SHIFTING THE BLAME?

SOUTHEAST ASIA'S INDIGENOUS PEOPLES AND SHIFTING CULTIVATION IN THE AGE OF CLIMATE CHANGE

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Dusun farmers seeding their swidden with hill padi, Sabah, Malaysia. Photo: Christian Erni.

In the name of forest conservation and development, colonial and post-colonial governments in Asia have for more than a century devised policies and laws seeking to eradicate shifting cultivation.[1] Many of the arguments brought against this form of land use – that it is an economically inefficient and ecologically harmful practice – have been proven inaccurate or outright wrong.[2] Notwithstanding all evidence, however, attitudes by decision makers and, consequently, state policies have hardly changed.

The current climate change discourse has taken the debate on shifting cultivation to another, a global level, reinforcing existing prejudices, laws and programs with little concern for the people affected by them. Now, shifting cultivation is bad because it causes carbon emission and thus contributes to climate change. The UK-based Forest Peoples Programme (FPP) and FERN have studied nine concepts for government programs on "Reducing Emissions from Deforestation and Forest Degradation" (REDD). Eight of these "identify 'traditional agriculture' or 'shifting cultivation' as a major cause of forest loss" (Griffiths 2008: 20). Again, it is the shifting cultivators who have to take the blame.

In Asia, the majority of the people practising shifting cultivation belong to ethnic groups that are generally subsumed under categories such as ethnic minorities, tribal people, hill tribes, aboriginal people or indigenous peoples.[3] The popular prejudices against shifting cultivation common in these countries are conflated with other negative attributes ascribed to indigenous peoples throughout the region: that they are backward, primitive, a hindrance to national progress, disloyal to and a security problem for the state etc.[4]

Even though it has been shown (see e.g. FAO, UNDP, UNEP 2008: 3) that the main causes of deforestation and thus carbon emission in Asia have been intensification of agriculture and large-scale direct conversion of forest for small-scale and industrial plantations (oil palm, rubber etc.), shifting cultivators still rank high on the priority list of decision makers for corrective intervention in their forest conservation programs. That so much attention has been paid to them by government in their REDD concepts therefore comes as no surprise.

But how much does shifting cultivation really contribute to global warming? To what extent do we actually know what is happening?

Shifting cultivation and climate change: What we know and what we do not

17% of global greenhouse gas emissions are believed to result from deforestation, making it the second largest source (FAO, UNDP, UNEP 2008: 1). According to the UN-REDD Framework Document (ibid.), "in many developing countries, deforestation, forest degradation, forest fires and slash and burn practices make up the majority of carbon dioxide emissions".

It is generally believed that about half of the deforestation in the tropics is the result of the expansion of traditional agriculture, above all shifting cultivation (Geist and Lambin 2001: 85). Geist and Lambin (ibid.), however, point at the need to differentiate between the different forms of land use commonly lumped together under the broad category of "shifting cultivation" or "slash and burn agriculture", such as between traditional rotational shifting cultivation and the opening up of land by migrant settlers. And they conclude that the cause of tropical deforestation is not so much traditional shifting cultivation but the expansion of permanently cropped land by migrant settlers (ibid.: 95).

The distinction between "traditional shifting cultivation" and the "slash and burn agriculture" of migrant settler colonization is crucial. They not only constitute fundamentally different forms of land use but are also practised by different people. Indigenous peoples in Southeast Asia, which we are mainly concerned with here, are practising what Geist and Lambin call traditional shifting cultivation. The concrete manifestations of traditional shifting cultivation, however, are as diverse as the people who practise it, and it is therefore not easy to define. For the purposes of this article, I am following Mertz et. al. (2009: 261) who "decided to define swidden cultivation in Southeast Asia as a land use system that employs a natural or improved fallow phase, which is longer than the cultivation phase of annual crops, sufficiently long to be dominated by woody vegetation, and cleared by means of fire".

In order to assess the impact of shifting cultivation on land cover, its contribution to deforestation and thus carbon emission, we first have to know how many people are engaged in shifting cultivation and what area is under this form of land use.

