Decriminalise agro-forestry!

A primer on shifting cultivation in Myanmar

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ideas into movement

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Summary

Shifting cultivation is a form of agro-forestry in which the cultivation of annual agricultural crops is combined with fallowing long enough for trees to grow before the plot is cultivated again. It is popular and widespread around the world. In Myanmar millions of rural working people have practiced shifting cultivation as their major livelihood activity for generations. Today, it continues to provide food security for families and communities in many parts of the country and is valued as a central part of their cultural heritage.

However, since the 19th century some governments have come to view shifting cultivation as inferior to their preferred form of farming – sedentary cultivation. From this perspective, shifting cultivation is portrayed as a 'bad' thing and a problem to be eradicated. Shifting cultivation is often framed as a major cause of deforestation and shifting cultivator's fallow lands are frequently labelled as 'degraded forest' or even 'vacant land' and appropriated by the state, sometimes then handed on to others to use. These actions have led to poverty, grievance and conflicts across many shifting cultivation areas.

Why is shifting cultivation so controversial, and why do different stake-holders hold such divergent views - for some a valuable and honourable tradition but for others virtually a criminal activity?

In this primer we explore the issues and consider how the Myanmar government might better represent the legitimate aspirations of the millions of shifting cultivators, particularly in the context of the peace process and political devolution. We reach five main conclusions and recommendations:

1 There remains much misunderstanding over the basic principles of shifting cultivation, particularly at Union government level.

   - *More information is needed to clarify the importance and contributions of shifting cultivation. Policy makers and bureaucrats working in relation to shifting cultivation systems (particularly in forestry, agriculture, land governance and ethnic affairs) must be educated to better understand these systems in order to reduce confusion, prejudice and resultant injustice.*

2 Political processes are typically hostile to shifting cultivators, and don't adequately reflect the democratic aspirations of small scale food producers who practice shifting cultivation.

 As Myanmar democratises, shifting cultivators' livelihoods must be recognised in law as legitimate, dignified and valued. Their interests should be accounted for in policies and laws. Policies and laws with a negative framing of shifting cultivation must be revised.

3 Although the policy situation could improve positive outcomes are not yet guaranteed. International scientific opinion has shifted a great deal in recent decades towards a balanced appreciation of shifting cultivation (e.g. Dressler et al. 2016), and domestically, the National Land Use Policy 2016 and current draft Agriculture Policy both give positive albeit general recognition. However, land and agriculture policy as well as climate and environmental policy and law-making processes are still unfolding under diverse influences.

 Policies to protect the specific vulnerabilities of shifting cultivation must be further elaborated and enshrined in law and bureaucratic practice. Shifting cultivating communities' lands (both currently under cultivation and currently fallow) must be recognised, customary systems empowered, and tenure security assured, especially for areas during the fallowing phase when they may not be occupied by crops.

4 Beyond legal recognition, ongoing support from government is needed, in order to advocate for shifting cultivators' interests and to help them achieve a bright future.

 Some form of agroforestry division or department is needed at state and national government level, to protect the livelihood security of rural working people who rely on shifting cultivation and to promote their development. The new Ministry of Ethnic Affairs may be the most suitable location as it has a specific mandate to protect ethnic communities' interests.

5 Shifting cultivators themselves must be well organized and well informed in order to be able to demand recognition and respect for their rights.

- *Local organisations, networks and federations are needed to develop, articulate and advocate for specific policy changes relevant to shifting cultivators' interests.*

1 What is Shifting Cultivation?

There is much disagreement over shifting cultivation today, partly apparently based on inherited negative bias and associations rather than technical understanding. At the outset we need to clarify the practice, and the ways in which it is distinct from either forestry or sedentary agriculture.

1.1 The common origins of cultivation

Almost all people on the planet rely for a large part of their nutrition on cultivation, the growing of selectively bred plants on prepared land, and the principles have changed little until very recently:

- To initially prepare a plot of land for cropping the pre-existing vegetation must be cleared, otherwise it would compete for sunlight, root space and soil nutrients. So the undergrowth and shrubs are slashed back, and larger branches and trees may be lopped or cleared as necessary.

- The resultant debris ('slash') can be physically removed, but the easiest way to deal with it is to allow it to dry and then to burn it off. As well as requiring little labour beyond fire control, burning has several beneficial effects: it makes several valuable nutrients (particularly potassium) available for the coming crops to use. It also improves the soil texture, eradicates potentially harmful organisms in the soil, and adjusts the microbial balance in the soil to be more favourable for cultivation.

- The plot may be ploughed, to break up the soil before sowing the seed, although it is often not necessary if the soil is relatively light, having good levels of organic matter, and if the soil ecology is healthy.

- A range of crops may then be cultivated. The most popular staple food crops around the world are carbohydrate-providing annual grasses (such as barley, wheat, rice, millet/*teff*, maize), although to a lesser extent, tubers (e.g. potatoes) and perennials (e.g. banana/plantains) are also cultivated as staples, depending on conditions. Farmers may grow a

range of different crops, both simultaneously (e.g. intercropping) and/or in sequence, the most nutrient demanding crops are typically grown first in a sequence (e.g. cereals) and then other less nutrient demanding crops (e.g. legumes and vegetables) in following years, as soil nutrient availability declines. Each location is unique, and farmers fine-tune location-specific expert technical knowledge through continuous experimentation, testing, practice and exchange, and pass it on across generations.

- After a few years of cropping, available soil nutrients, and therefore yields inevitably decline and additionally weeds tend to become more stubborn. If other land is available, then it is the most efficient use of labour to abandon the plot and move on, to clear another. And as the yield eventually declines there they would move on again.

- After several years, the farmer may have cultivated and abandoned several plots. The effort of clearing new areas is greater than clearing secondary regrowth, and so they would at some point return to cultivate on the initial plot, where after several years soil fertility will have recovered.

