



# The wavering path to paludiculture in Indonesia

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Wim Giesen

Euroconsult



**Mott MacDonald**



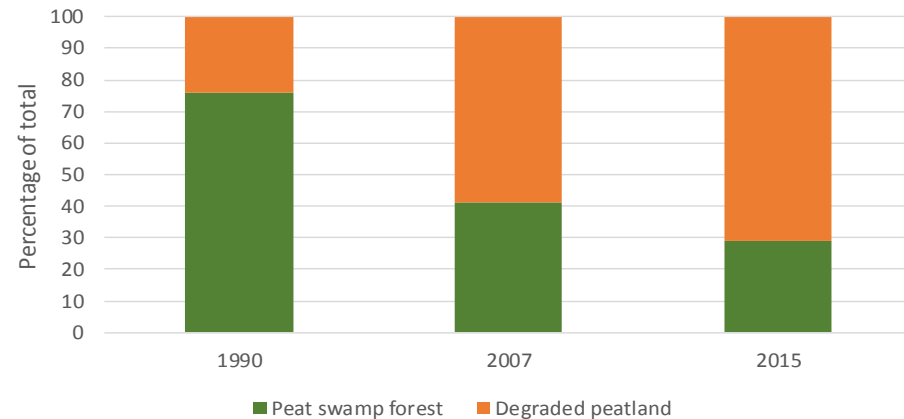
# Outline of presentation

1. Peatland issues in Indonesia
2. Potential for paludiculture
3. Current situation
4. Way forward

# Peatland issues

- Peat swamps formerly >13Mha on Indonesian Borneo and Sumatra
- Until 1980s these were mostly forested (i.e. peat swamp forests)
- Logged & drained: now major source (45%) of carbon emissions & fires, (+ increasingly) flooding issues
- Indonesia pledged to reduce carbon emissions by 29% by 2030 (41% if foreign assistance given)

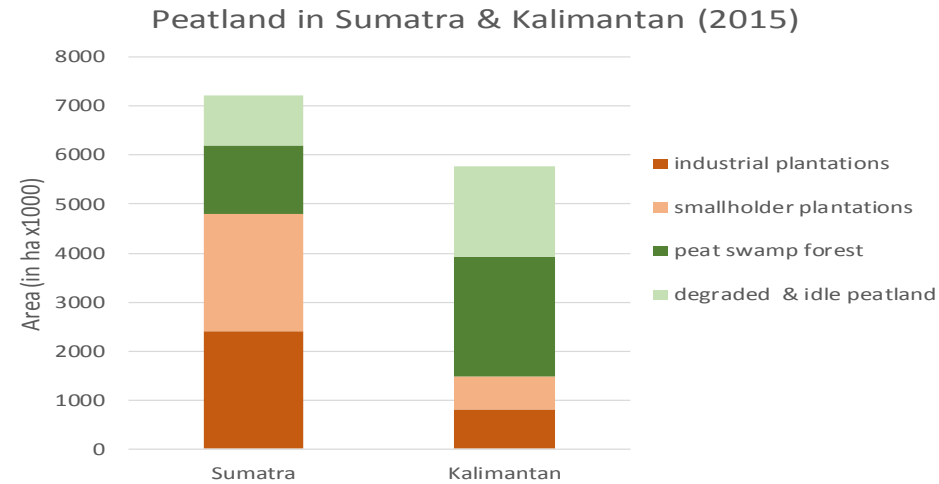
Peat swamps P. Malaysia, Sumatra & Borneo ( 2015)





# Peatland issues

- Drivers: logging in 1980s/1990s, plantations (oil palm & pulp) >1990s
- Plantations 2015: Kalimantan 26%, Sumatra 66% of peatland area (6.3 Mha)
- 850,000 ha burnt in 2015 El Niño
- Indonesian Peat Restoration Agency (BRG) established Jan. 2016, with mandate: coordinate restoration of 2.0 Mha by 2020





What can Indonesia do to restore degraded peatland?

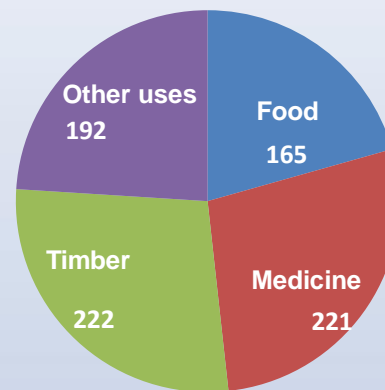




# Potential for paludiculture

- >1400 angiosperms in Indonesian lowland peat swamp forests
- >500 of these have a known use
- >80 have known major economic use (PROSEA)
- ongoing BGPP project in Sumatra: 20+ species selected for trials with local communities

Giesen, W. (2015) - Utilising non-timber forest products to conserve Indonesia's peat swamp forests and reduce carbon emissions. *J. of Indonesian Nat. Hist.* 3(2):10-19.



