

WORKING PAPER 206

# **Assessment of governance mechanisms, livelihood outcomes and incentive instruments for green rubber in the Lao PDR**

Miles Kenney-Lazar



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Center for International Forestry Research (CIFOR)

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# Abbreviations

DAEC	Department of Agricultural Extension and Cooperatives
FPIC	free, prior, and informed consent
ha	hectare
ICRAF	World Agroforestry Centre
Lao PDR	Lao People's Democratic Republic
MAF	Ministry of Agriculture and Forestry
NUOL	National University of Laos
NEM	New Economic Mechanism
NGO	nongovernmental organization
NTFP	non-timber forest product
TLIC	Turning Land Into Capital
TNI	Transnational Institute
PES	payments for ecosystem services
PLUP	participatory land use planning
REDD+	Reducing Emissions from Deforestation and Forest Degradation +
RILS	Rubber Integrated Livelihood Systems

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# 1 Introduction

Over the past decade, the cultivation of rubber trees<sup>1</sup> has expanded rapidly throughout the Mekong region, from more established centers of production in Thailand, China and Vietnam to new sites in Laos, Myanmar and Cambodia (Fox et al. 2014). Much of this expansion is due to rising demand for rubber from China and related increases in rubber prices from 1990 to 2010.<sup>2</sup> Concurrently, the governments of Laos, Myanmar and Cambodia have initiated economic, political and legal reforms that have opened up their countries to higher levels of foreign investment and trade. They have promoted the industrialization of agricultural production, particularly of rubber, as a strategic cash crop (Fox et al. 2014). Consequently, rubber has expanded rapidly and extensively throughout all three countries, leading to extensive socioenvironmental transformations in rural areas. Such expansion has been halted, however, due to a crash in rubber prices since 2012.

In the Lao People's Democratic Republic (Lao PDR or Laos), a small amount of rubber was planted by the colonial French in the southern province of Champasak during the 1920s. However, the sector did not expand until the late 1990s and early 2000s, in response to demand from neighboring Vietnam and China, and to a rapid rise in global and regional prices for latex. Through exchanges of expertise, planting material and capital across the Lao–Chinese border, particularly through kinship and ethnic ties, a small number of farmers in Luang Namtha Province, northern Laos, began planting rubber. Plantations expanded most extensively and rapidly as a result of the entrance of Chinese rubber investment, beginning in 2003, particularly throughout the northern provinces of Luang Namtha, Bokeo, Oudomxai and Luang Prabang. Most Chinese rubber companies entered production contracts with Lao farmers, whereby each partner would provide essential inputs, and then the trees, latex, or revenue would be divided amongst them (Shi 2008). Some Chinese companies were able to acquire modest-sized land concessions. However, since 2005, large-scale land concessions have mostly been granted in the central and southern provinces to Vietnamese investors, and to Chinese and Thai investors to a lesser extent (Schönweger et al. 2012). Estimates of the amount of rubber trees planted throughout the country vary and should be used with caution. However, data collected by 2010 showed that 129,000 ha of land has been granted for rubber concessions (Schönweger et al. 2012), although not all of the land granted has necessarily been cultivated with rubber. The National Agriculture and Forestry Research Institute (NAFRI) estimated that in 2008, 140,000 ha of rubber had been planted (Douangsavanh 2009), while more recent estimates reported in the Vientiane Times newspaper that 300,000 ha had been planted nationwide (Vientiane Times 2012). Rubber plantations are mostly concentrated in the northern and southern provinces of Laos.<sup>3</sup>

The rapid expansion of rubber in Laos and other new sites of production in the Mekong subregion has generated critique and concern due to the social and environmental implications of monoculture production, particularly in the form of large-scale plantations. Numerous research projects have found that despite the promise that rubber will reduce rural poverty, the opposite effect can occur due to a number of conditions, such as if farmers do not retain control of their land or rubber trees, if contracting arrangements between investors and farmers are unfair and exploitative, or when rubber prices bottom out, among other factors (Shi 2008; Kenney-Lazar 2012; Fox and Castella 2013). Additionally, rubber plantations have been shown to be a cause of deforestation (Shi 2008; Kenney-Lazar 2010; Molina 2011) and a loss of biodiversity and ecosystem services (Alton et al. 2005; Ketphanh et al. 2006), especially due to poor land zoning processes. In mountainous areas of Southeast

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1 In this report, the term rubber only refers to the latex from rubber trees, not manufactured synthetic rubber.

2 Global and regional rubber prices began dropping dramatically in 2011, slowing the expansion of new rubber plantations in these countries.

3 Northern provinces with high concentrations of rubber include Luang Namtha, Bokeo, Oudomxay and Luang Prabang. In the south, there are significant plantations in Savannakhet, Salavane, Xekong, Champassak and Attapeu provinces.

Asia, rubber has been shown to induce drier conditions at the local level, surface erosion, loss of soil health, sedimentation and disruption of stream flows, and risk of landslides (Ziegler et al. 2009). Additionally, carbon emissions are likely to increase when primary or secondary forests are converted to rubber (Fox et al. 2014; Warren-Thomas et al. 2015).

This research project is a response to the challenges and opportunities offered by the rubber boom in mainland Southeast Asia. The project has two main objectives. The first is to analyze the range of obstacles that prevent the emergence of ‘green’ rubber. The second is to identify policy and governance mechanisms that enable rubber production to be ‘greener,’ both environmentally and socially.

