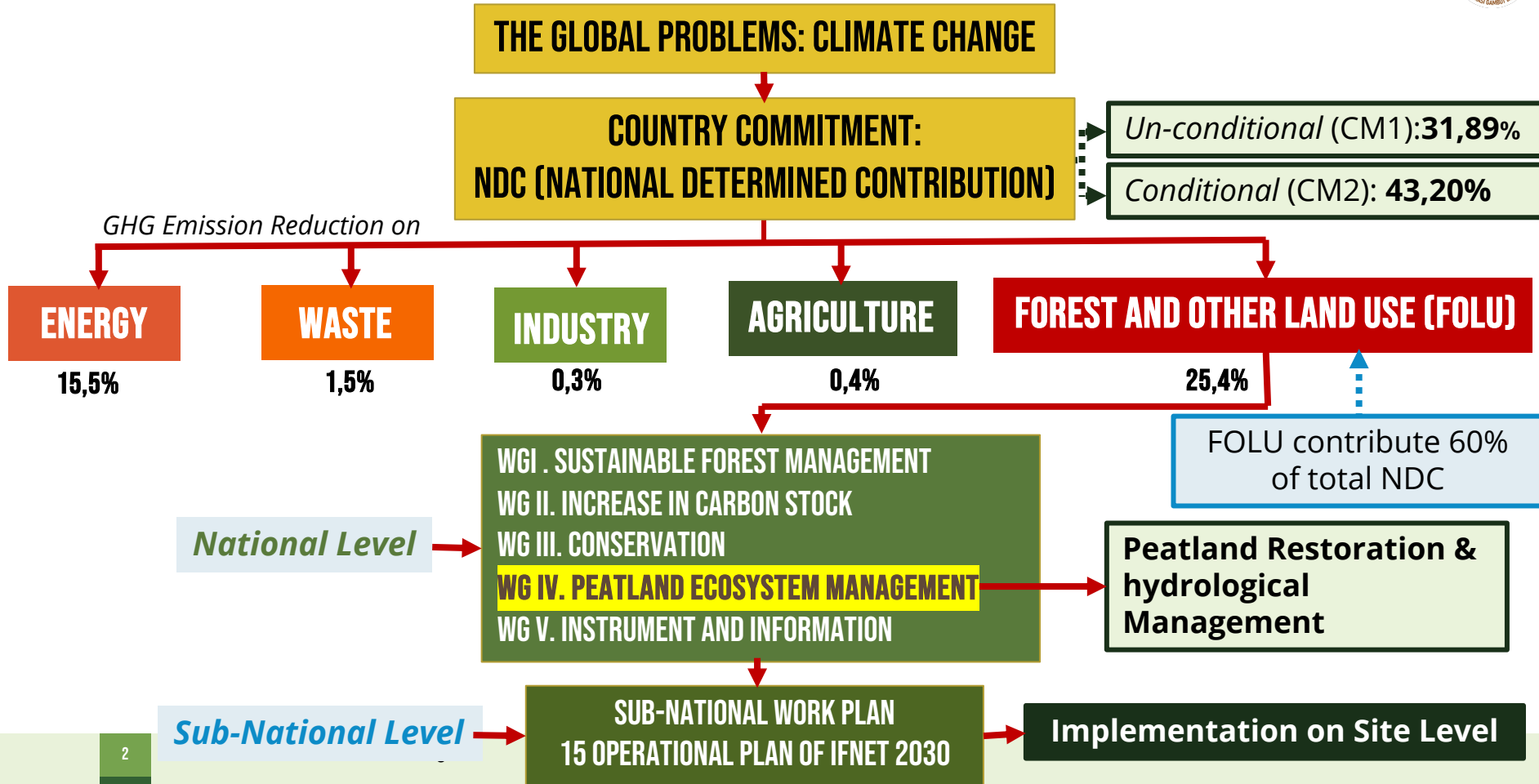# CURRENT PROGRESS OF BRGM WORKS IN RESTORING DEGRADED PEATLANDS IN INDONESIA
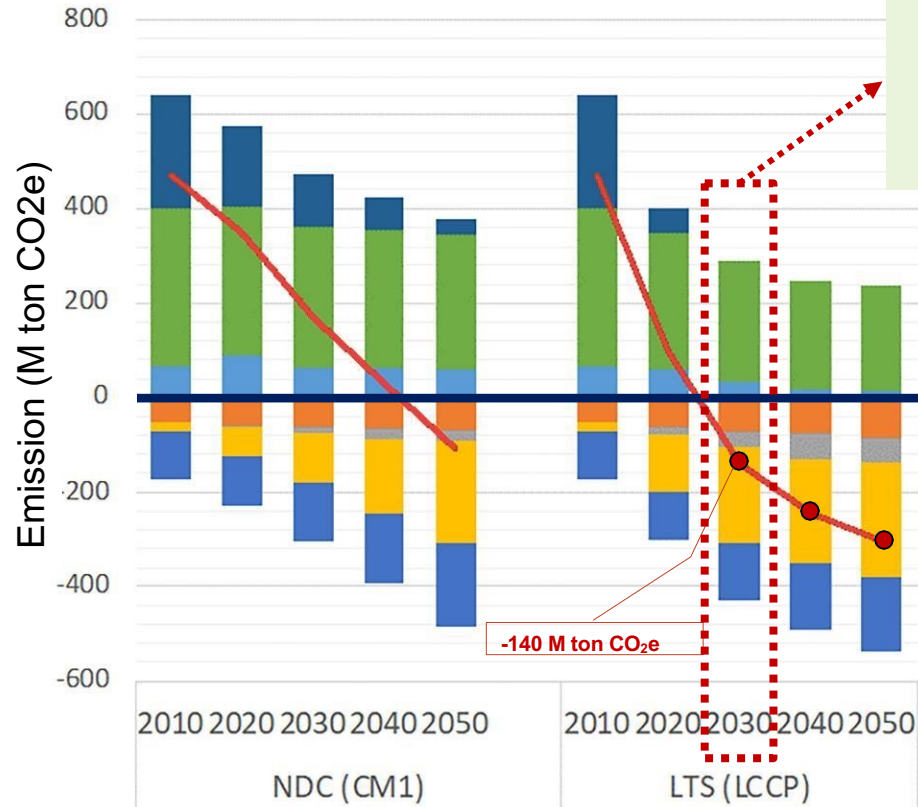
The 4th Indonesia-Japan Forest Talks (IJFT-4)
Tokyo, 8th November 2023

