



# Peatlands and fires in Southeast Asia

## A stocktake of knowledge products

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### Introduction

Transboundary haze pollution is one of the most severe environmental issues in Southeast Asia (ASEAN 2009; Zhang and Savage 2019). Transboundary haze from land/forest fires has caused enormous impacts such as economic losses, loss of natural resources and ecosystem degradation, increased greenhouse gas emissions, health problems and losses in the social sector (Harrison et al. 2009; Huijnen et al. 2016; Saharjo 2022).

For more than two decades, the Association of Southeast Asian Nations (ASEAN) has recognized the transboundary problem of haze. The ASEAN Agreement on Transboundary Haze Pollution (AATHP) is the foundation for intergovernmental coordination in tackling transboundary haze in the region. AATHP and its implementing modalities include the ASEAN Peatland Management Strategy (APMS) and the ASEAN Roadmap on ASEAN Cooperation towards Transboundary Haze Pollution Control with Means of Implementation (ASEAN Haze-Free Roadmap). These modalities highlight the crucial role of sustainable peatland management in reducing transboundary haze pollution and improving peatland ecosystem governance (Evers et al. 2017; Terzano et al. 2022).

The Measurable Action for Haze-Free Sustainable Land Management in Southeast Asia (MAHFSA) programme

is one of several actions in ASEAN. Supported by the International Fund for Agricultural Development, MAHFSA is a joint initiative between the ASEAN Secretariat (ASEC), the Global Environment Centre and the Center for International Forestry Research. As one key activity, MAHFSA stocktakes knowledge products, developing and deploying them in relation to peatlands and fires in Southeast Asia. This aims to reduce transboundary haze pollution and its impacts, promoting sustainable forest management and peatland conservation in Southeast Asia.

In 2022, Dermawan and colleagues produced “A stocktaking of knowledge products on peatlands, fires and haze in Southeast Asia, 1990 to 2020”. The analysis categorized knowledge products into five themes (policies, tenure, economics, best practices and monitoring), as well as by geographical location (country and region) and by elements of integrated fire management (prevention, preparedness, suppression and recovery). Finally, by applying text and co-occurrence analyses, the study highlighted salient topics of knowledge products related to peatlands in Southeast Asia. Data for this study came from four scientific databases (Scopus, Web of Science [now Clarivate], CAB Abstract, and Proquest) and publications of MAHFSA partners. This info brief provides an overview of results from Dermawan et al. (2022).

## What can the existing knowledge products tell us?

Keywords in each thematic area on Table 1 reflect the main topics on the studies of peatlands and fires in Southeast Asia. Other keywords are used beyond those listed in Table 1 but with less significant appearance.

An initial analysis of the keywords on thematic areas, geographical coverage and elements of integrated fire management reveals several insights. First, given the significance of Indonesia peatland areas, studies on them not surprisingly dominate knowledge products on peatlands in Southeast Asia. At the same time, keywords on Southeast Asia and ASEAN show a comparable frequency with Malaysia, the second largest country with peatland cover in Southeast Asia. Second, knowledge products do not show evenly distributed thematic area keywords. Among the five thematic areas, monitoring and tenure are the dominant keywords. This trend is similar to the knowledge products collected from scientific databases and the publication of MAHFSA partners. Finally, a similar uneven pattern appears on the keywords on the elements of integrated fire management (prevention, preparedness, suppression and recovery). Data from scientific databases highlight that more keywords are about recovery and prevention. However, publications of MAHFSA partners show more keywords on prevention and suppression, indicating the efforts to prevent fires and rapid response to fire occurrences.

Co-occurrence means the appearance of two keywords in a sentence or a paragraph. By focusing on the co-occurrences among keywords at the sentence level, the study attempts to understand the thematic keywords that appear in the same sentence as the keywords on countries and the integrated fire management elements. Using data from the scientific databases, co-occurrence between thematic areas and integrated fire management shows that prevention and recovery dominate in each thematic area, especially in policies, tenure and economics. Meanwhile, co-occurrence analysis between thematic areas and country shows the dominance of peatland monitoring. Finally, co-occurrence between integrated fire management elements and countries indicates the prominence of prevention in seven countries in Southeast Asia and at the regional level and recovery in the remaining three countries. Analysis of MAHFSA publications reveals a similar pattern in the co-occurrence between thematic areas and integrated

fire management. Again, prevention is the main keyword found in each thematic area.