The term ‘green rubber systems’ is not well-defined in the literature and is largely a concept used to stimulate research and analysis on the potential for improving the environmental and social dimensions of rubber production. In this project, green rubber is framed as rubber production and trade that supports the maintenance or enhancement of ecosystem services, and that contributes to intrahousehold empowerment of women and poverty alleviation at both the household and community scales.

This report focuses on both governance challenges and opportunities for the emergence of green, or at least *greener*, rubber systems in Laos. A key finding of the report is that one of the main challenges for developing green rubber in Laos is a lack of direct government support – in the form of policy and extension – for the types of rubber production that provide benefits for smallholders and maintain ecosystem services. Effective policy and extension approaches include private land tenure and usufruct rights for farmers, subsidized agricultural inputs, low interest loans and technical agricultural extension support (Fox and Castella 2013). Problematically, there is a high level of governmental support for large-scale agribusiness production of rubber, which provides fewer benefits to smallholders and the rural poor and creates larger-scale environmental impacts. Nonetheless, there are a number of opportunities for greening rubber systems in Laos by way of state-led, community-based and novel or emerging regulatory systems.

These findings are supported in the following sections of the report. Section 2 provides an overview of the analytical methodology employed in the project. Section 3 examines the national policy context of rubber production in Laos, providing an analysis of the various types of legislation and policy that promote and support rubber production, and guide different types of cultivation. Section 4 outlines the various types of rubber production that are actually occurring and their environmental and livelihood outcomes: rubber concessions, contract farming and smallholding production. Section 5 defines three different types of governance processes that not only constrain but also enable the potential for green rubber in Laos – these include community-based mechanisms, traditional state-led regulatory mechanisms and novel or emerging regulatory systems.

## 2 Analytical methodology

The green rubber research project is geographically focused on Laos and Myanmar, with this report focusing on the former country. The methodologies used to collect and analyze data are the same for both countries, as described below. The approach for data collection was relatively straightforward – the country studies use the existing available literature, focusing on scholarly articles and gray literature. The libraries searched included Google Scholar and the Lao Farmers and AgriBusiness (LaoFAB) Online Document Repository.<sup>4</sup> A number of different keywords were used in the search, including: rubber, agroforestry, Laos, Thailand, Southeast Asia, land concessions, contract farming and smallholder production. All major sources relevant to the research focus for both countries were collected – such as literature on policy and legislation, international development support, livelihood and environmental outcomes, governance processes, etc. The sources collected are representative of current debates on policy and land and resource governance mechanisms and development outcomes of rubber production.

In addition to a review of relevant documents and literature, consultations were held with key stakeholders working in the nonprofit and academic sectors who are specialists in the development of rubber production in Laos. They were asked questions on the following themes: the key environmental and social challenges facing rubber development, governance challenges and opportunities for rubber and the potential for developing green rubber in the Lao PDR context.

There are four main aspects of rubber production examined and analyzed in the study: 1) the policy context of rubber production in each country, 2) the range of livelihood and environmental outcomes taking place as a result of rubber production, 3) the obstacles that prevent the emergence of green rubber production, and 4) the governance possibilities for the emergence of green rubber. The analytical methodologies for each of these components is described below:

1. *National policy context of rubber production*: Based upon the literature and research available, the policies, legislation and regulations for each country that are relevant for rubber production are identified. Consensus within the literature was sought as to how the relevant policies have led to the emergence of rubber production, in particular leading to the predominance of different social and political–economic modalities, such as independent smallholder production, contract production between farmers and investors and large-scale estate production via land concessions.
2. *Livelihood and environmental outcomes*: In this component the analysis focuses on common livelihood and environmental outcomes, both positive and negative, resulting from the production of rubber. Specifically, positive and negative outcomes are examined for different modes of production, i.e. smallholding, contract farming and concessions. There is a wide range of perspectives concerning the social and environmental impacts of rubber production, and therefore the analysis utilizes evidence-based studies that have collected primary field data on livelihood and environmental outcomes.<sup>5</sup> In cases where studies have found conflicting results, the range of outcomes reported is presented rather than focusing on one type of impact over another.
3. *Obstacles to the emergence of green rubber*: Based upon the analysis of previous studies and our own analysis of the various factors influencing different social and environmental outcomes, the main obstacles that prevent the emergence of green rubber production systems are identified. This includes a variety of different aspects, such as biophysical, technical, socioeconomic and political–economic constraints. This section examines how these various obstacles actually prevent the emergence of green rubber, based on evidence found in the reviewed literature.

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4 <http://www.laofab.org> (this database of references is on a freely accessible website that requires the user to register).

5 It is possible that already conducted research studies may have focused on the worst case scenarios, thus biasing the outcomes of the literature review.

4. *Green rubber governance possibilities:* The final component of the project utilizes all of the other components to identify various possibilities for improving the governance of rubber production to move toward green rubber. Such possibilities are examined along the lines of community-based, traditional state-led regulatory, and novel or emerging regulatory mechanisms. Examples of community-based mechanisms are community forestry or communal land management approaches. Traditional state-led regulatory mechanisms, particularly the implementation of safeguards for managing social and environmental outcomes, might include land zoning and policies promoting different types of production schemes. Novel or emerging regulatory, voluntary and market-based instruments include payment for ecosystem services (PES) schemes, the imposition of ecological taxes or fines, subsidies or tax breaks for green rubber production, or preferential purchase programs. Such systems could only be effective if implemented with clear criteria and indicators for what constitutes 'green rubber.' The analysis focuses on the types of schemes that are already present in each country and that have been assessed within the literature, as these are the schemes that have been implemented thus far. Additionally, a discussion is included of additional mechanisms or approaches that have yet to be developed, but could be appropriate for the country context.