How much land is under shifting cultivation?

Recent attempts to assess the number of people engaged in shifting cultivation in Southeast Asia[5] came to a sobering conclusion: that due to various reasons, such as the complex, dynamic and diverse nature of shifting cultivation, the inclusion of shifting cultivators in broader categories like "smallholders" in government statistics, or because the existence of shifting cultivation is politically contentious, there is no reliable data available.

So only a very rough estimate is possible, and the actual figure for the number of shifting cultivators in Southeast Asia may lie somewhere between 14 and 34 million people (Mertz et. al. (2009: 286).

Assessing the land area under shifting cultivation has proven equally difficult (Schmidt-Vogt et. al. (2009: 277), and we have to conclude that any attempt at quantifying the contribution of shifting cultivation in the region to greenhouse gas emissions is destined to fail.

If we cannot assess the global or regional extent of shifting cultivation, and therefore its overall share in the emission of greenhouse gases, do we at least know what happens to carbon stocks in land under shifting cultivation at the field level?

And how does this compare with other forms of land use?

Harvesting root crops. Buhid, Buswak community, Occidental Mindoro, Philippines. Photo: Christian Erni.

Buhid elder bundling his share of the maize harvest. Buhid, Buswak community, Occidental Mindoro, Philippines. Photo: Christian Erni.

Left: Threshing newly harvested beans. Lahu, Nong Tao community, Chiang Mai province, Thailand. Right: Preparing newly harvested sweet potatoes. Buhid, Fanuban community, Oriental Mindoro. Photos: Christian Erni.

Does shifting cultivation cause deforestation?

One of the basic distinctions that has to be made in the discussion on shifting cultivation and deforestation is that between established, rotational systems in secondary forest and the pioneer systems which open up primary forest.

If we focus our reflection on the form of shifting cultivation traditionally most commonly practised by indigenous peoples in Asia – the rotational system of short cultivation and long fallow – and, if, as Van Noordwijk et. al. (2008: 11) argue, we take the commonly used FAO's definition of "forest" as our point of departure, this form of shifting cultivation actually does not cause "deforestation".

The internationally accepted definition of forest has two components: one that specifies canopy cover and tree height, and one that refers to the institutional framework of forestry, as it includes '*areas normally forming part of the forest area which are temporarily unstocked as a result of human intervention such as harvesting or natural causes but which are expected to revert to forest*' (UNFCCC/CP/2001/13/Add.1 as quoted in van Noordwijk et al., 2008a).

The 'temporarily unstocked' part of the definition is intended to allow clear-felling and replanting as normal forest management, but the definition implies that shifting cultivation and fallow rotations are not deforestation, as long as trees achieve the specified height and canopy cover.

Clear-felling for developing fast wood or oil palm plantations is possible within the forest definition, but so is land clearing followed by assisted regrowth of woody fallow vegetation. The usual listing of shifting cultivation as a driver of deforestation is thus not aligned with the internationally accepted definition of forest.

Following the FAO definition of forest, which has been heavily criticized for allowing tree plantations to be considered as forest, means that shifting cultivation cannot be considered to cause deforestation but "forest modification".

This seems to be increasingly recognized by international organizations like the FAO, UNDP or UNEP and, in the global discourse on climate change, shifting cultivation has come to be associated with forest degradation rather than deforestation (FAO, UNDP, UNEP 2008).

What happens to all the carbon?

Since sequestration of atmospheric carbon dioxide in vegetation and soil organic matter is an important factor affecting greenhouse gas concentration in the atmosphere, changes in vegetation cover, and especially deforestation and forest degradation, are watched with increasing concern by the global community, and are therefore being addressed by climate change mitigation schemes such as REDD programs. Undeniably, burning a swidden field, whether it has been cut in primary or secondary forest, does release carbon, and this, after all, is what climate change mitigation schemes are trying to prevent. But what actually happens throughout a full cycle of shifting cultivation? Is there a way to assess how much carbon is actually released?