PEATLAND RESTORATION ON INDONESIA FOLU NET SINK (IFNET) 2030

THE GLOBAL PROBLEMS: CLIMATE CHANGE

COUNTRY COMMITMENT: NDC (NATIONAL DETERMINED CONTRIBUTION)

- *Un-conditional* (CM1): **31,89%**
- *Conditional* (CM2): **43,20%**

GHG Emission Reduction on

ENERGY	**WASTE**	**INDUSTRY**	**AGRICULTURE**	**FOREST AND OTHER LAND USE (FOLU)**
15,5%	1,5%	0,3%	0,4%	25,4%

FOLU contribute 60% of total NDC

National Level →

WGI . SUSTAINABLE FOREST MANAGEMENT
WG II. INCREASE IN CARBON STOCK
WG III. CONSERVATION
WG IV. PEATLAND ECOSYSTEM MANAGEMENT
WG V. INSTRUMENT AND INFORMATION

→ **Peatland Restoration & hydrological Management**

Sub-National Level → SUB-NATIONAL WORK PLAN 15 OPERATIONAL PLAN OF IFNET 2030 → **Implementation on Site Level**

CONTRIBUTION OF PEATLAND MANAGEMENT ON ACHIEVING IFNET 2030 (NDC-CM1 DAN LTS-LCCP 2050)

IFNET 2030 achieved by diminishing the emission from peat fire through peatland restoration effort

-140 M ton CO_2e

Source of emission
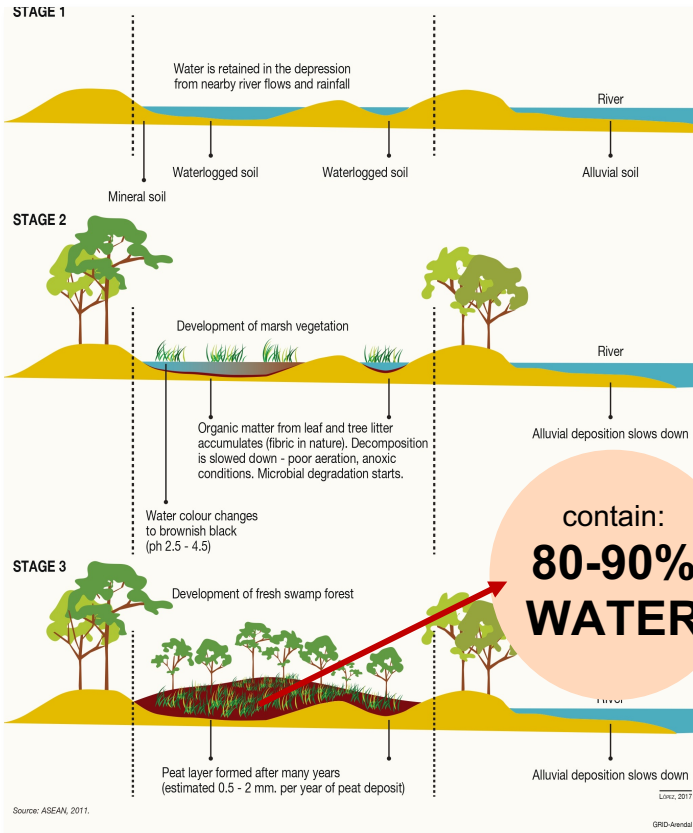
- Peat Fire
- Peat Decomposition
- Deforestation

