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POLICY BRIEF

Shifting cultivation landscapes in transition: Where are the forests?

Safeguarding forest cover and ecosystem services while transitioning shifting cultivation to resilient farming systems

KEY ISSUE

In its traditional form, shifting cultivation involves a short cultivation phase followed by a long fallow phase, which allows regeneration of forests. Transition to settled agricultural systems has been at the expense of regenerating fallows resulting in shortened fallow cycles, a permanent change in landuse and land cover, and a drastic depletion in forest cover. The permanent change in land use and land cover as fallows get converted to settled agriculture affects ecosystem services. While traditional shifting cultivation entails long fallow cycles that allow regeneration of fallows into secondary forests, settled systems permanently erase this possibility resulting in an irreversible change. Thus, for every hectare of shifting cultivation transformed to settled agriculture, a proportionate area of forests is permanently lost, negating the land degradation neutrality process inherent in shifting cultivation. This has serious implications for the provisional and regulatory services available in shifting cultivation landscapes with a significant reduction in biological diversity, hydrological services and carbon sequestration capability. The long-term ramifications for the sustenance of ecosystem services and for global warming and climate change are only too obvious. It also defeats the very purpose for which the transition was introduced: arrest deforestation, increase forest cover and prevent environmental degradation. Programmes designed to facilitate transitions in shifting cultivation must therefore take measures to address the negative fallouts and ensure the sustenance of ecosystem services while drawing lessons from community innovations available across the region.

This policy brief examines the impact of transition from shifting cultivation[1] to settled agriculture on forest resources, including forest cover, and sustenance of ecosystem services. It discusses possible solutions to address the issue drawn from community innovations and project experiences in South and Southeast Asia.

Introduction

Policy perceptions on shifting cultivation have been significantly shaped by an FAO publication in the late fifties that appealed for replacing the practice as it was considered 'the most serious landuse problem in the tropical world'[i]. Perceptions influenced by this appeal view the practice as primitive, economically unviable and a cause of tropical deforestation. Despite growing scientific evidence to the contrary and a revision of this position by several countries and international agencies[ii, iii, iv] policies based on this misconception still strive to replace the practice with settled agriculture even today.

Such policy positions, in conjunction increasingly with market forces, have led to the rapid expansion of settled agriculture across landscapes in South and Southeast Asia over the last decades[v, vi, vii] with shifting cultivators gradually adopting alternative forms of agriculture[viii, ix, x, xi, xii, xiii]. Although the practice persists, terrace cultivation and plantations have become prominent features of village landscapes across the region[xiv, xv, xvi, xvii]. The transition has

[1]Shifting cultivation discussed here refers to the practice where farmers return to a previously cultivated plot after the fallow period, which may, with a sufficiently long fallow period, have regenerated into secondary forest. It does not refer to pioneering shifting cultivation that requires the clearing of primary forests for cultivation.

not been without cost as upland landscapes indicate that regenerating fallows too are being converted to terraces and plantations disrupting, thereby, the natural process of land recuperation and eroding the capacity of the land to regenerate into forests, leading to a drastic depletion in forest cover. The replacement of fallows with settled agriculture, therefore, has long term implications for land and forest resources and associated consequences for ecosystem services, including hydrological and carbon sequestration[xviii, xix, xx, xxi, xxii]. As settled systems replace fallows, South and Southeast Asia are already feeling the effects with an alarming increase in forest cover depletion.

Why are forests lost as shifting cultivation transits to settled agriculture?

Settled agriculture, while holding the promise of food security, improved nutrition and enhanced incomes, has resulted in wide-scale landuse change leading to erosion in the diverse resource bases upland communities depend on, particularly forest resources and services. Is this unique to transitions in shifting cultivation areas or is it common to any agricultural transformation? What is unique to transitions in shifting cultivation that require extra caution? These questions merit serious consideration.