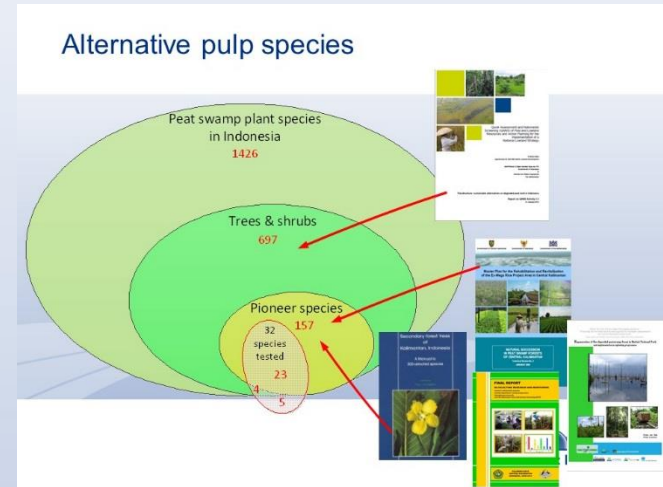
Useful peat swamp forest plant species.



# Potential for paludiculture

## Plantation options:

- alternatives for *Acacia* pulp:
  - 697 PSF trees/shrubs includes 157 pioneer/secondary forest species
  - 23 tested, 9 to be trialled by company
- alternatives for oil palm:
  - *Aleurites moluccana* (candlenut, PSF)
  - illipe/tengkawang (*Shorea* spp. ±PSF)





# Potential for paludiculture

## Many opportunities for paludiculture:

- Rewetting seen as key to restoration, emissions reduction & curbing fires
- Potential paludiculture species identified
- GOI regulations & agency (BRG) support paludiculture
- NGO, market & donor interest

**In these circumstances, Indonesia must surely be developing many 1000s of hectares of paludiculture?**





# Thriving paludiculture? Not really!

## Commercial pulp & oil palm plantations:

- Companies have unrealistic expectations, e.g. alternative pulp species to be as productive as *Acacia crassicarpa*, that has benefited from >30 yrs domestication
- Alternative pulp species programs: too little, too late?
- Currently being tried as alternative for oil palm biofuel: *Reutealis trisperma* (native Euphorbiaceae, but not a peatland species!)





# Thriving paludiculture? Not really!

## Smallholders, NGOs, MoEF (1)

- Traditional **sago** smallholders, e.g. in Riau & Aceh, Sumatra (>100 yrs)
- Total area of several 10,000 ha
- Has declined (in ha) in past decades rather than expanded (e.g. used to be in Jambi, Sumatra, now gone)

## Paludiculture, but not thriving





# Thriving paludiculture? Not really!

## Smallholders, NGOs, MoEF (2)

- Traditional *Hevea brasiliensis* rubber in peatland, already for a number of decades in Sumatra & Kalimantan

**Not paludiculture: drainage-based: groundwater levels at minus 30-40 cm**





# Thriving paludiculture? Not really!

## Smallholders, NGOs, MoEF (3)

- *Dyera polyphylla* (jelutung) planted in peatland, mainly in Jambi
- Company PT. DHL with 2000+ ha (1996-2004)
- Local communities with ICRAF, MoEF & NGO support (2008-2015)

**Not paludiculture: PSF species, but no rewetting**





# Thriving paludiculture? Not really!

## Smallholders, NGOs, MoEF (4)

- **Tengkawang/illipe nut (*Shorea* species)** trials in West Kalimantan by Inhutani / UGM from 2003-2009.
- Undrained but logged peatland, enrichment planting along transects: 2,200 ha

**(Accidental) Paludiculture: but not thriving** (nothing since 2009)





# Thriving paludiculture? Not really!

## Smallholders, NGOs, MoEF (5)

- Recent programmes (many NGO-supported) since 2015 have focused on range of species, including kopi *Liberica*, cocoa, dragonfruit, *Aloe vera*, pineapple, papaya, ginger, etc...
- Limited rewetting

**Not paludiculture: all species require drainage** (thankfully only few 1000 ha planted, still ongoing!)





# Reason for lack of progress (1)

## Rewetting not 100%: technical aspects

- **Box dams**, by NGO & Government programmes:
  - community involvement provides income & ownership
  - (boat) access via spillways & canals (drainage! GWL at -35-40 cm)
  - cultivation of dryland species remains possible
- **Compacted peat dams** around large scale plantations:
  - require heavy equipment for construction
  - raised water tables around/in plantations to prevent fires
  - by-pass spillways (drainage! -50 cm) so that *Acacia* plantations are 'dry'





# Reason for lack of progress (2)

## Rewetting not 100%: regulatory aspects

- “Managed drainage” promoted by plantation lobby
  - Eko-hidro approach (company APRIL, 2010): core 30% of dome protected, outer zone drainage -65 cm, 1.2-1.8 km wide buffer zone (30% of dome, in PP71/2014)
  - GOI regulations: drainage to max. -40 cm (PP71/2014; PP57/2016)
- ‘Managed drainage’ incorrectly presented as “sensible & sustainable compromise” (e.g. IPB Bogor, Singapore Institute Int’l Affairs, ...) full rewetting = too radical!

