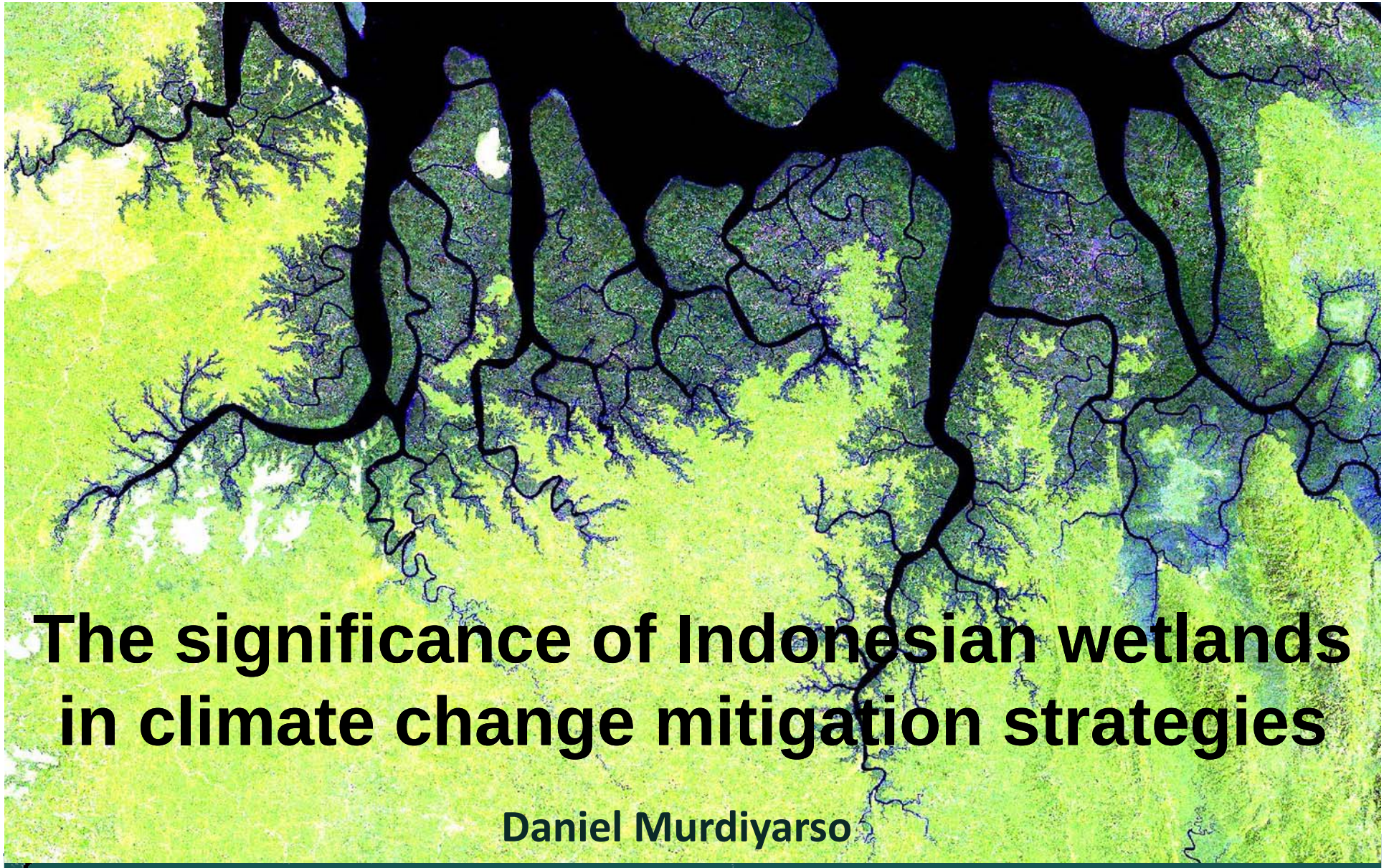

The significance of Indonesian wetlands in climate change mitigation strategies

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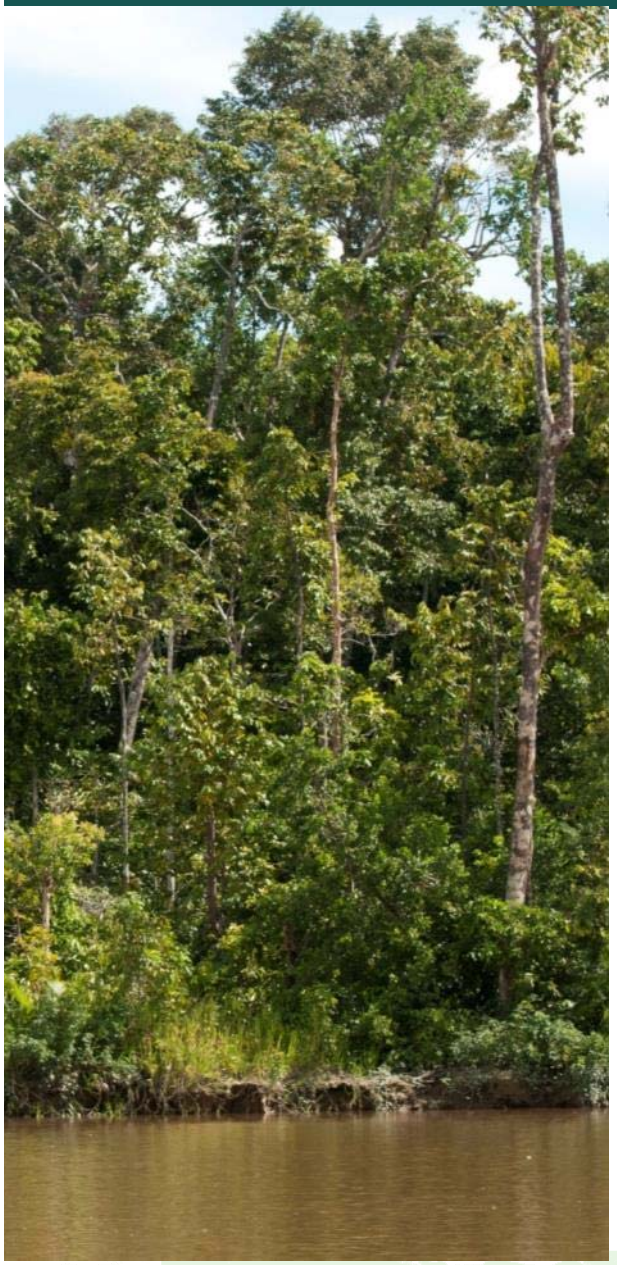
SWAMP Sustainable Wetlands Adaptation and Mitigation Program