The uniqueness of shifting cultivation lies in that it involves two distinct land uses – agriculture and forestry – that alternate sequentially in time on the same plot. Forest management is an integral part of the practice and is crucial to its sustenance, with farmers initiating fallow management measures even as they prepare a plot for cultivation[xxiii, xxiv]. A shifting cultivation landscape is, thus, a mosaic of agricultural fields interspersed with regenerating fallows of different ages all of which mature into secondary forests given a sufficiently long fallow period. Unlike settled agriculture which results in a permanent change of landuse and landcover, shifting cultivation can, therefore, claim to be the only agricultural practice that engages in land degradation neutrality in allowing the addition of a new fallow to compensate for every parcel of land cleared for annual cultivation. According to the FAO[2], 'in areas of shifting cultivation, forests, forest fallows and agricultural land appear in a dynamic pattern where deforestation and the return of forests occur frequently in small patches'[xxv]. In contrast, for every hectare of shifting cultivation transformed to settled agriculture, a proportionate area of forests is lost permanently, negating the land degradation neutrality process inherent in shifting cultivation. This unique character needs to be recognised and given due cognisance in policy formulation and programme development for transitions.

Due to lack of awareness and misunderstandings of the sequential alternation between agriculture and forestry in shifting cultivation, policy makers and programme developers have never considered this dual landuse when formulating policies or programmes to manage shifting cultivation. It is perceived either as an agricultural practice and brought under the purview of agriculture or as forests and therefore subject to forest regulations and management. Regenerating fallows are often viewed as abandoned, vacant wastelands or as temporarily unstocked land free of tenurial encumbrances and open to conversion. This perception makes fallows the first choice for transformation to permanent plantations and other settled agricultural practices, overlooking the fact that these will, over time, mature into secondary forests. The landuse change that the misconception promotes has serious implications for the provisional and regulatory services available in shifting cultivation landscapes, resulting in significant reduction in the biological diversity, hydrological services, and carbon sequestration capability of such landscapes. Second-generation issues of forest cover depletion and ecosystem service erosion are the fallouts of overlooking the true potential of fallows in policy formulation. Thus, efforts to replace shifting cultivation with settled agriculture for the purpose of arresting deforestation and preventing environmental degradation have become counter-productive, defeating the very objective for which the approach was introduced. This needs to be corrected.

Transitions: What have been the trade-offs?

As farming systems shift to cash crops, the expansion in plantations has been at the cost of regenerating fallows. This encroachment has had several fallouts, among them, the drastic reduction in fallow cycles which results in a distortion of shifting cultivation[xxvi]. This leads, in turn, to a decline in crop diversity and productivity, significantly affecting food availability[xxvii, xxviii, xxix, xxx, xxxi]. As landuse pressure increases, shifting cultivators are forced to return to their plots at shorter intervals disrupting the natural process of land recuperation and regeneration of fallows into secondary forests[xxxii, xxxiii]. The end results are land degradation and drastic depletion in forest cover.

[2]Deforestation is defined as a direct human-induced conversion of forested land to non-forest land. It implies the long-term or permanent loss of forest cover and transformation into another landuse, including agriculture. This excludes areas where trees have been removed due to harvesting and where the forest is expected to regenerate naturally or with the aid of silviculture practices. The same authors define degradation as 'a reduction of canopy cover or stocking within the forest'.

Transition to permanent agricultural systems also erases the continuity of ecosystem services provided by regenerating fallows. The most profound – and routinely overlooked – impact of cash crop expansion has been the depletion in the resources harvested from different-aged regenerating fallows. Research underscores the critical importance of different-aged fallows as a rich resource base of food and nutrition for upland communities[xxxiv, xxxv, xxxvi, xxxvii, xxxviii]. Different-aged fallows allow a wide diversity of plants and animals to colonise and thrive in their environment and, as they mature, support the ecological succession of a wide range of herbs, shrubs and tree species, providing conducive habitats for microflora and a wide diversity of insects and other wild animals. Together, they constitute a substantial proportion of the food and nutritional resources of shifting cultivators and other upland communities. The fallows also offer fuelwood, house-building material, medicinal plants, fibre and dyes and a wide diversity of non-timber produce which are critically important in the shifting cultivator's subsistence economy[xxxix, xl]. The conversion of fallows to permanent agricultural systems deprives the upland communities of such provisional services. This increases the drudgery of women who must gather these from farther afield with far-reaching implications for the health, nutritional security and overall well-being of the community.

