



Rush for cash crops and forest protection: Neither land sparing nor land sharing



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ABSTRACT

In many countries with large tracts of tropical forests, there is a dual focus on enhancing forest protection and increasing commercial agriculture for economic development. Laos is a case in point for this development as the Government of Laos (GoL) has a strong commitment to economic growth, which rural farmers in part help realize through a rush for cash crop production destined to be sold in neighboring countries. Maize cultivation, for example, is rapidly expanding and grown under a contract-farming system for Vietnamese markets. At the same time, GoL attempts to increase nationwide forest cover and prepares for REDD+ (reducing deforestation and forest degradation). This paper explores how the recent boom in cash crops is impacting land use and livelihoods of local communities, as well as affecting forest conservation in Hua Meuang District of Huaphan Province in northeastern Laos. We also examine how local authorities react to these changes and navigate the contradicting policies. Furthermore, the paper analyzes to what extent the land sparing intention of land- and forest-land allocation policies are fulfilled. We found that the production of maize has rapidly expanded in Hua Meuang District since the mid-2000s as a result of high demands for maize in Vietnam and because local authorities see the crop as a way to reduce rural poverty and reduce traditional subsistence shifting cultivation practices. Communities have increased the areas that they dedicate to maize cultivation and have achieved an increase in both income and household assets. Maize has replaced upland rice cultivation as well as primary and secondary forests. Although the government policies aim to spare land for forest conservation by intensifying agriculture, the result is rapid agricultural expansion and no spared forest. Moreover, the traditional land-sharing landscapes with forest, fallows, and fields are being transformed, creating landscapes that are increasingly dominated by agriculture. This may still be in line with economic development policies, but it is at odds with forest conservation policies, REDD+ policies, and the GoL target of increasing forest cover in the country.

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1. Introduction

In many countries that still have large tracts of tropical forests, there is a dual focus on enhancing forest protection while at the same time developing the economy by increased production of cash crops. Both targets are, of course, highly relevant for countries

with high levels of poverty. As natural forests are becoming increasingly commoditized, e.g., through the proposed REDD+ mechanism (Reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries), there is potential scope for forest protection to contribute more directly to economic transfers to high-poverty rural areas. Linkages between conservation and land-use intensification have been studied both in theory and by using local case studies, and these are, for example, outlined in the debates on land sparing (divided landscapes with totally protected forests and intensified agriculture on surrounding lands) versus land sharing (multi-

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functional landscapes serving both conservation and agricultural purposes).

This approach to understanding landscape management was launched by Green et al. (2005) and has sparked a rather polarized debate. Some conservationists have been strongly favoring the sparing approach in which land use policies should ensure that primary forest areas are left untouched in order to conserve specialist species that only thrive in such habitats (Gibson et al., 2011; Phalan et al., 2011). Other scholars, however, have pointed out that biodiversity can be just as high or higher in the shared landscapes that are often the outcome of traditional agricultural systems such as shifting cultivation (Rerkasem et al., 2009; Xu et al., 2009; Berry et al., 2010). Moreover, it has been shown that intensification processes may lead to further agricultural expansion as opportunity costs of agricultural production increase, thus not leading to any spared land for conservation (Rudel et al., 2009; Lambin and Meyfroidt, 2011). In recent years, more balanced views emphasize that there should be room for both types of landscapes to benefit from a broad range of ecosystem services (not just biodiversity conservation) (Grau et al., 2013; Fischer et al., 2014). In addition, the need to ensure optimization of conservation and food production objectives may need elements of both sharing and sparing and in any case the best choices are always highly context specific (Butsic and Kuemmerle, 2015; Law and Wilson, 2015). Thus, it appears that this debate is rather quickly changing from polarized to reconciling views.

Such scientific debates can be highly useful in guiding policy on land-use planning, but the question remains as to whether they are reaching the appropriate policy-makers. For this to be achieved, agricultural and environmental policies must be coordinated to make the right choices between forest protection and land-use intensification. In many countries, policy-makers responsible for agricultural development and poverty reduction are disconnected from those responsible for environmental conservation (DeFries and Rosenzweig, 2010). Moreover, the land sparing and land sharing debate has had a somewhat restricted application in the scientific debate as there are numerous case studies that, without relating their results to land sharing and land sparing, actually show that neither is occurring. This is especially the case in many developing countries where rapid conversion of forest lands to annual cash crop production and industrial plantations is taking place (Galford et al., 2010; Brown, 2012) and where attempts at increased agricultural production appear in the guise of a land-sparing approach, but in reality these often serve neither forest conservation nor poverty reduction (Barrett et al., 2011; Ferraro et al., 2011).

There are many examples of agricultural intensification efforts that are justified by their assumed effect on both poverty reduction and, by default, forest protection. These include a study from Madagascar indicating that the expansion of intensified cash crop production such as maize has been one of the major causes of deforestation (Scales, 2011), and it has been argued that concessions and expansion of biofuel feedstock plantations lead to dispossession of land and increased poverty in Ghana, Cambodia, and Laos (Schoneveld et al., 2011; Hought et al., 2012; Kenney-Lazar, 2012; Neef et al., 2013). In Sarawak, several waves of large-scale oil palm expansions have led to questionable outcomes for local people (Ngidang, 2002; Cramb et al., 2009; Fox et al., 2009). More recently, smallholders in some of these areas now reject the large land development schemes and grow their own oil palm, benefitting from the infrastructure of the large schemes (McCarthy and Cramb, 2009; Mertz et al., 2013). Many of these agricultural development schemes argue that they indirectly aim at protecting remaining forests, but in reality, besides their questionable effect on poverty reduction, they have little, if any, connection to forest-protection efforts, which increasingly are limited to small 'islands'

of old-growth forest (Curran et al., 2004; Fitzherbert et al., 2008). Similarly, forest protection efforts rarely link to land-development policies (Brussaard et al., 2010) even though expansion of cash crops is often identified as a driver of deforestation (Lambin et al., 2001; Haberl et al., 2014) and therefore could be used as an argument for stronger enforcement of forest protection. Consequently, policies aiming at either 'forest conservation' or 'economic development' are working towards different goals that, from a spatial point of view, are mutually exclusive. From a land sparing-land sharing perspective, we hypothesize that this may actually result in not achieving the beneficial goals that would be expected from either land sparing or land sharing. What appears to happen is that unenforced land sparing policies and new economic opportunities make people abandon traditional land sharing approaches and the result may be wholesale conversion of the landscapes to more or less intensive agriculture with very little forest left. This perspective has – to the best of our knowledge – not been discussed in the literature.