RESEARCH PROGRAM ON Forests, Trees and Agroforestry

CGIAR

Outline

- Introduction
  - Why wetlands are important?
  - Wetlands: global and national context
- Methodology development
- Findings
- Impacts pathways and outcomes
- Key messages



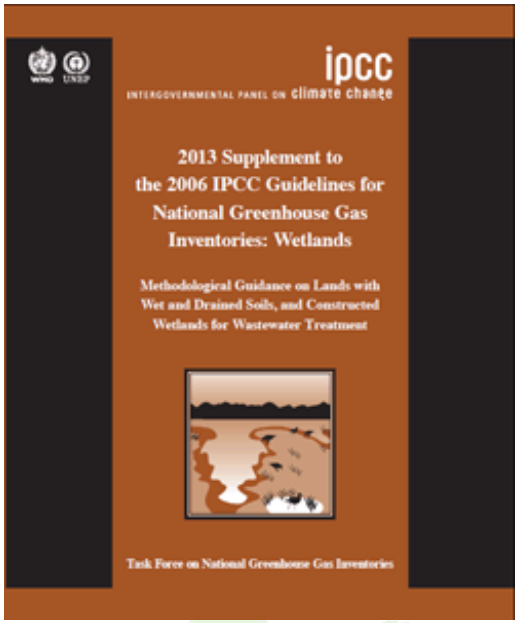
Why wetlands?

