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REDUCING GHG EMISSIONS FROM PEAT LANDS AND OIL PALM IN INDONESIA; A JURISDICTIONAL APPROACH

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Over the last 30 years Indonesia has become a dominant global commodity supplier of palm oil and pulp and paper and while this has been a major contributor to the economic development of the country, this production has resulted in significant forest loss and the draining of peatlands. This has led to degradation of the peatland through subsidence and fire, causing massive GHG emission and threatened the livelihoods of thousands of landholders.

Badan Restorasi Gambut

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the David & Lucile Packard FOUNDATION

The central portion of Sumatra, such as the Siak District in Riau typifies this dichotomy, with over 70% of its original peatlands and forest cleared and drained since 1990. Today oil palm and pulp and paper plantation make up a staggering 43% of the Siak's landscapes with only 19% of the land remaining in natural forest. These drained peatlands are now experiencing historic rates of fire and peat subsidence that threaten livelihoods of thousands of landholders, cause health risks, and produce a significant portion of Indonesia's annual GHG emissions. In response to these threats – and in line with the Government of Indonesia's effort to reduce its emissions by 29% by 2030 – the Siak Government has committed to alter its development pathway by piloting a 'Green District' jurisdictional level sustainable development approach.

Through the Packard Foundation, Winrock International along with local partners such as Elang, are collaborating with the Siak government to help bring this vision into reality.

This program focuses on three pillars to reduce GHG emissions:

1

Development of a Green District land use planning and monitoring platform that will help with the monitoring and management of peatland water tables, land cover change, GHG accounting, and district government spatial planning.

2

Improved smallholder management and production on peatlands, to help improve production while reducing GHG emissions and facilitating more sustainable management practices.

3

Supporting clean energy infrastructure development to identify opportunities and policy pathways for oil palm mills to reduce GHG emissions through POME-to-energy capture.

The 2015 fires caused havoc to the Indonesian economy and resulted in a **loss of $16.1 billion USD over three months**.

43 million people were affected

500,000 people were hospitalized

emitted an estimated **1,750M MT** of CO_2 into the atmosphere

Source: https://e360.yale.edu/features/despite-government-pledges-ravaging-of-indonesias-forests-continues

Land use planning and monitoring platform:

Following Indonesia's One Map policy, Winrock is developing a spatial data management system with the Siak Distrct government that can be used by the district government to improve spatial planning and effectively measure, monitor and report on their Green District objectives.

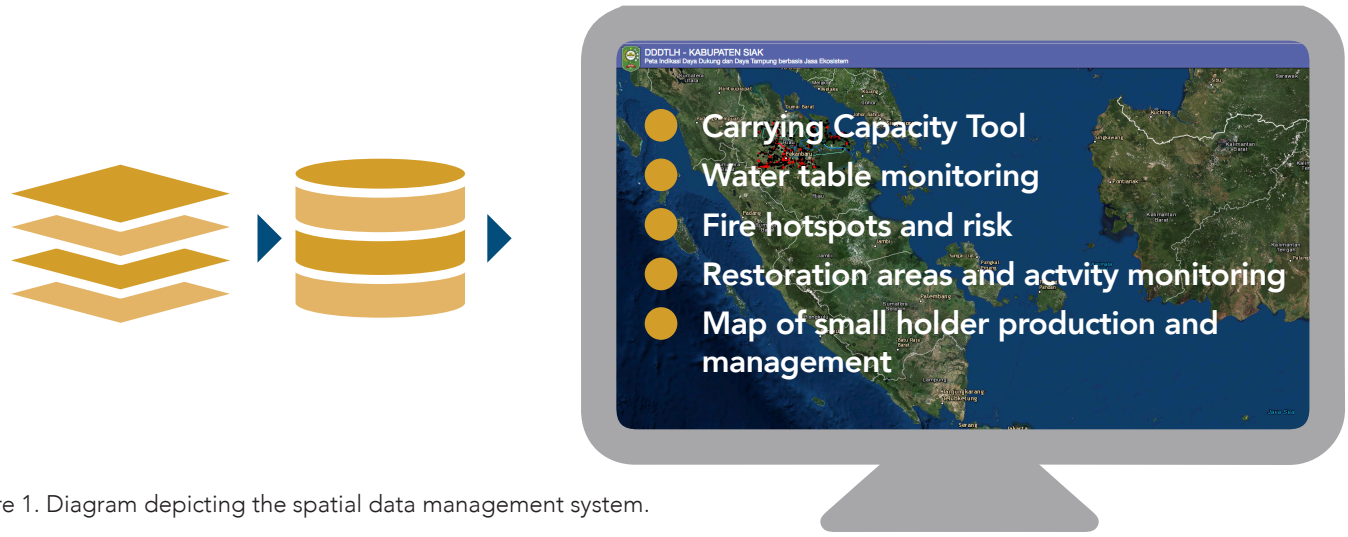


Figure 1. Diagram depicting the spatial data management system.

