

Stopping haze when it rains: lessons learnt in 20 years of Alternatives-to-Slash-and-Burn research in Indonesia



1995

2015



At the Rio conference in 1992 where global conventions on climate change and biodiversity were adopted, the seeds were sown for a globally supported effort in and by Indonesia, the Philippines, Thailand, Cameroon, Brazil and Peru to identify, support and implement 'alternatives to slash-and-burn'. More than 20 years of research and action have brought new insights, but the issues are still on the agenda. Every episode with haze and land-clearing fires draws the attention of policy makers but once the rains come the urgency of change is forgotten.

Key findings

1. The fire & haze issue is the tip of an iceberg of land use change in tropical forest & peatlands,
2. Non-burning conversion methods exist but cost more than use of fire,
3. Excessive logging and conversion of forests pays,
4. Land and forest ownership remains contested,
5. Command and control systems remain weak, international market pressure helps locally,
6. Attractive alternative land use options are scarce.

Implications

- The real issue is how land use decisions and rights are handled
- Without serious law enforcement and public naming and shaming, the incentives remain high to ignore and circumvent rules
- A substantive change in economic incentives (incl. loss of markets, loss of investors, increased costs of noncompliance) is needed
- Without clarity on adat land claims the one-map efforts miss a key element
- Emerging voluntary standards for low-footprint commodities need to scale up nationally
- Support is needed for low-impact (agro)forestry options and restoration on peat is needed.

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Is forest conversion the issue or the way this is done?