# 3 National policy context of rubber production in Laos

The expansion of rubber in Laos since the late 1990s and early 2000s can be viewed within the policy context of the country's transition from subsistence economies toward state-coordinated, market-oriented development, a heavy emphasis on agro-industrial cash crops and a push toward attracting large-scale foreign investment. Such a transition was initiated by the introduction of the New Economic Mechanism (NEM) in 1986, which led the national economy on a path toward greater liberalization, releasing controls on markets and trade, and ultimately encouraging foreign investment. An important dimension of the push toward market integration was encouragement of commercialized agriculture, especially as a replacement to agricultural production viewed as unproductive, such as shifting cultivation. Since the 1989 National Forestry Conference in particular, the government has led a sustained effort to stabilize and eventually eliminate shifting cultivation – replacing swidden fields with cash crops is one strategy of doing so, rubber being viewed as an ideal replacement over the past two decades (Alton et al. 2005; Shi 2008).

While promoting smallholder agricultural commercialization, the Lao government has increasingly pursued large-scale agro-industrial development schemes with the aid of foreign investment. The use of state land by foreign and domestic investment projects was first authorized by the 1992 Prime Ministerial Land Decree, which permitted state land leases and concessions. Land concessions were supported, although informally, and were promoted by the 2006 government approach of Turning Land Into Capital (TLIC), which sought to enhance the value of land through investment and the creation of land markets. The approach of TLIC was then used in particular cases to endorse and approve large-scale land investments, including the development of rubber plantations via land concessions, particularly in the central and southern provinces (Dwyer 2007, 2013b). Many of the land concessions for rubber plantations in the central and southern regions of Laos have been established by Vietnamese corporations, while some Chinese and Thai companies have also planted a smaller area of plantations in this subregion (Schönweger et al. 2012). In contrast to smallholder and contract production in the north, the impacts of land dispossession and livelihood displacement as a result of rubber plantations are much more extensive in the south (Baird 2010; Kenney-Lazar 2012; Global Witness 2013).

Rubber production in northern Laos has largely developed along the lines of smallholding production and contract farming between Chinese companies and Lao villagers (Shi 2008). Chinese investment in the region has been heavily influenced by China's opium substitution program, which began in 2006. The aim of the program is to reduce the import of opiates into China from Laos and Myanmar by providing opium farmers in those countries with alternative livelihood options and thus reducing the production of opium for export (TNI 2010). Under the crop substitution component of the program, companies participating in the scheme receive various forms of state subsidies and financial incentives, such as eased bureaucratic procedures and labor regulations, tax exemptions, subsidized investment depending on the size of the project, and difficult-to-attain permission to import crops. In northern Laos, however, Chinese companies have largely been unable to secure land concessions and thus have had to invest via contract farming. This is largely due to a 2005 agreement among governors of the three northern provinces of Luang Namtha, Bokeo and Oudomxai to promote contract farming and restrict concessions in order to avoid the negative social and environmental impacts associated with the latter (Vongkhamor et al. 2007).

In addition to the attempt to restrict the development of concessions by governors in the north, other legislative decisions represent the government's unease with the concessions model. Since 2007, the Lao government has imposed, but also repealed at certain points, a series of moratoriums on land concessions. The most recent moratorium, which was passed by the Prime Minister in 2012 (Order 13/PM 2012) and in effect until the end of 2015, put a temporary ban on all new land concessions for eucalyptus plantations, rubber plantations and mining. The purpose of the moratorium is to provide a period of time for assessing the impacts of concessions in these sectors and consider legislation for addressing negative impacts and maximizing positive dimensions. Thus, there is an opportunity in Laos to reflect upon the approach toward planting rubber and to consider alternative directions.

## 4 Socioecological dynamics of Lao rubber

The focus of this section is the varying socioeconomic forms in which rubber is produced in Laos, and the social and ecological dynamics of these differing forms, or in other words, the variation in degrees of rubber being 'green.' There are three main ideal types of rubber production in the country: 1) estate plantations established by agribusinesses, often on land acquired through government land concessions; 2) contract farming, whereby a joint arrangement is set up between investors and farmers, based upon some sort of division of inputs and production revenues; and 3) production by smallholding farmers, whereby farmers use their own land, labor and capital to establish their plantations. For social dimensions, each type of production is reviewed based upon the degree to which it has affected household poverty, social empowerment and gender relations. For environmental dimensions, rubber production is reviewed in terms of a variety of impacts, such as deforestation, biodiversity, soil quality, pollution and impacts upon ecosystem services. The key socioeconomic and environmental dynamics of each type of rubber production are summarized in Table 1 below.