> ***"Shifting cultivation is our cultural tradition, and it is sustainable. Shifting cultivation is the mother of agriculture. Shifting cultivation is not the cause of deforestation"***
> *(Lahu man, Workshop participant, 14 August 2017, Kengtung).*

This has been the original cultivation system everywhere in the world. It is how cultivation began and how it continues in areas that are most suited to it. It has proved extremely popular as a technical innovation, which reliably provides large quantities of crops. It is important to be clear: for most of its long history there has been nothing controversial about shifting cultivation. These days it has become labelled as 'shifting cultivation', or swidden, or a range of other local names, to distinguish it from cultivation where fallowing has been reduced, even discontinued, through intensification.

1.2 Nutrient cycling, fallowing intensity and synthetic nitrogen

Why did lowland cultivators modify this original cultivation practice? To answer this question we must examine 'nutrient cycling', the fundamental challenge in agriculture: how farmers maintain soil productivity whilst cropping. All soils are in a dynamic balance between soil formation and soil erosion processes:

- *Soil formation* involves a range of processes, including for instance rock weathering and microbial 'humification', that convert soil ingredients (rock and organic carbon-based plant materials) into fertile topsoil.
- *Soil erosion* involves processes, like leaching and wind erosion, that deteriorate topsoil.

Cropping affects these processes, typically slowing soil formation by disrupting the soil biodiversity and soil, and accelerating erosion, removing significant quantities of nutrients from the soil in the crop and exposing the topsoil to erosion by clearing the protective layer of vegetation.

Farmers try to remedy the negative impacts of cultivation on the soil in three main ways:

1 Firstly, through fallowing practices discussed above, leaving the field to recover, to reduce weathering and promote soil formation;
2 Secondly, by trying to promote nutrient capture in the cultivation system itself – for instance cultivating specific crops like clover, legumes, nitrogen fixing trees and algae in wetland cultivation systems;
3 And thirdly by augmenting nutrients lost and the soil structure by applying available materials, particularly composted organic matter and farmyard manure from livestock.

Historically, virtually all farmers left fields fallow and in almost every farming system we observe a spectrum of fallowing intensity – with some proportion of cultivated lands left fallow to restore their productivity. As pressures to intensify production gradually increased over time and with limited land to shift to, so fallow periods became shorter, and alternate sources of nutrients had to be found as a substitute.

Wet rice is unusual because it is a wetland species, and so its cultivation simulates its wild habitat, where waterborne algae fix substantial amounts of nitrogen from the atmosphere. Thus, in most wet rice systems there is less need for fallowing or augmenting nutrients to achieve a basic crop level.

What has fundamentally changed this basic nutrient management balance is the industrial production of the main macro-nutrients for plant growth: nitrogen (N), phosphorous (P) and potassium (K). Once nitrogen began to be synthetically produced and marketed on a large scale, after the Second World War, fallowing was no longer essential to maintain yields. For this main reason, it has been possible to reduce fallowing in many plains cropping systems.

There are however several serious side effects of relying on external inputs rather than the soil itself to provide nutrients for the crop. One is a decline in the health of the soil, the plants and the nutritional quality of the food. The soil ecology is severely damaged by an external input-based regime, and soil formation processes decline (Ingham 2014). Other soil micro-nutrients are not replaced along with the macro-nutrient external inputs, and so their availability declines, and the food produced becomes increasingly nutritionally deficient.

Another problem is that the industrial production of ammonium nitrate demands large amounts of energy (an estimated 1.2% of global energy use), thereby contributing to greenhouse gas emissions and climate change. Further, synthetic N itself is highly volatile, and for every tonne of synthetic nitrogen fertiliser applied, between 1 - 5% goes to the atmosphere as N2O (Shcherbak et al. 2014), again contributing a significant proportion of greenhouse emissions

> ***Any nitrogen [applied as fertilizer] not taken up by plants is met by soil microbes that turn the fertilizer into nitrous oxide, an ozone-depleting gas that is also 300 times more potent than carbon dioxide*** *(Harball 2014).*

For hill areas, soil fragility and erosion vulnerability mean that fallowing remains the fundamental strategy to maintain crop yields. Shifting cultivation involving long fallows is particularly popular in the upland humid tropics, where the combination of higher ambient temperature, good soil materials and good humidity and rainfall ensure relatively rapid restoration of fertility.

1.3 On-farm trees and agro-forestry

- Trees play several crucial roles in shifting cultivation:
- Trees reduce soil erosion on slopes, stabilise soil, and promote deeper soil and deeper water infiltration and retention.
- Trees produce organic matter, especially via leaves, which can rapidly enhance the soil condition and water retention of the soil.
- Some tree species (e.g. elder - *Alnus sp.*) rapidly fix nitrogen in the soil, and so accelerate fallowing.
- Trees regulate the local micro-climate, reducing local temperatures and improving rainfall and precipitation recycling (Ellison et al. 2017).
- Trees provide habitat for biological diversity.
- Trees can provide produce such as timber, fuelwood and foods.

For these reasons, during the cropping phase trees are often only pruned or coppiced rather than being cleared. This means that after cropping the tree can regenerate and provide the numerous benefits more rapidly than if it must grow from seed. Because of the presence of trees, shifting cultivation is considered a form of 'agro-forestry':

> Agro-forestry is ***"a collective name for land use systems and technologies where woody perennials are deliberately used on the same management units as agricultural crops and / or animals, in some form of spatial arrangement or temporal sequence. ... there are both ecological and economic interactions between the different components"*** *(Nair 1993).*

Agroforestry can involve both mixing trees and annual crops (like alley cropping) at the same time, as well as sequencing annual crops and then trees over time.

It is possible to intensify shifting cultivation in various ways if needed, and cultivators have done so in many areas, for example through introducing specific tree species during the fallowing period which accelerate nitrogen fixation such as *alnus* species mentioned above, or to promote trees which can provide a valuable crop, such as teak. In principle it is not necessary to stop long fallows cultivation altogether (sedentarisation) in order to intensify production.