Laos provides an interesting case for examining this situation, since the Government of Laos' (GoL) efforts regarding land use planning can best be characterized as land sparing. The national Land and Forest Allocation (LFA) program – implemented since the mid-1990s – epitomizes this with its focus on containing traditional agricultural activities by local communities in limited areas in order to spare forests for regrowth (Lestrelin and Giordano, 2007; Fujita and Phanvilay, 2008; Lestrelin et al., 2012; Castella et al., 2013). However, a range of different drivers of land use change (outlined in more detail in the next section – including the LFA itself) have led to continuing declining forest cover (Tong, 2009; DoF, 2012), agricultural expansion (Thongmanivong and Fujita, 2006) and pressure on protected areas (Rao et al., 2014), none of which testify to the intended outcomes of the LFA. In this paper, we therefore analyze various land-use planning processes aimed at forest conservation (such as the proposed REDD+ mechanism) and agricultural intensification (such as cultivation of hybrid maize – hereafter maize – for the Vietnamese market) and their interplay with the LFA to understand the effects on land use, livelihoods of local communities, and forest protection. Moreover, we discuss whether the approach and outcomes of policy implementation can be characterized as land sparing or land sharing, or whether none of the two characterize the land use change pathways in Laos. First, however, to set the scene for the analysis, we outline the main drivers of land use change in Laos.

2. Drivers of cash-crop expansion and forest protection in Laos

The multiple and complex drivers of forest and land-use change observed on a global level (Lambin et al., 2003) are also found in Laos. According to the GoL, these drivers include traditional shifting cultivation and population growth (GoL, 2005), whereas scholarly studies also identify government policies on land reform—such as the LFA itself—as drivers of land-use change (Thongmanivong and Fujita, 2006; Fujita and Phanvilay, 2008; Broegaard et al., in review). The LFA had been implemented in an estimated 7130 villages by 2005 (GoL, 2005), and besides sparing forests, it also has a stated goal to reduce poverty through agricultural intensification. The rate of the poor in the shifting-cultivation landscape is about 46.5%, while the national poverty rate is 34.7% (Messerli et al., 2008; Heinemann et al., 2013), but this is partly because shifting cultivation is practiced in upland areas in the northeast and the south, where there is little access to services and employment, and where it is difficult to practice intensive agriculture due to the rugged character of the terrain (Epprecht et al., 2008). Nevertheless, it has become a major discourse in the LFA that shifting cultivation needs

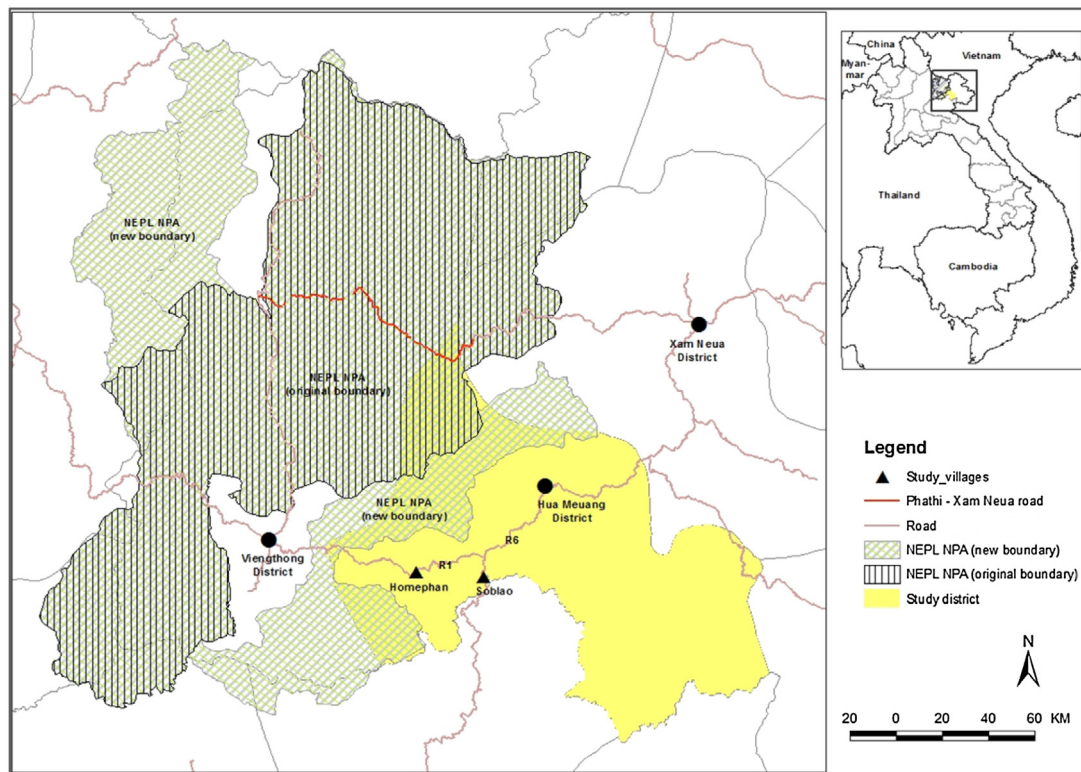


Fig. 1. Study sites in Laos—small map on the right indicates the location of Huaphan Province in Laos.

to be halted, and this has led to peculiar definitions of the system. For example, shifting cultivation of upland rice with 3–4 years fallow is allowed, but is now called rotational agriculture. Similarly, when rice is replaced by commercial maize, it is no longer considered shifting cultivation by technical staff at the provincial and district levels or by the villagers even if fallowing is still used (Vongvisouk et al., 2014). Moreover, the LFA has also been shown to create social inequity as rural households with greater social and economic power can bargain to obtain larger land areas than other households, effectively upholding existing differences in land and resource access (Lestrelin et al., 2011).