**Table 1. Typology of rubber production arrangements and associated socioeconomic and environmental dynamics in Laos.**

Type of production	Socioeconomic dynamics	Environmental dynamics
<i>Estate plantations (land concessions)</i>	Dispossession of villagers' agricultural and forest land with minimal and inconsistent cash compensation	Deforestation and loss of biodiversity
	Wage labor opportunities are available, but do not compensate for income and subsistence from expropriated lands and natural resources	Loss of ecosystem services Pollution (runoff from use of fertilizer, pesticides, and herbicides)
	Villagers do not directly bear the costs of price crashes	Damage to local landscape (debris-filled and dry streams)
<i>Contract farming</i>	De facto dispossession of agricultural and forest lands in land-sharing contracts	Deforestation and loss of biodiversity, but at a smaller scale than for estate plantations
	Potential for income generation dependent upon fairness of benefit divisions (revenue or latex)	Loss of ecosystem services, but at a smaller scale than for estate plantations
	Enables smallholders to access capital and technical expertise when they otherwise might not be able to	Pollution (runoff from use of fertilizer, pesticides, and herbicides), but at a smaller scale than for estate plantations
	Farmers are susceptible to risk of price crashes	
<i>Smallholding</i>	Smallholders maintain control of land	Deforestation and loss of biodiversity, but at a smaller scale than for estate plantations
	Smallholders gain full benefits of latex production and revenues, but must access capital and technical expertise independently	Loss of ecosystem services, but at a smaller scale than for estate plantations
	Farmers are susceptible to risk of price crashes	Pollution (runoff from use of fertilizer, pesticides, and herbicides), but at a smaller scale than for estate plantations

Sources: Alton et al. 2005; Obein 2007; Vongkhamor et al. 2007; Luangaramsri et al. 2008; Shi 2008; NLMA et al. 2009; Baird 2010; Dwyer 2011; Molina 2011; and Kenney-Lazar 2009, 2012.

## 4.1 Land concessions and agribusiness estates

Cultivation of land concessions has become the predominant means by which rubber is produced in Laos. Most concessions for rubber have been granted in southern Laos to both private and state-owned Vietnamese companies – the largest concessions are for 10,000 ha (Obein 2007). Smaller concessions, however, are located throughout the rest of the country, and have been granted to Thai and Chinese companies in particular. Land concessions fall within the government's broad approach of turning land into capital, as they theoretically generate revenue for the government from concession fees and taxes. Land is rented from the government – smaller concessions can be granted by the provincial government while larger concessions must be granted by the central government – for rates between US\$5 and US\$30 per hectare per year<sup>6</sup> for periods of 30 to 50 years (Decree 135/PM 2009). However, rubber companies are often provided an exemption from the concession fee for the first five to seven years of the project, before they are able to harvest the latex and gain a profit, thus delaying the revenue stream and reducing the total amount received. Additionally, one research project conducted toward the beginning of the concessions boom showed that concessions were not providing much revenue to the government – total revenue from concessions of state land assets in the 2004–05 fiscal year only represented 0.24% of national GDP (Schumann et al. 2006).

Apart from generating revenues and taxes, the Lao government views land concessions as a strategy for generating rural development, particularly by creating jobs in rural areas, with the goal of alleviating poverty and transitioning farmers into a modern economy (Dwyer 2007). Not only are concession companies encouraged to hire local labor, but they are required by the Labor Law to provide priority to Lao workers and that a majority of workers be Lao.<sup>7</sup> Thus, the main benefit that rubber concessions provide to local communities is the opportunity for employment. Wages on the plantations are low to moderate, between 25,000 to 50,000 kip per day (approximately US\$3.15 to \$6.25) and in some cases provide welcome cash income to farmers whose livelihoods are primarily subsistence based (Luangaramsri et al. 2008; Molina 2011; Kenney-Lazar 2012).<sup>8</sup> An additional benefit for villagers when they work as wage laborers rather than establishing their own rubber plantations is that they are not affected directly when rubber prices crash. In the case of estates, the investing company rather than the worker bears all of the risks for changes in the price of latex. The major effect would be indirect, if the company hires fewer laborers due to lower profitability of production.

Research, however, has shown that farmers in the areas surrounding the rubber project do not work on the plantation for two reasons (Baird 2010; Kenney-Lazar 2012). The first is that the amount of labor available is variable – not much labor is needed during the first seven years (because there is no rubber to harvest), apart from the very first year when labor demands are high for clearing land and planting the trees. The second is that farmers do not want to work as daily wage laborers – they are used to and prefer to work based upon their own schedule. They prefer to work when they are in need of cash and take days off for village events, which does not suit the company's needs for regular employment.

The main problem with wage employment, however, is not the wages or availability of work but that it is rarely adequate and commensurate with the lands, resources and ecosystem services that communities lost to the plantation (Fullbrook 2009; Wright 2009; Baird 2010; Molina 2011). Wage

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6 The difference in rates depends on when the agreement was signed and where the project is located. Rates for projects signed after 2009 are higher due to a Prime Ministerial decree passed that year increasing the fees. The rates are higher for land concessions in districts with better infrastructure (roads, electricity) than in those with less.

7 The Labor Law of 2006 put a cap on the percentage of foreign employees in the work force – less than 10% of manual workers and less than 20% of skilled professionals could be foreign. The 2013 amended Labor Law increased these percentages to 15% and 25%, respectively.

8 It should be noted that these data on wages are biased from the south. Wage rates in the north may be higher due to scarcity of labor, but the economics of employment on rubber plantations is generally understudied and insufficient data are available.

labor can be beneficial for households or communities near the plantation, if they did not have to concede critically important lands and resources for the rubber plantation. Most communities near the project, however, lost access to household and communal agricultural and forest lands and this is the principal social and ecological impact of concessions upon communities. Legally speaking, companies are granted concessions of state land, but in reality there is little available land owned by the state that is not used by Laotian rural communities, and often that land has been in use and under local customary tenure systems for multiple generations (Barney 2009). Thus, state land concessions for rubber plantations lead to the direct dispossession of lands and resources that are critically important for the livelihoods of rural people, especially the rural poor (NLMA et al. 2009; Baird 2010; Kenney-Lazar 2012). While concessions often target lands regarded by the state as ‘degraded,’ particularly swidden fields and fallows and communal forest and livestock grazing areas, these lands are important for local livelihoods and the provision of ecosystem services (Baird 2014). A national land concessions inventory conducted from 2007 to 2011 showed that the majority of land concessions (45%) were granted on the land cover class ‘unstocked forest and ray,’ which consists of upland or small-scale agriculture (Schönweger et al. 2012). Without access to these resources, farmers have to supplement them with market-purchased items – most research has shown that the wages gained on plantations are not sufficient to replace the loss of subsistence items (Obein 2007; NLMA et al. 2009; Fullbrook 2010; Kenney-Lazar 2010).