1.4 Shifting Cultivation is integral to indigenous culture

Shifting cultivation often involves the exercise of sophisticated indigenous technical knowledge. Cultivators can use as many as forty or more distinct crops, each selectively bred for preferred characteristics such as taste, nutrition and medicinal benefit, yield resilience and so on. Each cultivator may have a range of plot management methods, which can optimise the productivity and the fallowing processes. These may include for instance laying logs and branches transverse to the slope to retain soil, 'no-till' sowing, and *bio-charing* the slash (covering the slash with mud to bake it like charcoal with restricted oxygen – providing a very valuable 'bio-char' material to improve soil condition).

However, shifting cultivation is not just a technical practice.

It is embedded in a social system: when a farmer leaves a plot to fallow they need the assurance that it will be possible to return to it in future years. This requires a local tenure system with authority. In many ethnic cultures, the material cultural practice of shifting cultivation is intimately interrelated with the social order with authority and decision-making powers over resource access and allocation as well as with festivals, rituals and the sense of sacred. There are often reciprocal collective labour activities around the cultivation calendar such as collective clearing, fire management, collective harvesting and so on.

> ***"We mostly solve our land problems the traditional way. The village headman and religious leaders help to mediate. Most of the problems are resolved at the village and township level. People have no legal documents, only have witnesses, so they want to solve these problems at the local level"***
> *(Lahu man, Workshop participant, 13 August 2016, Kengtung).*

Shifting cultivation, therefore, is not simply an individual activity but a community supported activity that takes place in the context of customary tenures and customary authority. Yet in Myanmar, customary tenures have not been recognised or supported by the Government. There seems ironically to have been increasing hostility to customary tenure systems *after* Independence, particularly during the socialist and dictatorship, and matters haven't yet changed significantly with the NLD-led government.

1.5 In review – why shifting cultivation, and why not?

> ***"Shifting cultivation is small scale for the Lahu community, only for survival. Ancestral lands are part of our culture, we want it to be recognized"***
> *(Lahu man, Workshop participant, 14 August 2016, Kengtung).*

We have seen how shifting cultivation involves leaving areas fallow for the nutrients to restore and the fallowing is often long enough for secondary regrowth forests to emerge. It is the original form of cultivation. Whereas in plains areas cultivation has often intensified due to population and taxation pressure, reducing fallowing and relying on external inputs, hill areas are bio-physically fragile and vulnerable to soil erosion, and not suited to such modifications. Shifting cultivation is now found mainly in the humid subtropical hill areas.

But shifting cultivation can be controversial to different observers, for different and sometimes contradictory reasons:

- *For sedentary cultivators and agriculture department officers*, what seems to be controversial about shifting cultivation is long term fallowing, especially with trees, which seems so much less intensive than sedentary cultivation, where synthetic fertilisers are often used with little concern for the side effects.

- For foresters on the other hand what seems controversial is not so much the trees in fallowing but the clearance of the trees for cultivation. They interpret this as 'degrading' forests, especially when fire is used.
- *For some involved in efforts to reduce greenhouse gas emissions,* shifting cultivation is accused of contributing unnecessarily to carbon dioxide emissions.
- *For outside businesses,* shifting cultivators' presence may be seen as an impediment to their appropriation of 'wasteland'.
- *For the shifting cultivators themselves* the system's key appeal is the integration of both trees and crops in a rotational production system that allows them to make the best use of their hereditary land and resources.

2 Shifting cultivation provides a range of benefits and fits with international policies

Shifting cultivation has endured for thousands of years, because it is effective, efficient, equitable and sustainable.

Effectiveness: The primary purpose of cultivation is to reliably produce nutritious food, and indeed the method generally achieves this under certain conditions, providing excellent well-being for families and communities where there are equitable social structures and tenure security.

Human nutrition globally has declined through the transition from a hunting and gathering based diet to one involving a large proportion of calories from cultivated carbohydrates. There is a growing recognition of the problem of malnutrition caused by the consumption of 'empty calories' of a high carbohydrate diet, a particularly acute problem when those calories are produced in intensive agriculture where there are far less micronutrients in the crop. As humans have increased the proportion of 'empty calories' from carbohydrates in the diet physiology and physical development has suffered (Mummert et al. 2011). These problems are far less apparent in shifting cultivation societies since the diet from a shifting cultivation system is likely to include high levels of macro and micronutrients in the food.

Shifting cultivation landscapes are often rich in biodiversity including wild animals which may be hunted for dietary protein as well as recreation. Diets from shifting cultivation landscapes typically involve diverse cultivated and wild harvested fruits vegetables, herbs and bushmeat. Furthermore, there appear to be far less dietary related disorders in these areas, such as diabetes, which is particularly prevalent in a milled rice-based 'plains' diet due to the high glycaemic index.

Efficiency: In upland and forest margin areas where labour availability is the main production constraint in agriculture, shifting cultivation provides the best returns to labour.

Equity: In the context of customary land tenure, shifting cultivation systems offer the potential for a more equitable distribution (and redistribution) of land, avoiding the extremes of wealth inequality often found in plains cultivation. There is also the implicit social justice of reciprocal labour exchange ensuring that those households with less labour automatically receive support. Poverty becomes a problem when shifting cultivation practices are impeded, by both land grabbing and by attempts to eradicate the practice, undermining food security. The freedom to practice shifting cultivation, as an aspect of the material culture of indigenous communities, is implicitly protected under the UN Declaration of Human Rights (UDHR) and the UN Declaration of the Rights of Indigenous Peoples (UNDRIP).

UN Convention of Human Rights

Article 17: (1) Everyone has the right to own property alone as well as in association with others. (2) No one shall be arbitrarily deprived of his property.
*Article 25:(*1) Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services...