- Annual Plant Species
- Regeneration of Secondary Forest
- Afforestation/ Reforestation
- Plantation Forest

Carbon sink
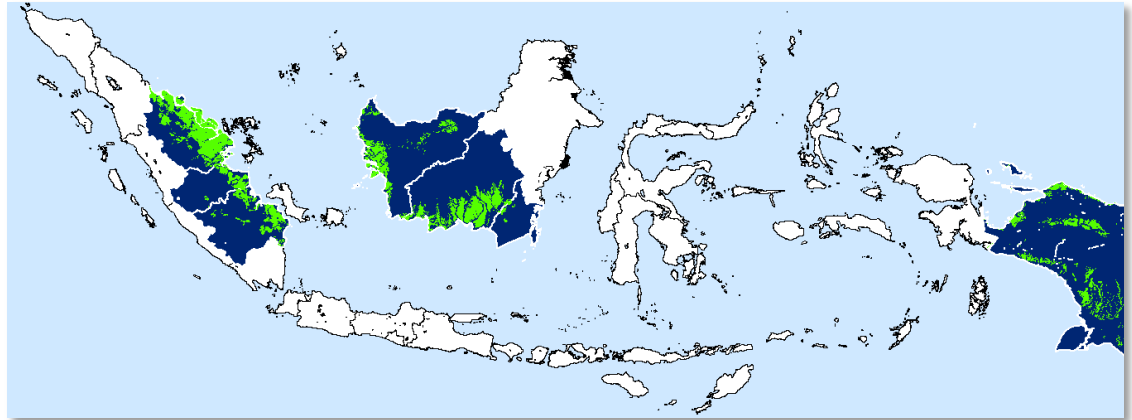
—— Net Emission

TROPICAL PEATLAND IN INDONESIA

Formation of Tropical Peatland:

STAGE 1

Water is retained in the depression from nearby river flows and rainfall

River

Mineral soil — Waterlogged soil — Waterlogged soil — Alluvial soil

STAGE 2

Development of marsh vegetation

River

Organic matter from leaf and tree litter accumulates (fibric in nature). Decomposition is slowed down - poor aeration, anoxic conditions. Microbial degradation starts.

Alluvial deposition slows down

Water colour changes to brownish black (ph 2.5 - 4.5)

STAGE 3

Development of fresh swamp forest

River

Peat layer formed after many years (estimated 0.5 - 2 mm. per year of peat deposit)

Alluvial deposition slows down

Source: ASEAN, 2011.

GRID-Arendal

contain:
80-90% WATER

Peatland Distribution and Status:

- Covers **±13.4 millions ha.**
- Mainly distribute in **7 Provinces of Indonesia**.
- More than **50%** has been **degraded.**
- About **29% for plantation and agriculture.**