Conversion of fallows also results in an irreversible change in vegetal cover of the plot. While conversion to terraces permanently denudes the undergrowth and tree cover, plantations result in a drastic depletion in the diversity of vegetation as plantations are predominantly monocultures or at best a mix of a few species. This depletion has serious long-term consequences for soil dynamics, soil carbon sequestration, nutrient cycling, and hydrological regime of such systems. Several studies indicate the high potential of young fallows for carbon uptake and sequestration[xli, xlii, xliii, xliv, xlv] suggesting that regenerating fallows could act as carbon sinks contributing to mitigation of global warming[xlvi]. Secondary forests derived from shifting cultivation have also been reported to grow faster and hence able to sequester carbon at higher rates in the early years, thus offsetting the carbon lost at burning much faster[xlvii]. The replacement of fallows with settled agricultural systems would thus permanently erase the critical role that shifting landscapes play in arresting global warming and combatting climate change.

Although the replacement of the practice with cash crops may hold the promise of cash generation for shifting cultivators, it also implies the eradication of their risk management strategy compromising their resilience and increasing their vulnerability to food insecurity and poverty. Transitions, therefore, need to be designed and implemented with utmost care and with a holistic socio-ecological approach, failing which even well-intended interventions and programmes could very well become counter-productive.

Safeguarding forests and ecosystem services: Learning from community initiatives and project innovations

As transitions will bring about changes in landuse influencing resource availability and provisioning and regulatory services of ecosystems, the challenge during transition is ensuring the continuity of the dual landuse of shifting cultivation, which alternates between cultivation and fallow forestry. Settled agricultural practices cannot accommodate this attribute as the change in landuse is permanent with no provisions

for the regeneration of forests. Steps must be taken, therefore, to ensure that the process of transition causes minimum damage through a careful balance between traditional management practices and new interventions.

As transitions cannot happen overnight and shifting cultivation will continue even as communities gradually adopt settled agricultural practices, a compromise during the transition period is to encourage prolongation of the cultivation phase, incentivising the shifting cultivator to remain in the same plot for more than the usual period. This will facilitate fallow regeneration and the flow of some of the ecosystem services through the addition of a few more years of rejuvenation. The 'two-year plus' and 'fireless' (*yamkui*) shifting cultivation practiced by Tangkhuls in some parts of the Ukhrul district of Manipur offer useful lessons in this regard. The cultivation phase of these versions of shifting cultivation lasts for at least four or five years. Mixed cropping dominated by a large diversity of legumes, low dominance of cereals, reduction of paddy, green mulching, traditional weed management practices, and the presence of nitrogen-fixing trees interspersed in the fields provide the necessary soil conditions for the longer cultivation phase[xlviii, xlix]. Examples of similar systems reported from parts of Southeast Asia offer localised versions suitable for the South East Asian context, especially relevant for countries such as Laos PDR where rotational agriculture has been permitted but requires suitable modifications to increase plot allocations and enhance access rights to fallows. Where plot allocation is by lottery and cultivation is for only one year as in Mizoram, India, and northern Chin state, Myanmar, tenurial access to family plots for extended periods is a must to incentivise farmers to invest in the plots allocated.

