diverse community characteristics (3 Districts: Ciamis District, Pangandaran District, and Banjar Municipality), and high levels of tenurial conflict.

Data collection procedure

Data was collected through in-depth interviews, participatory observation, and document review. In-depth interviews were conducted with all stakeholders related to

the management of social forestry in the area designated for KHDPK. The participatory observation was performed by conducting close observations with the community, which had obtained a social forestry management permit in the area designated for KHDPK. A document review was conducted on documents related to the management of social forestry in Indonesia, including legislation, reports from government agencies, and local and global scientific publications.

In this study, interviews were conducted in two ways. First, interviews were conducted using purposive sampling with semi-structured questionnaires. Second, interviews were conducted using the snowball sampling method, with a maximum of three informants for each category. The criteria for informants were those who mastered the information on substantive matters discovered during the preliminary interview. Key informants were divided into three levels. First, the national level consisted of: (i) the Directorate of Social Forestry Area Preparation (1 respondent), (ii) the Directorate of Social Forestry Business Development (1 respondent), (iii) the Social Forestry Center (*Balai Perhutanan Sosial)* (2 respondents), and (iv) the Forest Area Stabilization Office (*Balai Pemantapan Kawasan Hutan*) Region IX (1 respondent). Second, the regional level consisted of: (i) Forestry Regional Office (*Cabang Dinas Kehutanan*) Branch VII (Ciamis, Banjar, and Pangandaran) (3 respondents), and (ii) Social Forestry Facilitators/Extension (2 respondents). Third, the local level consisted of: (i) communities that were members of forest farmer groups holding social forestry permits in the KHDPK area and village officials in research locations (15 respondents from five villages/ 3 respondents per village), (ii) Non-Governmental Organizations (3 respondents), and (iii) the Association of Village Forest Community Institutions (LMDH) of Ciamis District (1 respondent). In total, there were 29 respondents.

Data analysis

This study employed a qualitative research design by integrating Elinor Ostrom's Institutional Analysis and Development (IAD) framework and Historical Institutionalism (HI) to analyze institutional change in social forestry under the KHDPK policy. The combination of these frameworks allowed for an in-depth examination of the structural configurations of current institutional arrangements and the historical trajectories that shaped them.

The IAD framework was used to map and analyze the action arenas of social forestry in the KHDPK area. In particular, the framework provided a lens to identify key actors, their positions, rules-in-use, and interactions affecting forest governance outcomes. Data coding was applied to Ostrom's eight design principles (Ostrom 1990) as analytical categories, which served as benchmarks for diagnosing the robustness of social forestry institutions. For instance, the principles of clearly defined boundaries, collective-choice arrangements, and local autonomy were operationalized into coding themes and indicators during qualitative analysis. Interview transcripts, participatory observation notes, and documents were coded deductively according to these principles, allowing inductive themes to emerge regarding challenges and adaptations in local governance practices.

Historical Institutionalism complemented this analysis by situating institutional change within a broader temporal and political context. We used process tracing to examine the path dependencies and critical junctures in Java's forest governance, identifying whether KHDPK represents incremental institutional layering, conversion, or a potential path disruption (Mahoney and Thelen 2010). Thematic coding incorporated concepts such as "institutional stickiness," "power asymmetries," and "actor reconfiguration" to trace how past decisions and power relations constrained or enabled current policy innovations.

The integration of IAD and HI in data analysis was conducted through six steps: (i) transcription of interview and field observation data, (ii) initial coding using Ostrom's design principles and institutional historical categories (e.g., path dependence, critical juncture), (iii) development of themes reflecting institutional robustness and transformation, (iv) triangulation of data across national, regional, and local actor levels, (v) mapping actor networks and rule configurations within KHDPK, and (vi) interpretation of findings within the theoretical lenses of IAD and HI. This analytical process ensured that both contemporary institutional dynamics and their historical antecedents were systematically incorporated into the study's findings.

The data obtained from relevant literature and in-depth interviews were then processed by coding. In more detail, there were six the steps in coding interview themes: (i) Transcription, i.e., converting the interview recording into a written transcript, (ii) Reading and Understanding Data, i.e., reading the transcript thoroughly to gain a general understanding of the data, (iii) Initial Coding, i.e., the data was broken down into small units, including eight Ostrom principles and institutional history, and labeled or coded based on the meaning contained therein in which this code can be a word or short phrase that describes the content of the data, (iv) Theme Development, i.e., similar codes were grouped together to form broader themes, (v) Reflection and Revision, i.e., reflect on the themes that have been developed and may revise or combine themes if necessary, (vi) Reporting, i.e., the results of the analysis, including the identified themes, were reported in narrative or tabular form. To synthesize the theoretical approach, Figure 1 illustrates the analytical framework linking path dependency, critical juncture, and institutional transformation under KHDPK.

Data reliability and validity

Data from in-depth interviews using snowball sampling requires a deliberate and transparent strategy. Snowball sampling is particularly prone to specific biases, the tendency of individuals to connect with similar others, and hidden population bias, which can threaten trustworthiness if not managed. To mitigate these challenges, some strategies were applied (Table 1).

Table 1. Snowball sampling verification strategy

Challenge in snowball sampling	Strategy for mitigation (ensuring trustworthiness)
Homophily bias (everyone is similar)	Purposeful initiation with diverse seeds; strategic guiding of the chain to seek different perspectives.
Lack of transparency	Maintain a detailed audit trail; practice reflexivity.
Superficial data	Use a meticulous interview protocol; interview to saturation; prolonged engagement.
Researcher bias	Peer debriefing; reflexivity; triangulation; member checking.
Unclear context	Provide a thick, rich description in the report.