The LFA has led to a decline in shifting cultivation areas as well as a reduction of fallow periods (Thongmanivong and Fujita, 2006; Lestrelin and Giordano, 2007). However, logging and illegal trade of forest products also affect forests in Laos (Robichaud et al., 2009; Barney and Canby, 2011) as does expansion of commercial agriculture with rubber, maize, and sugarcane (Thongmanivong and Fujita, 2006; Thongmanivong and Vongvisouk, 2006; Kenney-Lazar, 2010). The increase in commercial crops is partly a result of the market-liberalization policy – the New Economic Mechanism – from the mid-1980s that initiated the promotion of private-sector activities. The GoL also encouraged populations in remote upland areas to move to lowland areas close to roads and other public services, where there was better access to land suitable for permanent agriculture (Fox, 2009). As a result, land use and forest resources in the lowland areas close to roads are more exposed to increased pressure from land-policy implementation than isolated upland areas, as people in the lowland areas convert their former shifting-cultivation areas into cash crop cultivation (Thanichanon et al., 2013).

The GoL also aims to increase nationwide forest cover as stipulated in 2005 in the National Forestry Strategy for 2020 and with the establishment of 18 National Protected Areas in 1993 that cover 2.8 million hectares or approximately 12% of the total country's land area (GoL, 2005). Nonetheless, forest cover in Laos has

continuously declined: from 47.2% of the country's land area in 1992 to 41.5% in 2002 and 40.3% in 2010 (Tong, 2009; DoF, 2012). Still, Laos remains one of the countries with the highest percentage of forest cover in Southeast Asia (FAO, 2011), although the continuous forest decline provides little evidence that the GoL's goal of 70% forest cover by 2020 is likely to be achieved.

Policies encouraging private-sector and foreign direct investment in cash-crop production, hydropower, mining, and forestry all stand in the way of this goal as they have turned Laos into an important resource frontier for transnational capital and large-scale land and natural-resource investment (Lestrelin et al., 2013). Thus, one of the drivers of the forest decline is the GoL land development policy slogan of 'turning land into capital' (meaning activating the land capital in terms of investment) (Dwyer, 2007). Rubber plantations, for example, have boomed in the northwest and the south of the country under contract farming and land-concession/lease systems (Manivong and Cramb, 2008; Shi, 2008; Kenney-Lazar, 2010; Khamphone and Sato, 2011; Sturgeon, 2013). This fits well with the GoL aims to use the land for co-investment or joint ventures with domestic and foreign investors and to channel land tax, rental fees, and profits into the state revenue system (Dwyer, 2007), but it tallies less well with the land sparing approach of the LFA as concessions take over community land that would otherwise have been set aside for forest protection and regrowth (Kenney-Lazar, 2010; Baird, 2011). Geographically, commercial crop production is expanding fastest in the areas bordering China, Thailand, and Vietnam, as traditionally there are good connections with private investors (and markets) in neighboring countries. For instance, during the 1990s and early 2000s, the rubber boom was driven by Chinese and Vietnamese investments (Manivong and Cramb, 2008; Shi, 2008; Kenney-Lazar, 2010; Kenney-Lazar, 2012) and various agricultural products are generally sold to the neighboring countries close to the production sites (Manorom et al., 2011). The maize boom in Huaphan Province, which is of particular interest as a case

Table 1
Interviewed institutions.

No.	Institutions	Office/division/section/unit/representative
Institutions at the national level		
<i>Ministry of Agriculture and Forestry (MAF)</i>		
1	Department of Forestry (DoF)	Office of Greenhouse Gas Emission Reduction from Deforestation
2	Department of Forest Inspection (DoFI)	Division of International Relations
3	National Agriculture and Forestry Research Institute (NAFRI)	Socio-Economic Research Center
<i>Ministry of Natural Resources and Environment (MoNRE)</i>		
4	Department of Forest Resource Management	Conservation Forest Management Division Division of Emission from Deforestation Management
<i>Ministry of Planning and Investment (MPI)</i>		
5	Department of Investment	International Investment Division
Institutions in Huaphan Province		
6	Provincial Agriculture and Forestry Office (PAFO)	A provincial REDD+ coordinator Agricultural Land Management Division Cabinet Division Forestry Division
7	Provincial Office of Natural Resources and Environment (PoNRE)	National Protected Area and Protection Unit Division of Land Management Division of Land Development and Planning Head Cabinet Division (former head of Nam Et-Phou Loey National Protected Area) Nam Et-Phou Loey National Protected Area (NAPL NPA) Office in Hiem District
8	Provincial Planning and Investment Office	Division of International Investment Division of Domestic Investment
Institutions in Hua Meuang District		
9	District Agriculture and Forestry Office (DAFO)	Land-Use Planning Unit Agricultural Extension Unit Forestry Unit
10	District Office of Natural Resources and Environment (DoNRE)	Head of the office Land-Use Planning Unit
11	District Planning and Investment Office	Planning and Investment Unit Statistic Information Management Unit
12	District Finance Office	Finance Management Unit Taxation Unit
Non-Governmental Organizations (NGOs)		
13	German Society for International Cooperation (GIZ)	Climate Protection through Avoided Deforestation (CliPAD) Northern Uplands Development Program (NUDP)
14	Wildlife Conservation Society (WCS)	WCS's Headquarter Office in Vientiane Capital Tiger Conservation Project in NEPL NPA Ecotourism Project in NEPL NPA
15	Netherland Development Organization (SNV)	SNV's Headquarter Office in Vientiane Capital Provincial REDD+ Coordinator in Huaphan Province Bamboo Development Project in Huaphan Province
16	Village Focus International (VFI)	The Rights-Link Lao Project
17	Lao Biodiversity Association (LBA)	The directors and a technical staff
18	Land Issue Working Group (LIWG)	The coordinator and a technical staff
Private Companies		
19	Sisouphan Company: Contract-farming for maize	
20	Chaleun Xam Company: Contract-farming for maize	
21	Phetkhamxay Chaleun Company: Contract-farming for maize	
22	Saengchan Agricultural Development Company: Contract-farming for Job's tear	
23	Wuhan Kaidii: Biofuel plantation investment	

study in this paper, started in the early 2000s and was also partly due to the proximity to the Vietnamese market (Willi, 2011).