An additional analysis on the publication of MAHFSA partners shows that each partner produces different kinds of knowledge. Most of the knowledge products take the form of journal articles, books and information briefs. In terms of content, most typically contain analysis, information pieces and guidelines. To complement the analysis from scientific databases and publications of MAHFSA partners, an additional scoping used knowledge products published primarily in English by key government agencies in Southeast Asia.

## Major gaps

A further analysis combined thematic areas and country by developing a simple ranking system. The thematic area with the highest number of co-occurrences was assigned a rank of 5, while the lowest number was ranked 1. Table 2 highlights areas that might be considered for each country, showing that knowledge product development considers topics relating to best practices. For example, there is a need for a comparative study on different best peatland management practices across countries in Southeast Asia.

Two additional knowledge products were suggested for consideration at the regional level: i) a guideline on burned area identification and mapping; and ii) a methodology and mapping of upland peat in ASEAN.

By conducting a similar process in the types of documents, Table 3 shows that guidelines and strategies are a higher priority for most countries, while analysis is lower. Key stakeholders in each country should be consulted on the results of this prioritization exercise.

The findings provide some indications on the priorities of thematic areas for each country. However, soliciting feedback from focal points could provide a better understanding of the knowledge product needs of each country.

The study shows that thematic areas and knowledge product types vary between ASEAN Member States (AMS). As such, during the programme, AMS will need to provide feedback on relevant issues.

**Table 1. Primary keywords in each thematic area**

Thematic area	Main keywords
Policies	Power relations, politics, institutions, decision making, regulations, governance
Tenure	Land use, smallholders, gender, private ownership, land clearing, conflict
Economics	Economy, development, markets, income, capital, investment
Best practices	Conservation, biodiversity, restoration, agroforestry, water management
Monitoring	Data, system, carbon, satellite, drought, technology, measurement



Table 2. Thematic areas for consideration by country

	Policies	Tenure	Economics	Best practices	Monitoring
Brunei Darussalam	**	*	**	***	*
Cambodia	***	***	*	*	*
Indonesia	*	*	*	***	*
Laos	*	*	***	***	*
Malaysia	*	*	*	***	*
Myanmar	**	*	***	***	*
Philippines	*	*	**	***	*
Singapore	*	*	**	***	*
Thailand	*	*	**	***	*
Vietnam	*	*	**	***	*

Note: \*\*\* higher priority, \*\* medium priority, \* lower priority

Table 3. Idea for prioritization of knowledge products by country

	Analysis	Guidelines	Information	Strategy
Cambodia	***	***	*	**
Indonesia	**	***	**	*
Laos	*	***	***	***
Malaysia	**	***	*	**
Myanmar	***	***	*	**
Philippines	**	***	*	***
Thailand	*	**	***	***
Vietnam	**	**	*	***

Note: \*\*\* high priority, \*\* medium priority, \* low priority



## Implications

The stocktake analysis highlights three implications for policy and practice:

First, gaps between countries identify a need for knowledge sharing among AMS. As the two largest countries with peatlands, Indonesia and Malaysia have ample lessons for other countries in the region. Indonesia has comprehensive multilevel regulations on peatland, ranging from planning, determination and law enforcement. Indonesia and Malaysia have also developed information systems that enable key government agencies to do real-time monitoring of various aspects of peatlands and fires. Both regulatory framework and technologies can be shared within the region.

Second, there is a need to develop relevant knowledge products by, for example, synthesizing the latest available knowledge on a variety of topics related to peatland. Furthermore, there is also a need for developing a repository of knowledge products where different audiences in the region can access the most recent knowledge products on peatland and fires. In this context, the ASEAN Haze Portal website (<https://hazeportal.asean.org>) – officially launched in February 24, 2022, serves as a knowledge repository, making available all knowledge products developed and events held under MAHFSA and other programmes, as a data management system (e.g. daily haze and hotspot map), and as a platform for engagement and collaboration. It also facilitates networking and knowledge sharing among Southeast Asian policymakers and other relevant practitioners.

Finally, the communication channels of AMS, ASEC and their partners can facilitate bottom-up approaches, such as soliciting feedback from audiences on their knowledge product needs.

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