

Rethinking Swidden Cultivation in Myanmar: *Policies for sustainable upland livelihoods and food security*

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University of East Anglia /Pyoe Pin - 2013

- Swidden cultivation, also known as shifting cultivation or *Shwe Pyaung Taung-ya*, describes a spectrum of rotational agro-forestry practices at varying levels of intensity prevalent in Myanmar's uplands. Swidden cultivation contributes to the livelihoods of millions of citizens, for whom it is a solution to upland food security.
- During the Colonial era Forest Departments, attracted by timber, entered into competition for control of the uplands with swiddeners, and sought to restrict them. Even after Independence, Colonial era prejudices and hostile assumptions have persisted. But in recent years perceptions are becoming more sympathetic, mainly due to scientific studies which confirm that under conducive conditions swidden systems are efficient, productive, sustainable and environmentally beneficial.
- The conducive conditions for stable swidden systems are however declining in many areas due to a range of factors: population increase, land shortage and tenure uncertainty, decline of technical skills and customary authority, market penetration and intergenerational cultural change. The cultivation systems are also becoming stressed as climate change threatens them further, including through increased fire incidence slowing fallows recovery.
- **The policy challenge is now how to support swidden cultivators to adapt their livelihoods to the changing conditions:**
 - 1) legitimate swidden cultivation practices
 - 2) provide secure tenure, through reinforcing customary authorities, revising national land legislation, handing over community forests, and protecting against land grabbing
 - 3) provide technical support for sustainable intensification, building on local technical knowledge and innovations
 - 4) promote rural enterprises for jobs and cash incomes



Plate 1: Sustainable swidden cultivation
(E. Kerkhoff)

1 What is Swidden Cultivation (SC)?

Swidden or shifting cultivation, also known as 'rotational agroforestry' and 'long fallows forest cultivation' is a traditional agricultural practice, from which many other farming systems have developed. The specific nature of the upland environment, fragile, rain-fed, lower soil fertility and more laborious, presents different challenges than the plains, and so leads to location-specific adaptations. Swidden cultivation involves cultivating a series of plots, one after the other sequentially. Abandoned plots are left to fallow for several years, typically long enough for pioneer tree growth. Shifting cultivation is more complex than either sedentary cultivation or tree farming. It is not nomadic, as abandoned areas are returned to, and it is not frontier 'slash and burn', where sites are subsequently put under sedentary cultivation or tree crops.

There are currently a spectrum of upland shifting cultivation practices prevalent in upland Asia. It is known as *Jhum* in Bangladesh and North East India; *Shwe Pyaung Taungya* in Myanmar; *Khoriya* in Nepal, *Lunxi di* in China, and various local names in Indonesia, and Papua. Across the Asia-Pacific region about 15% of the population are considered 'forest dependent', many of whom are shifting cultivators. In Myanmar estimates shifting cultivators range from 2 - 20 million people, possibly as high as half of Myanmar's upland population,

cultivating at various levels of intensity perhaps as much as 22.8% of the country's land area.¹

1.1 *How does swidden cultivation work?*

The cultivating household returning to a fallowed patch after in some cases as long as 20 years or more, **clears** the regrowth. Sometimes trees are only lopped or pollarded, and tree stumps may be left to help later regeneration. After the debris has dried, **controlled burning** clears the debris, and serves a number of beneficial functions. It releases nutrients (especially potassium), improves the soil structure making it easier for planting and decreases soil acidity. Burning also eliminates pest insects, plant diseases, soil microbial pathogens and weeds. Fire control may involve community mobilisation to prepare fire lines and patrol. In some areas bio-charring is practiced (i.e. covering the fuel materials with soil to reduce oxygen presence during combustion leading to charred residues which are excellent for soil structure).² In longer fallow regimes, there is less need for weed suppression, and sometimes there may be mulching of the debris rather than a burn.

¹ Personal correspondence U San Win, Yezin University

² a fact known to cultivators globally for at least 5 centuries around the globe, but only in the last decades recognised by agronomists for its soil enhancement benefits.

The **cultivation phase** may range from just one to several years. Cultivation practices can be highly complex, involving variously intercropping (other crops cultivated in the spaces between the main crop), relay cropping (a 2nd crop started in between the 1st), green manure cover crops, low or zero tillage (dibbing), inclusion of trees and so on. Cultivation may involve a wider range of crops as sedentary cultivation, – as many as 50 have been reported in areas of North East India.