Prolongation of the cultivation phase must be complemented with effective management practices that accelerate fallow regeneration. Among the Tangkhul farmers, fallow management practices commence alongside vegetation clearing to prepare fields for the coming year's cultivation. When slashing the vegetation, several plant species are retained, which are either thinned or felled at waist height and retained as trunks. These serve several utility purposes while allowing the fallow vegetation to regenerate and mature subsequently into secondary forests as the shifting cultivation cycle progresses. In addition, farmers also introduce certain species with ecological or economic value into their fields during the cultivation phase, thus enriching the future fallows[l, li]. In Nagaland, India, the Nagaland Environment Protection and Economic Development Project (NEPED) has encouraged shifting cultivators to add tree crops in their fields, a form of agro-forestry that would enrich future fallows.

Excellent examples of transformation from shifting cultivation to forms of settled agriculture, worthy of emulation by communities for whom the dual landuse of shifting cultivation is no longer available, are also found in various parts of South and Southeast Asia. Among them are homegardens, agro-forestry and tree farming systems[lii]. Households in the uplands of northeast India, who have translocated crops from shifting cultivation fields to homegardens, are devoting that space in their shifting cultivation fields to commodity crops or gradually transforming them into agro-forestry and tree farming systems[liii]. Farmers of Karbi Anglong, Assam, who introduce broomgrass, bay leaves, cinnamon and local tree species in the fields prior to fallowing, harvest the first three sequentially in the first few years, allowing the plots to develop into forestry plots in later years. The Serampas in Sumatra, Indonesia have introduced diverse cash crops in their shifting cultivation fields, which are harvested sequentially, with the system maturing to mixed cinnamon agro-forests[liv, lv]. Elsewhere in Indonesia, shifting cultivators introduce rubber into the early fallows, which develop into 'rubber jungles' mimicking natural forests to near perfection[lvi]. In the practice of 'relay cropping' among shifting cultivators in Baoshan province, China, upland rice is followed by rattan and bamboo, finally culminating in tree crops for timber[lvii]. Similarly, the Benuaq-Dayak from East Kalimantan, Indonesia, nurture a wide variety of resources in forest gardens (*simpukng* or *kebotn*), which are sustainably harvested over generations[lviii]. Such forest gardens should be encouraged as they can address livelihood needs while nurturing the tree cover and retaining the ecosystem services. The key considerations in the transformation of shifting cultivation to agro-forestry and tree farming is to avoid monocultures and encourage the inclusion of food crops, which promote species diversity and ensure sequential harvesting while mimicking multi-tiered mixed forest systems.

Utility forests, found among many upland communities, with regulated access to households to draw forest produce for household consumption, constitute an excellent example of landuse management for continuity of ecosystem services, including hydrological services. Called Sunu among the Aos of Nagaland Ramhuai or Ngaw among those in Mizoram, access rights of households to them are governed by well-laid out customary norms. Among the Apatanis of Arunachal Pradesh, elaborate landscape management to ensure a sustained flow of ecosystem services also includes clan-managed catchment forests to safeguard the hydrological services[lix, lx]. Such designated forests and forested landscapes provide provisioning and regulatory services and are a common feature of many village landscapes across South and Southeast Asia, offering excellent examples on landuse management for continuity of ecosystem services.

Community Conservation Areas (CCAs) is another example found among villagers in the project districts of the North Eastern Community Resource Management Project (NERCORMP). Built on traditional landuse practices across northeast India, CCAs address consumption needs while ensuring the sustainability of water and other resources. CCA ownership lies with communities and Natural Resource Management Groups (or NaRMGs) set up by NERCORMP to manage them. As part of this, communities have come together to establish wildlife corridors to reduce crop depredation and human-wildlife conflicts. In some districts, wildlife sanctuaries have been established based on rules and regulations developed by the villagers themselves. To date, NERCORMP has succeeded in setting up CCAs in around 1350 villages covering approximately 2000 km^2. Setting up inter-village CCAs involving neighbouring villages is the logical next step in parts of Myanmar[lxi]. In setting up such CCAs, the involvement of all stakeholders – village elders, women, youth and religious leaders – is essential to ensure inclusion of the poor and marginalized, equitable benefit sharing, and a socially acceptable and socially owned process. The NERCORMP experience suggests that a key ingredient for the sustainability of such initiatives is that they be women-driven and incorporate traditional knowledge and resource management practices into 'modern' approaches.

