



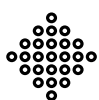
Factsheet

Mainstreaming forest landscape governance based on forest-water-energy-food nexus toward sustainable forest landscape management in Indonesia's border areas

Duration
2023–2027

Indonesia's land borders face constant deforestation due to population growth, economic pressure and inadequate institutional capacity. This degradation impacts water, energy and food security, particularly for women and vulnerable groups. Fragmented landscape governance and limited social inclusion further escalate these issues.

The emerging forest-water-energy-food (FWEF) nexus is identified as a vital solution for these complex, interlinked problems. This research project aims to develop participatory recommendations based on forest landscape governance (FLG) principles to mainstream the FWEF nexus perspective into inclusive local development strategies, ensuring sustainable forest management in strategic transboundary areas.



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Ongoing work focuses on:

- developing a baseline through participatory transboundary studies on socioeconomics and policy frameworks, including impacts on vulnerable groups
- formulating evidence-based models tailored to transboundary issues as a framework for the FWEF nexus approaches
- mainstreaming these approaches into government regional development strategies for integrated planning at all levels
- developing implementation strategies and guidelines that promote gender equality and social inclusion in ground-level natural resource management
- developing participatory recommendations using FLG principles to promote the FWEF nexus in strategic border areas

The outcomes and impacts of this work include:

- improved FLG and sustainable management of transboundary forest areas
- integration of the FWEF nexus into inclusive government local development strategies
- enhanced capacity for communities, especially women and vulnerable groups, to participate in resource management and voice aspirations
- evidence-based policy frameworks to support Sustainable Development Goals and national climate targets, including REDD+ and Nationally Determined Contributions

Methodology

The study uses participatory action research with mixed methods design, starting from the village level and working up to the national level. Quantitative methods involve household surveys and biophysical measurements to construct Structural Equation Modeling-Partial Least Squares (SEM-PLS) models of the FWEF nexus. Qualitative methods include expert judgments, focus group discussions and multi-stakeholder dialogues for context analysis and policy drafting. A nested system approach facilitates data analysis from specific sites to provincial levels. The framework ensures human rights, gender equality and social inclusion throughout the process, aiming to build common understanding and evidence-based policy recommendations.



Selected outputs

Published

This 2025 *Pertanian Terpadu* article,¹ examines factors affecting lowland rice yields in Motalun Village, West Malaka District, Indonesia. Based on a survey of 41 farmers and regression analysis, it finds that land area, seeds and fertilizer significantly increase production, while labour and farming experience do not.

Published

This 2025 *Nusa Sylva Journal* article,² examines transboundary river water resource use along the Indonesia–Timor-Leste border, focusing on local governance and community management of the Motamasin River in West Timor. It highlights the need for integrated and sustainable water governance approaches that consider both social and physical dimensions in vulnerable border regions.

Forthcoming

Three village regulations codeveloped with communities in East Nusa Tenggara to establish forest governance frameworks based on the FWEF nexus. The regulations outline protected zones, firewood collection rules, monitoring mechanisms and customary sanctions to support sustainable resource management.

Forthcoming

A policy brief presents research findings from three villages using SEM-PLS analysis and spatial data. The brief highlights the interconnected nature of forest, water, energy and food systems and proposes inclusive governance, policy integration and cross-border collaboration with Timor-Leste.

Study sites

Indonesia

- 1 Alas Selatan village, East Kobalima district, Malaka Regency, East Nusa Tenggara province
- 2 Alas village, East Kobalima district, Malaka regency, East Nusa Tenggara province
- 3 Aji Kunig village, Sebatik Tengah district, Nunukan regency, North Kalimantan province

- 4 Fatulotu village, Lasiolat district, Belu regency, East Nusa Tenggara province
- 5 Mosso village, Muara Tami district, Jayapura regency, Papua province

Timor-Leste

- 1 Salele Village, Beiseuc district, Tilomar regency, Cova Lima province

Team focal points

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Timor-Leste

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- 1 Klau, M. I., Koehuan, J. E., Kette, A. U. S., Suratama, S. M., & Dethan, J. J. S. (2025). Determinasi faktor produksi terhadap produktivitas padi sawah di wilayah perbatasan: Studi empiris di Desa Motaulun, Malaka Barat. *Jurnal Pertanian Terpadu*, 13(1), 65–76. <https://doi.org/10.36084/jpt.v13i2.626>
 - 2 Hermalinda, M., Amaral, S., Koehuan, J. E., & Dethan, J. J. S. (2025). PEMANFAATAN SUMBER DAYA AIR SUNGAI BATAS NEGARA DI DESA ALAS SELATAN KECAMATAN KOBALIMA TIMUR. *Jurnal Nusa Sylva*, 25(2), 51–61. <https://doi.org/10.31938/JNS.V25I2.853>

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Explore is a research network and community of practice supporting forest landscape governance research in Southeast Asia through participatory action research, capacity building and policy engagement. It advances inclusive, practice-based collaboration among researchers, practitioners and communities, while strengthening connections between research, policy and practice across the region.

The Explore Secretariat at RECOFTC, in collaboration with partners, provides support, training, mentorship, technical input and opportunities for cross-learning throughout the research cycle.

For more on Explore, visit recoftc.org/projects/explore or write to us at explore.secretariat@recoftc.org.



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