Van Noordwijk et. al. have compiled data for below and above ground carbon stock, i.e. soil organic matter (humus, roots etc.) and vegetation, in different types of land cover. They found that, in the transition from forest to swidden, and then to continuous cropping, there is a tendency to lower the organic matter content of the soil and thus its capacity to sequestrate carbon. While there is only a slight decrease in soil carbon when forest is converted to swidden, the depletion of soil carbon is much higher in the transition of swidden into permanent agriculture: nearly 30 tons per hectare (from 56 to 29 tons) (op. cit., p. 32).

In other words, when a primary forest is opened for shifting cultivation, only little carbon is emitted into the atmosphere due to decomposing soil carbon, while a much larger amount is emitted when shifting cultivation is converted to permanent agriculture.

With respect to carbon stock above ground, they found that the trend "is similar to that below ground, except that the magnitude of the decrease is much higher as forest is converted to swidden and swidden converted to permanent cropping" (op. cit., p. 32). According to their measurements, above-ground carbon stock in primary forest was 254 tons per hectare, that of an 8-year old swidden fallow was 74 and a field under cultivation was between 2 (for vegetable) to 4 (for cassava) (ibid.).

These figures reveal that conversion of primary forest to secondary fallow forest under shifting cultivation does imply a considerable release of carbon into the atmosphere. We have to remember, however, that most shifting cultivation systems practised by indigenous peoples are rotational systems. So in trying to at least get an idea of the contribution of shifting cultivation to global carbon emission, we again have to distinguish between these established and the pioneer systems. Of course, rotational shifting cultivators also had to open up virgin forest at one point, and this forest has a much higher carbon stock than any other kind of land cover. But so did most other forms of agriculture. Nobody would seriously demand that the removal of the original virgin forest, which may have happened hundreds or thousands of years ago, be included in the overall assessment of carbon emissions in present-day agriculture in Europe, or the alluvial plains of Asia. The crux of the problem here is that shifting cultivation is not recognized as an established form of agricultural land use, or agroforestry. In order to treat it equally with other agricultural systems, we need to de-link it from the original conversion of primary into secondary forest and confine our analysis to what is happening in the course of the productive cycle in rotational shifting cultivation and, in the longer term, during several such cycles.

Research over the past decades has shown that, if fallow periods are long enough, rotational shifting cultivation is a stable system in which soil fertility can be maintained (Nye and Greenland 1960; Ruthenberg 1971; van Noordwijk et. al. op. cit.: 20). This implies that, once established (i.e. as primary forest has been converted into secondary fallow forest), rotational shifting cultivation can be expected to be carbon neutral. Whatever above-ground and soil carbon is released through burning and decomposition during the preparation of the field and the cropping period is sequestered again by plant growth above ground and by formation of humus in secondary fallow forests.[6]

In its discussion of land-use change as a source of greenhouse gas (IPCC 2006, paragraph 1.4.1), the Intergovernmental Panel on Climate Change acknowledges one crucial and often overlooked aspect of shifting cultivation: the fallow. "Forest clearing for shifting cultivation (2) releases less carbon than permanent forest clearing because the fallow period allows some forest regrowth". Again, the crucial question when discussion shifting cultivation and climate change is what we compare it with.

How does shifting cultivation compare with other forms of land use?

Most commonly, the point of reference are undisturbed forests. As pointed out earlier, underlying such a view is the still widespread lack of recognition of shifting cultivation as a form of agriculture, or agroforestry. For Bech Bruun et. al. (2009: 377) comparing

Figure 1: Above-ground carbon stock in vegetation under different forms of land use (tons/ha)