PROBLEM OF INDONESIA'S TROPICAL PEATLAND

THE LENGTH OF DRAINAGE CANAL 239.803 KM

Effect of peatland drainage

Equal to 6 times of the circumference of the earth

Ecology VS Economy trade off
Land based development:
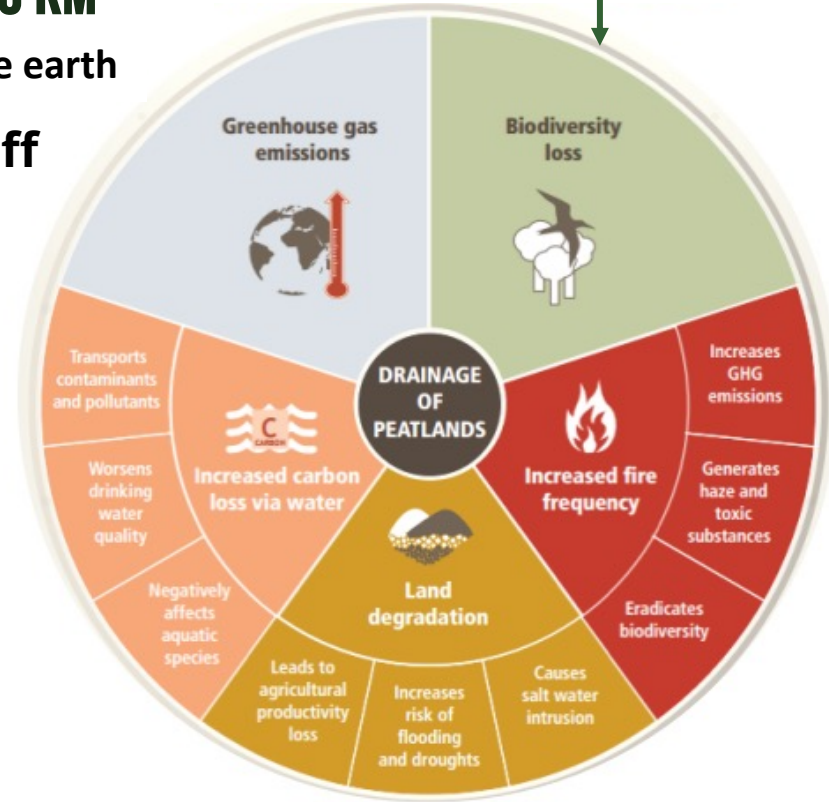Forestry, Agriculture, mining, and infrastructure

Complexity of Interest
Government- Private- Local Community

Uncertainty
- Limitation on data, inf. & technology
- Sectoral Policy

DRAINAGE OF PEATLANDS

Greenhouse gas emissions

Biodiversity loss
- Increases GHG emissions
- Generates haze and toxic substances
- Eradicates biodiversity

Increased fire frequency

Land degradation
- Causes salt water intrusion
- Increases risk of flooding and droughts
- Leads to agricultural productivity loss

Increased carbon loss via water
- Negatively affects aquatic species
- Worsens drinking water quality
- Transports contaminants and pollutants

INDONESIAN FOREST FIRE 2015

Forest Fire in 2015

2.646.089 Ha

areal terbakar 2015 · hutan alam · hutan tanaman

Forest Type	Forest Status	Area (Ha)	% Total forest fire	
Peatland	Forest Area	686.000	26%	35%
	Other Land Use	195.000	8%	
Mineral Soil	Forest Area	1.044.000	40%	65%
	Other Land Use	653.000	25%	

However, most of Emission released from Peat Fire

Peatland and Mangrove Restoration Agency Republic Indonesia

Basic Formation
Presidential Decree of Republic Indonesia No. 120/2020

Position
Peatland and Mangrove Restoration Agency is a non structural institutions

Task of BRGM

Facilitating the acceleration of peatland restoration implementation; and improvement the community welfare in peat restoration areas in 7 (seven) provinces.