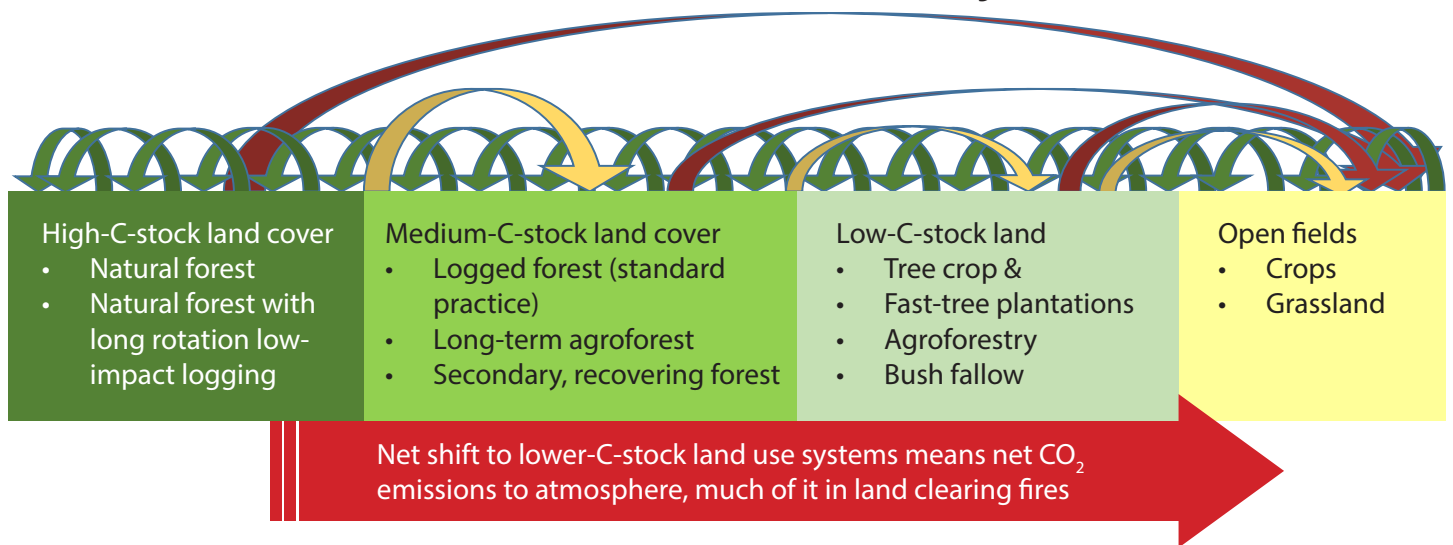


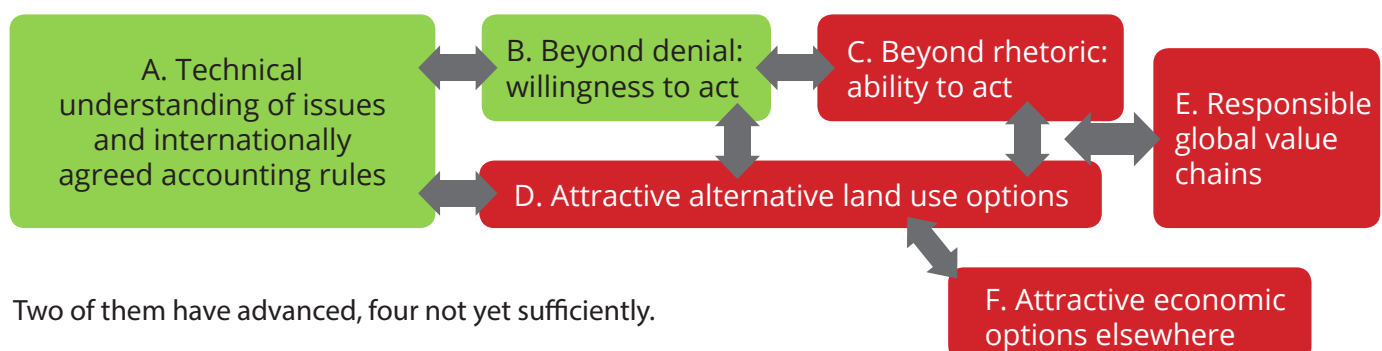
Figure 1. Overview of the land cover change that drives the use of fire as land clearing tool

Haze derived from land clearing fires comes back to the policy agenda with a predictable pattern. Years that El Nino and the Indian Ocean Dipole conspire to cause exceptionally dry periods (as in 1997/8 and 2015) form the peak, but the issue is never far away. Three main categories of fire are A) Fires as accident, B) Fire as a tool and C) Fire as a weapon, and they require different steps. Most of the fire in Indonesia is of type B, with occasionally land use conflicts contributing to type C. For the Type-B fires, we need to separate discussion on tropical forest conversion per se, from the way it is done (with or without use of fire) (Figure 1)

Starting from the 1995 ASB Indonesia report and the analysis of underlying causes of the 1997/8 fires, technical, social and economic understanding has increased, and there now is a general willingness to act, with conflict-reducing solutions in some places (see ASB briefs for examples), but still the 'ability to act' is short of what is needed (Figure 2).

One issue that has emerged is the limited attention span of the policy debate: in the heat of debate on a current crisis, promises are made to prevent a reoccurrence, but giving that a real followup beyond rhetoric remains a challenge. Our key findings are focussed on the need to shift the costs and benefits for those who still decide to use fire to clear forests. As long as excessive logging and conversion of forests pays while non-burning conversion methods cost more than use of fire, the temptation to rely on this shortcut will persist. This more so because land and forest ownership remain contested. We have seen and documented cases where international market pressure helps locally to make conversion of peatlands to oil palm less attractive, but apparently there still are other markets that don't sufficiently care about where their raw materials come from. Alternative, low-impact land use options and their value chains remain underdeveloped.

Six broad knowledge-to-action links interact:



Two of them have advanced, four not yet sufficiently.

Figure 2. Overview of progress in linking knowledge to action on reducing fire and haze in Indonesia

An ongoing case study of Peat Fire Risk Management in Tanjung Jabung Barat District (Jambi) clarifies the issues and options in local context.

Fire is a serious problem in degraded tropical peat forest and peatland in Indonesia, particularly in Sumatera. Fire risks in degraded peat swamp forest were caused by deforestation, canalization which drained peatland and land occupation due to spontaneous migration. Forest and land clearance by slash and burn increase peat emissions. Canalization drains water from peat, which contributes in increasing peat emission and accelerating the drying. This practice is an inexpensive tool and the simplest technology in land preparation (Wibowo *et al.*, 1997). Peatlands that are drained become susceptible to fire and it has high risk to wildfire. Alternative options are available, such as manual slashing, but many still prefer slash-and-burn practice.

Peat Fire Risk Management was assessed by doing two aspects of research, e.g. (i) social-policy study on the fire on peatlands, and (ii) alternative techniques on land preparation and silviculture of peatland rehabilitation. The objectives of the research were to identify current problems, drivers and actors of basic and mediating factors of fire on peatlands in Tanjung Jabung Barat (Tanjabar) District, Jambi Province, and identify alternative solutions including silviculture techniques on degraded peatland of Bram Itam Forest Management Unit in Tanjabar district.