After a patch is cultivated for a few years soil fertility decline and weed growth presents a dilemma for all cultivators. Where land is the primary limiting factor cultivators typically increase labour inputs to cycle nutrients and tackle the weeds. But where labour is the limiting factor and where alternate land is available, typical in hill areas, the most efficient use of labour is to move to another plot, leaving the abandoned plot to **fallow**. During fallow periods soil gradually recovers its condition.

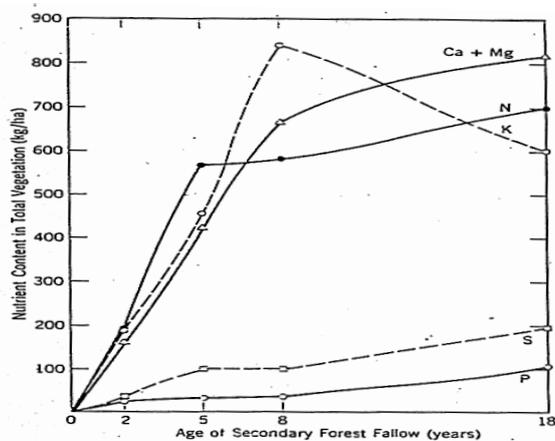


Figure 1: Soil nutrient accumulation under SC: a secondary forest fallow in Yangambi, Zaire (Bartholomew et al. 1953)

The fallowing phase can involve active management interventions including promotion of specific tree and/or shrub species for a range of purposes. These can include more *effective* fallowing (e.g. nitrogen fixing, soil stabilisation and soil organic carbon promotion); for more productive fallowing (e.g. fruits, wood products, fodder); and for other reasons such as hydrological functions, ecological or religious functions. There is an important balance to be struck between effectiveness of fallows (i.e. of fertility recovery) and productivity.

Swidden systems produce a distinctive patchy **mosaic landscape**, containing cultivated plots and regenerating fallows of different ages. Within SC systems there are also typically a range of **soil and water conservation measures** at the site as well as the landscape level. These can include contour bunding, stone walling; ridge and gully forest conservation / protection; zero tillage with dibbing stick; Nitrogen fixing alder species and so on

The cropping / fallow balance is critical: it determines whether or not the system suffers a net loss of nutrients and erosion.

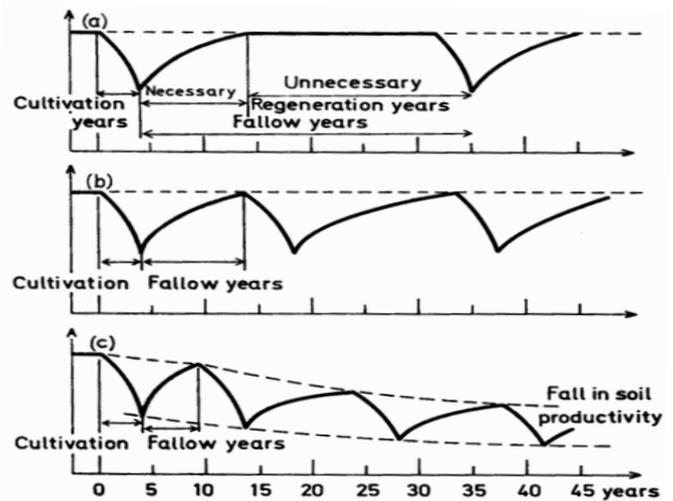


Figure 2: The relation between length of fallow and soil productivity in shifting cultivation (Guillermin 1956)

If the fallow period is shortened there will be less time in which the soil recovery processes and vegetation successions can take place. If the fallow period continues to be reduced, an observable change occurs in fallow vegetation; secondary forests may be reduced to shorter, thinner stemmed, fewer, woody bush or jungle species. Less directly observable, but nevertheless critical changes will also occur in the soil, often resulting in declining crop yields. See figure 2.

1.2 Cultural integrity, social capital and social security

Swidden cultivation is typically performed by indigenous ethnic groups, whose cultural practices include customary tenure institutions and authority structures; collective and reciprocal work, and indigenous technical knowledge systems including ethno-botanical knowledge.

Village authorities and customary institutions are essential to regulate the swidden farming system as a community. These institutions involve shared norms, values, and cultural traditions. A particularly important institution is **common property** for land: which is typically held not as an 'open access' resource but under regulated access whereby portions are allocated to different households. Customary authorities also act to resolve conflicts over land. Reciprocal labour sharing is another important social institutions. The social organisation of labour increases efficiency particularly for land clearing and collective fire management. In some areas patches are cultivated by the whole community, apportioned out to individual households.

