The wavering path to paludiculture in Indonesia

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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)](chart)

- Peat swamp forest
- Degraded peatland

![Images of Peatland Issues](images)
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

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
- Local communities with ICRAF, MoEF & NGO support (2008-2015)

Not paludiculture: PSF species, but no rewetting
Thriving paludiculture? Not really!

Smallholders, NGOs, MoEF (4)

- 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 a range of species, including kopi Liberica, cocoa, dragonfruit, Aloe vera, pineapple, papaya, ginger, etc...
- Limited rewetting

**Not paludiculture: all species require drainage** (thankfully only a 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
Paludiculture species:

- Initially: promotion in peatland restoration programmes of species that require drainage: *Aloe vera*, pineapple, Liberica coffee, dragonfruit (a cactus!), papaya, ginger, etc....
- Paludiculture species need rewetting, this is not always recognized or undertaken.
- Other issues .... example of jelutung
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 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
Thank you for your attention

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