- Wetlands are important in the global carbon cycles
  - Very high C stocks, some of the highest on the planet
  - Highest rates in deforestation/land cover change in the tropics → GHG emissions
- Wetlands provide numerous ecosystem services
  - Natural sponge → flood control
  - Habitat for rare and endangered species
  - Coastal systems protect from storms and tsunamis
  - Breeding and rearing habitat for fish and shellfish
  - Sources of wood and other forest products
  - Ecotourism
  - High biodiversity

Global context

2013 SUPPLEMENT TO THE 2006 IPCC GUIDELINES FOR NATIONAL GREENHOUSE GAS INVENTORIES: WETLANDS

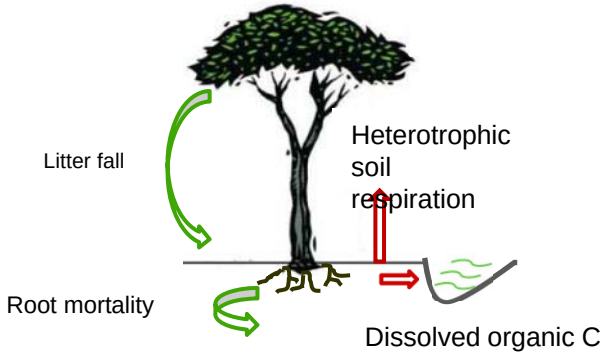
http://www.ipcc-nggip.iges.or.jp/home/wetlands.html



1. Introduction
2. Drained Inland Organic Soils
3. Rewetted Organic Soils
4. Coastal Wetlands
5. Inland Wetland Organic Soils
6. Constructed Wetlands for Wastewater Treatment
7. Cross-cutting Issues and Reporting