Shifting cultivation		
Long fallow-systems (>10 years)	80 (24-160)	Bruun et.al. 2009
8-years fallow forest	74	van Noordwijk et.al. 1995
4-years fallow system	8-9	Bruun et.al. 2009
Agroforests		
Rubber agroforest (Indonesia)	90	Bruun et.al. 2009
Rubber (agro)forest (Indonesia)	116	van Noordwijk et.al. 1995
Permanent agriculture seasonal crops		
Continuous annual cropping	1-4	Bruun et.al. 2009
Annual cropping vegetables	2	van Noordwijk et.al. 1995
Annual cropping cassava	4	van Noordwijk et.al. 1995
Monoculture tree plantations		
Casuarina tree monoculture plantation	21-55	Bruun et.al. 2009
Rubber plantation	50	Bruun et.al. 2009
Oil palm		
Indonesia, 20-25 years rotation	48-91	Bruun et.al. 2009, van Noordwijk et. al. 1995
Malaysia	36	Bruun et.al. 2009

environmental aspects of shifting cultivation with those of primary forests is problematic "most fundamentally because a primary forest is not a production system, thus for the farmers forests do not represent an alternative to swidden cultivation".

We have already briefly referred to research by Van Noordwijk et. al. (2008) in Indonesia, who documented the loss of soil and above-ground carbon stocks during transition from primary forests to shifting cultivation, and the considerably higher loss when shifting cultivation is transformed to permanent agriculture.

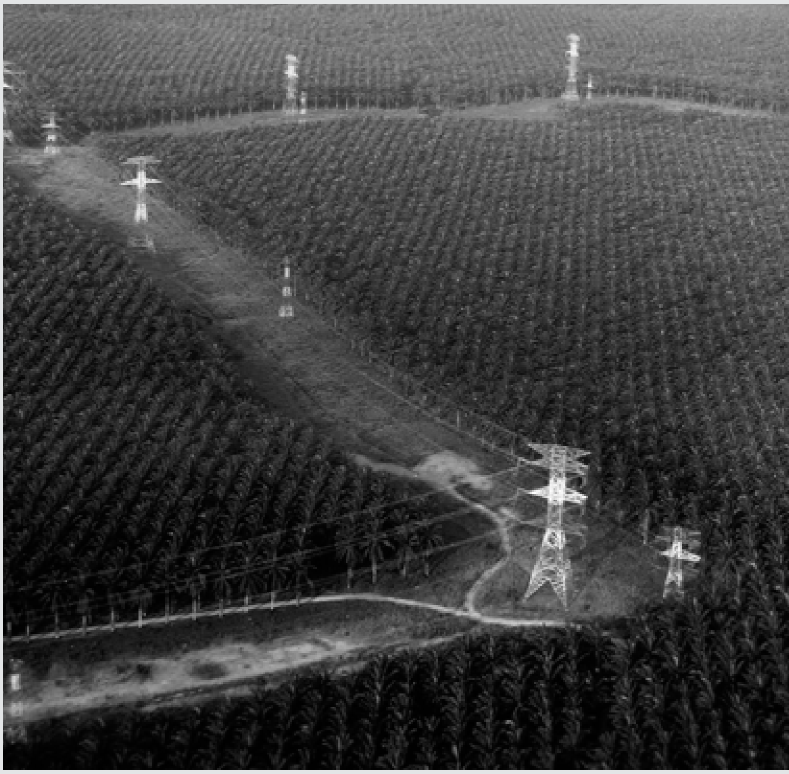
In trying to assess the consequences of a change from traditional long-fallow shifting cultivation to other forms of land use in terms of carbon storage and soil quality Bech Brun et.al. (2009: 375) come to similar conclusions.

The table above summarizes data on carbon stocks in vegetation under different forms of land use provided by Bech Bruun et. al. (2009) and van Noordwijk et. al. (1995). Only the former's refer to time-averaged carbon stocks (i.e. the average over a full cycle).

The conclusion we can draw from this data is that, even when soil carbon is not taken into account, carbon sequestration in traditional shifting long-fallow cultivation is superior to that of permanent land use, and of most tree plantations, alternatives which governments throughout the region are aggressively promoting and often imposing on indigenous communities.

We have to stress, however, that this applies only to a situation of sufficiently long fallow periods. We do not have any precise criteria for sustainability of shifting cultivation systems. The minimum length of fallow that maintains soil fertility and thus long-term sustainability depends on many factors and can therefore vary considerably according to local conditions. In any case, the implication of long fallow periods is that only comparably low population densities are possible.