**-40 cm becomes target,  
not lowest GWL**



### SPECIAL REPORT

PEATLAND MANAGEMENT & REHABILITATION IN SOUTHEAST ASIA:  
MOVING FROM CONFLICT TO COLLABORATION

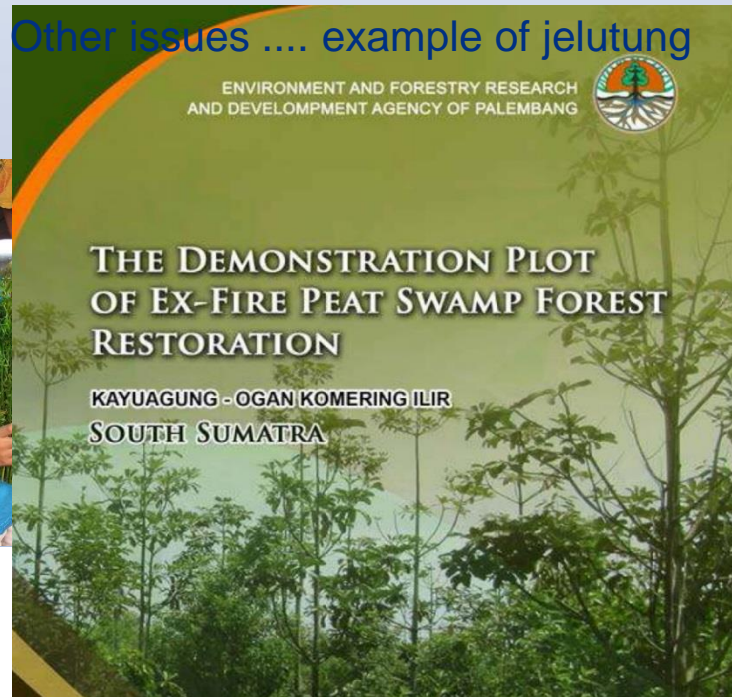
JUNE 2017



# Reason for lack of progress (3)

## Paludiculture species:

- Initially: promotion in peatland restoration programmes of species that require drainage: *Aloe vera*, pineapple, Liberica coffee, dragonfruit (a cactus!), papaya, ginger, etc....
- Recent positive development: Permen 16/2017 *Technical Guidelines on Peat Ecosystem Rehabilitation*: lists true paludiculture species
- Paludiculture species need rewetting, this is not always recognized or undertaken.
- Other issues .... example of jelutung





# Reason for lack of progress (4)

## Example: *Dyera polyphylla* (jelutung):

- Latex producing, for dentistry (molds), insulation, chewing gum,...
- Tapped in natural forests, decline → production decline, end users sought alternatives
- Attempts to replant since 1996 (private sector), ± 2008 MoEF, ICRAF, local communities
- Fires plagued these replanted jelutung (most = burnt!), as not linked to rewetting
- Market 'lost' is not automatically regained: needs to be redeveloped
- Regulations to control harvest NTFPs in natural forests now hinder paludiculture



Permits required for **harvesting NTFPs**. Government Regulation No.41/1999 and No.6/2007, & MOEF Regulations No.46/2009 and No.54/2016.

Permits required for **processing NTFPs**. As per Regulation No.6/2007.

Permits to **trade NTFPs**. Forestry Ministerial Decree No.55/2006 requires permit holders to present NTFP freight invoices..

**Taxation of certain NTFPs** (such as jelutung). Trade Ministerial Decree No.12/2012 states that for Jelutung latex, IDR60.000/kg needs to be paid; this decree also covers other NTFP products.



# Way forward: recent positive developments

## Regulatory support:

- Permen 16/2017: lists paludiculture species
- Ban on use of fires for clearing land also extended to farmers <2 ha
- Endorsement of compacted peat dams (involving use of heavy machinery) & 100% rewetting conservation areas (BRG, MOEF)

## Funding support:

- Range of donor agencies remain supportive (Norway, UKCCU, UNDP, ...)
- Wetlands International's Peatland Partnership Fund (May 2017) small-scale initiatives (by NGOs, CBOs)
- private sector interest





# Way forward: what is needed?

## Regulatory support:

- Revision of regulations that tax & hamper paludiculture development (e.g. jelutung)
- Refinement of regulation stating GWL in drained peat should not be lower than -40 cm

## Technical support:

- Studies on water retention in peatland (pF curves) to refine -40cm regulation
- Performance studies (of promising paludiculture species) & domestication programmes
- Market studies & market development (e.g. jelutung, sago)
- Means of accessing rewetted peatland without draining or causing extensive damage





A photograph of a man in a black shirt and cap looking up in a dense tropical forest. The forest is filled with tall trees and thick undergrowth. The man is positioned on the right side of the frame, looking towards the left. The background is a dense canopy of green leaves and tree trunks.

Thank you for your attention

[wim.giesen@mottmac.com](mailto:wim.giesen@mottmac.com)