

Policy Briefs

Sustainable Management of Peatland,

Forest Fires, and Transboundary Haze in Thailand.

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Content Summary for Policy Report

1. Executive Summary

This policy report addresses the challenges and opportunities of sustainable peatland and swamp forest management, which are vital to climate action and environmental protection. Peatland forest fires, often severe and difficult to detect early, pose significant threats to both the atmosphere and human health through haze and pollution. However, these forests also serve as large-scale carbon sinks and help prevent catastrophic flooding. Torn between the benefits and risks of peatland forests, the central question is how to strike a balance between the two. Sustainable management requires collaboration among local communities, governments, and experts to balance conservation with development needs.

Main recommendations can be summarized as follows.

Governance Unlocking: Enhance local governance by addressing resource, commitment, knowledge, and regulatory gaps to improve policy translation and implementation. Strengthen inter-agency coordination and mobilize political support is a must for stakeholders to improve local governance and administrative capacities.

Spatial Management: Adopt an area-based management strategy that emphasizes inter-provincial coordination and regional cooperation. It is important to integrate geospatial data and promote community involvement in forest conservation and land use management.

Innovation and Resource Management: Increase the implementation of a resourcedriven policy approach by investing in technology (e.g., drones for fire monitoring or water sensors) and mobilizing economic support and knowledge capital to improve forest management, reduce pollution, and support local communities.

Overall, this report emphasizes data-driven decision-making, sustainable common-pool resource management, and evidence-based policy outcomes. By integrating local governance, innovative technology, and community participation, the report offers a pathway for sustainable peatland management, addressing current environmental challenges while fostering long-term climate resilience. Key recommendations (policy check box):

Data-driven: ensure the evidence-based policy monitoring and evaluation

Knowledge-driven: promote the translation of knowledge to local context

Resource-driven: secure essential budget, human resources, and technical capacities

Collaborative Power and Participation: engage local communities and policy networks to create co-benefits for both the community and the forest, fostering a harmonious co-existence.

Political Capital: mobilize political support, leadership, and local commitment

2. Background

Peatland and swamp forests present both challenges and opportunities for sustainable climate action. One major challenge is that peatland forest fires are often severe and difficult to detect early. These fires can cause significant damage to the atmosphere and human health through haze and pollution. However, these forests also serve as large-scale carbon sinks, help preserve natural wetlands, and prevent catastrophic flooding. Swamp forest fires are mostly caused by human activity. Sustainable peatland management must involve local communities, government stakeholders, and local experts to ensure the forest's protection and benefits. Beyond legal forest conservation, policy stakeholders and decision-makers should explore collaboration and develop shared agreements for sustainable forest management, emphasizing community engagement and appropriate governance strategies.

The policy recommendations can support the ambitions of the ASEAN Peatlands Management Strategy (APMS) by strengthening capacities for the sustainable use and management of peatlands and promoting an integrated approach that leverages knowledge and innovation. This policy brief facilitates knowledge exchange by providing policy insights, drawing from input by academic experts, practitioners, and reflective discussions. It also proposes solutions based on participatory activities and engagement. By synthesizing best practices with an integrated policy design approach, the brief offers collective insights and lessons for sustainable peatland management and addressing haze and pollution in Thailand and the region.

3. Policy frameworks and alignment for practice: Insights from academics and practitioners

The alignment and translation of the regional plan, national plan, and local management of the peatland framework are important for sustainable local forest and resource management. This policy brief highlights the key observations and challenge and opportunities of the translation of the ASEAN Peatlands and Management Strategy (APMS) into local planning and implementation. There are three levels of plan: the ASEAN Peatlands and Management Strategy (APMS), the Thailand National Action Plan for Peatlands (NAPP), and locally Phru Khuan Khreng Peatlands' Comprehensive Management and Conservation Plan.