In many parts of the tropics, and particularly in Southeast Asia, the population-land ratio did reach such critical levels. In most cases it was not so much population growth but government restrictions on shifting cultivation and large-scale alienation of indigenous peoples' land that were the main cause of land scarcity and, consequently, a shortening of the fallow period. In contrast with the predictions of



Left: View of an area under traditional rotational shifting cultivation practiced by indigenous peoples on Mindoro island, Philippines. Right: Aerial view of a corporation-owned oil palm plantation over Malaysia. Photos: Christian Erni.

concerned policy makers and environmentalists, however,

> *... rather than collapse, swiddeners around the world are modifying their practices. Many shifting cultivators have developed cultivation cycles that more closely resemble crop rotation systems and agroforestry operations than what has conventionally been called swidden, ...* (Padoch et. al. op. cit.: 30).

Indigenous peoples' land use and climate change mitigation: the unappreciated potentials and the obligations

Countries like Malaysia and Indonesia have, in recent years, launched ambitious land conversion programs for large-scale oil palm plantations, and rubber plantations have been established on a large scale in Southwest China over the past decades(Padoch et.al. 2007:33), and are currently rapidly expanding in Cambodia and Laos (IWGIA 2009: 344, 363). These programs have come under heavy criticism due to their contribution to deforestation, loss of biodiversity, environmental pollution and dispossession of indigenous and local communities.[7] As we can conclude from the data compiled in Figure 1, recent research shows that the carbon sequestration capacity of industrial tree plantations such as oil palm monocultures is generally lower than that of agroforestry systems, including traditional long-fallow shifting cultivation, which is more beneficial to local people[8] and biodiversity.[9]

Especially at a landscape level, the carbon sequestration capacity of land under indigenous land use systems is by far superior since they usually include not only a mosaic of various anthropogenic vegetations – fields cultivated with annual crops, fallow land, agroforests, home gardens, orchards etc. – but also natural forests, either community forests which cover their needs for various wood and non-wood forest products, or sacred and other protected forests. In response to the growing scarcity of forest resources and declining biodiversity, indigenous communities throughout the region have developed or refined existing systems of what has come to be known as community-based forest management (CBFM). The potentials of CBFM are increasingly being recognized not only because it has proved to be an effective approach to forest conservation but because it also provides income to the predominantly poor indigenous and non-indigenous communities

Long-fallow shifting cultivation is still practiced in the interior of Sabah, Malaysia. Photo: Christian Erni.

living in or near forests. In some countries, like the Philippines, CBFM was adopted as part of the national forest conservation strategy and, throughout Asia, there is a clear trend toward state forestry policies that formally recognize the rights, roles and responsibilities of communities in forest management .[10]

CBFM and indigenous peoples' land-use systems are, however, still not recognized for their potential contribution to carbon sequestration and, therefore, climate change mitigation. Forest management in general and CBFM in particular are not part of the Clean Development Mechanism (CDM) under the Kyoto Protocol. Likewise, forest conservation does thus far not qualify for consideration under REDD programs if the respective areas are not under immediate threat of deforestation. This again does not permit the inclusion of indigenous peoples' forest conservation and agroforestry practices.[11] At present, much of the discussion on REDD focuses on the potential negative impact on indigenous and other forest people, since there are good reasons to expect that government-controlled REDD programs will lead to further dispossession of indigenous and other forest communities, and new forms of elite appropriation of benefits (Griffiths 2008, CEESP 2009). Furthermore, the expected banning of shifting cultivation, the use of fire in forest and pasture management and other forms of forest use will have significant costs for local people. It is therefore now widely recognized that the implementation of REDD without the recognition of indigenous peoples' and other local communities' rights, and without consideration for their livelihood security, will only increase poverty, lead to conflict and may ultimately backfire as people are likely to resist and even sabotage such programs (Van Nordwijk 2008: 42).