Rubber land concessions are also known for generating significant environmental impacts, which create direct losses for rural communities and also lead to degradation of the national environment. There are a number of cases in which concessions have led directly to deforestation by allocating areas with dense forest areas for concessions, allocating lands within protected and conservation forests, and cases where investors have cleared beyond the boundaries of their allocated concession and into areas with high forest cover (Schönweger et al. 2012). There are anecdotal examples of significant logging occurring in rubber concession areas. For example, Kenney-Lazar (2010) found that in the lands cleared by the Vietnamese rubber company HAGL in Attapeu Province, valuable hardwood timber was stacked and awaiting pickup. HAGL has an extensive logging and wood furniture business, including a furniture factory in Attapeu, and thus likely had rights to the timber in the concession area. In such cases, however, it is often unclear whether the company or the government has legal rights to the timber and which actor profits from its sale.

In addition to deforestation, rubber concessions can have destructive impacts upon the rural landscape and associated ecosystem services important for communities in the area. Legal prohibitions against clearing within 50 m of streams and rivers are oftentimes not followed – they are filled in with soil and debris when clearing land for the plantation, leading to a destruction of local watersheds, transformation of local water flows and negatively affecting village water sources. Villagers often report that streams and rivers dry up after plantations are established, partly due to reckless land clearing but also potentially due to heavy water use by the rubber trees (NLMA et al. 2009; Kenney-Lazar 2010). The clearance of forested areas, both primary and secondary, and of swidden fallows leads to a loss of biodiversity, which impacts livelihoods by reducing the availability of non-timber forest products (NTFPs), which play an important role in diversifying local diets and providing nutrients, and are also used as a primary source of cash income. Another important ecosystem service lost to concessions is the availability of lands – forest and grasslands – for cattle grazing.

Finally, estate rubber plantations have a strong environmental footprint because of the pollution resulting from their often heavy use of fertilizer, pesticides and herbicides. The most significant impact of the use of agricultural chemicals is the use of herbicides, sprayed in between the rows of rubber trees to kill weeds to reduce the labor costs for removing or cutting the weeds manually (Obein 2007). Villagers often report that the herbicides, along with other chemicals, are heavily used and run off into nearby streams and rivers, thus polluting the village water supply – as a result, villagers are afraid to drink and bathe in the water (Kenney-Lazar 2010).

In sum, estate rubber plantations by agribusinesses on land granted via state land concessions are far from comprising a green form of rubber production due to the significant negative social and environmental impacts that commonly occur. Rather than alleviating household- and community-level poverty, rubber concessions are more likely to increase poverty. They additionally disempower households and communities by expropriating their lands and impelling them to become dependent upon the company to make a livelihood as wage laborers. Rubber concessions tend to degrade rather than maintain ecosystems through deforestation, loss of biodiversity and ecosystem services, damage to landscapes and pollution.

## 4.2 Contract farming

Another predominant form of rubber production, although primarily found in northern Laos, is contract farming. As described in Section 3, contract farming is more common than land concessions in the north due to an agreement by governors of the northern provinces to limit concessions; thus, contract farming became the primary mode via which companies invested in rubber production (Vongkhamor et al. 2007). Contract farming takes place between Laotian farmers and a variety of different types of investors, mostly Chinese companies but also Chinese–Lao joint ventures, Lao companies, independent Lao investors and wealthier rural households seeking to expand plantations beyond their own lands. There are a wide variety of contract farming arrangements that occur, in terms of inputs provided and division of output materials or revenues. For the sake of simplification, two broad types of contract farming are discussed: 1) contracts whereby the harvested product is divided, popularly known as “2+3” contracts, and 2) contracts whereby management of the land is divided at some point during production, popularly known as “1+4” contracts (Shi 2008).

Contracts that divide the harvested product are often referred to as “2+3” based upon which party provides the five required inputs of rubber production and sale. The farmer provides two inputs without compensation, her/his land and her/his household’s labor. The investor provides the three other inputs: capital (particularly rubber seedlings, fertilizer and tools), technical expertise for growing rubber, and access to a market to sell the latex, meaning that they will purchase the rubber from the farmer. At harvest, the latex is divided between the investor and farmer – the farmer typically retains 60 to 70% of the product (Kenney-Lazar 2009).

Contracts that divide management of the land are referred to as embodying “1+4” projects because the only uncompensated input the farmer provides is land, as she/he is paid daily wages for her/his household labor on the plantation. As planned in the contract or agreement, these contracts would lead to the division of trees or land rather than the latex at harvest, but whether these plans are actually followed in practice has yet to be studied. In the agreements, the farmer would retain control of only 30 to 50% of the land, depending upon the contract and the investor.<sup>9</sup> This division would occur at some point during the growth of the trees, anywhere between the first to seventh year, depending upon the contract. Additionally, the farmer would no longer be paid a wage for laboring on her/his own portion of the plantation after the division has occurred (Kenney-Lazar 2009). This type of contract is in many ways similar to a land concession, as the investor gains control of a certain percentage of the land for the duration of the rubber plantation, which can be 30 to 40 years (Shi 2008). Furthermore, larger investors such as Chinese rubber companies often sign contracts with the whole community, rather than with individual households, for communal land and thus are able to gain control over a much larger plot of land than if they had only signed with individual households.