Accelerate mangrove rehabilitation in nine provinces

Function of BRGM

Implementation of peat restoration

Planning, controlling, and evaluating peat restoration

Construction, operation, and maintenance of rewetting infrastructure

Strengthening community institutions in the context of peat restoration

Socialization and education of peat restoration

Improvement of community livelihoods on peatlands

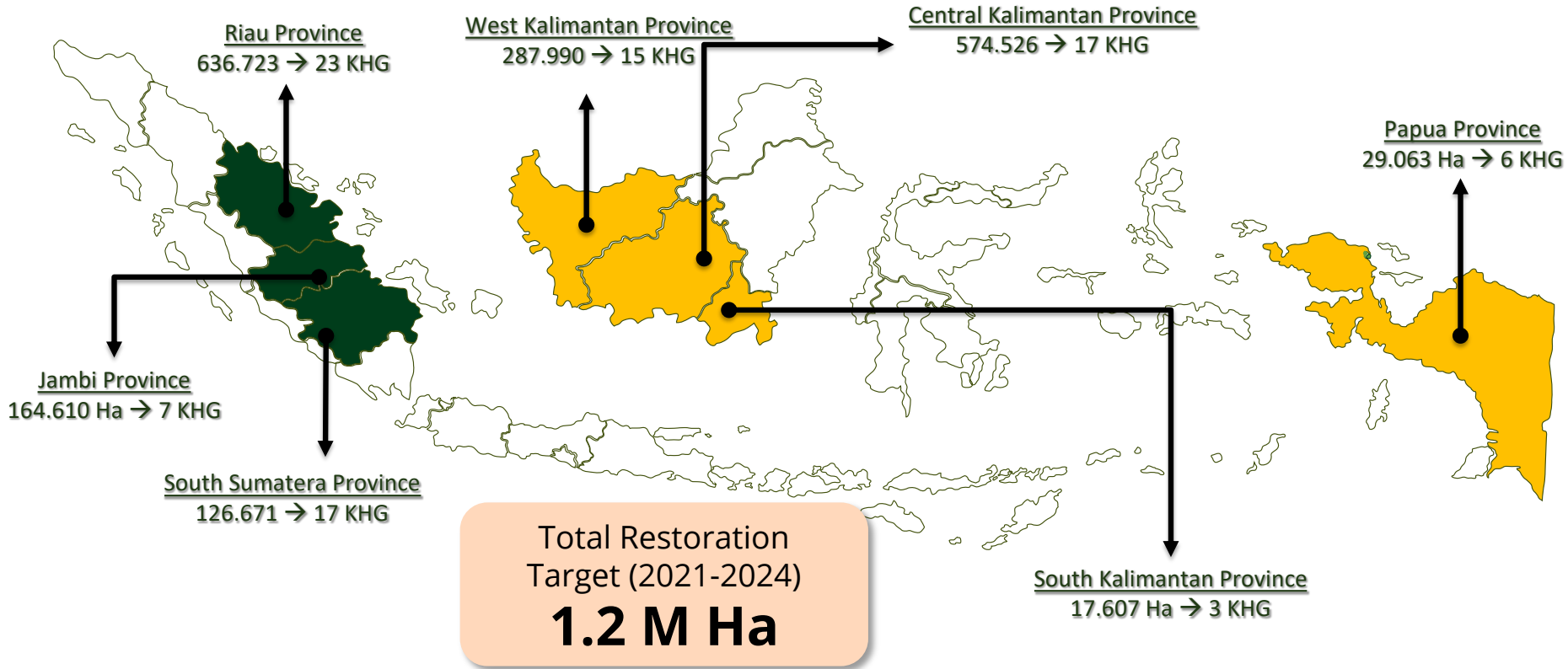Accelerating mangrove rehabilitation, inside and outside forest areas, in 9 provinces

Administrative support

Implementation of other functions assigned by the President

RESTORATION TARGET 2021-2024

Riau Province
636.723 → 23 KHG

West Kalimantan Province
287.990 → 15 KHG

Central Kalimantan Province
574.526 → 17 KHG

Papua Province
29.063 Ha → 6 KHG

Jambi Province
164.610 Ha → 7 KHG

South Sumatera Province
126.671 → 17 KHG

Total Restoration
Target (2021-2024)
1.2 M Ha

South Kalimantan Province
17.607 Ha → 3 KHG

RESTORATION STRATEGY AND PROGRESS

R1
Rewetting

R2
Revegetation

R3
Revitalization
of Livelihood

Restoration Progress 2017-2022:

7.785 Unit of Canal Blocking
184 Canal Backfilling
14.087 Unit of Deep Wells

2.187 Ha peatland were revegetated
through Plantation, and Supporting Natural Regeneration

1.246 community group were revitalized
through Land based, water based, environment service based

16% of the community enterprise are developed through business incubation program until 2023
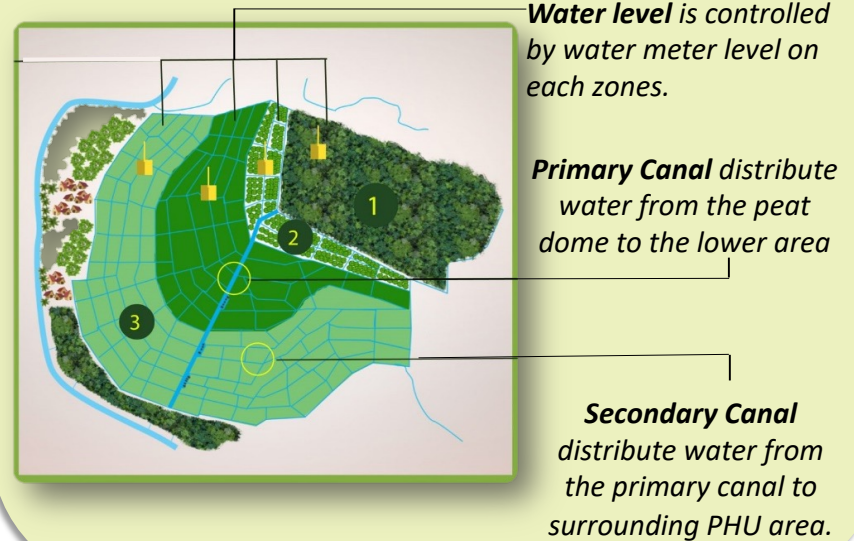
Badan Restorasi Gambut dan Mangrove

PEATLAND HYDROLOGICAL UNIT

(A management unit for peatland restoration practices)