The UN Declaration on the Rights of Indigenous Peoples clearly states that indigenous peoples have the right to participate in decision-making processes directly relevant to their lands and territories. So far, however, indigenous peoples and their organizations have not been allowed to participate effectively in the discussion on REDD. During the 13th Conference of the Parties of the Framework Convention on Climate Change (FCCC) in Bali, indigenous peoples' delegates repeatedly and vehemently protested their exclusion from the negotiation process. They issued public statements and recommendations on climate change

Permanent cropping of temperate vegetables has replaced shifting cultivation in many areas in the uplands of Northern Thailand. Photo: Christian Erni

mitigation and adaptation, including REDD, expressing the keen interest of indigenous peoples to help find effective, just and sustainable solutions to climate change, but also their concerns about the current REDD policies and global finance mechanisms, which risk violating human rights and further marginalizing forest-dependent peoples (Griffiths 2008:29).

The potential contribution of indigenous peoples' land management systems to REDD and climate change mitigation in general has so far received far too little attention. This despite the fact that in Brazil, for example, it was found that recognizing indigenous peoples' rights over their territories is the most effective way of preventing deforestation (CEESP 2009: 5). Recognizing indigenous peoples' rights to land, territories and resources, and their land-use and management practices in REDD and other climate change mitigation schemes is therefore not only an obligation emanating from the provisions of the UN Declaration on the Rights of Indigenous Peoples but can also substantially contribute to more effective climate change mitigation. As Cotula and Mayers (2009) point out, the recognition of tenure rights should be a "start-point" rather than an "afterthought" in REDD. ❑

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Harvesting swidden rice in Kralah village, a Kreung community in Ratanakiri Province, Cambodia. Photo: Christian Erni.

Notes

1 See e.g. Fox et. al 2009, Padoch et. al. 2007 in general, IWGIA 2007 for Laos, Pulhin et. al. 2005 for the Philippines, Laungalamsri 2005 and Forsyth 1999 for Thailand, Phuc 2008 for Vietnam, or Dove 1985 for Indonesia. Another term commonly used for this form of land use is swidden agriculture. It is derived from the Old English term "swidden", meaning "burnt clearing" (IFAD et.al 2001: 24f).

2 See e.g. Dove 1983, 1985, 1996; Padoch 1985; Forsyth 1999, Laungaramsri 2005, Nielsen et.al. 2006, Forsyth and Walker 2008.

3 See Erni 2008 for a compilation of articles on the use of the concept of indigenous peoples in Asia, and overviews of common designations and state policies in various countries of the region. In recognition of their increasing self-identification as indigenous peoples, I will throughout the article use this term.

4 See e.g. various contributions in Duncan ed. 2004.

5 Padoch et. Al. (2007: 32f), Mertz et. al. (2009: 282).

6 Quantitative data providing proof of this assumption, i.e. documenting the changes in carbon over several cycles of shifting cultivation, is scarce. One of the few detailed long-term studies was done by Lawrence (2005).

7 See e.g. Forest Peoples Programme 2005, Colchester et.al. 2006, Perkumpulan Sawit Watch et.al. 2007 on oil palm plantations.

8 With 34%, a considerable share of Indonesia's palm oil is produced by smallholders (Van Noordwijk et.al. 2008: 34). However, unlike rubber, the production of oil palm poses considerable technical constraints which limit the autonomy of smallholders as independent producers [ ] smallholders tend to be tied, often by debt and by technical constraints, to large palm oil concerns, limiting their ability to negotiate fair prices or manage their lands according to their own inclinations (Colchester et.al. 2006: 39).

9 On biodiversity in different forms of land use see Rarkasem et.al 2009, van Noordwijk et.al 2008 p. 32f.

10 See e.g. Poffenberger 2006, RECOFTC 2007.

11 Generally, the problem with REDD is that it does not provide incentives for maintaining good forest management and low deforestation rates, whether at the country or the project level. It has been pointed out that this may in fact create perverse incentives, i.e. that it may encourage increasing deforestation in order to be able to access REDD compensation payments for lowering deforestation rates (see e.g. Dooley 2008:9, Angelsen 2008: 52) rather than receiving incentives to maintain these low rates using methodology based on historical baselines. Incentives are required to maintain these low rates of deforestation, as there is a real risk of international leakage threatening these forests.

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