CASE STUDIES ON PEATLAND USE AND THEIR IMPACTS – The Indonesian Experience

(*EXPERIENCE IN SUMATRA DAN KALIMANTAN)*

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INTRODUCTION (1)

- Peat land is unique ecosystem and fragile
- Peatland in Indonesia around 20 juta ha (52% of tropical peat land)
- Peatland for agriculture in Indonesia have been started since Dutch colonization in Indonesia
- Several ethnic in Indonesia, such as, Bugis, Banjar, Melayu have developed peatland for agriculture for long time. They have developed sustainability agriculture using primitive technique in small scale.

DISTRIBUTION OF PEATLAND

- Global peatland area : 423 825 000 ha
- Tropical peatland area : 38 317 000 ha

  (9.04 % of global)
- Peatland area in Indonesia : 20 073 000 ha

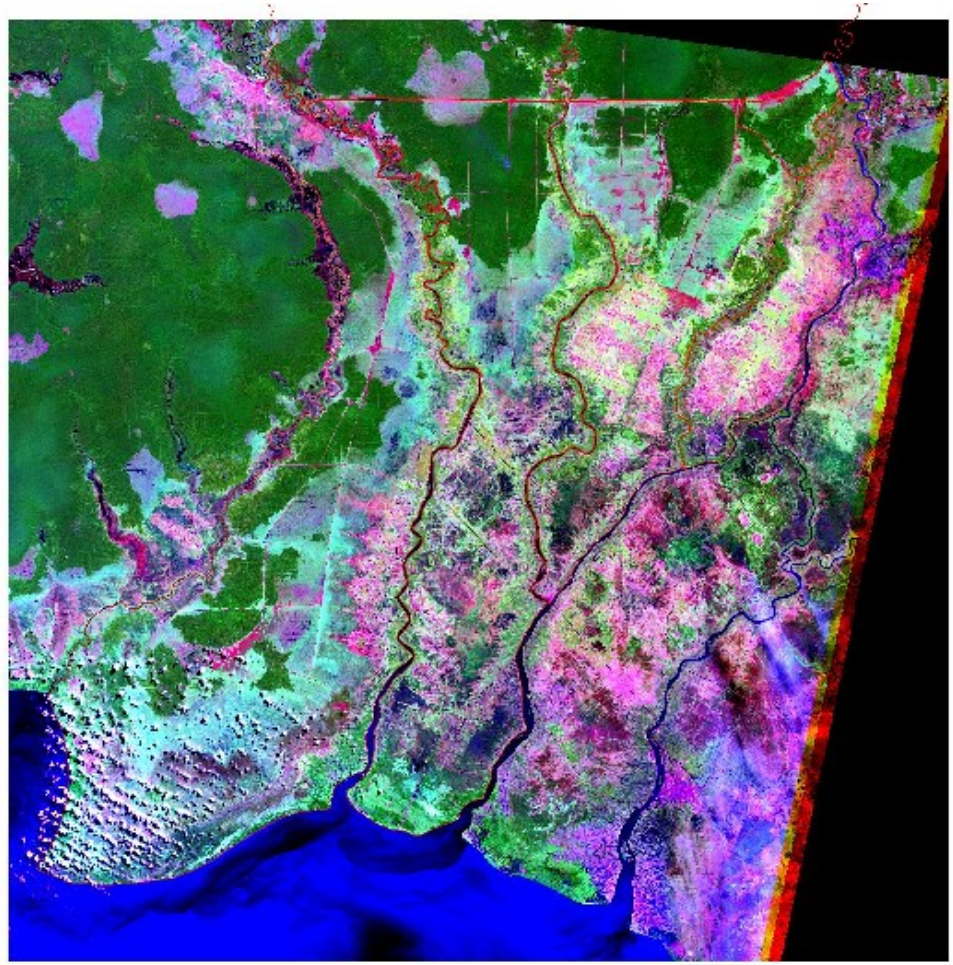
  (52.4 % of tropical)
- Peatland area in Malaysia : 2.730.500 ha

  (7.1 % of tropical)