These plans form a multi-level policy framework with recommendations for achieving sustainable peatland management and advancing the following agenda:

- Strengthening the of essential resources including budget, personnel and technical capacities of responsible agencies for natural and forest protection and volunteers
- Increasing the awareness of the conservation of peatland and swamp forest and necessities to maintain its rich biodiversity and wetland
- Enforcing regulations, promoting fire protection and prevention, and negating the forest impact to natural ecosystem, human health and living quality
- Supporting the area-based management and local cooperation and horizontal inter-agency coordination for quittable management of natural resources and risk prevention
- Promoting the multi-sectoral coordination and linking the research to practice and to local community engagement

The implementation of the plan needs to consider the natural characteristics and geographical challenges. The challenges facing the Phru Khuan Khreng forest in Nakhon Sri Thammarat are primarily three interconnected factors: the conflict of interest between conservation and land use development activities, differences in overlapping authorities and legal enforcement regarding the forest, and difficulties in maintaining fire-proof water levels in the peatland. The first factor is the most challenging to address, requiring a participatory approach and the establishment of appropriate rules for sustainable resource management. The overlapping authorities necessitate the clear identification of the "area manager" and well-defined operational rules to coordinate shared goals in natural conservation and proactive fire protection.

The successful design and implementation of these plans and recommendations significantly rely on a *resource-driven policy and management approach*. Essential resources in local areas are often lacking in Thailand, particularly due to gaps in local budget allocations. Contributions from donor agencies and private entities to local organizations could support the implementation of peatland management by providing technology, knowledge, capacity building, equipment, and funding.

Ensuring the *resource-driven policy and management approach* can support the local adoption of sustainable peatland management strategies and prepare for fire risk prevention and response through:

- Investment and support risk monitoring and surveillance technology by using drones for fire monitoring and real-time situational assessment
- Diversifying vehicles and equipment such as employing engine boat for surveying and site monitoring
- Applying water level sensor technology in risk assessment and water management
- Engaging and expanding local organizations of volunteer network, surveillance network, local communication, entry checkpoints and risk communication and translation
- Establishing common rules for shared resources pulling and expertise such as in the areas of water management (including ground water), geospatial information and local administration and legal enforcement (local governance)

The major concern in policy adoption and implementation is the resources gap. Most of these essential resources are demonstrated in the GIZ's SUPA Thailand Program. Mobilizing such resources depends on inter-governmental coordination, clear policy guidelines, and multi-sectoral cooperation to support local efforts. A resource-driven policy and management approach requires agreements on cooperation, adequate funding, human resources, technological tools, mutual trust, and strong technical and knowledge capacities.

4. Policy Recommendations

The management of peatland forests requires a sustainable policy approach that addresses the complexities of natural conservation, land-use management, and community engagement, fostering understanding with local populations. The goals extend beyond fire prevention and disaster response. Effective peatland management depends on reducing resource gaps and addressing challenges that hinder sustainable natural resource management, while ensuring human safety and well-being. Unlocking the high potential of peatland management for climate action also requires overcoming institutional challenges. To achieve these policy ambitions, it is crucial to unlock the potential and address the barriers related to local governance, spatial management, and innovation.



4.1 Unlock Local Governance

Unlocking institutional and policy potential begins with enabling the effectiveness of local governance. Local governance serves as the institutional response in hotspot areas, and it plays a crucial role in translating policy into action that addresses local needs and demands. The first step is to identify institutional gaps within local governance and administration. The policy challenges related to peatlands, forest fires, and transboundary pollution are inherently cross-sectoral and cross-boundary. A top-down decision-making approach is insufficient for ensuring effective

policy implementation and sustainable outcomes. The key gaps in the local governance structure and processes are highlighted as follows:

- \Rightarrow The lack of comprehensive land use for peatland areas
- ⇒ Misalignment of the resources and conflicting of responsibilities among the local and regional local authorities
- ⇒ Insufficient knowledge capacities and up-to-date training of local administrators and staff to respond to local climatic and environmental challenges
- ⇒ Centralized budgeting process hinders local administration to access and utilize the public budget
- ⇒ Insufficient resources for local resources management including knowledge gap, human resource gap, authority gap, and incentives gap to manage local natural resources and regulate the land use
- ⇒ Limitations in utilizing data and technology hinder proactive prevention and mitigation of natural hazards

These significant gaps in local governance reduce the ability of local administrations and regional bodies to respond effectively to local threats. Existing legal enforcement measures are insufficient to address the situation in Khun Khreng, particularly in promoting co-existence and mutually beneficial interactions between communities and forests. Although the Thai Decentralization Act was enacted decades ago to transfer authority and responsibilities from specialized departments to local administrations at the provincial and sub-district levels, there has been a lack of actual decentralization and the transfer of budgets and knowledge for local planning practices. This lack of knowledge and capacity is particularly evident in resource governance, especially in forest management, biodiversity conservation, and forest fire protection.