UN Declaration on the Rights of Indigenous Peoples
Convinced that control by indigenous peoples over developments affecting them and their lands, territories and resources will enable them to maintain and strengthen their institutions, cultures and traditions, and to promote

their development in accordance with their aspirations and needs,
Recognizing that respect for indigenous knowledge, cultures and traditional practices contributes to sustainable and equitable development and proper management of the environment,
Emphasizing the contribution of the demilitarization of the lands and territories of indigenous peoples to peace, economic and social progress and development, understanding and friendly relations among nations and peoples of the world,
Article 10: Indigenous peoples shall not be forcibly removed from their lands or territories. No relocation shall take place without the free, prior and informed consent of the indigenous peoples concerned and after agreement on just and fair compensation and, where possible, with the option of return.
Article 11: 1. Indigenous peoples have the right to practise and revitalize their cultural traditions and customs. This includes the right to maintain, protect and develop the past, present and future manifestations of their cultures, such as archaeological and historical sites, artefacts, designs, ceremonies, technologies and visual and performing arts and literature
Article 25: Indigenous peoples have the right to maintain and strengthen their distinctive spiritual relationship with their traditionally owned or otherwise occupied and used lands, territories, waters and coastal seas and other resources and to uphold their responsibilities to future generations in this regard.
Article 26:

1. Indigenous peoples have the right to the lands, territories and resources which they have traditionally owned, occupied or otherwise used or acquired.
2. Indigenous peoples have the right to own, use, develop and control the lands, territories and resources that they possess by reason of traditional ownership or other traditional occupation or use, as well as those which they have otherwise acquired.
3. States shall give legal recognition and protection to these lands, territories and resources. Such recognition shall be conducted with due respect to the customs, traditions and land tenure systems of the indigenous peoples concerned

Sustainability and low impact: Industrial farming uses an increasing range of toxic chemicals including pesticides, herbicides fungicides, and synthetic fertilisers. These are, to varying levels, poisonous to the farmer, to the environment, and often to the end consumer. They are also expensive. In shifting cultivation systems such chemicals are not typically used.

There is increasing demand for food produced without synthetic fertilisers or pesticides - these foods command a higher price premium as they are recognised as being higher quality, more nutritious and having less food safety risk. Moreover, there is also a price premium for so-called heirloom crops in the West – food crops produced from traditional seed varieties which may not grow as fast or yield is high but have better taste, nutrition and health characteristics. Shifting cultivation foods are normally 'default' organic and use heirloom seeds.

Agro-diversity and food security: Shifting cultivation systems are resilient, partly through cultivating a range of crops – which diversifies risk of food insecurity, and partly as the intensity can be adjusted to prevailing conditions. Shifting cultivation maintains a diverse range of different cultivation practices – this maintains human technical heritage, seed heritage, and therefore improves resilience of human food security in general. Shifting cultivation contributes to wider food security, elimination of hunger and realization of right to food at various scales (beyond a single household or village). Many have assumed that only through technical innovations of continuously intensifying conventional farming can we 'feed the world', but in fact we can see in shifting cultivation that relatively low intensity and diverse farming systems also have an important role to play (IAASTD 2009).

Landscape management: A landscape approach means finding places across the landscape for different land uses. This is increasingly recommended by international bodies concerned that as sedentary agriculture and commercial plantations have spread, there are less and less spaces for natural ecosystems that can produce the ecosystem services (particularly biodiversity conservation, hydrological and climatic) on which human societies depend. The forms of customary land governance enabling shifting cultivation typically involve multiple land uses, and shifting cultivation itself involves landscape level governance as it balances cultivation and fallowing.

> ***"There are no land grants for shifting cultivation, only for paddy lands. Our ancestral lands have passed from generation to generation, and the village recognize this"*** *(Lahu man, Workshop participant, 14 August 2016, Kengtung).*

Carbon positive: During the fallow period carbon is sequestered through photosynthesis. In the burn phase, much of this carbon is released back to the atmosphere -- but not all. Some of the sequestered carbon has entered soil or washed down in the form of leaves or roots etc. So an overall 'carbon budget' for a stable shifting cultivation system is likely to be what is called 'net positive' over time – sequestering more than it releases.

On the other hand, modern industrial agriculture is highly carbon negative, one of the major contributors to climate change, in four main ways: firstly, loss of soil carbon through expansion and intensification of soil management; secondly, emissions from the manufacture, transport and use of highly volatile synthetic nitrogen and other nutrients; thirdly, through the use of petrochemicals in the various aspects of mechanisation in modern farming (e.g., for ploughing, harvesting, processing, transportation); and fourthly, high methane emissions from wet padi fields and also intensive livestock. A recent Chinese study (Xu et al 2013) found identified the carbon footprint of a ton of Chinese rice to be between 1.3 and 2.5 tonnes of CO2 or equivalent.

Overall: Shifting cultivation can lead to better outcomes than settled cultivation in specific agro-ecological conditions – superior nutrition, food security and right to food, better wellbeing and social cohesion and equity.

3 There is a diverse heritage of SC practices in Myanmar

Myanmar has many characteristics that make it well suited to shifting cultivation systems, including high ambient temperatures, reliable rainfall, and suitable soils. For this reason, shifting cultivation has flourished for generations, so that now there is a diverse heritage across ethnic upland areas, including Chin, Kachin, Shan, Karen and Karenni areas. So far there is

no comprehensive study, so we must rely on various publications to piece together a picture. Here is an illustrative case from Chin state:

Shifting cultivation in Myanmar: Case Studies from Bago and Chin (POINT 2016)

Case study of two villages in Kanpetlet Township, Chin
In these two villages almost all the people except some teachers and pastors are practicing shifting cultivation. Lack of proper transportation, health services and education are big challenges and difficulties for people in this area. There are large areas of mountains with closed evergreen forest that the villagers conserved customarily in both villages. There are many kinds of wild animals such as deer, bear, wild pig rabbit, foxes, monkey, *serow* and so on. Also, there are many different kinds of birds in these areas.

Almost all the villagers in both Chin research areas depend on shifting cultivation and irrigated land during rainy season for subsistence, animal husbandry, collecting forest products and labour migration to earn cash. In 1992, government forestry department officers told the villagers to stop shifting cultivation. However, as it is the traditional way of life on which they depend for their livelihoods and there is no alternative, villagers continued practicing it.