Development of methods

Flux change



Findings: mangroves

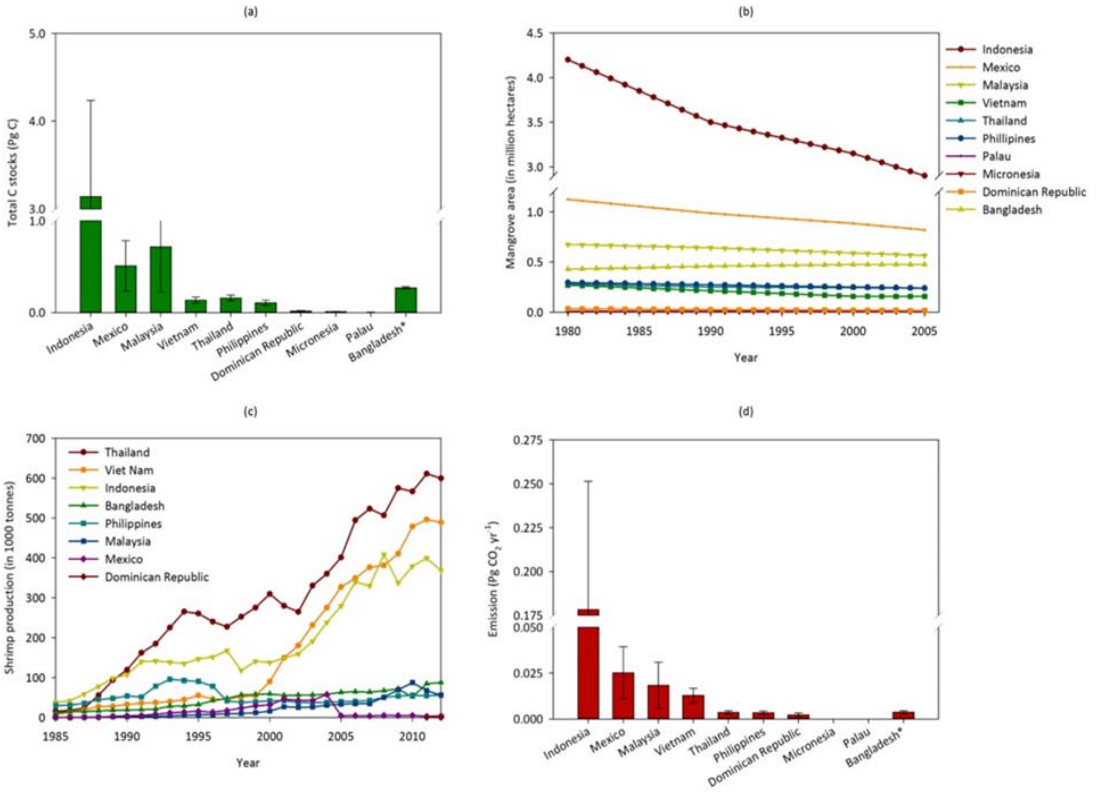
nature climate change

LETTERS

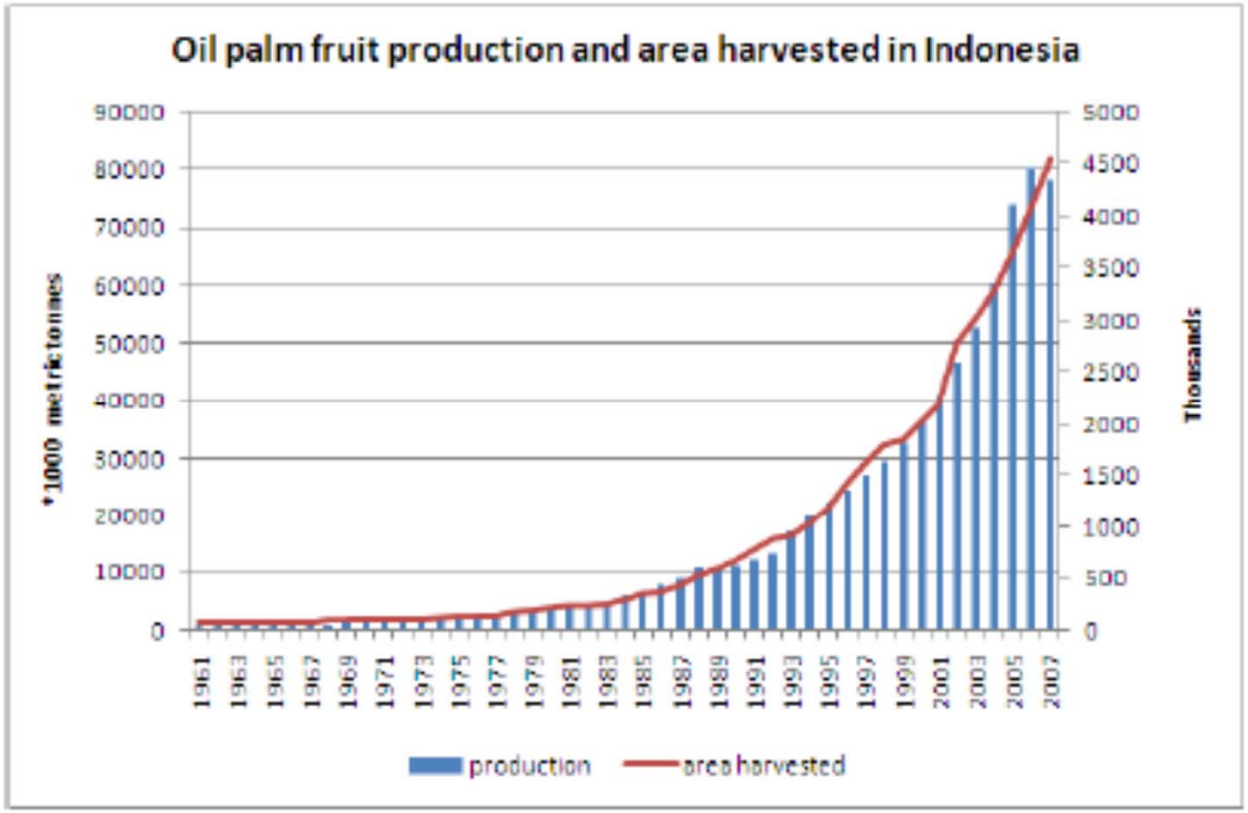
PUBLISHED ONLINE: 27 JULY 2015 | DOI: 10.1038/NCLIMATE2734