3. Case area setting

The present study focuses on Huaphan Province in northern Laos (Fig. 1), an area that epitomizes the current developments in the country. Huaphan Province has been identified as having the highest potential natural forest regeneration in Laos (DoF, 2012), but private sector investment in commercial crops is rapidly expanding. Maize is one of the main crops drawing in investments, while other crops such as Job's tear and various types of biofuel and industrial tree plantations are also being promoted by district and provincial authorities. At the same time, Huaphan Province harbors the majority of the Nam Et-Phou Loey National Protected Area (NEPL NPA), which is a high-profile area for tiger conservation. Nonetheless, NEPL NPA is being encroached by maize cultivation and by the construction of a new military road from Phathi Village to Xam Neua (the capital of Huaphan Province) – passing

right through the core-zone of the protected area. A REDD+ feasibility study in the NEPL NPA and its buffer zones concluded that REDD+ was not economically feasible due to historically low levels of deforestation (Moore et al., 2012), but this only shows that history is a poor predictor of the future: the high market demand for maize may lead farmers to expand maize cultivation further into the NEPL NPA and the military road may also facilitate future encroachment.

In this paper, we focus on two villages in Hua Meuang District of Huaphan Province, namely Homephan and Soblao (Fig. 1). These villages have mixed ethnicities and are located close to the buffer zone of the NEPL NPA. Originally, both villages were located inside the NEPL NPA within the administrative boundary of Hua Meuang District, but they were moved to their current locations in the mid-1980s (Soblao) and early 1990s (Homephan). Homephan is dominated by Khmu, who traditionally practice shifting cultivation for household subsistence; however, once they settled in this village, they received paddy (wet rice) fields abandoned by the former inhabitants in the area who moved out for security reasons during the 1980s. People in Soblao are dominated by

Lowland Lao (*Lao Loum*), who traditionally practice both paddy and shifting cultivation. The locations of the two villages have different economic development opportunities. Homephan is located along the national road number 1 (R1) from Hiem District to the capital of Huaphan Province (Xam Neua District), and people in this village mainly rely on farming activities. Soblao is located along the national road number 6 (R6) connecting Huaphan and Xiengkhuang provinces (and onwards to Vientiane Capital and the south of the country), where commercial or trading activities abound. In addition, Soblao is also one of the focal socio-economic development villages (*sarm sang*) in Hua Meuang District under the GOL's socio-economic development project.

Land-use planning (e.g. LFA) is implemented in the district (Broegaard et al., in review) and in both villages, and as elsewhere in Laos it is aimed at reducing shifting cultivation areas, increasing forest conservation, and promoting permanent agricultural practices. Moreover, Hua Meuang District has been appointed a 'REDD+ district' in Huaphan Province, and the German Society for International Cooperation (GIZ) funded 'Climate Protection through Avoided Deforestation Program' (CliPAD) is assisting the province in setting up a jurisdictional REDD+ approach and creating demonstration activities for REDD+ (GIZ, 2014). While this potentially could be an important driver of land use change in the future, REDD+ activities have so far had very little impact locally in Laos.

The villages thus represent typical northern Laos communities that have been moved from a protected area, have undergone land use planning exercises restricting their land use, and also engaged in various cash crop schemes.

4. Methods

This paper is based on two field visits conducted in April–May and November–December 2013 using multiple materials and methods. These methods included a household questionnaire survey, semi-structured interviews, secondary data collection, and spatial analysis of satellite images. The survey included 50 households in Homephan and 52 in Soblao. The surveyed households were randomly selected from a list containing all households in each village and represent all household statuses, occupations, and ethnicities in the study villages. A few households (three in Homephan and five in Soblao) were unavailable and these were replaced with other households selected randomly from the remaining households.

We carried out semi-structured interviews with representatives of different governmental institutions at different administrative levels (national, province and district), Non-Governmental Organizations (NGOs) and projects, as well as private companies. Governmental organizations included relevant departments, divisions, sections and offices under the Ministry of Agriculture and Forestry (MAF), the Ministries of Natural Resources and Environment (MoNRE), and the Ministry of Planning and Investment (MPI). Authorities of the two selected villages were key-informants at village level. The NGOs and donor organizations included only organizations working on land-use planning, forest conservation, and livelihood development. In total, we interviewed 23 institutions (Table 1) and representatives from the two study villages. Interviews were carried out in Lao and immediately translated to and from English by one of the researchers and interview notes were taken in English—sometimes backed up with tape recordings—and these notes were then coded according to key aspects of the research questions and analyzed using NVivo-software, version 8.

We also collected documentation from various institutions. These included official reports and local data on land use and land-use planning (both the LFA and Participatory Land-Use Planning (PLUP)), regulations, investment agreements between governmental authorities (mainly provincial and district levels)



Fig. 2. Photo of sign stating that shifting cultivation has been stopped. The sign states that Homephan Village in Hua Meuang District, Huaphan Province has stopped traditional shifting cultivation practices as of 13.06.2013—or literally: “have ended the cutting of forest for the purpose of planting upland rice”.

Source: Photo taken by Thouthone Vongvisouk in 2014.

and investment companies, contract-farming agreements, statistics of agricultural production, infrastructure development, project reports, etc. This information was triangulated with the information from the household survey and semi-structured interviews.

Finally, a spatial analysis was carried out using Rapid-Eye satellite images from November 2010 and 2012 using the remote sensing software “ERDAS IMAGINE” and then mapped by ArcGIS10.2. We first classified the land cover into seven classes: primary forest, secondary forest, older fallow, young fallow, active cropping area (crop land), built-up area, and water. However, since it is difficult to distinguish the differences between secondary forest and old fallow, as well as between young fallow and crop land, we finally grouped land cover into five classes: primary, secondary forest (fallow), crop land (including actively cultivated area and young fallow), built-up area, and water.

5. Results

The two study villages in Huaphan province have been negotiating a complex path between conservation of the NEPL NPA at or within their village boundaries, restrictions on shifting cultivation by the LFA, as well as new opportunities for agricultural intensification through cash cropping of hybrid maize and other forms of contract farming. Here we first outline some of the ‘boundary conditions’ related to the NEPL NPA and the LFA and then move on to discussing the agricultural intensification.

The NEPL NPA was established in 1993, but management was not actively enforced until the 2000s, at which time the International Union for Conservation of Nature (IUCN) began to provide financial and technical support followed by continuous support from the Wildlife Conservation Society (WCS) until today (Moore et al., 2012). One important aspect of the enforcement relates to the boundaries of villages located close to the NPAs. The authorities of one of our study villages were concerned that they had lost agricultural land to the NEPL NPA when the NPA staff re-defined its boundary in 2010. Although the authorities of the village referred to an LFA map from 2002 to claim their village boundary, the NPA staff disregarded the LFA. They argued that it was not geo-referenced and therefore inaccurate regarding the boundary of the NPA.