In contrast to rubber concessions described in Section 4.1, contract farming offers a number of social advantages to farming households. Farmers without enough capital to grow rubber independently are given the opportunity to produce rubber with the financial and technical support of an investor – this is

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<sup>9</sup> Small-scale investors such as wealthier farmers tend to strike agreements that divide the land between each party more evenly, often dividing to give half each (Kenney-Lazar 2009).

especially important for farmers who may have enough capital to purchase the required inputs, but after converting rice fields to rubber would not be able to produce enough rice or afford it during the seven years prior to harvesting latex and gaining an income. Additionally, they are able to retain control over at least part of their land. Farmers should, in theory, be able to increase their incomes and alleviate poverty by growing rubber through contracts with external investors.

In reality, however, there are a number of pitfalls associated with contract farming that have limited the ability of farmers to profit. The most obvious are those associated with contracts that divide land, as the farmer or community loses control over a large portion of their land to the investor, and are thus left with little land from which to earn an income (Shi 2008; Dwyer 2011). A major problem with contracts that divide latex is that some farmers are unable to support themselves during the seven years prior to harvest after converting their rice fields to rubber, particularly if they lack other sources of income. In some cases, they borrow money at high interest rates to purchase rice and wind up in a vicious cycle of debt, thereby increasing their food insecurity (Nanhthavong 2012). A more general problem related to commercialized agricultural production is that even when poverty is alleviated in the short term, it leads to longer-term environmental risks and costs that can cancel out the short-term gains (Wong et al. 2014). Vongkhamor et al. (2007) note that many smallholders were not interested in contract farming, even when the farmers retained 70% of the latex, because they felt that they could cultivate the crop on their own and retain all revenue.

Another major problem that plagues contract farming is that farmers bear a significant amount of the risk if rubber prices crash, a problem that farmers are currently dealing with. Since 2012, rubber prices in Luang Namtha, northern Laos have been falling, and in 2014 they fell to a quarter of their highest price in 2011 (Vongvisouk and Dwyer 2016). Many farmers were prepared to endure seven years of hardship prior to tapping the latex due to the promise of high rubber prices and incomes, while the low rubber prices have made their investment of land, time and labor less worthwhile. The silver lining to the rubber price crash is that the rubber agribusinesses are less interested in their investment and in certain cases are letting the farmers tap and sell all of the latex, rather than dividing the revenues because the low prices make the latex essentially worthless for the companies (Shi 2015). Farmers, however, have been able to continue tapping their trees and making a small amount of extra cash income, despite the low prices.<sup>10</sup> If prices rise again there may be conflicts between farmers and investors concerning the terms of the contracts. Yet many farmers have already begun to convert their rubber plantations to banana or maize crops.<sup>11</sup> Additionally, farmers have been selling their tree plantations to larger landholders, thus leading to the concentration of land ownership throughout the area (Vongvisouk and Dwyer 2016).

Environmentally, many of the impacts of rubber plantations produced via contract relations are similar to those from large-scale concessions, but occur to a lesser degree. Small-scale plantations tend to replace swidden fields and fallows, reducing associated ecosystem services, biodiversity and the availability of NTFPs. In some cases, they encroach upon intact primary forest areas, but this occurs rarely and to a minor degree in comparison with large-scale state plantations (Shi 2008). Small-scale plantations also use fertilizer, herbicides and pesticides, but to a much lesser degree than large-scale plantations (Shi 2008).

Rubber contract farming, as it currently operates in Laos, is generally a greener form of production than that on large-scale estates or concessions, as there are more opportunities for farmers to increase incomes and to retain greater control over their lands. In addition, farmers find that using their labor on their own farms is less disempowering than being dispossessed of their land and working as wage laborers in estate plantations. While the environmental impacts related to monocropping are broadly similar, the impacts

10 Who these farmers are, however, is not always clear. Shi (2015) finds that since the planting boom of the 2000s, rubber plantations have been exchanged and consolidated, and thus the successful 'smallholders' may be acquiring much larger plots of land.

11 In Bokeo, most rubber plantations have been converted to banana plantations, as reported by Stuart Ling on the online LaoFAB forum on 25 September 2015. Ling is a long-term consultant based in Bokeo researching labor conditions on banana plantations. Via personal communication, Dr. Grace Wong, a senior scientist at CIFOR, learned in August 2015 from conversations with officials at MAF and NUOL that farmers are already converting rubber to maize.

from contract farming are lower due to the smaller scale of production and the role that farmers play in choosing which lands to convert to rubber. The social–environmental impacts of rubber contract farming, as it currently operates, differ depending upon the type of contract. Latex-sharing contracts provide greater social benefits to farmers than do tree-sharing contracts. Latex-sharing contracts provide a greater cut of the revenues to the farming household, thus increasing the potential to profit, and the farmer does not lose control of her/his land in the process, in contrast to tree-sharing contracts. However, not all farmers are able to or prefer to wait seven years to harvest latex and gain an income, and thus in certain cases, they have preferred to get paid immediately in the tree-sharing schemes (Shi 2008). Furthermore, tree-sharing contracts target large areas of village communal land, similar to a concession, and thus can lead to the conversion of larger areas of swidden fields and fallows, driving swidden agriculture into more remote forest areas (Dwyer 2013a).