PHU are divided into the water zones that integrally managed

Water storage, Conservation

1 *Peat Dome*

Native plant species, water level ±20 cm

2 *Dome Buffer Area*

Cultivated area, water level ±40 cm

3 *Cultivation Area*
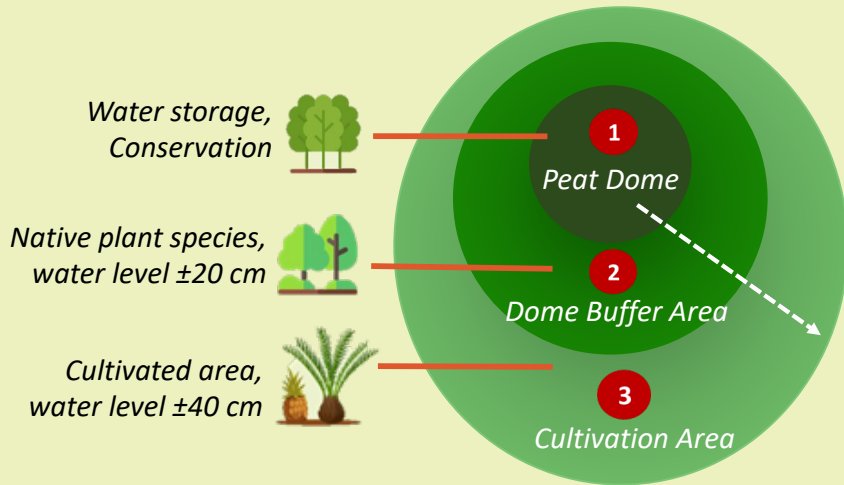
During dry season, the water storage in the peat dome are distributed to the PHU areas to maintain water level in all zones.

Water level *is controlled by water meter level on each zones.*

Primary Canal *distribute water from the peat dome to the lower area*

Secondary Canal *distribute water from the primary canal to surrounding PHU area.*

BRGM RESTORATION ACHIEVEMENT

2016 – 2020
Partial and Quick Response

Restoration Target:

2,676,601 Ha

- Concession:

  # ± 1,700,000 Ha

- Non-Concession (Conservation area & Other Land Use):

  # ± 900,000 Ha

BRGM Achievement 2016-2020

834,000 Ha

2021 – 2024
Systematic and Integrated

Restoration Target (All Non-Concession):

1,200,000 Ha

BRGM Achievement 2021-2022

514,000 Ha

Total Peat Stewardship Village (2016-2022)

784 Villages

PEATLAND HYRDOLOGICAL UNIT MODEL

The PHU Model Concept:

Comprehensive
Cover all aspect and part of peatland ecosystem

Systematic
Interconnected with each other to form a system

Integrated
Unifying the management purpose of each stakeholder in one big purpose, i.e. Indonesia FOLU NET SINK 2030.

One of PHU Model
KHG Sungai Mendahara-Sungai Batanghari (Jambi)

WATER LEVEL MONITORING TOOL (APTMA)

1. Telemetry device installed in peat area to **record hydrological information** contained on peat and send it to BRGM server to be **displayed on SIPALAGA web platform (www.sipalaga.brg.go.id)**

2. Installed sensors includes **Rainfall** Sensor, **Soil Moisture** Sensor and **Water Level** Sensor

The purpose of peatland water level monitoring:

1. The condition of water level in peat land.
2. The performance of the rewetting infrastructure (i.e. deep well, canal blocking)
3. Early warning system of peat fire.
4. Consideration of the intervention on water management in peatlands.

Total APTMA in 2023
153
Unit

Telemetry Sequence
of Peatland Data Monitoring

data processing

water level

Sender and Storage

monitor via computer/ mobile

BRGM server

Bulk sensor (sensor curah)