The policy recommendations to "unlock" the capacities of local governance and administration are grounded in the need to address four main implementation gaps: (1) resource gap; (2) commitment gap; (3) knowledge gap; and (4) regulation gap. The following recommendations aim to address these gaps and enhance the potential of local governance. It is crucial to

- ⇒ Stimulate inter-agency coordination and network governance for mobilization and utilization shared monetary and non-monetary resources, including expertise and knowledge
- ⇒ Mobilize political capital and acceptance of the local political and administrative power to enable collaboration and access to resources and ensuring continuity of policy initiatives and efforts
- ⇒ Connect with local and regional universities, knowledge hubs, and research institutions to facilitate the translation of knowledge to local administrations and communities, enabling the utilization of data-driven decision-making.
- ⇒ Enforce a comprehensive legal framework in ensuring rights to clean air, Clen Air Act., is instrumental to integrate cross government ministries and department and promote the financial mechanisms for the co-beneficial resources and land use

The recommendations focus on building knowledge and experience through the support of policy and knowledge networks, as well as collaborative governance. At the local governance level, it is essential to promote a knowledge-driven policy network that enables the translation of expertise and intellectual assets to local actors. This approach should also encourage local administrations to utilize data and information in their planning processes. Access to financial resources should not be restricted to top-down decision-making; local administrations at both provincial and sub-district levels should have the authority to collect local land use taxes and mobilize local funding and public donations. The key expected outcomes of "unlocking governance" include continuous political support, collective experience, expanded knowledge, and sustained local efforts in managing their areas—fostering ownership of policy issues, instruments, and solutions.



4.2 Unlock Spatial Management and Intervention

One of the most significant challenges for sustainable peatland management is the lack of appropriate area-based governance. The fragmentation of land use regulations and sectoral approaches to complex wetlands and peatlands poses major concerns in achieving integrated area management. There is a pressing need to transition from fragmented governance and overlapping authorities toward a more cohesive area-integrated approach. This section highlights the necessity for an area management strategy and inter-governmental coordination by introducing examples, case studies, and policy interventions.

The current peatland management strategy in Khuan Kreng is predominantly reactive, primarily focusing on responsive measures to address wildfires. The existing management practices emphasize these reactive and responsive strategies:

- Reduction in hotspot and burn scar areas
- Increased number of fire stations, fire response teams, and centers

- Increased number of forest fire surveillance teams
- Decreased time for on-site fire detection, response, and post-event reviews
- Decrease in areas experiencing recurring fire events

Local and area-based peatland management, under the authority of the Department of National Parks, Wildlife, and Plant Conservation, is primarily reactive, focusing on responding to local hazards. These strategies have been enforced as assessment criteria for local authorities in the region. However, what is missing is sustainable forest resource management and active community engagement, which could generate mlong-term positive impacts for both the forest and community dwellers.

This report recommends shifting the focus toward a conservation-based approach, which includes the protection of wetlands, conservation of swamp areas such as Boh-Lhom Park, and maintaining natural protective boundaries to safeguard against land-use development and encroachment from inhabited areas. Decisionmakers and government authorities should also consider the co-benefits of community-based forest management and explore how communities can contribute to and benefit from natural conservation efforts. A participatory and communicative policy design approach is required to balance the interests of natural conservation, fire prevention, and the resource needs of local communities.

The recommendations for area integrated land use management and participatory management approach are explained below.