In these ways cultural practices relating to swidden produce both a material cultural heritage including indigenous technical skills passed on to the next generation, and also a unique 'cultural landscape' involving a unique and rich biological diversity.

Swidden cultivation is found in upland areas across the World. In Asia, it is found across mid altitudes of the eastern Himalaya and widely in upland South East Asia, as Figure 3 below illustrates: (upland intensive mixed (4) and highland extensive mixed (5) farming systems).

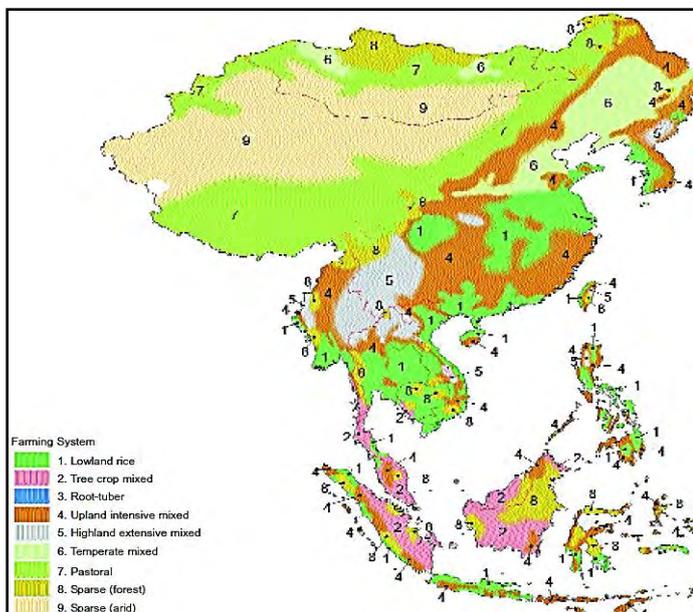


Figure 3: Farming systems in South East Asia (FAO 2010)

2 Is swidden cultivation bad? Science and logic

Swidden cultivation began to be seen as destructive only in the mid-19th Century, as Colonial forest departments entered into competition with swiddeners for control of the land, they began to characterise swidden cultivators as primitive, unproductive, even ‘pre-agricultural’ in contrast to forester’s so-called ‘modern’, ‘scientific’ management. Governments introduced policies to obstruct the practice and remove ethnic populations from the valued forests. The Colonial administration of land imposed 19th century euro-centric assumptions of legitimate land uses. Many of these policies, and the hostile assumptions and attitudes on which they are based, persist to this day. Even though they are rarely based on more than subjective preference, they have been selectively employed to unfairly de-legitimate cultivators’ rights in ways that would be unacceptable for lowland cultivators.

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

But, despite intensive and lengthy government efforts to control shifting cultivation, the practice remains prevalent over large areas.

2.1 Scientific studies of swidden cultivation

Objective comparative evaluation of swidden with other land uses would need to compare specific criteria such as biodiversity impact, livelihood benefits, labour and land use efficiency (bearing in mind that generic comparisons are difficult due to the diverse spectrum of location-specific actual practices). There are also surprisingly few comprehensive studies of SC. However several rigorous research studies on swidden cultivation in the tropics now point to the strength and resilience of many of these systems, the high returns to

labour they offer; and the species enrichment and biodiversity conservation they allow³.

2.2 Comparing environmental impacts

Swidden cultivation’ is often blamed for deforestation by foresters. But is SC relatively more or less destructive of forests at site level than forestry harvesting or forest clearance for sedentary agriculture? Probably less: a long fallows swidden system is very similar to a forester’s rotational tree plantation system, but with an additional few years of cultivation between felling and replanting. It involves a more diverse mix of tree and other species. The FAO Global Forest Resource Assessment include a category for ‘temporarily unstocked forests’ to encompass lands under forest management after felling and before regrowth. Swidden cultivated areas and early fallows could reasonably be categorised as ‘temporarily unstocked forests’. Since foresters do not object on environmental grounds to their own tree felling it seems illogical that they object to others doing the same.

Swidden cultivation undoubtedly has a greater impact on natural forests than rigorously implemented low impact selective logging within continuous cover forestry (CCF) practices. But low impact logging, in Myanmar as elsewhere, have remained more a noble intent than a reality, as the Myanmar Timber Enterprise and local sawmills have been blamed for widespread unregulated felling of forests.