soil moisture sensor

water level sensor

PEATLAND RESTORATION MONITORING SYSTEM (PRIMS)
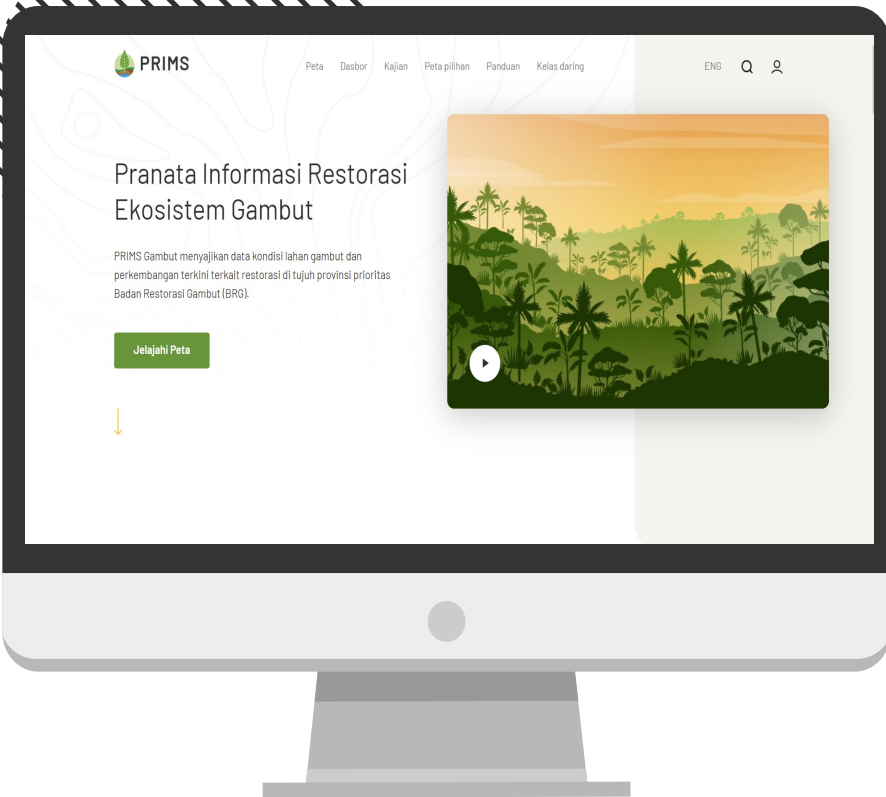
1. An **online web-GIS platform that provides the latest restoration progress** data in the seven priority provinces of the BRGM.

2. PRIMS can provide users with **information on restoration activities, peat degradation indicators, and restoration impacts.**

3. PRIMS, SIPALAGA , and SISFO (rewetting infrastructure verification system) are integrated as one.

PEAT ECOSYSTEM RESTORATION INFORMATION SYSTEM (PRIMS)
https://prims.brg.go.id/

01. DAERAH KERJA KAWASAN EKS - PLG
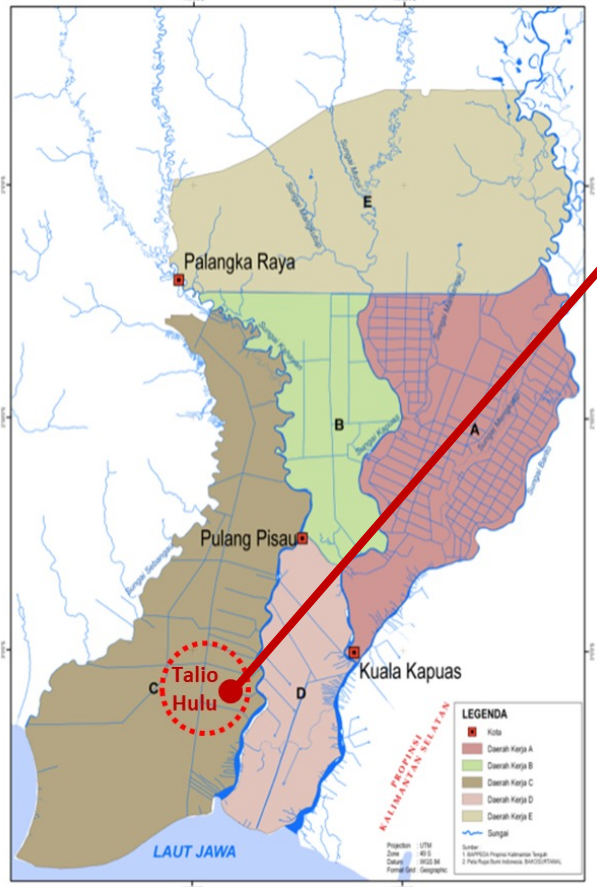
LESSON LEARN: REVITALIZATION OF RICE FARMING IN EX-PLG PEATLAND AREA

Talio Hulu Village, Pulang Pisau District, Central Kalimantan (Block C of ex-PLG Area)

- Former transmigration areas (1980s);

- Former 'Mega Rice Project' target (1980s);

- The location was equipped with primary and secondary irrigation canals;

- However, this former project was failed due to the rice production was unprofitable;

- Leaving **abandoned** and **neglected land** as the **sources of peat fires**.