Source: Kallio et al. (2016), Saunders et al. (2018)

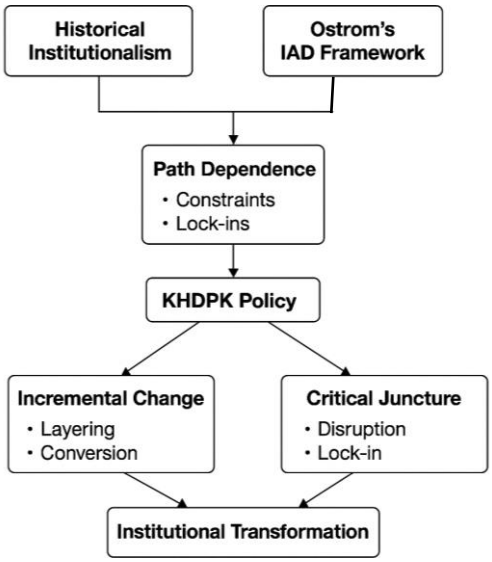

Figure 1. An analytical framework used in this study to investigate the institutional transformation of the KHDPK policy

RESULTS AND DISCUSSION

The evolution of the social forestry program in Indonesia is a tale of dynamic interplay among political, economic, and social forces. The program has undergone several generations, each characterized by significant policy changes and issues. Social forestry development in Indonesia can be divided into three generations, each corresponding to key political transitions (Table 1). The first generation overlapped with the New Order era, emphasizing state control over the forest. The second generation established new legal and implementation regimes during the Reformation era. Today's third generation is marked by wider stakeholder involvement, formalization of permitting regimes, and more participatory land management (Fisher et al. 2019). Each generation echoes changes in policy, governance, and community involvement. The overview of each generation of social forestry in Indonesia is explained below.

First generation: Forest access (before 2007)

The first generation of social forestry started during the New Order era, with top-down control and minimal participation from society. It set the stage for subsequent reforms by stressing the importance of more participatory forest management practices (Fisher et al. 2019). It was an era in which the concern was to give access to forest resources. However, access to forests by communities was highly restricted and strictly regulated by the state, especially during the New Order regime. It was production-oriented forestry and less about environmental sustainability and community welfare. Forest management was primarily conducted by state-owned corporations such as Perhutani (in Java Island) or large concessionaires in other islands. Communities were sometimes involved as labor in reforestation or provided with small-scale harvesting rights, but without secure tenure. Some early schemes, like *Hutan Kemasyarakatan* (HKm), were piloted but were not widespread.

Second generation: Forest rights (2007-2015)

With the political reforms in Indonesia, the second generation of social forestry was happening. In this period, new legal structures and mechanisms for restructuring forest management to incorporate community involvement and solve tenure disputes were introduced (Fisher et al. 2019; Maring 2022). The recognition of community rights and participatory forest management is emphasized in this era. Post-Suharto reforms (1998) and the decentralization policy catalyzed the second generation of social forestry. The Constitutional Court ruling of 2007 and the following forestry law reforms created space for recognising *adat* (customary) rights and more secure community tenure. For the first time, five central schemes of social forestry were introduced, namely *Hutan Desa* (Village Forest), *Hutan Kemasyarakatan* (Community Forest), *Hutan Tanaman Rakyat* (Community Plantation Forest), *Kemitraan Kehutanan* (Forestry Partnership), and *Hutan Adat* (Customary Forest). These schemes allowed for more formal access and management rights for communities. Unfortunately, at this time, social forestry still faces bureaucratic hurdles and lacks strong implementation support.

Third generation: Livelihoods and enterprise (2016-Present)

This generation of social forestry emphasizes enhancing community welfare and developing forest-based businesses. Under President Joko Widodo (Jokowi), social forestry became a national priority, especially under the 2014-2019 and 2019-2024 RPJMN (national medium-term development plans), which targeted 12.7 million hectares of state forest allocated for community management. Social forestry in this generation focuses on improving livelihoods, promoting forest-based enterprises, and linking communities to markets. The present time is also characterized by an increase in social forestry policies at a very rapid pace, along with a widespread increase in forest cover under designation. The increase seeks to legitimize co-management and improve community well-being, but is confronted with access, exclusion, and responsibility issues

of the local people (Erbaugh 2019; Fisher et al. 2019; Sahide et al. 2020). The third generation is concerned with community capacity development, access to finance, ecotourism, agroforestry, and strengthening cooperatives (Table 2). Despite the expansion, challenges remain, including overlapping claims, limited technical support, and delayed permitting.

Transformation of social forestry under the KHDPK policy

The state forest area (*kawasan hutan*) in Java Island is 3.3 million ha, or only 23.49% of the area of the island, while the population is approximately 60% of the population of Indonesia. Forest and environmental conditions in Java are experiencing very high pressure, resulting in the continued decline in forest cover and the carrying capacity of Java's forest ecosystem. Reconfiguring Java's forests needs to be carried out as a corrective action against the past forest resource management and control model. In Java, problems related to forest areas are accommodated in the policy of Forest with Special Management (KHDPK). The KHDPK policy implies that part of the area was initially managed by the state-owned company Perum Perhutani, and the government takes back the authority to resolve social, economic, and ecological problems that burden the company. The government aims to implement more sustainable practices and involve local communities in the management of these forest areas. This approach is intended to balance ecological preservation with the surrounding populations' economic needs, ensuring that forest resources and local livelihoods can thrive together.

