



Improving Capacities Towards **REDUCING GREENHOUSE GAS EMISSIONS**

From Peat Swamp Forest Fires in Indonesia

Forest Research and Development Center, Research Development and Innovation Agency, Ministry of Environment and Forestry, in collaboration with the School of Ecosystem and Forest Sciences, the University of Melbourne and funding support from Asia-Pacific Network for Sustainable Forest Management and Rehabilitation (APFNet) and Australian Government

Rationale

- **Tropical peatlands** are the area of high carbon density and plays an important role in carbon-gas land-atmosphere interactions. The largest share of the tropical peat forest carbon pool is tropical peatland forest in Indonesia, which is estimated at 57 Gt or 65% of the total.
- Currently peat swamp forest (PSF) in Indonesia is subject to rapid **degradation** due to strong economic and social pressures for timber and land for agriculture and plantations. Clearance and drainage of PSF over recent decades has resulted in an unprecedented increase in **peat fires**, with smoke and pollution affecting not only Indonesia but all south-eastern Asia. Currently, emissions from drained and burnt peatlands contribute 2 Billion tCO₂ per year and account for 5% of the global carbon budget.
- Emissions from peat fires is subject of a great uncertainty as only a few empirical based parameters of fuel loads and their combustion efficiency are currently reported in the literature.
- **Lack of knowledge** on how different fuels contribute to GHG emissions makes it very difficult for the Agencies to develop well-targeted policy for emission reduction.
- The main components of the **GHG emission estimation** are the product of area burnt (Area), fuel load (FL), a combustion factor (CF) and the emission factor specific for each gas (EFi). Parameters for FL, CF, as well as patchiness of the burnt area remain highly uncertain for Indonesian PSF and directly influence emission estimates. At present, emissions from PSF fires are not currently reported in the GHG inventory due to high levels of uncertainty in the available data.
- This project addresses a significant knowledge gap in GHG emissions from fires in PSFs and aims at **developing a robust methodology for estimating GHG emissions from PSF fires, and policy recommendations for emission reduction actions**. In a carbon sensitive environment, when economies and local communities can be financially rewarded for reducing GHG emissions, improved accuracy of estimates in the emissions from PSF fires and understanding the fuel drivers of emissions can become critical for ecosystem service payments.

Goals

The main goal of this project is to **improve the capacity** of forest managers, local communities and policy makers to understand the drivers of GHG emissions that is crucial for developing best practices and policies for emission reduction.



Objectives

1. To **improve the knowledge base** of fuel loads (fine and heavy) and their combustion characteristics in peat swamp forests at different stages of degradation;
2. To **develop robust methodology** for estimating GHG emissions with better and more accurate parameters (CO₂ and non-CO₂) from peat-fires for inclusion in Indonesia's reporting of Forest Reference Emission Level (FREL) to the UNFCCC;
3. To **build and extend the scientific basis for developing adaptive management options** and enhance the capacity in decision making for GHG emission reduction from peat-fires;
4. To **expand network and build capacity** through workshops, communications and policy notes to further enhance the information sharing and technology transfer.

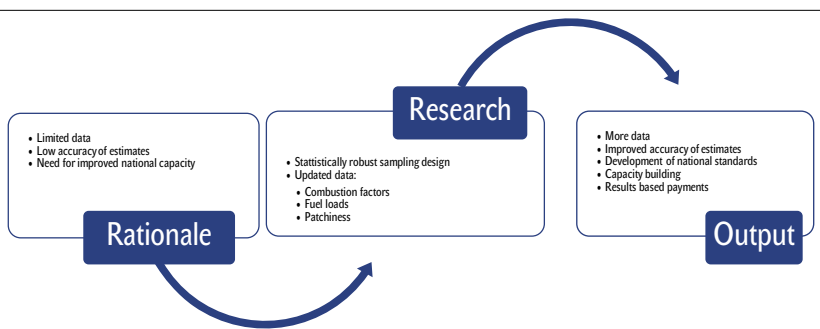
Expected Outputs

1. A **comprehensive baseline of GHG emission** from peat swamp forest fires;
2. An **updated methodology on estimating GHG emissions** from PSF for Indonesia's international reporting;
3. A **set of recommendations for reducing GHG emissions** from forest fires;
4. High quality peer-reviewed **publications** making results of the project transparent and readily available for international reporting and verification under the UNFCCC requirements for the result based payments on emission reduction.



Key Activities

1. Comprehensive **literature review** and development of a statistically **robust experimental design** for measurement of fuel loads and pyrogenic carbon in the field, further **develop a comprehensive baseline** of GHG emission from peat swamp forests fires;
2. **Data analysis of GHG emissions parameters** and relationship between fire intensity, fuel type, forest degradation stage and emission release;
3. **Development of policy recommendations** for emission reduction in PSFs based on the results of the field study.
4. **Capacity building and results dissemination** of the research through workshop, training, conferences, publications, and staff exchange.



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