An innovative community-led approach for harmonising settled agricultural options with customary land management and tenurial arrangements for the purpose of safeguarding forest cover and sustaining ecosystem services is found in Mopungchuket of Nagaland, India. The resident population in the village has depleted due to migration leaving a substantial portion of shifting cultivation land unutilised. The Village Council has demarcated such land near roads for cash crops and plantations and made them available to any member who wants to take up the same[lxii]. Other villages, too, can emulate the example of Mopungchuket and earmark one or more parcels with easy acess for settled agricultural pursuits while the rest can be nurtured as regenerating fallows, forest gardens or catchment reserves. However, allocation of plots or access to plots within these parcels should be on the same arrangements as traditionally followed for shifting cultivation. Such an approach will facilitate a transition that is in harmony with customary tenurial regimes while simultaneously introducing a landuse zonation that enables the conservation of forest resources and continuity of ecosystem services.

Participatory perspective landuse planning and mapping (PPLUPM) offers an effective tool for resource co-management at the landscape level involving both the community and relevant government agencies. PPLUPMs engage the community – including women – to map present and future landuse at the village level, clearly demarcating areas for settled agricultural use, shifting cultivation, settlements, and utility and reserve forests. Experiences from NERCORMP and a UNDP project in Nagaland, India, where PPLUPM was piloted, including participatory 3-dimensional modelling (P3DM), suggest that such exercises can catalyse landuse planning and resource management at the grassroots. The Agro-biodiversity Initiative (TABI), in collaboration with the Government of Laos PDR, in the uplands of Laos, where participatory Forest and Landuse Planning and Management Approach (FALUPAM) has been introduced, reveals a similar success story. Field appraisals suggest that it has wide appreciation from the community and government agencies and is an effective way to improve management and access to diverse food and nutritional resources available in the regenerating fallows and other forest systems. It has also positively impacted ecosystem services and is a promising approach to strengthening tenurial security[lxiii].

Participatory landuse planning and mapping not only improves transparency in land governance but also enhances the advocacy capacities of communities with the relevant authorities. It also helps communities to identify areas that need to be conserved for ensuring continuance of ecosystem services. The Participatory Perspective Landuse Plans (PPLUPs) thus generated should be ratified by the relevant authorities – traditional institutions, the respective district revenue and landuse authority and forest department – so that any future allocation of land for settled agricultural purposes is strictly confined to those areas earmarked for such purposes in the PPLUP. In fact, making PPLUPs mandatory for all rural development activities would be a step in the right direction as it would make conservation and safeguarding of ecosystem services central to all development initiatives. The IFAD-funded Fostering Climate Resilient Upland Farming Systems (FOCUS) project has introduced participatory landuse planning in the states of Nagaland and Mizoram in India and it is planned for introduction in the IFAD-funded Eastern State Agribusiness Project and Western State Agribusiness Project in the states of Shan and Chin in Myanmar. Lessons drawn from these projects can be used to refine approaches for facilitating transition of shifting cultivation to settled practices while ensuring the conservation of forests, thereby ecosystem services.

As concrete proposals are needed for formulating actionable policy interventions, in the section below, key recommendations for policy action as well as field-level interventions are listed for consideration by policy makers and programme implementers who are engaged in managing change in shifting cultivation areas.

Key recommendations

1. As shifting cultivation will continue in various forms till such time that shifting cultivators, especially the poor, develop capacities to transit completely to settled agricultural systems, policy makers must pro-actively encourage prolongation of the cultivation phase by providing effective extension and technical services and incentivising the shifting cultivator community and the individual farmer to continue cultivation in a plot for longer than the customary period. This will result in semi-sedentarisation, increasing the fallow cycle, aiding the rejuvenation and regeneration of forests and restoring many of the ecosystem services. Effective fallow management practices building on traditional approaches to complement and strengthen such efforts should be encouraged.