### 4.3 Independent smallholding production

Smallholding contract production in northern Laos is quite common. Equally common is independent production by smallholder farmers who produce rubber without engaging in a production contract with an investor. They raise their own capital to purchase seeds or seedlings, learn the technique on their own (often through connections with other rubber growers), use their own land and labor, and plan to sell the rubber on their own (although they are often unsure of who exactly they will sell it to, claiming prior to the rubber crash that Chinese traders would purchase their product) (Kenney-Lazar 2009). As a result of their independent production, these farmers have the right to retain all revenue from the harvested latex, although studies have not been conducted on how they fared after the rubber crash. Although they produce rubber independently, they are dependent upon the market, particularly on Chinese traders, for inputs (seedlings, fertilizer and tools) and the sale of latex. Additionally, some farmers raise capital by taking out loans, thus creating dependence on creditors (Alton et al. 2005). Nonetheless, independent smallholding production occurs throughout northern Laos, occurring in Luang Namtha, Bokeo, Oudomxai, Phongsaly, Xayaboury and Luang Prabang provinces.<sup>12</sup> In one study, 72% of the households growing rubber in Luang Namtha and Bokeo provinces were independent producers (Kenney-Lazar 2009).

For farmers that can afford it, independent smallholding production is the most socially advantageous form of rubber production, because the farming household is able to reap all of the revenues from production and has the potential to significantly increase household income, or at the very least gain access to some cash income. Additionally, labor costs for smallholders are lower than for agribusinesses because farmers employ themselves and can exploit non-wage household labor – therefore, smallholding production can remain profitable when international prices are low (Delarue 2009). The caveat is that many farmers are unable to afford independent production. Not only do they have to purchase the seeds, seedlings, fertilizer and tools, they must access enough capital, land and labor to grow the rubber trees for seven years prior to the first harvest without jeopardizing household access to food. Additionally, producing rubber independently puts a level of risk upon the household greater than the risk the households face if they grow rubber trees in contract with an external investor – the cost of tree failure or price crashes fall completely upon the household and thus it is important that households are able to cope with such crises.

Another social advantage of independent rubber production is that farming households have the freedom and potential to engage in cooperative forms of production and marketing with other households in the community or even among villages (Shi 2008). This has not commonly occurred, however; the best known case of cooperative production and marketing is Had Nyao village (which is also the most well-known case of successful independent rubber production in Laos). Production groups of 13 to 14 households were created whereby the households would work in rotation across

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<sup>12</sup> While a precise definition of smallholdings in terms of the size of land plots is not used here, plots referred to in this report are no larger than a few hectares of land.

the rubber fields of each household, thereby compensating for individual household labor constraints. Additionally, the villagers sold their rubber collectively in bulk to traders who came to the village to pick it up, thus increasing their marketing power (Kenney-Lazar 2009).

Environmentally, the impacts of independent smallholding production may be similar to those of contract farming. The impacts, however, are even smaller due to the smaller scale of the plantations, as the farmers have less capital for investment and also do not use large areas of communal lands, as is the case for the tree-sharing contracts. Plantations are mostly developed on lands that farmers find suitable for tree production without significantly impacting their surrounding environment, including ecosystem services and availability of NTFPs (Shi 2008). Nonetheless, smallholding monoculture plantations still reduce biodiversity, limit ecosystem services, and in some cases may lead to pollution from use of fertilizers and agrochemicals.

Of the three forms of rubber production occurring in Laos, independent smallholding production has the greatest potential for improving livelihoods by increasing incomes and alleviating poverty and limiting environmental impacts. Farming households are more empowered when they retain control over their land and labor in the rubber production process. Furthermore, their independence offers the greatest opportunities for engaging in cooperative forms of production and marketing and also greener forms of production, such as agroforestry and mixed cropping.

# 5 Greening rubber: Opportunities and challenges

This review shows that Lao rubber is produced and traded in a variety of social forms, none of which form ideal green rubber systems, but that vary in their ‘greenness,’ particularly in terms of their potential for poverty alleviation and social empowerment, and to a lesser degree in their environmental impacts. Thus, while there are a number of different opportunities and points of entry for greening rubber production in Laos, there are also many associated challenges as a result of the governance context. This section focuses on methods for promoting green rubber in Laos. Section 5.1 provides a conceptual overview for what an ideal green rubber system might look like, based upon examples from other countries in Southeast and South Asia. Section 5.2 reviews three different types of governance strategies for promoting green rubber systems in the Lao context: traditional state-led regulatory mechanisms, community-based mechanisms, and novel or emerging regulatory mechanisms.

## 5.1 Conceptualizing green rubber systems

As defined in the introduction, green rubber systems can be understood as rubber production and trade that support the maintenance or enhancement of ecosystems, and that contribute to intrahousehold empowerment of women and poverty alleviation at both the household and community scales. Such a broad definition means that there are a number of different ways in which rubber systems can be more or less ‘green.’ In this section, an ideal form of green rubber is described, which can be used as a point of comparison with the rubber production systems actually existing in Laos. It can potentially be seen as a goal for the development and evolution of rubber in the country. This ideal form of green rubber production would be smallholder-controlled production, using agroforestry or mixed cropping methods, and organized through a production or marketing cooperative, receiving technical and financial support from the state or nongovernment bodies. Additionally, rubber production should be spatially planned and zoned in such a way that it does not replace intact, dense primary forests, but rather leads to the generation of a dynamic and diverse agroforestry landscape of mixed and integrated land uses. Each of these various aspects of a green rubber system are described throughout the rest of this section.