Forest conservation thus overrules the LFA, but the LFA remains the legal document when it comes to restricting agricultural activities within village lands. Officially, the villages have stopped shifting cultivation of upland rice in accordance with the LFA and Homephan village even received an approval sign stating this (Fig. 2). In fact, shifting cultivation of both upland rice and maize

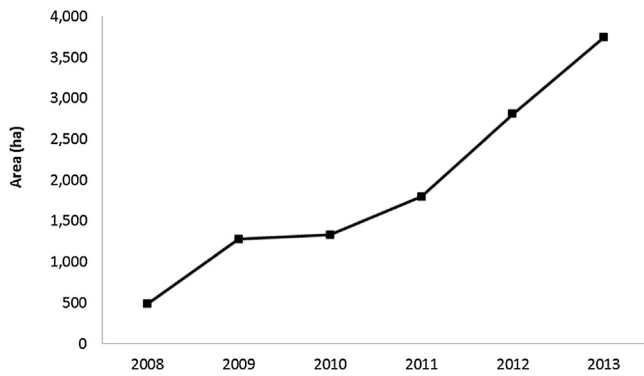


Fig. 3. Total maize cultivation area in Hua Meuang District.

Source: DAFO in Hua Meuang, 2013.

is still practiced in the village: rotation of shifting cultivation for maize is often 2–4 years (although some maize fields are intensively cultivated for several years without fallow), while the rotation for upland rice is seven years or more. The local re-interpretation of the LFA in which maize cultivation is not called shifting cultivation, coupled with the provincial and district authorities' support of maize cultivation as a means of poverty reduction, gives local legitimacy to the expansion of maize cultivation areas and associated deforestation. A technical staff member from the District Agriculture and Forestry Office (DAFO) in a neighboring district expressed that “...we know that local people in some villages expand their maize cultivation areas by encroaching forests, but as technical staff, we cannot do anything to stop them because maize is a cash crop supported by the district and provincial authorities for rural poverty reduction”. This indicates that although the LFA had been implemented in the village in order to allocate land for agriculture and spare land for forest conservation, government authorities acknowledge that poverty reduction is best achieved by not following a land sparing strategy.

Overall, our interviews with institutions at both provincial and district levels and with private companies indicate that the authorities have warmly welcomed agribusiness investment by private investors in the province as a means of supporting poverty reduction. As a result of the promotion of commercial-crop cultivation, the size of the maize cultivation areas in Hua Meuang District increased from 488 ha in 2008 to 3745 ha in 2013 according to data collected from DAFO (Fig. 3). The district authorities (especially DAFO) are encouraging villagers to replace shifting cultivation of upland rice with maize cultivation and this has indeed led to a reduction in upland rice areas. However, villagers typically spare some fallow-plots in isolated areas, inaccessible by vehicle, for upland rice cultivation, whereas the maize cultivation is mainly found close to roads and villages. The expansion of maize is clearly contradicting the LFA policy on forest conservation as local people convert fallow and forest land into maize fields, areas that should have been set aside for regrowth.

At village level, information from household surveys indicates that villagers have increased their agricultural land since maize cultivation began in the mid-2000s. They have increased the areas used for maize cultivation and fallows, while areas for upland rice cultivation have decreased (Fig. 4). Two different sources of data were used to estimate the development of the area used for maize cultivation: (1) household surveys, in which villagers were asked about the size and location of their fields at different points in time, and (2) records of the seeds of maize received by villagers and recorded into the notebooks of the village tax collectors in both villages. In one of the villages, data were furthermore triangulated with information from one of the three maize companies working in the village. The amount of maize seeds has been converted into cultivation area based on the information provided by the vil-

lagers and technical staff at DAFO in Hua Meuang. An estimated 18–20 kg of seeds are used per hectare and we thus used an average of 19 kg of seeds per hectare to calculate the area. Although some seeds may not have been planted during the planting season, we trust the much stronger increase in maize cultivation areas obtained from the notebooks (*dotted red line*) more than the data from households (*solid red line*). This is partly because the interviewed households are unfamiliar with the area measurements and often consider one plot as ‘one hectare’ (and might add: ‘a large one’ or ‘a small one’). Moreover, there could be an incentive to under-report if land expansion is not in line with the LFA. This means that their estimation of agricultural land is probably an underestimate, except for paddy rice fields, which have been measured for tax collection purposes – paddy area reported in household surveys coincided with figures recorded in the village tax collectors’ notebooks.

As a consequence of the maize boom, people in Homephan and Soblao have increased household income and assets since they started cultivating maize in the mid-2000s. There is an especially steep increase in transportation and communication tools (Fig. 5). Villagers use these tools mainly for facilitating their agricultural production, e.g. by using trucks and tractors to transport agricultural products from field to home and onwards to markets. Many households spend cash income (at least partly from maize) to buy motorbikes for their children to travel to school and return home from school quickly so that they have time to participate in agricultural work. Cell phones are frequently used for communication with agricultural investors and traders or with children studying in the provincial or national capital. As income from maize is also frequently used to finance education, for hiring labor and for increasing mechanization such as plowing, villagers perceive that they have reduced poverty by increasing maize cultivation areas. In addition to helping themselves out of poverty, the villagers find that they in this way contribute to developing the country by achieving national goals of rural poverty reduction.

Other income sources are less important in Homephan village, where the majority of people are farmers and earn their income predominantly from on-farm work. This is different in Soblao where, thanks to its location on a main road, trading is the predominant source of income, alongside other off-farm occupations. According to interviews with authorities of Soblao Village, more than half of the households in the village are engaged in commerce—and this is one of the reasons why the village is selected as a *sarm sang* village. Only Khmu families, who moved to the village after 1990, still heavily rely on shifting cultivation for upland rice cultivation.

