



Minimizing carbon loss through integrated water resource management on peatland utilization in Pulau Burung, Riau, Indonesia

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What is peatland and why is it matter?



Peatlands are wetlands with almost entirely of organic matter derived from the remains of dead and decaying plant material.





Peatland diagram

Carbon storage

Why peatland utilization is in bad place?



Drainage made peatland dry and vulnerable to fire





Annual CO₂ emissions from land-use change

Peatland fire contribute to global GHG emission







Opportunity

Available peatland area suitable for agriculture. Inherently use by local communities for farming. Growing research on new innovation.

JENIS-JENIS TANAMAN REVITALISASI PADA LAHAN GAMBUT KEDATON



Challenges

- Severe limitations for agricultural use i.e. acidic condition
- Subsidence that leads to carbon loss.
- Fire risk.

Key to sustainable peatland utilization: Keeping the peatland wet



Examining how an integrated water resource management can reduce carbon emission from peatland management.



Study Area





KATEMA

West Sumatr

Jambi

Bengkulu

South Sumatra

Java Sea

PULAU BURUNG DISTRICT

Is a lowland, flatland, and peatland. Has a climate type A based on Schmidt-Fergusson. Within Sungai Gaung-Kampar PHU.

In 1986, via PIR-Trans scheme, transmigrants were given houses and land for coconut plantation.

A local, private company facilitate the agriculture practice. Including building the water management system.

Method



Water management





Water table depth from 106 points.

Carbon emission



Subsidence



Fire occurrence based on field observation and interview.

Emission = Carbon Density x Subsidence

Result – water management





Water Management Trinity

An integrated water resource management.Canals - dikes - water gates and dams.A close system.Canal is **not to drain** but to **store water and transportation**.



Result - water table range



Water table depth - 2019



Result - subsidence rate



Pulau Burung Subsidence – 1987 to 2019



Average 1.7 cm per year Cumulative 54.1 cm in 32 years Comparison with cumulative subsidence in plantation with drained peatland

Result - carbon emission



Carbon emission in different peatland utilization





- Proper water management means **regulating the water in peatland, not draining**. It is the key to sustainability.
- With a regulated water table, subsidence is lower. It can reduce CO₂ emission up to 30 200 Mg CO₂ per ha per year.
- Effort to do sustainable peatland agriculture is even more pressing with climate change (increasing variability).
- To support the sustainability practice, regulation should be made accordingly and enforced thoroughly.
- More importantly, this effort should support local community. When the locals understand the benefits, they can commit to safeguard the peatland as well.