The potential of Indonesian mangrove forests for global climate change mitigation

Daniel Murdiyarso[1,2]*, Joko Purbopuspito[1,3], J. Boone Kauffman[4], Matthew W. Warren[5], Sigit D. Sasmito[1], Daniel C. Donato[6], Solichin Manuri[7], Haruni Krisnawati[8], Sartji Taberima[9] and Sofyan Kurnianto[1,4]

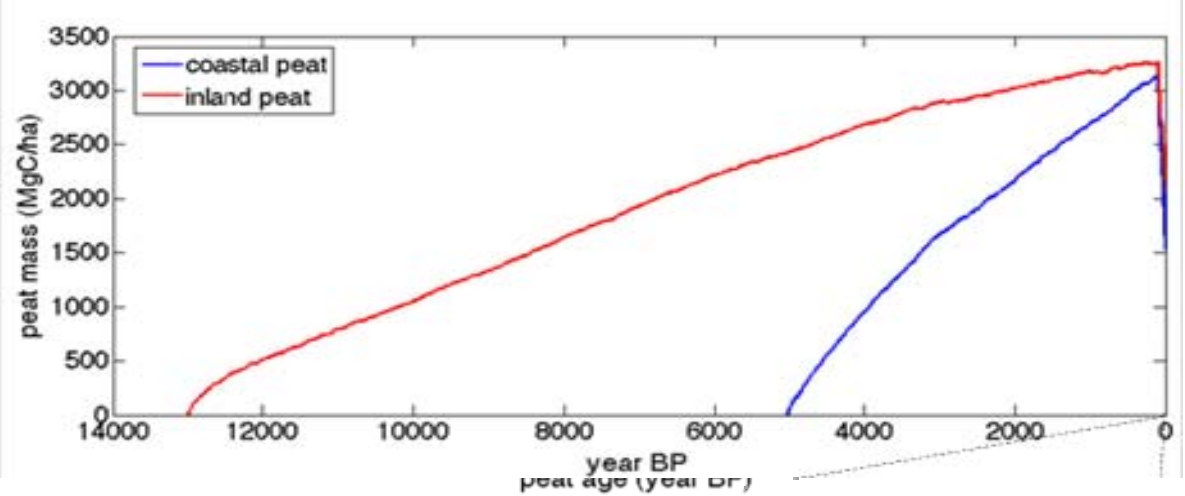


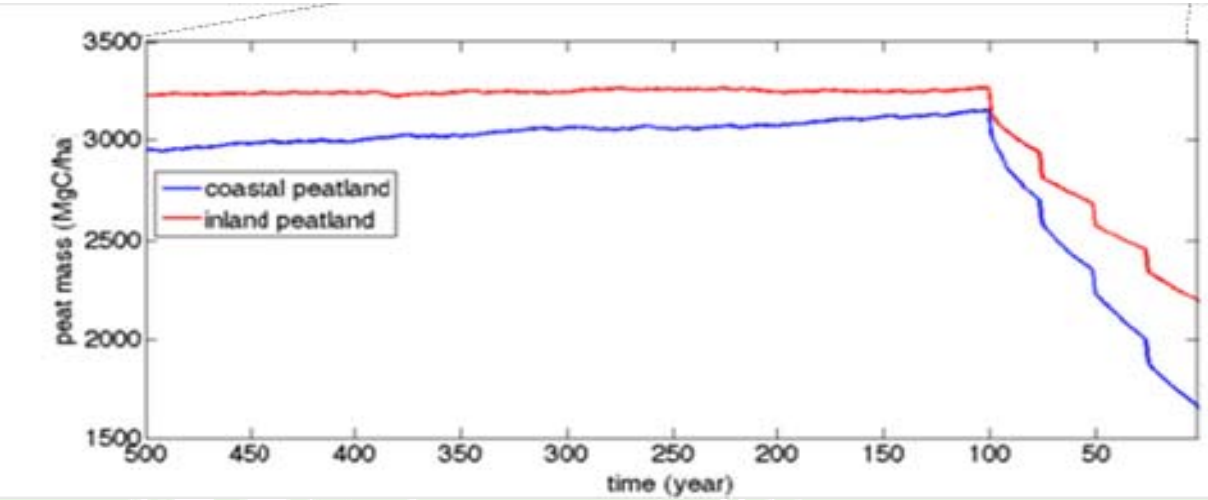