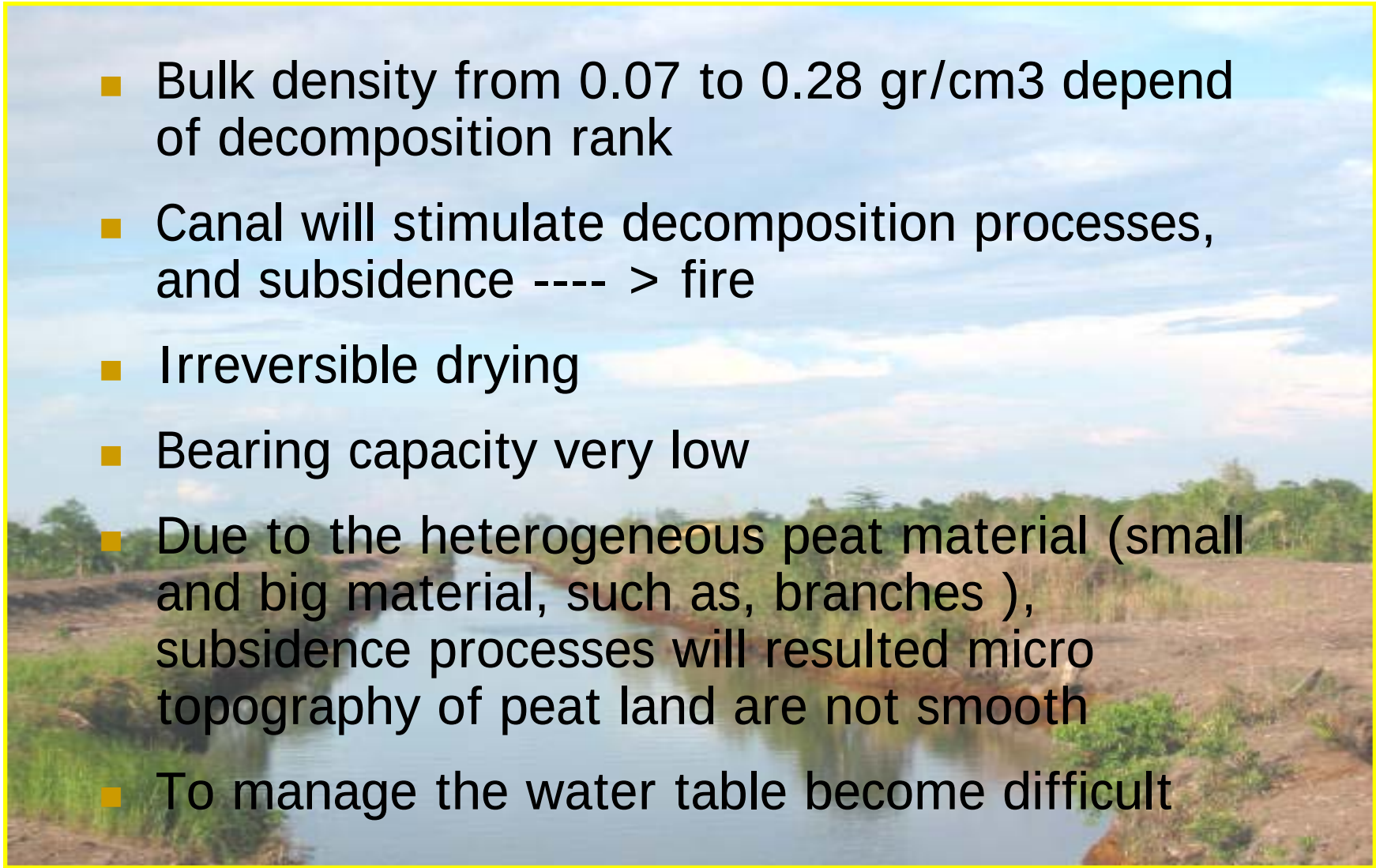
(Radjagukguk, 2005)

INTRODUCTION (2)

- Peatland for agriculture in big scale in Indonesia have been started since 70 era
- Several year later, a lot of peatland area was neglected by farmer due to low fertility
- Several private company could develop peatland for estate plantation and good production
- Base on the problem above, this paper will discuss the problem and how to manage peatlanfd for agriculture with reference on experience in Kalimantan and Sumatra.



THE CARACTERISTIC OF TROPICAL PEATLAND (1)



- Bulk density from 0.07 to 0.28 gr/cm3 depend of decomposition rank
- Canal will stimulate decomposition processes, and subsidence ---- > fire
- Irreversible drying
- Bearing capacity very low
- Due to the heterogeneous peat material (small and big material, such as, branches), subsidence processes will resulted micro topography of peat land are not smooth
- To manage the water table become difficult

THE CARACTERISTIC OF TROPICAL PEATLAND (2)

- In general, pH very low (range between 2,8 and 4.3) , low macro and micro nutrient------→ low fertility
- Base saturation low
- In several places, below the peatland there were sulfides material ---------→ become toxic

PROBLEM TO MANAGE PEATLAND FOR AGRICULTURE

- Base on the characteristic of peatland, there were several problem to manage the peatland for agriculture: such as,
  - Bulk density is low
  - Easy to over drained
  - Subsidence
  - Sulfides material
  - Low fertility