The monitoring platform integrates with an **innovative water table measurement system that will provide near real-time monitoring of water tables, subsidence and GHG emission across the peatland.**

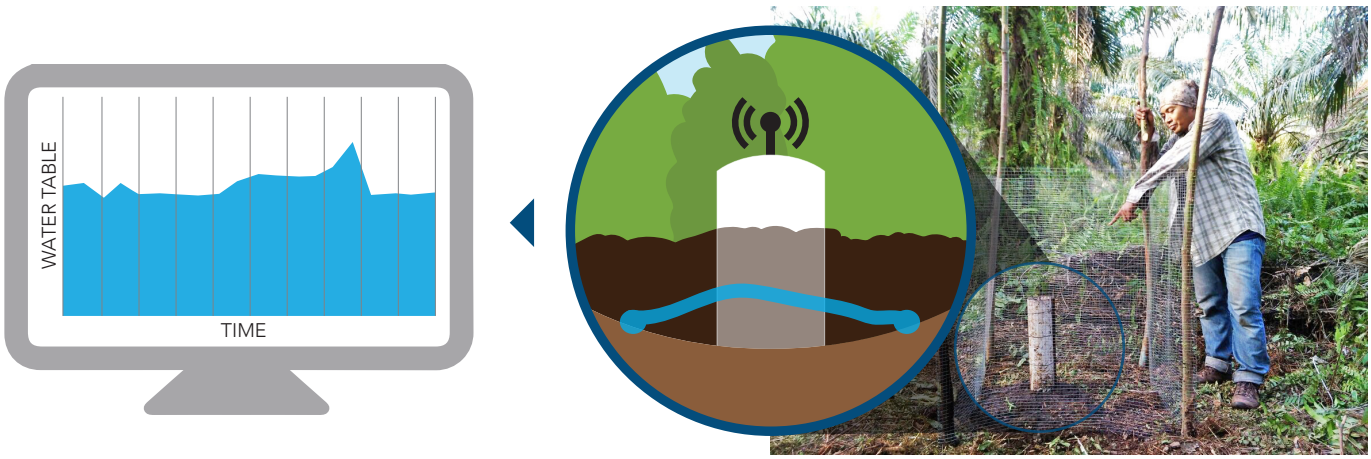


Figure 2. (a) Graphic of remote sensors reporting on water tables from the peatland to an online platform every 6 hour. (b), picture from the design phase of the field work

In collaboration with the Siak government and the National Peatland Restoration Agency (BRG) Winrock is developing a system can be used to plan, establish and monitor canal blocks; implement flooding to fight fire or restore peatland; improve water tables for production purposes; and monitor peatland subsidence and GHG emissions. Overall the ability to monitor water tables across the peatland provides an invaluable tool for planning sustainable, adaptable and resilient development trajectories for the government and local communities.

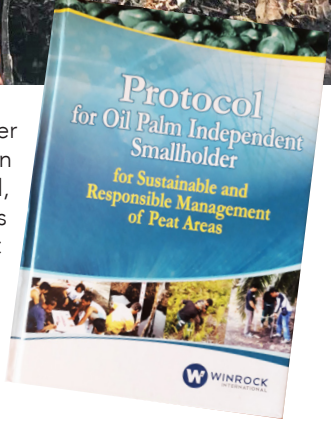
Improved smallholder management and production on peatlands

Winrock and Elang are working with the Siak government, farmers and farmer groups to pilot ways that smallholder farmers can become an integral part of the Green District strategy, maximizing production, improving the environment and reduce GHG emissions. In some production areas improved water table management and other BMPs can achieve a win-win, increasing production and mitigating environmental degradation from fire, subsidence and GHG emissions. In other areas poorly producing oil palm could be replaced with wetland tolerant crops (paludiculture), providing opportunities for farmers to both restore peatland while maintaining some agricultural production. In other areas that are severely degraded, and critical for conservation, Winrock is assisting BRG and the Siak government in retiring and rewetting the peat back to a natural state.

Paludiculture field site

Oil palm farmers make up around **60%** of the total oil palm area in Siak

However, smallholder farmers often struggle to achieve even half the production of larger producers due to poor water table and nutrient management



Winrock's Smallholder Protocol, developed in coordination with Cargill, Costco, and IDH provides best management practices for smallholder oil palm producers.

Clean Energy Infrastructure:

Winrock and the Siak District government are currently engaging with companies and the regional power provider on ways that POME-to-energy could be implemented under the Green District strategy. This has the potential to reduce the emissions from commodity production and alter its development pathway towards cleaner, renewable energy. Palm oil mills generate large amounts of liquid waste known as palm oil mill effluent (POME), which releases methane to the atmosphere due to the decaying process. POME-to-energy capture systems eliminates the emission and converts the methane into energy. In Siak there are twenty mills with total capacity of 870 ton per hour. The POME effluent in these lagoons is estimated to release 792,000 tCO2e every year. If captured this could generate power for around 45,000 households (total capacity of 21MWe). Therefore, POME-to-energy could provide a valuable source of energy for local communities, and may represent the single biggest emission reduction potential in Siak that oil palm companies could achieve without large-scale agriculture reforms.

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