With the decrease in the forest area, it is crucial to decide so that the role of the forest can be maximized economically, socially, and environmentally. With the issuance of the KHDPK policy, around 1.1 million of the 2.4 million forest areas previously managed by Perhutani were handed over to the Ministry of Environment and Forestry (now the Ministry of Forestry). According to its proportion, most forest areas gazetted for KHDPK are in East Java Province, around 45% (Tables 3 and S1; Figure 2).

Table 2. Development of social forestry in Indonesia

Generation	Timeframe	Focus	Key features
1st	Pre-2007	Access	Limited rights, state dominance
2nd	2007-2015	Access and rights	Legal frameworks, formal schemes
3rd	2016-Present	Access, rights, livelihoods, and enterprise	Economic empowerment, enterprise development

Table 3. KHDPK area of each province and per forest area function

No	Province	Forest area					
		Protected forest		Production forest		Total	
		Ha	%	Ha	%	Ha	%
1	Banten	7,740	1.66	52,239	8.18	59,979	5.43
2	West Java	175,517	37.72	163,427	25.59	338,944	30.70
3	Central Java	66,749	14.35	136,239	21.33	202,988	18.39
4	East Java	215,288	46.27	286,744	44.9	502,032	45.48
Total (Ha)		465,294	100	638,649	100	1,103,943	100
Percentage (%)			42,15		57,85		100

Source: Ministry of Environment and Forestry 2022)

Figure 2. Map of Forest with Special Management (KHDPK) in Java Island, Indonesia. Source: State Forest Stabilization Service (BPKH) Region IX 2024

Almost half of the forest area allocated for KHDPK is a protected forest (*Hutan Lindung*). Most of the problems in protected forests are critical land (*lahan kritis*, a government term for highly degraded land) or tenurial conflicts. With KHDPK, it is hoped that these two problems can be overcome. The issuance of the policy cannot be separated from various considerations. According to Hendroyono (2022), there are seven reasons for issuing the KHDPK policy: (i) as a correction to Perhutani's business governance to only focuses on managing forest areas for wood production as the main activity, (ii) redistribution of land and forest area control, mainly through the social forestry scheme, (iii) opportunities for resolving agrarian conflicts between communities living in or around forest areas in Java, (iv) opportunities for recognizing community ownership rights to land that was previously in conflict with Perhutani, (v) development of new economic productivity centers in forest areas to eliminate Perhutani's monopoly on control of forest areas in Java, (vi) restoration of ecological damage in Java's forest as there are at least 472,000 hectares of degraded forest in Java Island managed by Perum Perhutani, and (vii) the realization of agrarian justice in rural Java after decades of chronic injustice in the ownership and control of land and forest areas. Eight strategic issues are the basis for issuing the KHDPK policy (Table S2).

There are six designated purposes for land allocation within the Forest Areas with Special Management (KHDPK), namely: (i) Social Forestry, (ii) Forest Area Arrangement as part of Forest Area Confirmation, (iii) Forest Area Utilization, (iv) Forest Rehabilitation, (v) Forest Protection, and (vi) Environmental Services Utilization. Each allocation corresponds to specific land areas based on policy objectives and the availability of suitable land (see Table S3). Approximately 60% of the KHDPK area is allocated for social forestry. In practice, social forestry activities also include the utilization of environmental services, land rehabilitation, and the utilization of forest areas (Table 4).

Before the implementation of the KHDPK policy, forestry partnerships under social forestry schemes in Java primarily consisted of two models: Social Forestry Utilization Permit (IPHPS - *Izin Pemanfaatan Hutan Perhutanan Sosial*) and Recognition and Protection of Forestry Partnerships (Kulin KK - *Pengakuan dan Perlindungan Kemitraan Kehutanan*). The Kulin KK scheme allowed communities to access and manage forest areas through formal partnerships with forest permit holders—in the case of Java, the state-owned company Perhutani. Under this arrangement, communities worked collaboratively within the framework of Perhutani's forest management plans. In contrast, the IPHPS scheme provided communities with business permits to manage specific forest blocks independently, allowing them to formulate and implement their forest utilization plans. Both schemes were designed as long-term partnerships, with durations extending up to 35 years. Following the issuance of the KHDPK policy, these previous partnership models have been formally transitioned into five nationally recognized social forestry schemes (Nurfatriani et al. 2023).

This transformation does not alter the rules of forest utilization according to the designated functions of State Forest areas. The Ministry of Environment and Forestry, in collaboration with Perhutani, has initiated a five-year transitional period (starting in 2023) to manage institutional changes and asset transfer related to social forestry within KHDPK. At the end of this period, a comprehensive evaluation will be carried out to assess the effectiveness of these schemes in achieving sustainable forest management and improving community welfare. The overarching aim is to ensure that benefits are equitably shared among local communities while maintaining the ecological integrity of the forest landscape.

Table 4. Comparison of conventional State Forests and Forest Areas with Special Management (KHDPK) in Java for social forestry schemes

Aspect	Conventional state forest area in Java	Forest Areas with Special Management (KHDPK)
Governing authority	State forestry enterprise (Perhutani)	Ministry of Environment and Forestry (MoEF), now transforms into the Ministry of Forestry (MoF)
Legal basis	Ministerial decree and MoUs with Perhutani	Government Regulation No. 23/2021; Ministerial Decree No. 287/2022, and further regulated by Ministerial Regulation No. 4/2023,
Main stakeholder for management	Perhutani, in partnership with communities	Communities directly facilitated by MoF and local governments
Community access	Limited and conditional upon Perhutani's agreement	Direct access granted and facilitated by government agencies
Types of social forestry schemes	Mostly IPHPS and Kulin KK schemes	Five formal schemes: Village Forest, Community Forest, Community Plantation Forest, Forestry Partnership, and Customary Forest
Institutional set-up	Centralized under the Perhutani hierarchy	Decentralized and collaborative between ministries, local government, and communities
Decision-making authority	Perhutani has significant control	Shared among the national, sub-national government, and communities
Objective emphasis	Timber production with limited social function	Social welfare, conflict resolution, ecosystem restoration
Monitoring and evaluation	Conducted by Perhutani	Led by MoF with multi-stakeholder oversight
Conflict resolution mechanism	Through Perhutani channels	Through MoF-facilitated multi-stakeholder engagement