Findings: peatlands



Murdiyarso et al. PNAS, 2010

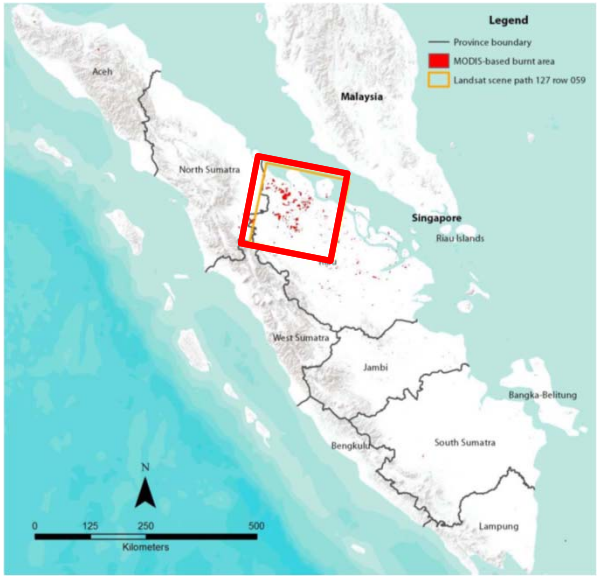
How long does it take to accumulate?

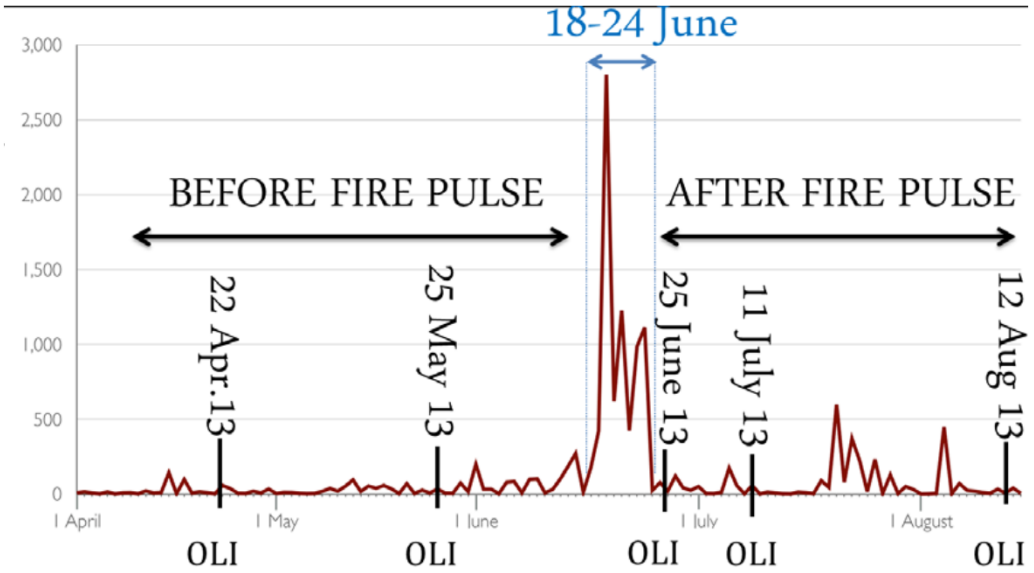




Kurnianto et al., GCB, 2014

Non El-Nino year and non forested lands





Gaveau et al. Scientific Report (2014)

Area burnt 163,336 ha (84% on peat).

Mostly on deforested lands (82%; 133,216 ha).