2. Traditional institutions and community elders should be motivated to increase the duration of the cultivation phase and to extend tenurial security to households for continued cultivation for the extended period based on dialogue and consultations. Such consultations are particularly necessary where existing tenurial arrangements allow only annual access to plots and prolongation of cultivation phase is not possible without extension of tenurial rights (e.g., Mizoram, northern Chin, Laos PDR). This can be done by nurturing a participatory technology development approach to promote change and covering the risks for the first few years, till such time that communities are convinced to prolong the cultivation phase and willing to make investments for productivity improvement.

3. At the plot level, improved soil and crop management practices blending traditional practices with modern scientific approaches must be made an essential component of any intervention to ensure soil health and ecosystem services accruing from soil dynamics.

4. Agro-forestry and tree farming should be promoted which complement community efforts at transformation. Multi-tiered mixed crop plantations composed of species with staggered gestation periods should be encouraged so that households are able to sequentially harvest produce. Local tree species with recognised ecological functions and those with commercial value should be introduced in mixed plantations to establish a balance between ecologically and economically important species.

5. Enrichment of fallows should be encouraged through support for required inputs, especially improved access to propagules of local forestry species that are in demand in markets. This should be complemented with tree farming concepts that nurture agro-forestry and sustainable forestry practices. Forest gardens that promote sustainable harvesting of wild edibles and forest produce from fallows while simultaneously ensuring community management of and responsibility for such forested areas should be introduced. This will contribute to government efforts to conserve upland ecosystems and ensure the continuance of provisioning and regulatory services. Community efforts can be incentivised by providing technical extension support and effective linkages to markets. Capacity building for value addition should be supported to enable the development of forestry-based micro-entrepreneurs.

6. Village institutions (and communities) should be encouraged to identify and earmark a few blocks in their traditional shifting cultivation area for promotion of settled agricultural practices with access arrangements based on the traditional customary arrangements and for promotion of forest gardens and catchment forests. Such land zonation will result in clear demarcations for agricultural landuse, forestry and conservation areas, thus safeguarding forest cover and ecosystem services.

7. Establishment of community conserved areas and expansion of utility forests should be supported, building on traditional practices of fallow management and frameworks for forest management to safeguard forest cover and ecosystem services, drawing lessons from traditional CCA management regimes such as those in northeast India and southeast Asia.

8. The establishment and expansion of community conserved areas and utility forests should be incentivised by introducing a Payment for Ecosystem Services (PES) model based on traditional, community-based PES arrangements as they would encourage community-led conservation efforts.

9. Gender-responsive participatory perspective landuse planning and mapping should be made an integral part of project implementation, ensuring that utility forests, CCAs, catchment forests, and other traditionally recognised systems are strictly conserved. PPLUPs should clearly demarcate different land uses (ongoing and planned) resulting in clear land zonations. Such plans and maps should be ratified by the community, the traditional institution and the relevant authorities. Proposals for any change in landuse, particularly for settled agricultural practices, should be entertained only

when all concerned parties ratifying the PPLUP unanimously agree.

10. PPLUPM should be mandated as a prerequisite in each project village before proposals for establishment of plantations or other settled agricultural activities are approved. The PPLUPM, ratified by the villagers and the relevant authorities, should constitute effective proof of a free and prior informed consent process and should be respected by all departments promoting land-based agricultural development programmes with no concessions granted under any circumstances.

11. Local/traditional resource governance mechanisms should be strengthened to include gender concerns and to prevent elite capture and privatization of fallow lands while promoting cash crop plantations.

12. Indicators based on the desired outcomes outlined above should be developed as essential elements of result-based monitoring frameworks.

Notes

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