Source: Summarized and analyzed from Government Regulation No. 23/2021; MoEF Regulation No. 4/2023

Ostrom's eight design principles in the context of the KHDPK policy

Elinor Ostrom's eight design principles are a constitutive strategy for the practical and sustainable governance of common-pool resources (CPR), including forests. Ostrom's design principles have been empirically confirmed in many studies, which prove their strength in governing common-pool resources, like forests. The principles are frequently employed as a lens through which to examine the success of community-based forest management regimes (Cox et al. 2010; Aligica and Cox 2019). Effective community forest conservation initiatives will exhibit all eight of Ostrom's principles, emphasising their significance in forging social capital and shared identity among community members (Wilkie and Painter 2021).

As one of the CPR utilization activities, implementing social forestry under the KHDPK policy can also be assessed using Elinor Ostrom's eight design principles. The evaluation results can be seen in Table 5. The evaluation of Ostrom's eight principles in social forestry under the KHDPK policy shows that two principles still do not meet the ideal condition, with only some indicators found. The two principles are local autonomy and conflict resolution. The principle of local autonomy does not apply fully in the context of KHDPK. This policy takes over the authority from Perhutani to the central government, in this case, the Ministry of Forestry. However, this authority is delegated back to the community in the case of HKm, community groups in the case of HTR, village government in the case of HD, and indigenous people in the case of HA. In addition, KHDPK also involves stakeholders at the local level, such as village governments and NGOs. Therefore, although "local autonomy" is enacted regarding authority, centralization still occurs.

The government has anticipated the potential for conflict in KHDPK, including areas close to settlements, roads, other licensing areas, and other social forestry agreement areas. Anticipation of conflict has also been made by only granting management permits to areas free of conflict, as evidenced by statements from all parties at the proposed location, including elements of the village government. Thus, the conflict resolution mechanism has been regulated, with facilitation from social forestry facilitators, social forestry acceleration working groups, and the governor. However, the principle of acceleration in conflict resolution may not be easy to realize. In addition to the possibility of bureaucratic obstacles, the small number of social forestry facilitators also creates a challenge. At the research location, for example, there is currently only one facilitator in Ciamis District and one facilitator in Pangandaran District. The number of organizations under the Ministry of Forestry at the regional and local levels is also still very limited. So far, there are only three social forestry centers for the entire island of Java. Compared to when management was under Perhutani, for example, there were structural organizations down to the sub-district and even village levels.

In certain instances, not all of Ostrom's principles are realized to their full extent. In Tanzania, for example, six of the principles were met partially, and boundary, rule, and conflict resolution problems led to unsustainable results, including higher deforestation rates (Perfect-Mrema 2022). Likewise, in Mount Merapi National Park, issues with authority and public involvement have prevented the complete implementation of these principles, impacting forest regeneration and biodiversity (Depari 2023). Local institutions, like Indonesia Timor's 'Adat,' have incorporated Ostrom's principles into the management of their forests. They illustrate the success of traditional knowledge and practices in maintaining common-pool resources, indicating that policymakers must take heed of existing conventional management systems (van Ast et al. 2014). African and Indonesian indigenous peoples also mirror these values in their community-based and ecological forest management (McIntyre-Mills et al. 2023).

Path dependencies of social forestry under the KHDPK policy

Social forestry in Indonesia is a critical component of the country's strategy for rural development, poverty alleviation, and sustainable forest management. It involves the transfer of forest management responsibilities to local communities, aiming to balance economic, social, and environmental objectives. However, the implementation of social forestry in Indonesia is complex and influenced by various path dependencies. According to Pierson (2000), path dependency suggests that past policy decisions create structures that constrain or direct future policy choices. Established “paths” narrow the possibilities for radical change since institutions are sticky.

Based on the analysis, there are two social forestry phenomena in KHDPK, namely (i) continuing the existing social forestry policy path (path continuation), and (ii) forming a new path that breaks the old path (path disruption/critical juncture). An overview of the path dependencies of social forestry in KHDPK can be seen in Figure 3. The indication of KHDPK as a path continuation can be seen in the fact that KHDPK still carries the spirit of social forestry, namely, the redistribution of management access to communities around the forest. Although it has a different name, there is institutional strengthening, such as LMDH, and KHDPK utilizes previously formed structures, including the legalization policy of Community Forest (HKm), Village Forest (HD), and Forestry Partnership (*Kemitraan Kehutanan*) schemes. However, there are also indications of path disruption indicated by: (i) KHDPK shifts the dominant role of Perhutani, which for decades has managed forest areas in Java, (ii) The government opens up greater space for actor diversification, including Village-Owned Enterprises (*Badan Usaha Milik Desa*/BUMDes), Social Forestry Business Group (*Kelompok Usaha Perhutanan Sosial*/KUPS), and cooperatives, not just LMDH, and (iii) There is a change in governance logic: from centralized wood production to community-based multi-party management. KHDPK is in the middle between continuing and disrupting the old path. This condition can be called a path modification, which is not completely cutting off the previous social forestry path, but not a full continuation. It is more appropriate to call it a reformulation of the existing path, with a critical shift in the institutional structure and distribution of authority.