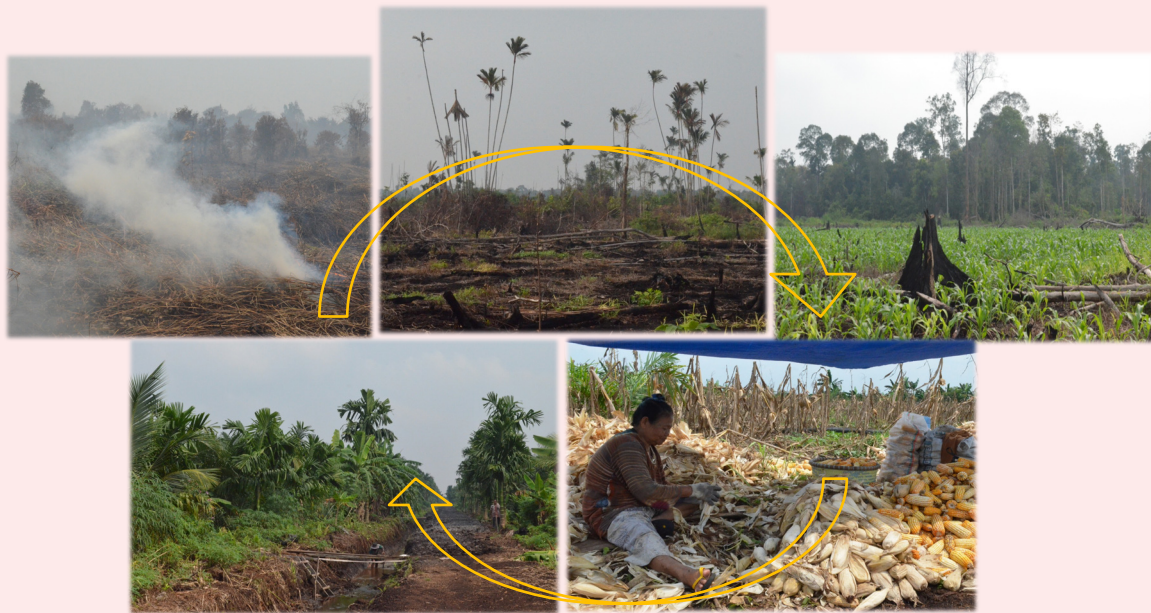


Figure 3. Peat fire problem in Bram Itam Forest Management Unit in Tanjung Jabung Barat district, Jambi Province

Methods

Methods employed in the study consisted of survey, focus group discussion and in-depth interview with key stakeholders, such as farmers, village leaders, NGOs, local governments and representatives of parliaments.

On-farm experiment was conducted inside the peat protection forest area (*Hutan Lindung Gambut*, HLG) of Bram Itam, by applying agroforestry system in degraded peatland.

About 30% of 15.965 ha peat forest area has been occupied by migrant farmers, before the forest was enacted as peat protection forest in 2009 (Decree of the Ministry of Forestry no. 78/2009).

The district forest office initiated peat forest rehabilitation covering 500 ha by promoting jelutung (*Dyera polyphylla*) as a native peat swamp species.

Site

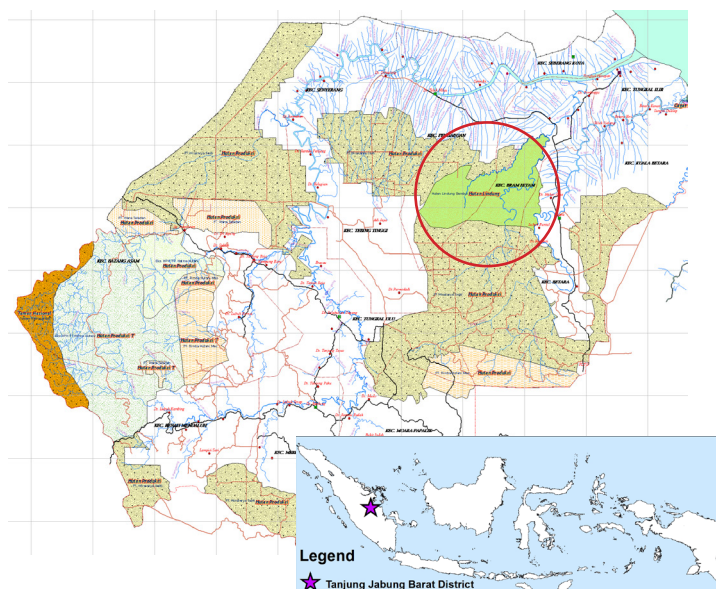


Figure 4. Tanjung Jabung Barat district, Jambi province. (Forest Management Unit of Bram Itam is indicated in green color)