Local governmental authorities expect to gain multiple benefits from the agricultural investment, including infrastructure development. Along with the boom in maize, the investment companies draw up contracts with villagers to construct agricultural feeder roads in order to facilitate their access to the maize fields and ease the transport of products. This road construction is financed by the investor, but ultimately paid for by the villagers. According to the District Public Works and Transportation Office in Hua Meuang, the growth of agricultural feeder roads in the district has rapidly increased since 2010 (Fig. 6). However, not all feeder roads have been officially approved by or reported to this office. We do not have aggregate data on this, but Homephan Village provides a telling example: only one feeder road 1.2 kilometers long has been officially approved by the office and included in official statistics, but interviews and field visits revealed that a total of five feeder roads with a combined length of 7.5 kilometers have already been constructed by two investment companies in the Homephan village territory. In principle, the District Public Works and Transportation Office requires the investment companies to submit their feeder-road construction proposals in order to obtain permission; however, no fines have been given for any of the roads constructed

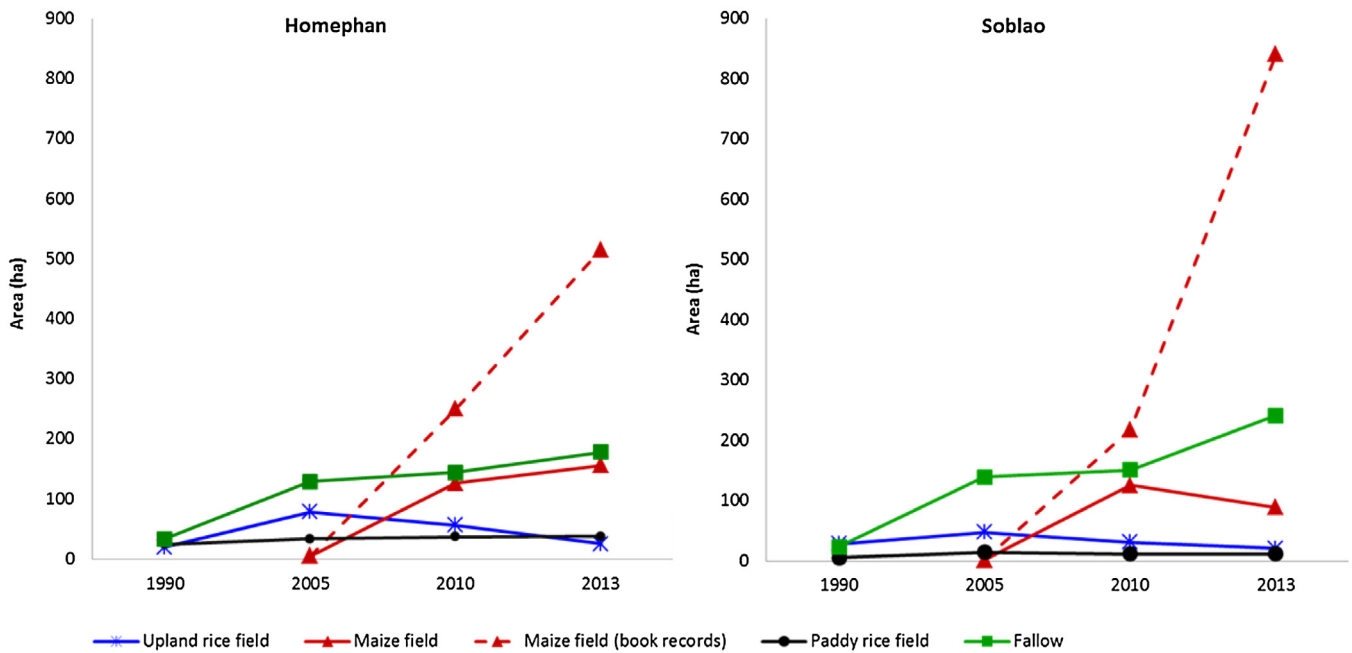


Fig. 4. Total claimed agricultural land by households in Homephan and Soblao villages.

Source: household survey and village book records.

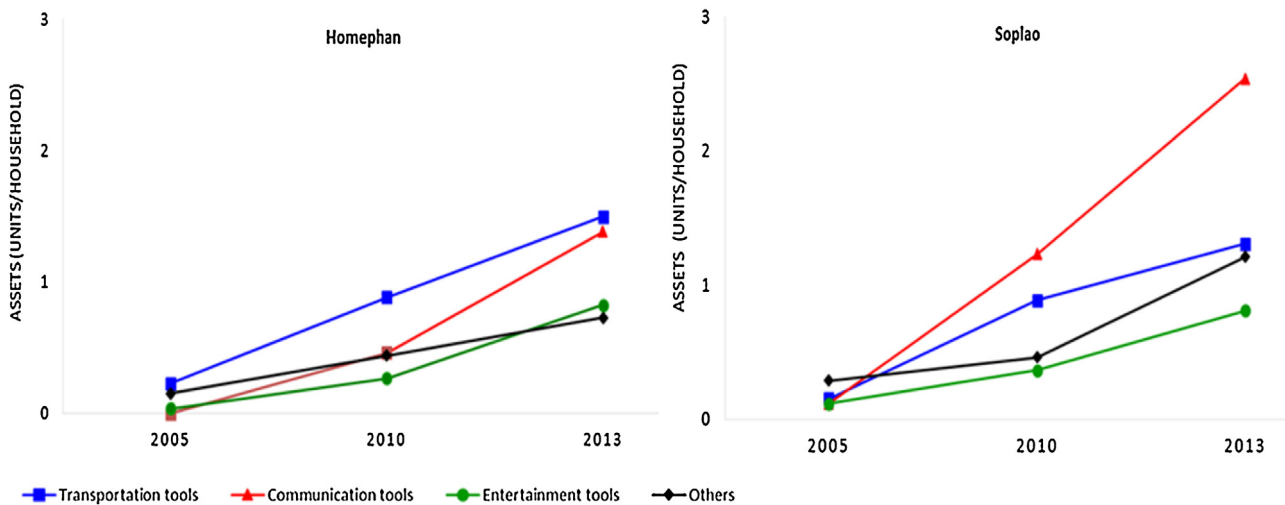


Fig. 5. Household assets in Homephan and Soblao villages.

Source: household survey, 2013.

without permission. The only real concern by the Public Work and Transportation officials seems to be that no agricultural feeder road enters the NEPL NPA territory. Based on interviews and field observations, the actual length of agricultural feeder roads constructed in Hua Meuang district is estimated to be several times higher than that suggested by the official data.

6. Land sparing or land sharing?

The change detection analysis indicates that primary forest areas in both study villages have dramatically decreased, while at the same time crop land has increased during 2010–2012 (Fig. 7). This indicates that people have converted not only fallows and former shifting-cultivation areas but also primary forest into maize-cultivation areas. However, secondary forest (fallows) also decreased from 2010 to 2012, while information from the

household survey indicates that fallows have increased since the mid-2000s. This is probably due to the recent intensification of the system whereby some maize is grown without fallow.