[The] fallow period is about 8 to 9 years. The fallow period is still stable up to this day. The plots are utilised for agriculture for only one year and then they shift to another plot. Shifting cultivators leave forests on mountain tops and around paths to farms for shade and to protect against the danger of strong wind and erosion. In these areas the forest cover is denser than the other places.

"Shifting cultivation is still the only way to ensure food security in our community"

Shifting cultivation plots belong to the villagers according to the *damaucha* principle – meaning any villager would ideally hold residents that comprise the descendants of the first founders who "wielded the machete" *(damaucha)* to clear the land and establish benevolent relations with the spirit of the land. However, all the plots are privately owned; the villagers share the plots in the village meeting and they are managing the land communally. Decision-making in allocation of land is led by the village administration elected in every three years. Allocating of the plots usually takes one or two days.

4 Clarifying some of the myths about shifting cultivation

There are several myths about shifting cultivation which repeatedly arise and each of which are mistaken. Here we review them in order to try to separate bias from science.

The myth: 'Shifting cultivation degrades forest'
The truth of the matter: Established shifting cultivation does not degrade forests, but rather sustains agro-forestry landscapes. Newly established shifting cultivation degrades forests in a similar way that any land use change – like logging, tree plantations or newly established padi cultivation – degrades forests. But there is very little expansion of 'new' shifting cultivation, and most shifting cultivation is a stable system, is lower intensity and therefore is lower impact than padi cultivation.

The argument that shifting cultivation degrades forests is often deployed by Forest Departments to justify labelling shifting cultivation land as 'degraded forests'. But shifting cultivation areas are not forests, and they are not agricultural lands either. Rather, they are a distinct agro-forestry land use system which lies somewhere between the two – creating a long fallow cultivation landscape. Shifting cultivation landscapes can have trees at

times and have no trees but annual crops at other times. Shifting cultivation landscapes are in some ways similar to tree plantations, both of which have a regeneration period after felling, although few foresters criticise their own tree plantations (or felling) for degrading forests.

The superiority of shifting cultivation to tree plantation is that it provides a few seasons' food crops before the tree canopy develops. Many shifting cultivators plant trees as they abandon the cultivation cycle and if it were possible to add up the number of trees there is a good chance we would find they plant more in aggregate that the Forest Department, and undoubtedly with better survival rates.

It is true that when shifting cultivation is first established in an area the land use will be changed probably from forest to shifting cultivation. But this is true also for logging and tree plantations, which also reduce the density of natural forests. It is also similar to when sedentary agriculture is extended to the new areas. So it is biased to single out only shifting cultivation.

Shifting cultivation areas tend to rely on stable rotation. Evidence suggests that globally shifting cultivation areas are actually shrinking (Heinimann et al 2017). Therefore, forests are not being converted to shifting cultivation overall. Rather, it's the other way around – shifting cultivation areas are either being abandoned or being appropriated to more ecologically destructive uses such as commercial agriculture plantations.

For further reading see:

- Kleinman, P.J.A., Pimentel, D., and Bryant, R.B. 1995. 'The ecological sustainability of slash-and-burn agriculture' in Agriculture, Ecosystems & Environment, 52(2–3): 235-249.
- Heinimann, A. et al. 2017. 'A Global View of Shifting Cultivation: Recent, Current, and Future Extent' in PLoS ONE 12(9): e0184479. Accessed at https://doi.org/10.1371/journal.pone.0184479.

The myth: Shifting cultivation causes poverty
The truth of the matter: Shifting cultivation can provide a good living where there is enough land and tenure security is assured.

We see many communities enjoying good wellbeing and food security from shifting cultivation. Productivity per hectare may be low in these systems but returns to labour effort is the more relevant measure for evaluating shifting cultivation, and it can be very good under supportive conditions.
It is true that we find poverty in some shifting cultivation areas (e.g. Chin). Shifting cultivation may sometimes also be a cultivation practice 'of last resort' if a household lacks alternative livelihood opportunities or plains land. But poverty is more likely to be an outcome of other factors rather than intrinsic to the shifting cultivation system, particularly policies limiting land access. Poverty in general remains largely a rural phenomenon and is not specific to shifting cultivation areas. The worst extremes of poverty in the world are in the highest padi production areas of the Ganges basin. Poverty is an outcome of many factors, and a particularly important one is government policy; hostile and biased policies emanating from national capitals can cause poverty.

For further reading see:

- Cairns, M., ed. 2015. Shifting Cultivation and Environmental Change. London: Earthscan.

The myth: Shifting cultivation contributes to climate change
The truth of the matter: Established shifting cultivation systems are carbon positive, unlike intensive wet padi farming, which is a major source of dangerous methane and nitrous oxide greenhouse gas emissions. Climate change scientists actually recommend intensive systems should adopt agroforestry practices to help mitigate climate change, not the reverse. The international agencies who erroneously criticize shifting cultivation on the grounds of GHG emissions are funded mainly by Norwegian petrochemical industry profits, so appear not only mistaken but somewhat hypocritical.

This is a common narrative deployed by those alarmed at the spectacle of burning in shifting cultivation systems and looking for easy targets. A recent REDD+ draft strategy (UNREDD 2018 draft) sought to frame shifting cultivation as a culprit for climate change, erroneously assuming with no supporting evidence whatsoever that the extent is increasing. The main

funder of UNREDD incidentally is NORAD – the Norwegian Development agency, whose budget is mainly generated from taxation on petrochemical revenues. So the Norwegian government is seeking emissions reductions in relatively income-poor tropical forest counties, rather than cutting its own petrochemical production, which is by far the main cause of climate change. This seems highly hypocritical.

A basic carbon budget from research indicates that shifting cultivation is generally slightly carbon positive. During the fallowing period carbon is sequestered, most of which stays on the site although some may be absorbed into the soil and washed downstream (e.g. leaves). At the burning period, much of that carbon is released back into the atmosphere although some is not. So a kilo of shifting cultivation rice from a stable system is likely to actually have a slightly positive carbon footprint.