Table 5. Evaluation of Ostrom's eight principles in social forestry under the KHDPK policy

Principle		Field-Based Example and Contextual Interpretation
Clearly defined boundaries	Yes	The boundaries of the area and actors are clear. KHDPK can be implemented in production and protected forests, as stipulated in the Indicative Map of Social Forestry Areas (PIAPS). The managers or subjects receiving social forestry permits in KHDPK are also clear in the existing schemes. In Ciamis, community members in one Forest Farmer Group (LMDH) reported that "*we now have maps showing our plot boundaries*," which reduced land-use disputes.
Proportional equivalence between benefits and costs	Yes	The government acts as a landowner. The community has the right to use the land for timber planting (for the HTR scheme), NTFP collection, annual crop cultivation, and fish and livestock rearing with predetermined proportions. Most of the profits from the activities are for the community. A specific agreement determines profit sharing, and the community is also taxed on land with an agreed-upon amount. By looking at the existing scheme, both parties (the state and the community) will benefit from the social forestry scheme in the KHDPK area. In West Java, farmers cultivating agroforestry crops noted that "*most of the income goes to the group, and the government's share is fair*." Yet, some groups expressed concerns over unclear taxation policies reducing net income.
Collective choice arrangements	Yes	Collective choice arrangements are manifested in the social forestry activity plan, determination of plant types utilized, profit-sharing provisions, and all agreements outlined in the cooperation agreement. Communities actively participate in decision-making regarding land use and profit-sharing arrangements. A facilitator in Pangandaran explained that "*the cropping plans are discussed in village meetings*." However, in one case, village elites influenced decisions, limiting broader participation among marginalized households.
Monitoring	Yes	The Minister of Forestry (through its structure) supervises the implementation of social forestry management in KHDPK. In implementing supervision, the Ministry of Forestry can involve provincial and regional apparatus organizations in the forestry sector, the social forestry working group, and/or partners according to their authority. Supervision is carried out on a. fulfilment of rights; b. fulfilment of obligations; and c. compliance with prohibitions and provisions in the management of social forestry. One community leader noted, "*We see facilitators visiting every few months.*" However, limited field personnel and resources mean monitoring is inconsistent, particularly in remote villages.
Graduated sanctions	Yes	Suppose the implementation of KHDPK in an area is not comply with the provisions of obligations and prohibitions. In that case, the Director General, on behalf of the Minister of Forestry, can reject the extension of the approval for the social forestry management permit.
Fast and fair conflict resolution	Partly	The resolution of social and tenure conflicts in social forestry management has been accommodated in the monitoring activities stipulated in the Regulation of the Minister of Environment and Forestry No. 4 of 2023. However, speed and fairness require separate measurements. In the criteria and indicators for evaluating the implementation of social forestry management, conflict resolution criteria have been regulated with indicators for the existence of SOPs for resolving conflicts or disputes in forest resource management. Conflict resolution mechanisms exist, but are often slow. In West Java, a farmer group's dispute with neighbouring villagers over boundary markers took over a year to resolve due to bureaucratic delays. A facilitator admitted, "*The SOP exists, but a lack of staff makes it hard to address issues quickly on the ground*."
Local autonomy	Partly	Institutionally, KHDPK is a form of centralization because it withdraws the authority to manage part of the forest in Java from the state-owned enterprise (Perhutani) to the central government. However, in its implementation, KHDPK involves more actors, including those at the local level, such as village governments and NGOs, in its management. This condition is different from the social forestry scheme under Perhutani. KHDPK represents a mix of decentralization and centralization. While communities have greater roles in management compared to the Perhutani era, ultimate authority remains with the Ministry. A farmer remarked, "*We feel more involved now, but big decisions are still made in Jakarta*."
Appropriate relations	Yes	The approval of social forestry management in KHDPK in five schemes has flexibility in management and greater community roles and authority. KHDPK supports multi-level governance by involving NGOs, local governments, and village institutions. In Pangandaran, an NGO partner facilitated capacity building for forest user groups. However, coordination gaps were noted: "*District forestry offices sometimes work separately from the Ministry's social forestry team*," said a regional officer.