In comparison to sedentary cultivation, swidden has lower impacts: the agricultural ecology is far more bio-diverse, especially during the fallow period when forest regrowth provides diverse habitats. Also virtually no toxic external inputs are used such as pesticides, herbicides, and synthetic fertilisers, which are damaging to the soil and water systems. In recent years agribusiness plantations have been spreading across hill areas of Asia. From an environmental point of view these are amongst the most damaging of any land use, far more so that swidden: exotic monocultures provide no biodiversity habitat, and often involve heavy use of toxic inputs. Agribusiness plantations in Asia are heightening the risk of species extinctions.

Does swidden cultivation transform more forested areas than sedentary agriculture, forestry or agro-plantations? Probably not, although we don’t have data. In comparison to permanently cultivated areas and even to tree plantations a stable long fallows SC system provides higher forest cover.

In terms of biodiversity, studies suggest a higher plant and wildlife biodiversity levels, in some cases than permanent forest (due to edge effects), and certainly higher agro-biodiversity than modern farming.

Internationally, traditional shifting cultivation systems are not necessarily a major cause of forest loss, and that greater attention needs to be given to other causes of

³ the two most significant international ones being the ‘Alternatives to Slash and Burn’ project (despite its value-laden title) and a recent ICIMOD project (Kirkhoff & Darlong 2009)

deforestation, including timber trading and land conversion.

Table 1: Comparing impacts of different land uses

Land use	Initial impact of land use change from primary forest	Biological diversity	Productivity
Natural primary forest (e.g. 'protected area')	-	✓ Very high	Range of ecosystem services and NTFP to a range of beneficiaries
Swidden cultivation	~ Reduced forest density to secondary forest	✓ High	Food prod., wood & NTFP to farmers
Settled agriculture	✗ Deforestation	✗ Low – very low	Food production to farmers
Timber extraction from natural forests	✓ Low degradation in theory, ~ Medium to high degradation in practice due to over extraction	✓ High to ~ medium (variable)	Timber to forester & merchants
Tree plantation	✗ Deforestation and replacement with monoculture	✗ Very low	Timber & poles to foresters merchants
Agri-business plantations	✗ Deforestation	✗ Very low	Commodities to merchants

Swidden cultivation systems also maintain relatively high carbon levels, unlike sedentary agriculture, and agri-plantations.

2.3 Livelihoods

A well-functioning swidden system can be a highly efficient use of labour, is more productive in hill areas than alternatives, and can lead to very good food security. Rotational agroforestry also supports, through customary institutions, social security and cultural integrity. Swidden cultivation is one of the most intensive and productive ways farmers can manage uplands, and provide substantial labour opportunities when compared for instance to agribusiness plantations, the profitability of which depends on minimising labour costs, thereby creating unemployment and social dislocation.

As rural economies have become incorporated into the cash economy swidden production is gradually adapting through incorporation of some cash crops.

3 Current status and stresses on Myanmar's SC systems

3.1 Nature & extent of swidden cultivation in Myanmar

In Myanmar it is not known how many & how widespread. A rough estimate would be around 7 million, based on several approximate measures, suggesting about half of the upland region's population, of about 17m are involved.

There seem to be clear variation by area. In Chin fallows remain relatively long, as much as 10-15 years, and customary authorities robust. In Shan the border with China has led to commercial initiatives changing cultivation incentives in more accessible areas for instance production of maize for animal feed.

The conditions that gave rise to the shifting cultivation adaptation include low population density, extensive land, and remoteness, especially from markets. These conditions have been rapidly changing across SE Asia in recent decades, due to a range of stresses, most of which in Myanmar are more recent and more rapid: population growth, enclosure of remaining wildlands for protected areas, strengthened state reach to implement sedentarisation policies, and the threat and actual manifestation of 'land grabbing' for agribusiness. All these factors are stressing the systems and pushing cultivators to lengthen the cultivation phase and shorten fallows. Also, partly due to the hostile political environment, there is an inter-generational decline in interest in shifting cultivation from many in the younger generation.

These stresses are leading to poverty in some shifting cultivation areas. However we must be careful to equate shifting cultivation with poverty *per se*, as the highest poverty incidence in Myanmar is in the highest productivity agricultural area of the lower Ayeyarwady (UNDP 2011).

3.2 Demographic change:

Despite a lack of reliable census, estimates suggest a population growth rate of 1-2%, and so there seems to be gradually increasing numbers of people in uplands, even taking out-migration into account. This is leading to generational splitting of family lands and to land hunger. There are no simple solutions, and intensification is increasingly urgent. There may be increasing outmigration of men and a feminisation of agricultural labour?