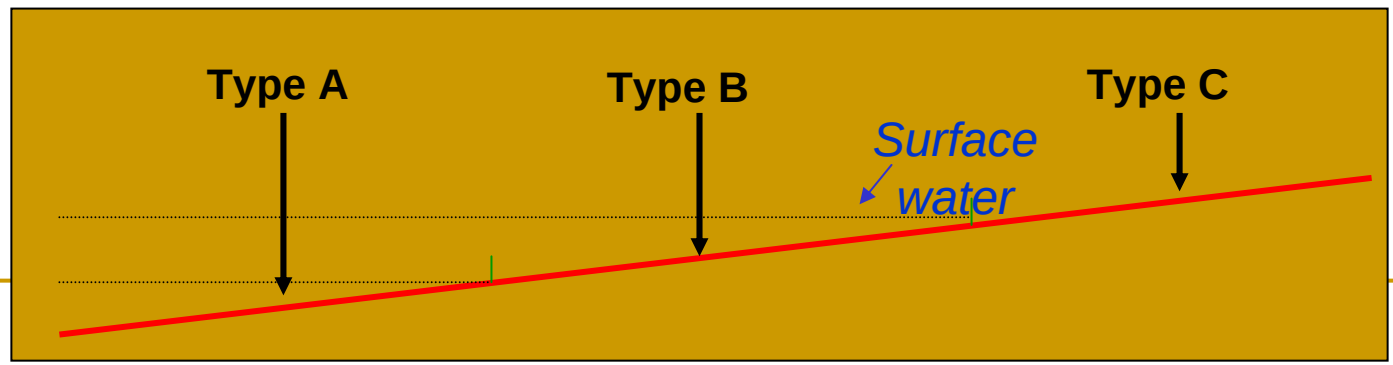
TRADITIONAL MANAGEMENT (1)

- **In Marabahan, South Kalimantan**
  - Handil system, primary canal perpendicular to River, primary canal 2 m wide only and 1 – 2 m deep
  - Every 200 m, there are secondary canal, perpendicular to primary canal with 1 m wide and 1 m deep.
  - There are “tabat” in front of secondary canal to manage the water.
  - There are forest at the end of primary canal as a water reservoir. These water will leach the acid water.
  - This system is still sustain although low productivity (3 ton per ha per year only)

  - **Lesson-learn**
    - Water management is the key for land management
    - Canal relatively --→ small so there is no over-drained
    - Forest in the end of primary canal as fresh water for flushing.

TRADITIONAL MANAGEMENT (2)

- **In Kab. Hulu Sungai Utara, Kalimantan Selatan**
  - Base on the water surface dynamic, traditionally peat swamp area divided : “Type” A, B, and C
  - Type C, water surface never reach that area (horticulture, rice field)
  - Type B, flooded during rainy season and dry during dry season (rice field, Sago)
  - Type A 3, always in flooded condition (fishery, “purun”)
  - Land management base on watun



TRADITIONAL MANAGEMENT (2)

Type	
A	Fishery, Purun
B	Rice field, Sago Husbandry
C	Horticulture, Rice field , Husbandry

Lesson learn

- Water dynamic for land classification
- Land management and type of crop base on water dynamic

TRADITIONAL MANAGEMENT (3)

- In Tembilahan, Sumatra
  - Farmer choose coconut as major commodity
  - Canal is small
  - Water table was managed by “tabat”
  - Up to now, coconut can be harvested

- **Lesson learn**
- Water table have been managed using small canal

TRADITIONAL MANAGEMENT (4)

- **Horticultural farming, Pontianak, West Kalimantan**
  - ***> 100 years***
  - ***Use of adaptive crops***
  - ***Conservation by shallow drainage***
  - ***Use of locally available ameliorants* (e.g. *ash*) *and animal manure***
  - ***Market assurance***

- **Lesson learn**
- Adaptive crops
- Shallow drainage

MANAGEMENT FOR ESTATE PLANTATION (1)

- **Acasia, Bukit Batu, Riau**
  - Primary canal quite wide , due to for drainage and transportation purpose, manage of water table quite strike
  - Secondary canal are small to control water table in land
  - Crop have been choosen: *Acacia mangium* and *Acacia crasicarpa*

- **Lesson learn**
  - Manage of surface water (in canal) and water table (in land) quite strike
  - They choose perennial crops
  - This system running well

MANAGEMENT FOR ESTATE PLANTATION (2)

- **Coconut estate, Guntung, Riau, Sumatra**
  - They manage peatland in one ecosystem
  - Drainage system controlled base on the root system of coconut
  - Production is good

- **Lesson learn**
  - Management is done in one ecosystem
  - Drainage system (canal) quite wide , surface water and water table in land was managed in good condition
  - This system is running well

KEY TO MANAGE THE PEATLAND

- Base on the lesson learn in several cases above : the key to manage peatland for agriculture are:
  - water management is key
  - We have to focus on water dynamics
  - Drainage system should not make over drainage
  - Peatland area not always for agriculture purpose. Can be used for fisheries, husbandry and other purposed.

THANK YOU FOR YOUR ATTENTION