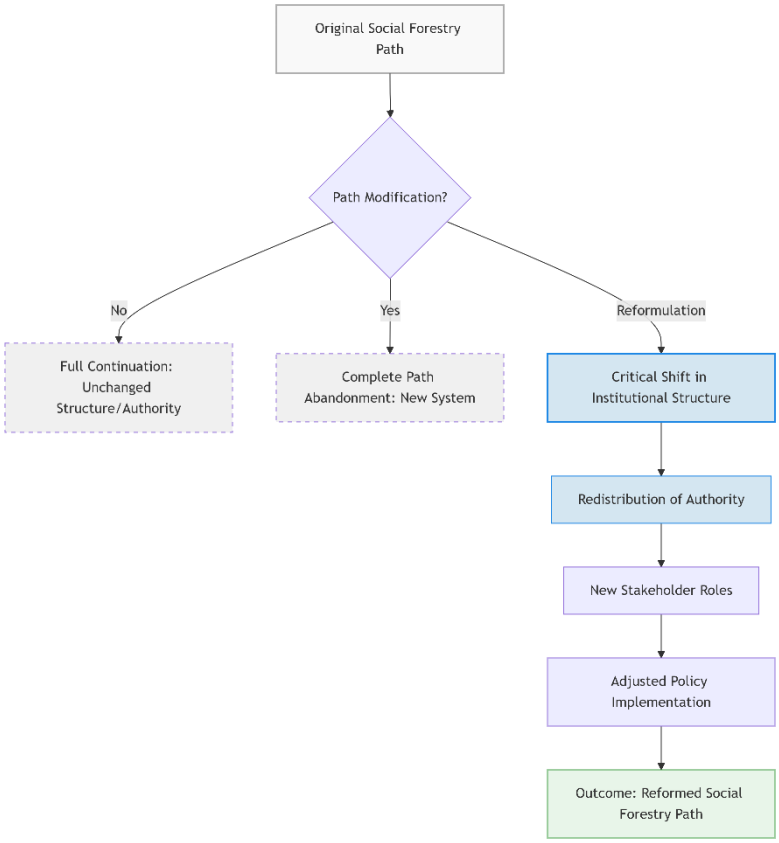

Figure 3. Path dependencies of social forestry under the KHDPK policy. Source: data analysis

Path dependencies are significant in shaping social forestry policies, as they influence continuity and change within institutional frameworks and decision-making processes. It often results in institutional rigidity, where existing norms and structures resist change. This can hinder the implementation of new, sustainable forest policies, as seen in various contexts where past decisions continue to shape current policy landscapes (Trædal et al. 2016; Nijnik et al. 2021). Historical decisions and entrenched power dynamics can perpetuate existing management practices, making innovative approaches like market-based solutions or community-driven initiatives. This is evident in cases where new policies, such as Payment for Ecosystem Services (PES), are adapted to fit existing frameworks rather than creating transformative change (Trædal et al. 2016). However, overcoming path dependencies requires significant institutional reconfiguration and stakeholder engagement. Efforts to break these dependencies often involve recognizing and integrating diverse knowledge systems, such as indigenous knowledge, to challenge existing paradigms and foster more inclusive and adaptive management practices (Parsons et al. 2019; Yona et al. 2019). Path dependencies are crucial in shaping social forestry policies by maintaining existing structures and practices. Addressing these dependencies requires strategic reforms, stakeholder engagement, and the integration of diverse knowledge systems to foster innovation and adaptability in policy development.

Critical junctures

Critical junctures in developing social forestry in Indonesia are pivotal moments or shifts that have significantly influenced its trajectory. These junctures are shaped by political, economic, and ecological factors, leading to various opportunities and challenges in implementing social forestry schemes. According to Pierson (2000) and Mahoney (2000), the criteria of critical junctures include (i) there is a break from the previous policy path (disruption), (ii) it is triggered by significant changes (political, economic, social), (iii) it has long-term consequences for the direction of policy, and (iv) the change is not easily reversed (lock-in effect).

It is necessary to test whether KHDPK meets the criteria for critical junctures. In the previous section on path dependencies, it was mentioned that KHDPK partially broke the old path. KHDPK is a policy that shifts Perhutani's authority over millions of hectares of forest in Java, which has been almost untouched since the New Order. It encourages formal collaborative and redistributive schemes in previously exclusive areas to the state and state-owned corporation (i.e., Perhutani). However, KHDPK has not completely broken the previous path of social forestry. It takes many elements of earlier programs (HKm, HD, partnerships), or can be called a semi-break or partial break. Significant changes triggered KHDPK. KHDPK was born amidst pressure from civil society and the agrarian justice movement, criticism of Perhutani's performance and

monopoly, political pressure for forestry governance reform in Java, and changes in national policies such as land redistribution, agrarian reform, and the target of 12.7 million ha of social forestry. It can be concluded that KHDPK meets the second criterion. Long-term consequences, the third criterion, are highly dependent on the level of success of the KHDPK. Finally, changes that are not easily reversed (lock-in effect) of the KHDPK are also uncertain. Currently, the status of the KHDPK can still change administratively because it is only enacted by a Ministerial Decree, not a Law or Presidential Regulation. So, the KHDPK has not been fully institutionally locked in. The condition of KHDPK according to the four characteristics above can be seen in Figure 4.

Based on the four criteria, KHDPK can be called an emerging, not a full, critical juncture. However, it opens opportunities for a new path in forest management in Indonesia, especially in Java. Using Mahoney's term, the KHDPK can be called "a potential critical juncture in motion." The level of success will depend on several factors, namely (i) whether new actors can consolidate this change, (ii) whether there is institutional lock-in in the form of stronger regulations (for example, government regulation or Law), and (iii) whether local communities gain substantive control, not just formal (tokenism).

Institutional change

The institutional changes under the KHDPK policy are also analyzed using the concept of institutional change from Mahoney and Thelen (2010), especially Institutional Layering and Institutional Conversion. Both concepts explain the dynamics of KHDPK without seeing it as a total disruption, but rather as a gradual change in the existing institutional structure. Institutional layering is the addition of new rules, actors, or mechanisms to existing institutions without replacing the old ones. Change occurs through gradual accumulation, not elimination. In this case, KHDPK does not eliminate the old social forestry scheme but adds a new layer through a multi-actor collaboration model in areas previously monopolized by Perhutani and the KHDPK scheme as an experimental zone for new governance. Meanwhile, the old institutions (LMDH, Perhutani, partnership schemes) still exist but have begun to coexist with new mechanisms such as Village-Owned Enterprises (BUMDes), Social Forestry Business Group (KUPS), and other forms of local community-based management. So, new layers are added to expand the logic of participatory governance, which was previously limited.