3.3 Reduced land access and growing tenure insecurity.

Land access has become increasingly competitive in recent years. Factors driving this include growing populations, expansion of Protected Areas, and land grabbing by agri-businesses. These factors mean land available for cultivation has reached a physical and administrative limit, and caused a so called 'end of the hinterland' as a common issue around the World (RRI 2011).

Swidden cultivators have historically relied on customary land tenure management. Yet with the decline in Myanmar's conflict the state is increasingly able to impose central governance and statutory regulation on previously remote areas. Statutory ownership is vested with the Agriculture Dept, administered by land records dept. , and recent reforms to land laws has made it easier for land to be allocated to business interests.

Weak or insecure tenure acts as a disincentive for cultivators to invest in sustainable land management. Thus secure tenure is an important priority.

The President's Office recently declared that occupiers will get tenure security - a very laudable statement of intent, however swiddeners cultivators only temporarily occupy each patch so whether they will receive tenure security on fallows remains to be seen.

Table 2: Property rights and swidden

Land law	<ul style="list-style-type: none"> - Most swidden cultivation fallows comes under jurisdiction of Dept of Agriculture. Fallow lands in particular are vulnerable to reallocation. - There is currently no indigenous land law or endorsement of customary land systems
Land use regulation	<ul style="list-style-type: none"> - Customary management systems - Protected Area regulations - Community forestry – but this currently discourages land uses non considered 'forest', and only offers a 30 year lease - conflict resolution
Recent changes	<ul style="list-style-type: none"> - Reduced conflict and democratisation increasing state reach. - Continuing land law revision process - Lobby from agribusiness for land allocation- - threatening to asset-strip swidden cultivators

3.4 Market access, monetisation and incorporation in international economy

As the cash economy expands rural people have increasing need for cash incomes. With improving access there are also increasing commercial opportunities for niche products and benefiting from local comparative advantages.

But there is also increasing commercial interest in access to the land they cultivate, and in several cases government willingness to sacrifice their interests to secure international investment.

Promotion of a statutory legal system overruling customary structures can transform the common property regime, where everyone has a share, into private or state property, leading to landlessness and poverty. It can also lead to increased dependence on market vagaries for their incomes and food security.

3.5 Adverse policy environment

Problems in swidden cultivation systems are often problem of counter-productive policies rather than inappropriate land use practices. Governments typically oppose it – desiring the revenue benefits and administrative simplicity of permanent forest or agriculture – and have implemented extensive programmes to achieve this. Even today Government staff typically lack an understanding of or interest in the ground realities for upland cultivators, and the prevalence of hostile departmental policies (forest, agriculture, hydropower, rural development, ...). Different department's policies are often conflicting .. hostile policies are often promoted by lobbies of vested interests ('timber mafia', settlers, commercial enterprises).

But this has proved counterproductive: a hostile policy environment can force the cultivation systems into suboptimal practices, (undermining customary authority structures and shortening fallows) or obstruct them altogether, leading to poverty and conflict, alienating cultivators and leading to degraded land.

The areas labelled as 'vacant' or 'wastelands' are typically productive or regeneration fallows. Mis-labelling them leads to their allocation to other uses.

In some countries the Agriculture departments have promoted chemical inputs, particular synthetic fertilisers,

which have affected the soil and nutrient cycling practices deleteriously. Regulatory frameworks biased against local landraces adapted to these systems

3.6 Stresses leading to deteriorating swidden performance

In the absence of mitigating adaptations, farmers may be forced to shorten fallow periods, extend the cropping phase, pushing the systems beyond their ecological resilience and into a degradation cycle in which weeds proliferate and yields decline, with declining returns to labour and increasing food insecurity (Cairns & Garrity 1997). Also, as productivity and economic returns are not assured, investment in land management is increasingly risky.

4 Supporting Myanmar's Swidden Cultivators in their transition to sustainable livelihoods

There is growing recognition internationally that a hostile policy bias against shifting cultivation practices is both unscientific and unfair. Instead policy makers can support the interests of their citizens by **stopping obstructing their livelihoods** and instead **helping improve** and adapt their livelihood systems in Myanmar's rapidly evolving context.

Box: The Shillong Declaration 2004 (ICIMOD)
'Shifting cultivation must be recognised as an agricultural and an adaptive forest management practice which is based on scientific and sound ecological principles... Regional, national and local policies ... need to be reappraised and ... reformulated.'