Land Clearing

Karya Jaya
-3,09404, 114,09973, 3,9m, 57°
9 Mar 2021 7:07:18 AM

Land Leveling

KA,petak suproyo,sedang bongkar galengan
-3°6'2", 114°4'57", 8,1m
05/05/2021 06:37:24

Irrigation system

K,A pendalaman mikro sir Utata selatan
-3,09917, 114,08336, 9,6m, 197°
21 Mei 2021 06.37,44

Planting and maintaining

2021/5/18 08:20

harvesting

Post harvest (rice milling)

LESSON LEARN: REVITALIZATION OF RICE FARMING IN EX-PLG PEATLAND AREA

Revitalization of rice farming in ex-PLG area is potential to support the rice estate program, and to prevent the annual peat fire.

Lesson learn from development of rice farming in peatland area:

1. The context of rice farming in peatland area must be put on **the framework of peatland conservation and food security** of the local community, not only on the economic benefits.

2. Implementation of rice farming in peatland area, should be done through modernize of **community farming approach**, instead of corporate farming.

3. **Diversification** of the commodity, through rotation and plantation system, are important to get the higher income for the farmer.

4. Rice farming in peatland area should be **conducted by involving by related multistakeholder**.

USAHATANI PADI
PADA LAHAN GAMBUT
PASANG SURUT

Pembelajaran dari Lokasi
Demonstration Farming Budidaya
Desa Talio Hulu Kabupaten Pulang
Provinsi Kalimantan Tengah

POLICY BRIEF:

USAHATANI PADI
PADA LAHAN GAMBUT PASANG SURUT

Pembelajaran dari Lokasi *Demonstration Farming*
Budidaya Padi di Desa Talio Hulu Kabupaten Pulang
Pisau Provinsi Kalimantan Tengah

ROADMAP OF PEATLAND RESTORATION

2016 – 2020

Partial dan Quick Respond

3-R dan DPG (Peat Stewardship Village)

2021 – 2024

Systematic And Integrated

3-R ; DMPG; Systematic and Integrated Peatland Restoration Model

2025 – 2030

Permanent & Sustainable Restoration

Contribution on FOLU sector on ENDC 2030

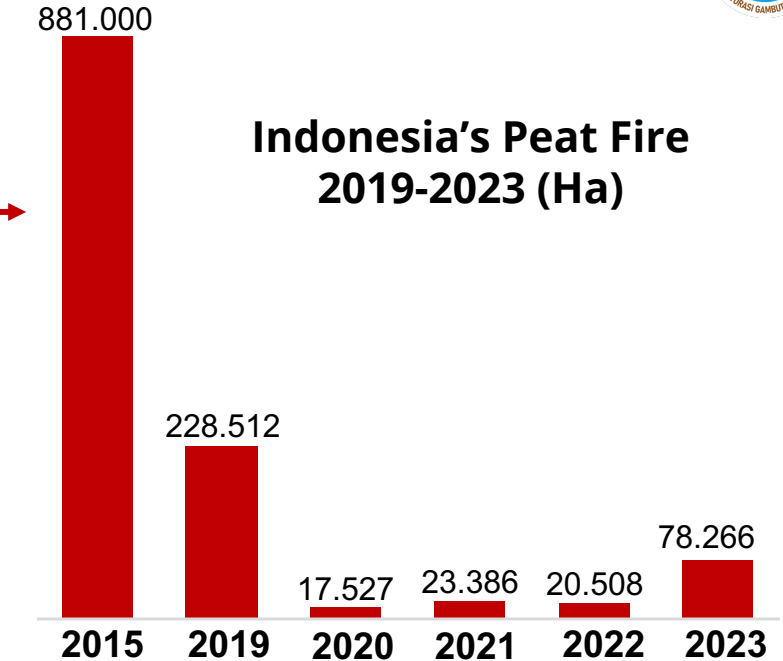# PEATLAND RESTORATION SUPPORT ACHIEVEMENT OF IFNET 2030

- **REDUCE EMISSION**

  1. Reduce deforestation on peatland area;
  2. Reduce peat fire.

- **INCREASE CARBON SEQUERSTATION**

  1. Peatland Revegetation;
  2. Paludiculture practice.

- **MAINTAINING ABSORBED CARBON**

  1. Water management;
  2. Maintaining absorbed carbon;
  3. Community enterprise development.

Indonesia's Peat Fire 2019-2023 (Ha)

Year	Value
2015	881.000
2019	228.512
2020	17.527
2021	23.386
2022	20.508
2023	78.266

The peatland restoration practice also **increase the awareness and the willingness of local community** to save the peatland from fires.

#BRGMINDONESIA
#GAMBUTMANGROVEUNTUKKEHIDUPAN
#NYATAMENJAGAINDONESIA

www.brgm.go.id   @brgm_Indonesia   @brgm_Indonesia

 Badan Restorasi Gambut dan Mangrove   Badan Restorasi Gambut dan Mangrove - BRGM