Figure 4. Critical juncture of the KHDPK policy. Source: data analysis

Meanwhile, institutional conversion is using existing institutions for new purposes or interests. Actors in the system began to reinterpret old rules to suit new contexts and goals. In the context of KHDPK, LMDH, which was initially formed to support Perhutani, is now becoming a leading actor in community-based management. In addition, state-owned production forest areas previously used for timber production by government enterprises are transformed into multi-business forestry (ecotourism, agroforestry, water management). The central forest management, the Ministry of Forestry, also changes from a passive regulator to a direct manager and facilitator of local actors.

There are some differences in social forestry transformation in Indonesia compared to other regions. Social forestry in Indonesia is dominated by government policy based on the evaluation of the previous scheme. Meanwhile, social forestry transformations in Africa and Latin America are often linked to broader decentralization reforms and grassroots movements. In Latin America, community forestry is closely tied to territorial rights and local autonomy, while in Africa, reforms are more externally driven, focusing on participatory inclusion and improved governance (Toumbourou et al. 2025). In both regions, success depends on secure tenure, supportive policies, and effective local governance. However, partial devolution and elite capture are common, and benefits are not always equitably distributed. Environmental, livelihood, and democratic objectives often conflict, and local communities may bear disproportionate costs (Santika et al. 2019; Toumbourou et al. 2025).

Social forestry initiatives across Asia and beyond provide valuable benchmarks for evaluating the institutional strengths and weaknesses of Java's KHDPK. Notably, Nepal's Community Forestry program stands out as a model of sustained community-led governance: over 1.2 million ha have been transferred to 15,000+ Forest User Groups, where robust Forest User Group Federations facilitate collective decision-making and technical capacity (e.g., operational plans, equitable benefit-sharing) (Larson and Dahal 2012). In comparison, KHDPK has formalized collective-choice arrangements and benefit-sharing but lacks analogous federated institutions, resulting in weak horizontal networks and uneven community voice.

India's Joint Forest Management (JFM) and subsequent Forest Rights Act (FRA) reforms also provide instructive parallels. JFM's early success in Odisha relied on state-community agreements and profit-sharing, though it did not grant tenure rights (Larson 2012). The FRA further shifted power by granting legal titles to scheduled tribes, yet implementation remains contentious due to bureaucratic resistance. KHDPK represents a similar hybrid: stronger than JFM in benefit-sharing and community involvement but still constrained by centralized authority and lacking formal tenure status.

Beyond South Asia, cases in Mexico (Community Forestry Enterprises), Korea (Village Forestry Associations), and Cambodia (community forestry since 1994) demonstrate that high degrees of local autonomy, legal recognition, and market access are correlated with positive environmental and livelihood outcomes (Larson 2012). KHDPK aligns with these models in promoting agroforestry and multi-stakeholder collaboration, yet it falls short in creating local economic autonomy. The lack of federated institutions to support market access and technical services remains a significant obstacle.

Implications for policy development

Using Ostrom's principles in forest management emphasizes the necessity for policies that reinforce the rights of communities to self-determination and offer competent assistance from national governments. This is essential for the communities to exercise their rights in the face of external threats (Wilkie and Painter 2021). Also needed are institutional arrangements that address power imbalances and enhance engagement in governance, such as Payments for Ecosystem Services in Brazil (Weins et al. 2021). The design principles outlined by Ostrom provide a valuable framework for comprehending and strengthening forest resource governance. Though they are widely advocated and applied, there are problems in their complete application, particularly in addressing institutional deficiencies and integrating traditional knowledge systems.

To successfully deal with path dependencies, reforms should be seen to make policy settings flexible and responsive to absorbing new ideas and practices. This involves fostering conversation among various knowledge systems and actors for new solutions to be explored and applied (Davies and Lafortezza 2019; Yona et al. 2019). Leverage points in current systems can target interventions with the potential to change trajectories towards more sustainable ones. This involves understanding the complex dynamics of ecological, social, and economic processes, resulting in path dependencies (Martin et al. 2022). More effective policy frameworks that address ecological functions, stakeholder coordination, and conflict resolution are necessary for social forestry to be more effective. Local government support and understanding of social forestry must be strengthened for successful implementation at regional levels (Maring 2022; Rahayu et al. 2024). Integrating local practices and knowledge through commoning is crucial to increasing social forestry programs because forest management policies are accepted and implemented at the local level (Julijanti et al. 2014)

By forming standard management practices and social relations, smallholder groups can work around formal regulations and attain the intended results of social forestry (Sirimorok et al. 2024). Local governments are essential in facilitating social forestry, yet their actions tend to be limited to a few agencies. Better insight, resource assignment, and policy encouragement at the regional level are necessary to optimize the effectiveness of social forestry as a forest conservation and community well-being strategy (Rahayu et al. 2024). There needs to be collaboration between government institutions, NGOs, and communities to address conflicts and provide sustainable management of forests (Asmin et al. 2019; Maring 2022). These are all due to the importance of sustainability in natural resource management by local communities (Adalina et al. 2014).

The issuance of the KHDPK policy marks a significant institutional shift in Java's forest governance, particularly in the redistribution of forest management authority from the state-owned company Perhutani to a broader range of actors. While this shift introduces elements of decentralization—such as greater involvement of local communities and village-level institutions—it also retains a strong element of central control, as ultimate authority remains with the Ministry of Forestry. This hybrid structure illustrates the ongoing tension between local autonomy and centralized oversight.

KHDPK offers opportunities to expand social forestry by enabling broader stakeholder participation, fostering community economic empowerment, and facilitating forest rehabilitation. However, it also presents notable risks. Among these are elite capture at the village level, legal ambiguities surrounding land tenure, and limited conflict resolution mechanisms. Moreover, the policy's current legal standing—based only on a ministerial decree—renders it vulnerable to political shifts and institutional reversals.