- ⇒ Adopting regional and inter-provincial coordination in practice and consider policy alignment and systematic perspective in fire risk prevention and mitigation
- ⇒ Promoting sub-regional cooperation framework in strengthening capacities of provinces, neighboring countries, and regions to adopt sustainable forest management regulation and best practice, for example, the promotion of the 'Clear Sky Strategy'
- ⇒ Translating of the policy framework to regional and provincial action plan, shared resources, identify key indicators, actionable commitment and focusing rights-based approach (e.g. rights to health, rights to clean air)
- ⇒ Providing Meaningful decentralization approach with focusing on tailormade capacity building and context specific policy measures and solutions
- ⇒ Focusing on local co-benefit (community forest) and specific need and context and location and delegate a greater power and responsibility to local authority as the area commanders and area manager

⇒ Applying data-driven approach and open information platform for monitoring and evaluation local administrative performance

The key to unlocking the potential and commitment of area-based management and spatial governance lies in focusing on a proactive approach to addressing haze, fire, and pollution, while promoting *evidence-based, data-driven management*. The application of geospatial data is crucial for local administration and decisionmaking, but this requires the transfer of knowledge and capacities to local organizations. A proactive and integrated approach can be achieved through effective land-use management. There are various strategies that can support sustainable landuse management.

The recommendations for sustainable land use management are based on:

- Establishing a shared data system, particularly for geographical mapping.
- Integrating legal enforcement based on shared public interests, moving away from a fragmented, siloed administrative approach.
- Fostering a shared understanding of the need to prioritize public interests, with decision-making based on local spatial characteristics rather than rigid policy measures and instruments.
- Building a shared commitment to sustainable solutions by emphasizing the socio-economic outcomes of forest management and defining appropriate methods to address context-specific needs, resources, and opportunities.

The adoption of sustainable land use management should be rooted in a systematic approach to policy management and design. This means that government actors should not solely focus on policy instruments, such as project implementation and legal enforcement. Greater attention must be given to holistic policy design, which is based on a deep understanding of local geographical characteristics, shared agreement on the end/result/target, and decisions driven by data and sound evidence.

The ultimate policy outcome for peatland management is fostering a harmonious coexistence between communities and the forest. Communities should be empowered to care for the forest themselves while minimizing pollution impacts on their areas. Policy solutions must prioritize prevention and the ecological balance of wetlands. The selection of measures should be context-specific, taking into account geo-characteristics and location. Decision-making should follow a decentralized, participatory approach, supported by evidence and data-driven insights.



4.3 Unlock Resources, Management and Innovation

Pursuing area-integrated and community-based forest management requires a *resource-driven policy management approach*. Identifying key resources for sustainable forest management is crucial for mitigating the broader impacts of haze and pollution while maximizing national capacities for climate mitigation. This section highlights essential resources in four key areas: economic resources, legal instruments, data and innovation, and knowledge capital. To "unlock management resources," this report provides insights into how the integration of these resources and capacities can effectively address wildfires and pollution both nationally and regionally.

Starting with *economic resources*, it is important to recognize that peatland and swamp forests are common-pool resources. This means the forest and land do not belong to any specific individual, but to all citizens and the state. These forests are common property for both local Thai communities and global citizens, as Khon Kreng is an international RAMSAR site under the Wetland Convention. This implies a shared responsibility—both at the individual and state level—to care for these forests

as common property. There are three key dimensions of economic resources to consider in the management of common-pool resources.

- The shared responsibility mindset that individual shall not take their personal advantage beyond ecological limited boundary and causing of the wider disaster impacts.
- The clear "rules-in-use" need to be adopted in how the resources should be taken, the appropriate amount, punishment rules and monitoring system. These rules are required to set and agreed upon the communities involved.
- The adoption of "payment for ecosystem services" (PES) for sustainable peatland management. This mechanism allows everyone to contribute financially to maintain the ecosystem of the forest. The money gained can be used to support forest conservation volunteer. The state can promote this payment for ecosystem services as tax deduction incentives. This mechanism require institutional set-up and responsible agency to manage the process.

The second key resource is utilizing *knowledge capital* to enhance the management system. It is crucial to raise awareness about the importance of peatlands and forests, as many Thais are still unaware of their vital role in our ecosystem and their contribution to national climate action and mitigation efforts. Therefore, fostering awareness through education and knowledge-sharing platforms is essential for understanding the ecological threats to peatlands and swamp forests. An important aspect of this knowledge transformation is shifting the perspective from viewing biodiversity solely as a resource for economic gain to recognizing it as **bio-cultural diversity**. This approach emphasizes local livelihoods, cultural practices, and community adaptation to their ecological environment, rather than focusing solely on resource extraction.