Contrast this with the negative greenhouse gas budget of plains agriculture, which is a major source of atmospheric methane and nitrous oxide. Scientists analysing emissions reduction from agriculture actually recommend agroforestry (on farm trees) as a pathway for intensive agriculture to reduce its impact.

For further reading see:

- Wollenberg, E., Richards, M., Smith, P., Havlík, P., Obersteiner, M., Tubiello, F.N., and Herold, M. 2016. 'Reducing Emissions from Agriculture to Meet the 2 °C Target' in Global Change Biology, 2(12): 3859–64. Accessed at https://doi.org/10.1111/gcb.13340
- AASTD 2009. 'Agriculture at a crossroads: Global report'. Washington: Island Press. Accessed at: http://www.fao.org/fileadmin/templates/est/Investment/Agriculture_at_a_Crossroads_Global_Report_IAASTD.pdf
- http://www.redd-monitor.org/

The myth: Shifting cultivation causes air pollution
The truth of the matter: Atmospheric particulates are produced in the burning phase in swidden, but are produced in greater quantities and with worse effect from large scale agricultural land conversion, padi stubble burning, forest plantation, coal and petrochemical burning.

It is indeed true that shifting cultivation releases particulates into the atmosphere through burning and that these reduce air quality to some extent.

However, we need to keep things in perspective.

The Myanmar Government Forest Department itself also practices seasonal burning of slash as a preparation for plantation. Particulates are also released into the atmosphere from petrochemical burning particularly coal-fired power stations, diesel for transportation and heavy oil from cargo ships -- and the release of petrochemical particulates is likely to be several orders of magnitude higher than the particulates released in shifting cultivation. Also, urban concentrations of particulate matter in Asia are far higher than rural, which reflects the fact that urban generation of particulates (from transport and industry) is far higher than rural. Furthermore, the burning off by the Malaysian and Indonesian commercial oligarchs of extremely carbon dense forest areas is undoubtedly the greatest source of particulates by many orders of magnitude, blanketing the entire South-East Asia region in a smog so dense as to render the contribution from shifting cultivation virtually irrelevant.

The myth: Shifting cultivation is inefficient and uses too much land
The truth of the matter: Shifting cultivation land use is multi-functional so cannot logically be compared to intensive single function land uses like sedentary agriculture. But it can be efficient in terms of returns to both labour and land, across its range of different functions. Furthermore, rightful land owners -- here ethnic communities -- have the right to use their lands for the functions and at the level of intensity and multi-functionality that they wish.

Shifting cultivation systems achieve an effective multi-functional balance at landscape level between food production and other 'ecosystem service' benefits. The practice also serves several wider cultural, social, ecological and perhaps even economic functions that we all do benefit from.

However, the benefits of shifting cultivation tend to be invisible and therefore taken for granted.

Land use is a complex political issue as there are so many different objectives which planners must balance. 'Too much' and 'inefficient' are measures that are in the eye of the beholder – and in the real world it is too often those 'beholders' who are biased against shifting cultivation who make policy. A narrow segment of society determining what is a proper land use is not democratic; Myanmar's new president has committed to democratic decentralisation, indicating a top-level commitment to self-determination.

5 Shifting cultivation in a changing world - limitations and threats

Whilst there are numerous merits to shifting cultivation, there are of course also some limitations. One concern is the risk of 'elite capture' – the abuse of the local customary authority structure within customary land governance. This has sometimes been observed, for instance in Chin. Yet the risk of abuse is on a much smaller scale at a community level, as compared to a centralised national government where the risk of unconstitutional dictatorship has already occurred with disastrous consequences. Further, there is always the opportunity for internal negotiation and for negotiation with other communities.

Still, problems like gender inequality in land access can be a cause of grievance. There is also a challenge with how to ensure sufficient flexibility in the system to accommodate the increasing social mobility and economic individualisation. However, probably bigger problems are external threats to the shifting cultivation systems. These systems rely on a relatively low population density and large areas. The world has changed a lot in recent decades and there are more pressures as there are more demands for land access. Furthermore, in Myanmar the more powerful centralised government has been seeking to assert jurisdiction across ethnic areas by force, so shifting cultivation systems rely for their sustainability on protecting the tenure of the fallows areas. But with outside influence, this can be undermined and the fallowing areas may be re-appropriated.

6 The hostile policy bias against agroforestry

Shifting cultivation has been seen negatively by central governments in many countries of the world, and shifting cultivators have been unjustly characterised as destructive, 'pyromaniacs', and worse, in some cases, even 'subhuman'.

6.1 Hostile policies

We can find many cases in Myanmar where policies profess a hostility to shifting cultivation:

> ***"discourage shifting cultivation practices which are causing extensive damage to the forests ..."***
> *(Myanmar Forest Policy 1995)*

> ***" ...eradicate shifting cultivation"*** *(National League for Democracy, Election Manifesto 2015)*

Policy pronouncements have been backed by hostile laws and administrative mechanisms, and this partly suggests that the hostility is rooted in a desire to capture and centralize state control – physical and decision making – over the land and forest resources currently being used by others and under the control of other non-state authorities and regulatory systems.

> ***"Lahu and other people depend on the forest area. We want to complain that our fallow land taken and confiscated. We also lose our land when the government declared our land forest conservation area"*** *(Lahu man, Workshop participant, 13 August 2017, Kengtung).*

There are three main land use categories at national level, beyond municipal areas: 'farmland' (sedentary cultivation), 'forest land' (under the jurisdiction of the state), and the anachronistic intermediate category of 'virgin, fallow and vacant' land.

The Farmland Law 2012: Sought to promote settled agriculture and maximise food production. However, it has not protected shifting cultivation, as statutory tenure is rarely accorded in shifting cultivation areas. Statutory tenure is not aligned with customary practices like fallowing and doesn't recognise customary authority. Moreover, corruption, bribe seeking, and malpractice have been reportedly prevalent in Settlement and Land Records Department (SLRD) field offices.