Evaluation using Ostrom's eight design principles reveals partial fulfillment of key governance criteria. While progress has been made in clarifying boundaries, enabling collective-choice arrangements, and establishing benefit-sharing mechanisms, critical gaps remain. In particular, the principle of local autonomy is weakly realized due to the continued dominance of top-down governance structures. Additionally, conflict resolution mechanisms are underdeveloped and constrained by limited field personnel and institutional presence at the site level.

To address these issues and ensure the success of KHDPK as a transformative forest governance model, several policy recommendations are proposed: (i) conflict resolution mechanisms must be institutionalized and resourced adequately. This includes increasing the number of field facilitators, establishing decentralized monitoring systems, and strengthening coordination across government agencies and NGOs (to support Ostrom's principle no 6: fast and fair conflict resolution), (ii) capacity building for village-level institutions, forest farmer groups, and social forestry business groups (KUPS) is essential to support autonomous decision-making, improve compliance, and strengthen community governance structures (to support Ostrom's principle no 7: local autonomy), (iii) legal harmonization is urgently needed to align KHDPK with broader land tenure systems, including recognition of customary rights. Elevating KHDPK to a higher legal status—such as through a presidential regulation or national legislation—would provide greater institutional stability and legitimacy, (iv) clarifying actor roles and fostering collaboration among new and existing stakeholders—such as LMDH, BUMDes, KUPS, NGOs, and local governments—is necessary to reduce overlap and ensure inclusive decision-making.

In conclusion, KHDPK represents a path modification rather than a complete disruption or continuation of previous social forestry arrangements. It reflects institutional layering and conversion within a shifting governance landscape. Whether KHDPK becomes a critical juncture depends on its ability to lock in reforms through inclusive, adaptive, and legally grounded practices. Future research should examine how emerging actor constellations shape the long-term outcomes of this policy and whether it delivers on its promises of equitable and sustainable forest management.

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Table S1. Area of forest in Java, Indonesia

Province	Forest area (ha)						
	Conservation forest			HL	HPT	HP	Total
	Waters	Mainland	Total				
Banten	51,467.00	112,991.00	164,458.00	12,359.00	49,439.00	26,998.00	253,254.00
DKI Jakarta	108,000.00	272.34	108,272.34	44.76	-	158.35	108,475.45
Jawa Barat	-	132,180.00	132,180.00	291,306.00	190,152.00	202,965.00	816,603.00
Jawa Tengah	110,117.00	16,413.00	126,530.00	84,430.00	183,930.00	362,360.00	757,250.00
Yogyakarta	-	910,34	910,34	2,057.90	-	13,851.28	16,819.52
Jawa Timur	3,506.00	230,126.00	233,632.00	344,742.00	-	782,772.00	1,361,146.00
Total (Ha)	273,090.00	492,892.68	765,982.68	734,939.66	423,521.00	1,389,104.63	3,313,547.97
Percentage (%)			23.12	22.18	12.78	41.92	100

Note: HL: Protected Forest, HPT: Limited Production Forest, HP: Production Forest. Source: Forest Area Improvement Center (BPKH) Region IX 2024

Table S2. Strategic issues in KHDPK management

Strategic issues	Existing condition
Social forestry acceleration	SF permits issued in Java Island is 48 permits/management rights units and cover ± 9,868 families with an area of 12,690 Ha. The target that must be transformed is 332,412 ha from the IPHPS Decree and the Kulin KK Decree that have been issued. The number of SF assistants has not been met.
Determination of forest areas in Java	• Still, 17% of the forest area in the Perhutani area has not been designated.
Conflict in forest areas	• At least there are approximately 107,334 ha identified as tenure problems according to Perum Perhutani which are spread across 5,251 locations in various strata, and around 47,529 ha of them are indicated to be in the KHDPK area in the form of settlements, social and public facilities, agricultural land, plantations, and ponds.
Critical land and adequacy of forest cover	From a total of 3.3 million ha, the land cover area of state forest in Java Island is 2.2 million ha (73.8%) in the form of forest cover and 0.81 million ha (23.2%) in the form of non-forest. A total of 208,738 ha of the KHDPK area is critical land that is the target of forest and land rehabilitation (RHL).
Water carrying capacity exceeded	Java Island is estimated to be able to support the water needs of a population of 153 million people with a total water utilization of 117.04 billion m^3 from the total available water of around 118.9 billion m^3. The population of Java Island in 2022 is 154.54 million people, which shows that the utilization of environmental services on Java Island has been exceeded.
Utilization of environmental services	• Increasing interest in nature tourism • Carbon Trading Trends • Only around 13,528 ha of forest in Java are managed as nature tourism objects.
Forest protection	• Forest fires • Forest protection/deforestation
Utilization of Perum Perhutani assets	Perum Perhutani assets located in the KHDPK area remain Perum Perhutani assets.

Table S3. Indicative area of KHDPK allocation based on each forest function

Allocation	Area based on forest area function (Ha)		
	Protected forest	Production forest	Total
Social forestry	166,993.13	426,273.45	593,266.58
Forest area utilization	13,081.26	70,490.71	83,571.97
Forest area arrangement in the framework of forest area confirmation	4,881.73	32,314.21	37,195.94
Forest rehabilitation (once successful, priority is allocated to social forestry)	79,815.14	101,913.24	181,728.38
Forest Protection	0	0	0
Environmental services utilization	200,522.64	7,655.62	208,178.26
Total	465,293.9	638,647.23	1,103,941.11
Percentage (%)	42.15	57.85	100.00