It is important to attaining the knowledge capital and setting the policy directions for bio-cultural diversity of the peatland and forest management. Three steps are required.

Process Tracing: Conduct a chronological analysis of forest-related problems over the past 10 years to gain a comprehensive understanding of policy gaps and pain points in forest fire management. This analysis should identify how to address these gaps using evidence and scientific approaches.

- Open Government Data and Data-Driven Platforms: Utilize open government data and data-driven applications as foundational tools for forest management. Government support for the development and use of mobile applications, such as FireD and Burncheck, is essential.
- Participatory Policy Dialogue: Organize participatory policy dialogues to engage local communities in decision-making processes. These open dialogues should address the interests of urban dwellers in maintaining clean environments while allowing for local community forest use, aiming to explore mutually agreed-upon, attainable solutions.

An important initiative in Thailand to overcome legal barriers for haze and pollution reduction is the drafting of the Clean Air Act. This act serves as a national legal and policy instrument to address this environmental concern, targeting governance gaps in the country. This *legal instrument* are aimed at addressing governance gaps in Thailand. The first gap involves the sectoral sources of pollution. The Clean Air Act Committee has identified six sectors contributing to pollution, with at least nine ministries involved in addressing these sectors. The act aims to integrate the efforts and responsibilities of these ministries, ensuring that any public investments and project developments consider strategies to minimize pollution emissions. Another significant governance gap is the enforceability of regulations. The enactment of the Clean Air Act would demonstrate a strong government commitment to reducing air pollution nationwide. Additionally, the act introduces financial mechanisms to support local efforts in decreasing emissions and establishes clear "rules of engagement" for local practitioners.

The final aspect of unlocking management potential is *technological innovation*. Sustainable area-based and land use management cannot be achieved without data-driven decision-making support. The application of space-based technology is crucial for responding to ecological hazards, particularly in relation to wildlife. Utilizing space-based technology and geospatial data can enhance evidence-based decision-making and inform local interventions effectively

The use of space-based technology could support the data-driven management approach and support for local intervention by:

• Monitoring Events: Conduct local situational analyses to ensure a safety approach for frontline responders.

- Scoping Hotspots: Identify hotspot and risk areas for comprehensive risk assessments and the selection of policy alternatives.
- Identifying Policy Options: Determine appropriate place-specific policy options and solutions, along with an assessment of their implementation.
- Knowledge Transfer: Facilitate knowledge transfer to frontline officers through data-sharing platforms and mobile applications.

Overall, the use of technology and data-driven approaches can connect space technology and innovation to enhance the efforts of local communities and responders, ultimately saving lives. Implementing an evidence-based support system will facilitate the assessment of alternatives and enable effective policy evaluation.

The recommendation for the *resource-driven policy approach* extends beyond merely mobilizing resources for implementation. Unlocking management resources involves the appropriate allocation of these resources and the establishment of mechanisms for effective policy assessment, evaluation, and alternative policy selection. Key considerations for a resource-driven policy approach can be considered as follows.

- Focus Beyond Traditional KPIs: Instead of solely relying on Key Performance Indicators (KPIs) or Objectives and Key Results (OKRs) related to reducing fire events, policy decision-makers should specifically identify different types of fire burning to effectively mitigate them. This includes distinguishing between: (1) burning for subsistence or "sufficiency carbon," and (2) burning for commercial interests—not just counting the number of incidents, but also considering the intent behind these actions.
- Enhance Roles of Research Agencies: Increase the involvement of research agencies and knowledge organizations in legal drafting committees to ensure informed policymaking.
- Establish Management Thresholds: Set management thresholds and limitations on burning practices, clearly defining the purposes for which burning is allowed. Identify pathways to reduce the frequency of events, taking into account both intent and context. There is a need to establish diverse national indicators for pollution reduction.
- Local Monitoring and Evaluation Mechanisms: Develop localized monitoring and evaluation mechanisms that continuously support local resources, livelihoods, and sociocultural contexts within strategic forest management, indicator setting, and evaluation.