> ***"We have common land, community forest area, shifting cultivation, pastoral lands etc. All without Form 7. It is recognized in our village and by neighbouring villages. We can manage it. It is difficult to apply for Form 7. We live in a conflict area and we do shifting cultivation, which is not recognized by Form 7. To protect all ethnic people we need to think about what we want rather than using Form 7"*** *(Woman, Workshop participant, 26 August 2016, Taunggyi).*

The Forest Law 1902, 1992: Sought to create an official 'forest estate' that would exclude non-rights holders (often called 'encroachers'), in order for the central state and its commercial subcontractors to control timber extraction and the revenue generated.

> ***"There is no legal recognition of customary systems of local ethnic people. They all have their own systems, they manage the forests"*** *(Woman, Workshop participant, 26 August 2016, Taunggyi).*

However, the composition of the forest estate has been a gradual and haphazard process, mainly because much of the remaining forests are in ethnic areas, and the constitutional status of these areas has been unresolved. Reservation of forests in ethnic areas the project is controversial and extremely lengthy, so central jurisdiction has not been asserted, although large areas are now coming under scrutiny by the central state authorities for potential designation as 'protected areas'.

Furthermore, the Forest Department effectively lost control of its forest estate to the military dictatorship, for whom short term revenue (and personal gain) was treated as a higher policy imperative than sustainable management, and consequently virtually all commercially valuable timber has been extracted.

Virgin, Fallow and Vacant Land Law 2012. Sought to assert jurisdiction over the land 'at government disposal' – that is, land that is neither under the forest estate nor having agricultural rights. Moreover, it facilitates the lease of this land to commercial investors in order to increase the productivity. The law has been widely labelled as a 'land grabbers' charter because it has facilitated the asset stripping of ethnic cultivation lands. This has served to further what some have called a 'Cold War' against ethnic society by the military and their commercial partners.

6.2 Causes of hostile policies

Why does do these hostile policies and laws exist? We can identify three fundamental problems:

There has been a social and political control imperative particularly in terms of colonial or dictatorship authority, on the fear that spaces not under central control and jurisdiction may become centres of independence, dissent and resistance. Even settled cultivation involved production controls in terms of directed crops and taxation in kind. Additionally, central state authorities may seek to extend their jurisdiction into areas not yet under their control, on the self-serving justification that what is currently happening in such places is not as good as what would happen if they had control over it. With this kind of logic, colonial rule set the social-political-institutional foundation for the kind of state simplification and political centralization to come, in which shifting cultivation is deemed a problem that needs to be eliminated.

Under the current 'hybrid' political regime, ex-President Htin Kyaw, in his inaugural speech emphasised the top political priority from Myanmar is federal decentralisation. The Pyidaungsu Accord 2017 said as much and so it may be that this is changing.

Secondly, there is an underlying conflict of economic interest when central administrators make judgements about land which could be valuable to them. Negative judgements may be selectively deployed to justify the appropriation of resources from the current owners. Foresters, for instance, may wish to extend their jurisdiction over the forest in order to protect it, manage it and generate revenue. However, their misinterpretation of an agroforestry landscape as a 'degraded forest' benefits them and enables them to generate new revenue streams. But the justification of 'protection' is hardly plausible considering the history of logging to exhaustion that has happened under the dictatorship (Springate-Baginski et al. 2016). This policy and administrative orientation is maintained partly by discursive power with the construction of authoritative narratives that demonize shifting cultivation.

Third, a technical misunderstanding based on the viewers' subjective position. Many lowlanders take an interest in upland livelihood and resource use, but then apply their own lens to make sense of what they see, and thus end up perceiving shifting cultivation as a deviation that is somehow inferior to the wet rice cultivation they are familiar with.

Hostility to shifting cultivation sometimes appears to arise from cultural narrow-mindedness, particularly in the colonial era, when colonial administrators imposed European assumptions on local practices. It may be that these European assumptions originally developed based on the very different European agro-ecological niche have persisted. Those who have a predilection for conformity may see diversity and difference as a problem in itself. Furthermore, there are many specialists in settled agriculture and agronomy, and many specialists in forestry and silvi culture, but few experts in agroforestry and upland cultivation, other than the cultivators themselves. There is also confusion over the use of fire on the part of non-cultivators, who often complain of carbon emissions without recognising that the long fallow period is when more carbon is being sequestered.

US academic Michael Dove has characterised this overall convergence of factors hostile to shifting cultivation as the 'political economy of ignorance' (Dove 1983). However, this heritage of hostile policies may be undergoing change. Internationally, the technical sophistication and effectiveness of

shifting cultivation systems are being recognised, with various studies (Cairns 2017; van Noordwik 2008).

Meanwhile, policy in Myanmar is also evolving.

6.3 Signs of change

The National Land Use Policy issued in January 2016, unfortunately, repeats the fallacious confusion from the colonial era between 'agricultural land' and 'fallow land' -- as if they are two different land uses, rather than sequential phases of the same cultivation system. However, the Policy does go to some lengths to recognise customary systems, which necessarily includes shifting cultivation practices that are intrinsic to them, in part Viii 'Land use rights of the Ethnic Nationalities', including the unambiguous statement that**:**

> *'Customary land use tenure systems shall be recognised in the [forthcoming] National Land law' [NLUP p.29, article 64]*

The Draft Agricultural Sector Policy of MOALI October 2016 indicates that its leading objectives include to 'safeguard the right of farmers' (p4) and subsequently states that:

> *'Arrangements will be made available for farmers' freedom of choice to undertake any farming activities in accordance with laws.'*

Although shifting cultivation and agroforestry are not specifically mentioned in either case, one might anticipate these are encompassed by such commitments.

We also see a growing movement on the part of the cultivators and local civil society organizations in Myanmar – and elsewhere in the world -- to represent their systems and campaign for them. The Shillong Declaration is an example of such efforts.