Fig. 7 shows that fallows in 2010 in the area close to the villages have been converted into crop land in 2012. This supports our information from the household surveys and field observations that local villagers convert former upland rice cultivation and fallows located close to the roads and the villages to maize cultivation areas. The greenest part in the north of Homephan Village is located in the so-called ‘village protection forest’ area, but even though it is a protection forest, it is also disturbed—probably by expansion of maize—as forest cover in the area has changed from primary forest in 2010 to fallow (classified as “secondary forest” in Fig. 7) in 2012. Therefore, while villagers claim to have lost agricultural land to the NEPL NPA in 2010, it appears that they have also expanded their agricultural land into village protection forest that they manage

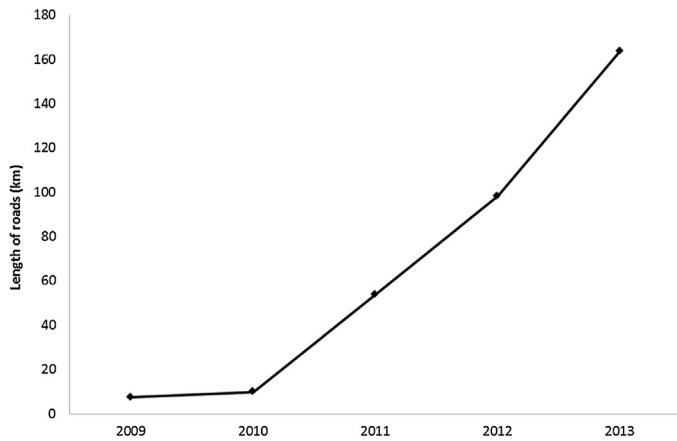


Fig. 6. Change in agricultural feeder roads in Hua Meuang District based on official data.

Source: District Public Works and Road Construction Office in Hua Meuang District, 2013.

themselves. Fig. 7 also testifies to our assumption that book records of maize expansion were more correct than household statements as the cropland increase between 2010 and 2012 corresponds well to the increase in maize area recorded in Fig. 4.

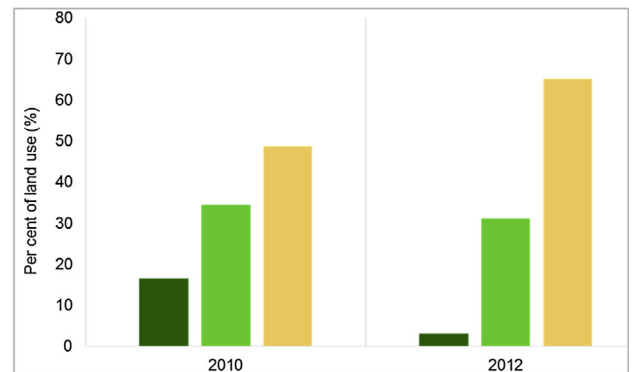
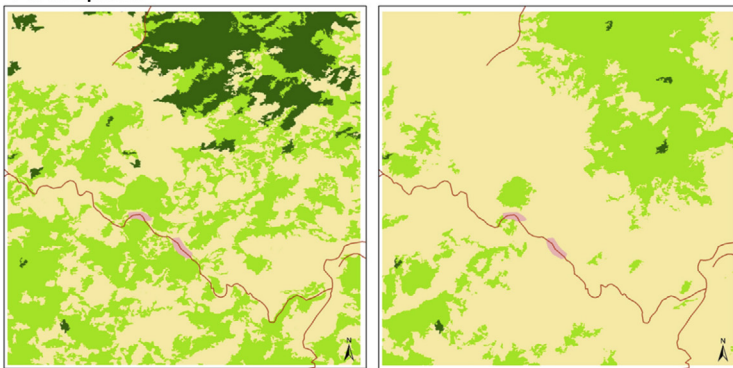
This was confirmed in a group discussion with villagers where, again, a local re-interpretation of land and forest allocation was invoked: “We understood that the village’s utilization forest can be used for whatever the villagers would obtain benefits (products) from.

Thus, this year we decided that households who do not have enough fallows can clear our village’s utilization forest for maize cultivation. As it is termed ‘village utilization forest’, we have to utilize it”. Such ‘free’ interpretations are not unique to the village level. Policies, laws, and regulations are also frequently misinterpreted or re-interpreted at higher administrative levels in order to justify why policies are implemented a certain way, possibly not as intended by policy-makers. This is typical of a policy environment, which is driven, but not necessarily well-coordinated, from the top, and the reality of which provincial, district, and village authorities have to deal with as best they can.

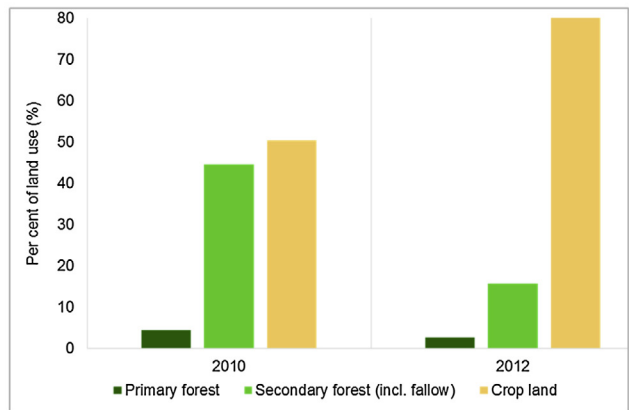
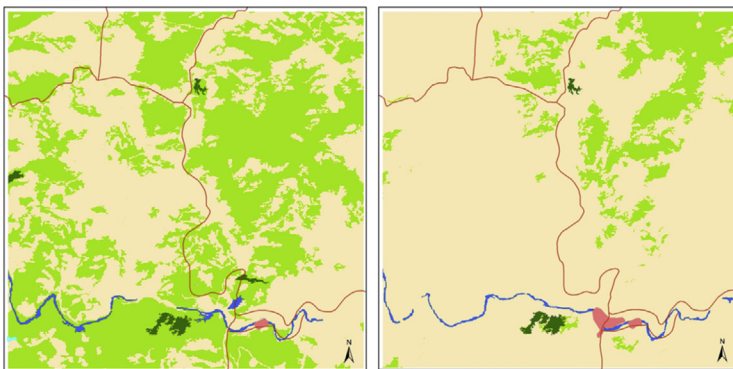
Moreover, the expansion of feeder roads to maize fields is an example of how a mismatch between officially recognized data and reality is largely ignored. This may be because the feeder roads are needed for maize production and as district and provincial government support maize production and development in their area in general, perhaps they are lenient towards ‘offenders’ that make roads without permission. It could also be a reluctance to punish the construction of small roads when the government itself is building the much larger military road through the NEPL NPA. In any case, road constructions are clearly important for intensifying agricultural production as shown elsewhere in Laos (Thanichanon et al., 2013).