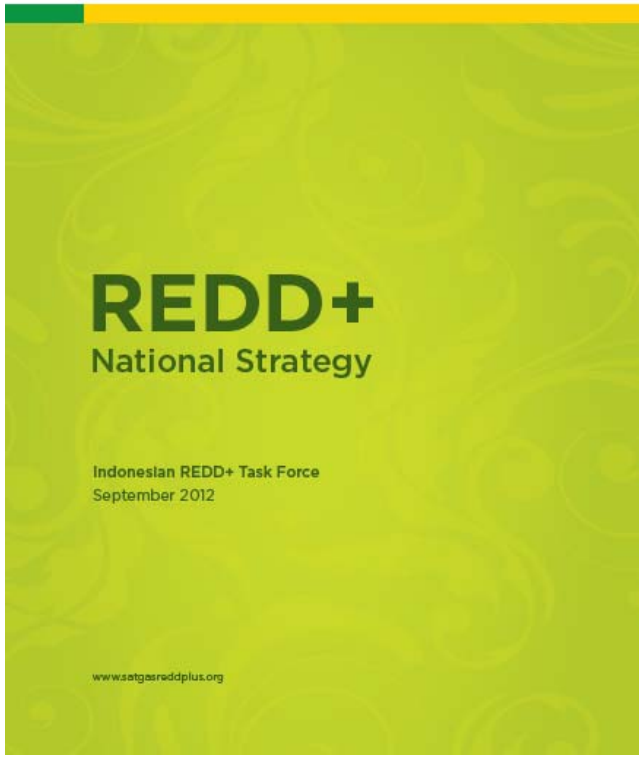
GHG emissions: 172 + 59 Tg CO2-eq or 31 ± 12 Tg C

(5–10% of Indonesia's mean annual emissions for 2000–2005)

Emission factors for drained peatlands

Land-use category	Climate / vegetation zone	Emission factor[a] (tonnes CO_2-C $ha^{-1}yr^{-1}$)	95% Confidence interval[b]		No. of sites	Citations/comments
Plantations, drained, unknown or long rotations[f]	Tropical	15	10	21	n.a.	Average of emission factors for acacia and oil palm
Plantations, drained, short rotations, e.g. acacia[f, g]	Tropical	20	16	24	13	Basuki *et al.*, 2012; Hooijer *et al.*, 2012; Jauhiainen *et al.*, 2012*a*; Nouvellon *et al.*, 2012; Warren *et al.*, 2012
Plantations, drained, oil palm[f]	Tropical	11	5.6	17	10	Comeau *et al.*, 2013; Couwenberg & Hooijer, 2013; Dariah *et al.*, 2013; DID & LAWOO, 1996; Henson & Dolmat, 2003; Hooijer *et al.*, 2012; Lamade & Bouillet, 2005; Marwanto & Agus, 2013; Melling *et al.*, 2005*a*, 2007*a*, 2013; Warren *et al.*, 2012
Plantations, shallow-drained (typically less than 0.3 m), used for agriculture, e.g. sago palm[f]	Tropical	1.5	-2.3	5.4	5	Dariah *et al.*, 2013; Hairiah *et al.*, 1999; Ishida *et al.*, 2001; Lamade & Bouillet, 2005; Matthews *et al.*, 2000; Melling *et al.*, 2005*a*, 2007*a*; Watanabe *et al.*, 2009

Impact pathways and Outcomes



In line with Forestry Law 41/2009 sections 1(b) and 1(c), the REDD+ scheme will be implemented in forested lands (including mangroves and peatlands) designated as forest areas or land designated as "other use" areas.