The Shillong Declaration on Shifting Cultivation in the Eastern Himalayas

Responding to the suggestion of the Hon'ble Union Minister of the Government of India on Tribal Affairs and Development of the North East Region, Mr P. R. Kyndiah, to propose a Shillong Declaration,

Recognising that Shifting Cultivation is key to production systems, both agriculture and forestry, for providing livelihoods to many ethnic and tribal groups in the tropical and subtropical highlands of Asia and Africa as well as Latin America,

Recognising that Shifting Cultivation is one of the most complex and multifaceted forms of traditional agroforestry practice in the world reflecting a robust traditional ecological knowledge,

Realising that Shifting Cultivation evolved as a traditional practice and is an institutionalized resources management mechanism at a species, ecosystem and landscape level ensuring ecological security and food security and thus providing a social safety net,

Being conscious of the diverse traditional institutions and tenurial systems pertaining to Shifting Cultivation in the eastern Himalayan region comprising Bangladesh, Bhutan, China, India, Myanmar, and Nepal,

Understanding that the institutional mechanisms ingrained in traditional Shifting Cultivation systems can ensure access to productive resources for every member of the community including landless people and the most marginalised groups,

Recognising that Shifting Cultivation is a way of life for a large number of indigenous, tribal, and other poor and marginalised upland communities,

Recognising that traditional Shifting Cultivation systems have been stressed by external and internal forces,

Having knowledge on existing policies on Shifting Cultivation in the countries of the Eastern Himalayas.

We, the participants from the eastern Himalayan countries, representing government agencies, farmers, international bodies, non-government organisations, academia, science and research institutions, local institutions, international donors and development assistance agencies, the private sector, and other professionals, concerned about Shifting Cultivation and shifting cultivators, regionally and worldwide, assembled in Shillong in Meghalaya, India from 6 to 8 October 2004 declare as hereunder:

a) That Shifting Cultivation must be recognised as an agricultural and an adaptive forest management practice which is based on scientific and sound ecological principles.

b) That it is imperative to provide an enabling environment in order to address the urgent livelihood and ecological concerns arising out of rapid transformations driven by development and other externalities including market forces.

c) That it is imperative to empower shifting cultivators as practitioners of rotational agroforestry to become active participants in decision making and policy processes that impact them most.

d) That it is essential to make existing research and extension services sensitive and relevant to the needs and challenges of Shifting Cultivation and shifting cultivators and simultaneously assimilate the traditional ecological knowledge of Shifting Cultivation into future research, development and extension processes.

e) That it is necessary to recognise the traditional institutions and intellectual capital generated from traditional practices relating to Shifting Cultivation and ensure its protection in the legal and policy regime.

f) That it is essential to provide interactive forums and environment for information access and sharing between multiple stakeholders at local, national, regional and global levels.

g) That it is imperative to acknowledge that women usually play the most critical role in Shifting Cultivation both at the activity and the impact level and therefore any development intervention must be sensitive to this fact.

And therefor

The regional, national, and local policies for Shifting Cultivation need to be re-appraised and, where necessary, reformulated. For this purpose, the detailed recommendations of the 'Shifting Cultivation Regional Policy Dialogue Workshop for the Eastern Himalayas', 6-8 October 2004, Shillong can provide input.

Where all policies and actions should be founded on the following guiding principles

To support decentralised, participatory, multi-stakeholder, interdisciplinary, eco-regional, and adaptive management approaches that respect human and cultural diversity, gender equity, livelihood security, and enhancement as well as environmental sustainability, where we value and build upon both traditional and scientific information and knowledge.

Adopted: 8 October 2004 at Shillong, Meghalaya, India

7 New policies for shifting cultivation are needed based on scientific appreciation and democratic principles

The hostile policy bias against shifting cultivation has caused untold poverty, misery and grievances and undoubtedly contributed to ethnic conflict in Myanmar.

As the country moves towards democratisation and federal decentralisation there is an urgent need for revision of policies relating to shifting cultivation livelihoods and land-use. Policies that value Myanmar's uniquely diverse heritage and protect and enhance the well-being of all ethnic peoples and all rural working people.

> ***"Shifting cultivation is sustainable and our cultural heritage"*** *(Male, Workshop participant, 14 August 2016, Kengtung).*

Firstly, it is essential that the government acknowledge the legitimacy of shifting cultivation livelihoods. These livelihoods should not be interpreted as criminal or degenerate, but as recognized as dignified and skilful and thereby valued.

Secondly, fallows for shifting cultivation systems must be assured. This means revising the existing raft of land laws and endorsing customary tenure systems, particularly the divisive 'Virgin Fallow and Vacant Land Law 2016 must be repealed or at least modified to remove 'fallows' from the risk of appropriation. The 2016 land use policy promised to support these systems and the policy must urgently be translated into legal provisions. Furthermore, constitutional and administrative decentralisation should allow state and regional governments to develop their own laws appropriate to all rural working people's and ethnic peoples' livelihood needs without bias or discrimination.

Thirdly, there is a need to advocate for agroforestry systems including shifting cultivation within the bureaucracy. Some countries have recently introduced agroforestry departments and considering how many millions of people are likely to depend on shifting cultivation it would make sense for Myanmar do the same. Myanmar needs an agroforestry department with the explicit mandate to protect promote and enable shifting cultivator communities. The Ministry of Ethnic Affairs may be the most appropriate agency as it has an overriding mandate to support ethnic affairs.

> ***"To legislate policy that allow systematic recognition of shifting cultivation system, with financial and technical support. The government must recognize and make law accordingly"***
> *(Male, Workshop participant, 14 August 2016, Kengtung).*

Lastly, livelihood support provision for shifting cultivation is urgently needed. After decades of conflict and predations on their resources and whilst at the same time in the context of increasing accessibility and increasing monetisation of the economy, communities need support to adapt to the modern realities. This could involve technical support for farming innovations such as enhanced fallowing enhanced nutrient her cash crops and so on.

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