These (re-)interpretations of (contradicting) policies have immediate and short-term implications. If maize is continuously supported by local authorities to respond to market demand and for poverty reduction, then forests—at least within the village’s boundaries—will undoubtedly continue to decline. Moreover, as land for agriculture becomes scarce and maize production becomes

Homephan



Soblao



Legend
 ■ Primary forest ■ Secondary forest (incl. fallow) ■ Crop land ■ Built-up — Road

Fig. 7. Land-use change in Homephan and Soblao villages during 2010–2012.

Source: Interpreted from Rapid-Eye satellite images taken in November 2010 and 2012

increasingly profitable, this will provide additional fuel for the increase in maize cultivation, at least as long as the market continues to expand as is currently the case.

This fits well with the ‘turning land into capital’ policy for economic development. However, it is taking place at the expense of the forest – or at least the forest that could potentially regenerate – and, as such, it contradicts forestry policies and government aims to increase forest cover and could compromise engagement in REDD+. It also defies the intentions of the LFA to spare land for forest protection by intensifying crop production – essentially no land is spared as expansion continues unchecked. Moreover, the traditional land-sharing landscapes with shifting cultivation that integrate forests, fallows, and fields are decreasing as fallows are very short in maize production and sometimes not employed at all. Accordingly, what appears to be happening in northern Laos is that well-intended land-sparing policies are not actually resulting in land sparing and they are, at the same time, contributing to the abandonment of traditional land sharing approaches by expediting the conversion of mosaic landscapes with forest and agriculture into pure agricultural landscapes. This case therefore supports the argument by [Angelsen \(2010\)](#) that future agricultural development will result in the expansion of production areas rather than reducing deforestation and also that of [Rudel et al. \(2009\)](#) who pointed to the lacking correlation between agriculture intensification and reduced rates of agricultural expansion. Essentially these authors argue that intensified agriculture (in terms of higher agricultural output per area unit, such as the conversion from upland rice to maize in the case study in Laos) will make agriculture more profitable, and expansion to new areas is also likely to occur either because more people move in or because people see returns on agriculture increase and therefore invest more. It is for others to judge whether the situation of neither land sparing nor land sharing in Laos is good or bad, but there is no doubt that economic development is a clear winner over forest-protection measures, especially those not linked to high-profile conservation initiatives such as the protection of large mammals. Poverty in terms of income and assets has been reduced – at least in the short run – for households engaging in maize production, and while we were unable to establish specific links between the LFA and poverty levels, other studies have stressed that it increases vulnerability as communities are forced to reduce the diversity of livelihoods ([Castella et al., 2013](#)). This confirms the questionable link between land sparing and poverty reduction observed elsewhere ([Barrett et al., 2011](#); [Ferraro et al., 2011](#)).

The question is whether these policies and development outcomes are intended or coincidental. In their study of hydropower decision-making and power in Laos, [Suhardiman and Giordano \(2014\)](#) identify multiple inconsistencies between co-existing policies as well as multiple, conflicting legal orders, and propose that “inconsistent policies and institutional discrepancies” should not be understood as gaps but rather as reflections of the existing power structure (p. 980). Based on their interviews and analysis they argue that the GoL uses the legal plurality as a means to achieve its development goals, focused on high economic growth ([Suhardiman and Giordano, 2014](#), p. 976). We cannot conclude whether the discrepancies between forest conservation policies and policies promoting cash crop investments and conversion from shifting cultivation towards (more intensified) cash crop cultivation observed in our study are coincidental or purposefully created by the State actors. There could be signs in both directions: the stopping of shifting cultivation of upland rice (see [Fig. 2](#)) does not explicitly say that shifting cultivation of maize should be stopped and this could be taken as a government blessing of cropland expansion as long as it is a cash crop. On the other hand, there is no doubt that the contradictions between coexisting policies allow the actors at all levels to choose the forum (or policy) that best supports their main inter-

est (cf. [von Benda-Beeckman \(1981\)](#) analysis of “forum shopping”). Furthermore, there were no signs in our field work data that the policy contradictions are a matter of much concern or something that is actively opposed at any administrative level.

7. Conclusion

Through contract farming, the production of cash crops such as maize can help increase economic incomes for rural communities, at least in the short term. In order to support agricultural development and reduce poverty, authorities at both district and provincial levels strongly encourage rural communities in Hua Meuang District to cultivate these commercial crops. They do so by actively reducing tax levels in order to attract investment companies and by choosing not to monitor the contraction between this income-generating activity and forest conservation. Although maize is a commercial crop intended to replace shifting cultivation of upland rice, it encroaches more into the forested areas than shifting cultivation of rice. Consequently, the recent boom in maize production has not reduced the area under shifting cultivation simply because it employs shifting cultivation practices similar to upland rice cultivation with shorter or no rotation.

The intentions of policies on agricultural development and forest conservation in Laos, as seen clearly in the LFA, favor a land-sparing trajectory of the landscape, whereby pristine forest areas are to be preserved for biodiversity and conservation of other ecosystem services. Agricultural land is restricted by the LFA, which promotes more intensive land uses in the allocated agricultural areas and reduces shifting cultivation. However, the actual implementation of the policies leads to an expansion of more intensive agriculture into natural forests and fallow areas that could be destined for regeneration. As a result, while the traditional shifting-cultivation practices favored a land-sharing landscape, the new development appears to favor neither sparing nor sharing as intensive agriculture is simply taking over forested land earmarked for protection and conservation, but not subjected to enforcement. The NEPL NPA remains to a large extent protected, but even here new road construction is likely to be a driver of further deforestation. The prospects for stopping deforestation and reducing forest degradation in this scenario are bleak as the degraded forests that would be eligible for protection and regrowth under a REDD+ mechanism are now disappearing fast.

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