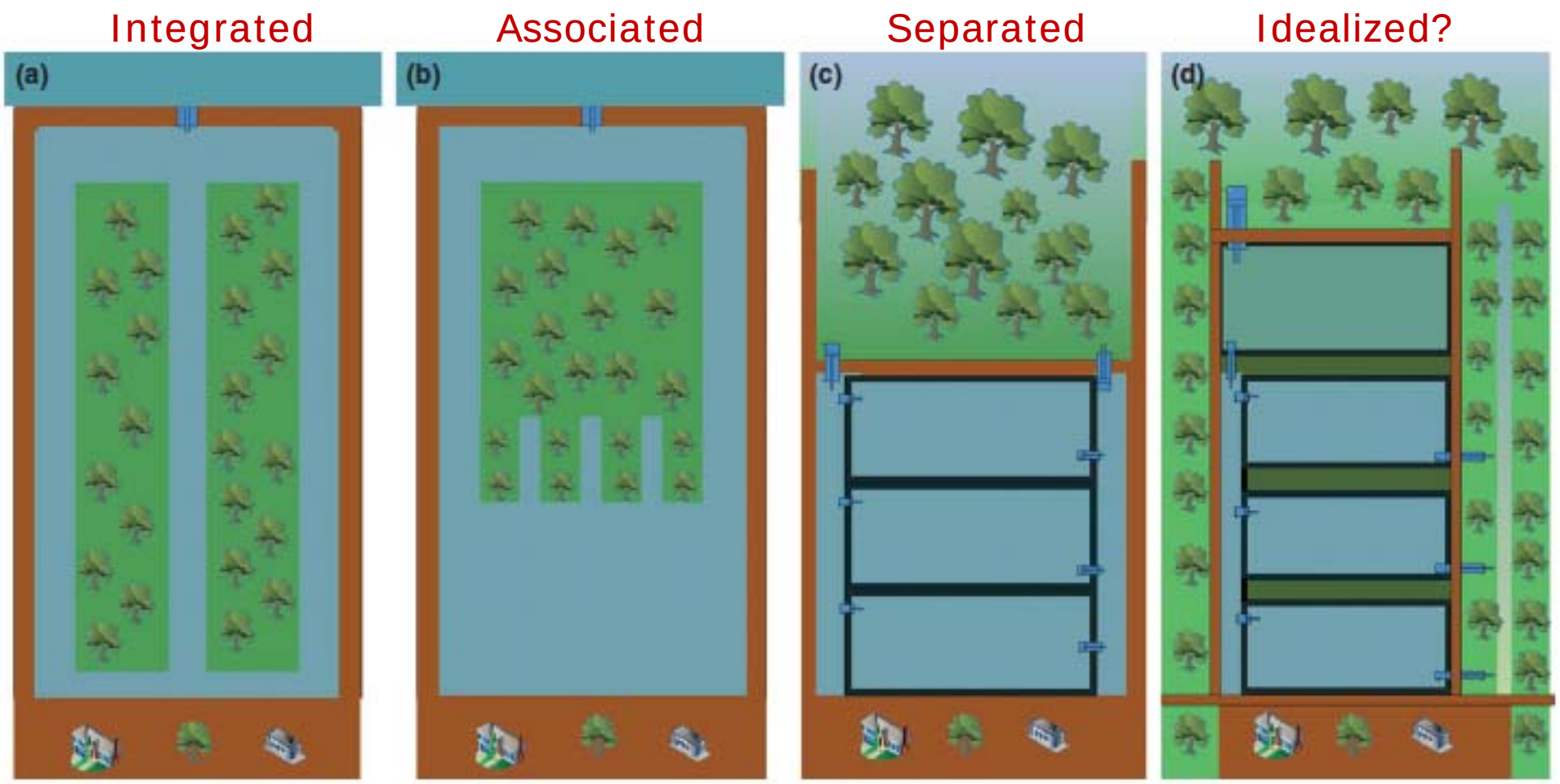
(p.10)

Provision of incentives for reforestation of forests and peatlands, such as replanting, rehabilitation of mangrove forests, development of town forests, and the expansion of community managed areas.

(p.28)

New approaches of restoration to improve coastal community resilience

→ Integrating science with local objectives



Bosma et al. 2014

Key messages

- Indonesian peatland and mangroves are key ecosystems for CC mitigation
- Emission factors and activity data of these ecosystems are readily available
- Including these ecosystems in the next National Communication is increasingly important
- Public policy communities are well informed

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