From the above discussion the following policy recommendations emerge:

a. Reorient the policy and administrative environment from hostility to support for improving swidden systems and swidders' livelihoods

Government policy should focus on sustainable poverty alleviation through working with citizens to support their aspirations and needs. This would mean:

1. **Remove explicit policies against shifting cultivation** (e.g. hostile policy statements in the Forestry Masterplan, Forest Department restrictions, land reallocation measures).
2. **Strengthen the implementation of existing beneficial policies** (e.g. agricultural development extension, marketing support, on farm timber production and marketing). Improved service provision to remote areas (e.g. health, education)
3. **Strengthen and capacitate swidders' customary institutions** for resource management & governance.
4. **Encourage co-ordination** between government agencies at all scales (national state, township, village tract). There is a need for some sort of local government role for land use planning

b. Ensure tenure security and customary mechanisms for Shifting Cultivation

Perhaps the most central issue for swidders is tenure security, both in cultivated patches and in fallows, as

land is their prime productive asset. Improving tenure security also improves the incentives for sustainable land management. Steps needed towards this include:

1. **Customary resource management institutions should be given statutory authority** for tenure management and arbitration. Traditional conflict resolution mechanisms must be empowered. Customary institutions though are not perfect, and they may need to be supported towards greater equity and fairness (e.g. more equal land access for the land poor, more gender equity).
2. **Statutory legal instruments are needed to protect swidden land tenures**, which typically overlaps forest and agriculture formal land categories. At present the best possibility is for regional government to develop new sub-laws to permit and regulate this swidden land, perhaps under the 2012 Farmland Law . (Pyoe Pin is working on this issue under an Upland Land Tenure pilot project).
3. **Village forest lands should be handed over of under Community Forestry Instruction** where communities request this. The CFI should also be strengthened by being converted into a law. It should also be modified to accommodate sustainable swidden cultivation practices, and the 30 year period of the lease should become perpetual.
4. **No asset stripping** of swiddeners through re-allocation of plots under cultivation or fallow land to outside agri-business land grabbers should be permitted. Land use planning is needed to endorse current use practices. If agri-businesses seek land institutional mechanisms are needed that they can negotiate with farmers for it, although non-ethnic ownership of ethnic hereditary domain lands should be restricted.

c. Support technical innovations for sustainable intensification , building on indigenous innovations:

Governments, academic bodies, development agencies and NGOs must invest in on-farm participatory action research initiatives to build on enhance traditional swidden practices and identify innovations. The need is to develop pathways for more sustainable intensification, building on traditional skills, and working with leading farmers as innovators and extension agents within and between communities. There are several aspects that could benefit from support:

- Intensifying the swidden cultivation system (e.g. improved production - enhanced soil management and nutrient cycling for improved yields - and fallowing methods);
- Intensifying and / or expanding into other components of the farming system, such as home gardens, livestock, sedentary cultivation.
- Improving post-harvest technologies and processing
- Handicraft value addition to produce
- Introduce labour saving technologies (e.g. draught power and mechanisation)
- Improving landscape management including fire management, forest and water channel protection - .

A wide range of different indigenous practices have already been identified around upland Asia towards achieving these, although transfer of techniques must be locally adapted.

'Land use in shifting cultivation communities is often transitional: Land use intensification is a near-universal process spanning a continuum from long cycle fallows to permanent agricultural farming.' (Cairns & Garrity 1999)

There are a range of technical innovations for sustainable intensification that can be tested and adapted; both traditional practices, more recent indigenous innovations, and also international innovations (e.g. 'bio-char;' composting- including advanced techniques like Activated Compost Tea (ACT) and improved fallowing (ICRAF 1997). Development approaches that build on existing potential and capacity are likely to be more acceptable to the farmers concerned and more achievable. (Kerckhoff 2006)

d. Promote livelihood diversification and enterprise development

It is increasingly important to help households adapt to the changing society by moving beyond subsistence cultivation livelihoods, take advantage of opportunities of income and spreading risk, and avoid indebtedness. In order to augment incomes and diversify livelihoods:

1. Market development should be encouraged based on local niche products. Commercial niche products can contribute to economic development that is adjusted to local circumstances and builds on existing potential.
2. Alternatives to informal money lending at high interest is needed to avoid intractable indebtedness. Saving and credit schemes may help.
3. Payment for ecosystem service schemes may possibly help, although international experience so far indicates payments are typically very small, and the strings attached, in terms of required changes to land use, compromising to existing practices. Nevertheless that opportunities may emerge cannot be excluded, e.g. catchment management, carbon.

Key references

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Acknowledgements

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Special thanks to Prof. San Win for guidance & advice.