Figure 5. Jelutong (*Dyera polyphylla*) planted in lands already established with oil palm

Results

Peat fire is common for Tanjabar communities and they classify the peat land into three categories: (i) sensitive to fire, (ii) moderately sensitive to fire, (iii) not sensitive to fire. The community will seriously keep the area from fire for the existence of their family sources of income.



Figure 6. Land not sensitive to fire (a), and sensitive to fire (b)

Table 1. Drivers and leverages of basic and mediating factors of peat fire in Tanjung Jabung Barat district, Jambi province

Factors	Drivers	Leverage
Basic	Open access to forest	Illegal logging, land occupation
	Migration	Tenurial conflict, land occupation
	Poverty	Livelihood options - tree based system
Mediating	Tradition of slash and burn	Oil palm expansion, crops planting
	Governance	Fire control and prevention - multidoor approach
	Incentive mechanism	<ul style="list-style-type: none"> Community forest management through community forest Promoting native tree species in agroforestry sistem (<i>Dyera</i> and <i>Palaquium</i>)

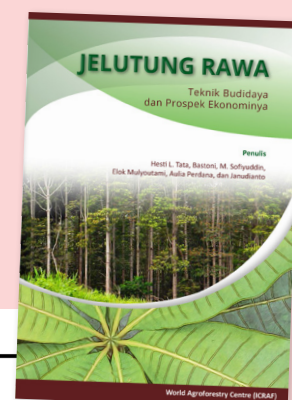
About 99.9 % of fire in Jambi was caused by human activities (Diana, 2014). Burning is a common technology applied in land preparation. It has been practiced for years in Tanjabar. This technology is considered easy to do, relatively cheap, does not take time (relatively fast to do), great result (clean) and the ashes make the soil fertile.

Peatland agroforestry system based on jelutong trees (*D. polyphylla*) and nyatoh (*Palaquim gutta*) was promoted as silviculture technique on managing the degraded peat protection forest that has been occupied by oil palm expansion. The cash crops, such as galangal and ginger, are intercropped to provide cash income for farmers. Community forest management, such as *Hutan Kemasyarakatan* (HKM), was promoted as an incentive mechanism to avoid land conflict and to rehabilitate the degraded forest.

Box: Jelutong as one of the options for peatland agroforestry

A technical manual in Bahasa Indonesia has just been released. A publication in peer-reviewed literature is on its way:

Agroforest Syst
DOI 10.1007/s10457-015-9837-3



Domestication of *Dyera polyphylla* (Miq.) Steenis in peatland agroforestry systems in Jambi, Indonesia

Hesti L. Tata · Meine van Noordwijk · Jasnari · Atiek Widayati

Way forward:

The real issue to prevent fire and haze episodes disrupting lives and economy in the region is how land use decisions and rights are handled. Without serious law enforcement and public naming and shaming, the incentives remain high to ignore and circumvent rules, as conversion using fire remains the cheapest method. A substantive change in economic incentives is needed, which can include the threats of loss of markets, loss of investors and increased costs of noncompliance through fines and court convictions. Without clarity on 'adat' land claims the one-map efforts miss a key element. Emerging voluntary standards for low-footprint commodities in global trade need to scale up nationally, while support is needed for low-impact (agro)forestry options and restoration on peat. Twenty years of ASB research have, unfortunately, not made the topic outdated; beyond increased understanding, solutions will have to emerge within the complex reality of sustainable development at village, district, provincial and national levels.

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The ASB Partnership for the Tropical Forest Margins is working to raise productivity and incomes of rural households in the humid tropics without increasing deforestation or undermining essential environmental services.

ASB is a consortium of over 90 international and national partners with an eco-regional focus on the forest-agriculture margins in the humid tropics, with benchmark sites in the western Amazon Basin of Brazil and Peru, the Congo Basin forest in Cameroon and DRC Congo, southern Philippines, northern Thailand, and the island of Sumatra in Indonesia.

The ASB Policybriefs aim to deliver relevant, concise reading to key people whose decisions will make a difference to poverty reduction and environmental protection in the humid tropics.

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