5. Re-imagine peatlands, forests, and nature in Thailand: co-creation and participatory workshops

5.1 Reverse the problems; Multiverse of solutions

Despite the complex policy and systemic challenges in peatland management, co-creation and participatory workshops have helped to identify a shared understanding of local problems and solutions, both in the near and long term.

The existing challenges include a continued lack of data-driven approaches in national and local decision-making, which hinders the decentralization of budgets and resources into the local governance context. Additionally, there are complex challenges related to transboundary and trans-regional threats and impacts. Cross-border administration has not yet been established to effectively respond to cross-provincial wildfires and the resulting pollution. Furthermore, there is a need to improve the understanding and relationship between officials and citizens to balance diverse and often conflicting interests.

The proposed policy solutions are divided into two parts. The first part consists of existing solutions that require reinforcement and ongoing support. These include

establishing a single command and incident command system, enhancing intergovernmental and cross-regional coordination, supporting sub-regional cooperation and knowledge sharing, and enacting legal instruments.

The second part comprises "breakthrough" solutions. These solutions are novel and have not yet been fully adopted, making them worthwhile for investment. Examples include the use of integrated big data, decentralizing appropriate resources and area-based authority, implementing adaptive land use measures to balance various interests, localizing technological use and innovation, and connecting research to local practices. Although these solutions are not new within academic circles, their implementation still requires an action plan, a policy timeline, and clear pathways.

5.2 Peatlands and the Planet: The Policy Future Timeline

The policy pathways highlight that not all proposed solutions can be implemented simultaneously. Therefore, a policy timeline, referred to as the "policy future timeline," needs to be created and adopted in the policy planning process. This timeline was developed based on a participatory workshop and co-creation activity titled "Reverse the Problems, Multiverse of Solutions." The policy solutions are strategically positioned within the timeline to reflect three main stages: past, present, and future.

In the first stage, the past, the focus is on state-led policy solutions. These solutions are primarily reactive to natural hazards and events. Key initiatives include the adoption of the Paris Agreement and the Net Zero target. These measures are instrumental in shaping sustainable peatland management. The successful management of the Khun Kreng Pha Phru can significantly contribute to national climate mitigation efforts.

The second stage, present, represents a combination of technological development and economic mechanisms. These policy solutions mark the early phase of institutional transition. They emphasize a conservative and nature-based approach to ecological challenges, supporting carbon credit systems, law drafting, and the development of clean technologies. However, these solutions still require knowledge transfer and financial investment to be effectively integrated into local planning practices.

The third and most extensive stage, future, focuses on the actualization of proposed measures in policy practice. These solutions are established as quantifiable policy targets aimed at reducing disaster events, lowering greenhouse gas emissions, and enforcing legal mechanisms. A key focus of the future is increasing local resources and budget support. Recommendations are based on achievements in institutional transition, such as integrated water management, appropriate zoning and land use, and flexible, adaptive fire and forest management strategies.

6. 'Unseen and beyond': conclusions and lessons for policy and practice

Several lessons can be drawn and operationalized from this policy report. The lessons for practice emphasize the need to transition from a reactive and responsive approach to a more proactive and area-integrated strategy, while also capitalizing on meaningful and appropriate decentralization processes. The policy recommendations center around new concepts, diverse perspectives, and existing efforts, which can be summarized as seven lessons for policy and practice.

- 1. The shift toward bio-cultural diversity with attention to local context and community culture, livelihood, and community-forest interdependencies
- 2. Community-based Forest Management approach with open policy dialogue in balancing diverse interests, risk and opportunity
- 3. Identify socioeconomic win-win solutions and equitable distribution of benefits to local communities
- 4. Right-based approach in nature, economic and community co-inhabitation
- 5. Comprehensive legal instrument that enables policy support and local efforts and overcome exiting institutional challenges
- 6. Accessibility to essential data and information for policy monitoring and evaluation
- 7. Engage with wider policy network and strengthen collaborative governance and coordination