Smallholder production has the greatest potential to provide benefits directly to the household and alleviate poverty. Smallholder rubber is not just an ideal – the majority of rubber production in the largest producer countries comes from smallholders: 93% of the sector in Malaysia, 90% in Thailand, 92% in India and 85% in Indonesia (Global Witness 2014). Not only can smallholder production increase incomes, it can do so in a way that empowers households and communities, as they maintain control over the production process, most importantly over their lands and labor, in comparison with the loss of power many experienced when working as wage laborers on large-scale plantations.

Smallholder rubber production has been shown to be more effective when organized in production and marketing cooperatives (Global Witness 2014). Cooperatives have played an important role in the rubber industry of India, which is the fourth largest producer of rubber globally (Indian Natural Rubber 2011). In the 1960s, the Rubber Board of India helped support the organization of district-level rubber cooperatives through organizational and financial support. In the state of Kerala, these cooperatives helped to improve the efficiency and productivity of rubber smallholder systems, enabling them to achieve a lower cost of production and better prices for their products compared with non-members. Rubber growers adopting a group approach could produce superior grades of rubber due to training from the Rubber Board and provision of facilities for processing good quality rubber. Growers were also more likely to adopt new technologies due to financial support from the Rubber Board as well as the strengthened bargaining power from being in the cooperative (Anjula et al. 2012; Varghese 2012).

From an environmental perspective, there are still a number of problems with smallholding production similar to those of large-scale plantations – agroforestry is one strategy of reducing environmental impacts, while also reducing the social risks of production.<sup>13</sup> Discussions of rubber agroforestry models are often based upon the model of ‘jungle rubber’ from Indonesia, which is a balanced, diversified system derived from swidden cultivation in which man-made forests with a high concentration of rubber trees replace swidden fallows (Gouyon et al. 1993). Most of the income derives from rubber, complemented with temporary food and cash crops during the early years. Perennial species that grow spontaneously with rubber provide fruits, fuelwood and timber, mostly for household consumption, and overall the system requires less input and labor (Gouyon et al. 1993). Since the 1960s and 1970s, with the development of high yielding clones, the tradition jungle rubber system, which uses seed-derived planting material, has become much less efficient compared with monoculture systems (Penot 1999), and consequently most farmers now practice monoculture. However, research by the World Agroforestry Centre (ICRAF) has shown that high yielding rubber clones can be combined with swidden cultivation without loss of latex productivity (Wibawa et al. 2006).

However, there are other types of rubber agroforestry or mixed cropping systems, some of which can be more productive and economically viable, such as mixed cropping systems in southern Thailand, as well as in Malaysia (FAO 2002). In Thailand, which is the largest producer of rubber in the world, producing 3.5 million metric tonnes annually – almost one-third of total global output during 2012 – the Thai government has promoted Rubber Integrated Livelihood Systems (RILS), a program through which smallholders are supported to combine rubber with livestock, fruit, fisheries, rice and other crops (Viswanathan 2008). There are four main types of rubber agroforestry or mixed cropping systems in southern Thailand (Somboonsuke 2011):

1. *Rubber–food intercropping systems*: short-lived plants such as pineapples, chilies, bananas, rice, sweet potatoes, long beans and maize, can be grown in between the rubber tree rows for up to three years before the trees shade out the crops.
2. *Rubber–fruit crop system*: fruit tree species such as guava, gnetum, long kong, salacca, mangosteen, durian and livistona can be grown in between the rubber tree rows throughout the whole productive period, as the fruit trees grow up with the rubber trees and thus continue to gain sunlight.
3. *Rubber–timber species systems*: timber species such as neem (*Azadirachta indica*) and teak can be grown in between the rubber tree rows throughout the life of the rubber trees.
4. *Rubber–livestock farming systems*: cows, poultry, swine, goat and sheep can be raised in the plantations once the trees are older than 18 months. An average of 6–8 livestock can be raised per hectare.

One of the main benefits of agroforestry and mixed cropping systems is that they diversify income and subsistence, thereby increasing the economic resilience of the farming system. Farmers can rely upon other trees, crops or livestock for income or consumption when rubber prices are low, thus creating a buffer for farmers’ incomes against price fluctuations. In Indonesia, when smallholders combine the production of rubber and rice, rubber provides income to meet needs for purchasing market goods while rice meets subsistence needs – this provides flexibility to smallholders in that they can abandon rice cultivation when rubber prices are high but return to it in economic downturns. This diversity is perceived by smallholders to be important – local farmers surveyed in Indonesia by ICRAF (2011) found agroforestry to be the most important use of land in comparison to both monoculture and simpler rubber crop systems, as it could provide a range of sources of income and food.

The other main ‘green’ dimension of agroforestry and mixed cropping systems is their ability to maintain and even enhance ecosystems. Such systems have a positive impact on soil quality, which leads to increased tree productivity – intercropping improves the soil due to nitrogen inputs from other crops, thus improving performance of the trees (Webster and Baukwill 1989 in Douangsavanh et al.

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<sup>13</sup> Agroforestry can be defined as the production of trees and crops or animals in the same area, either at the same time or in rotation. Agroforestry integrates trees, plants and animals in a long-term, productive system, thereby maximizing land use (Somboonsuke et al. 2011).

2008). One study in China shows that rubber trees yield more when grown with other crops than on their own in a monoculture plantation because fertile topsoil is lost in monocropping due to erosion, leading to lower yields overall and over time (Cardinale et al. 2011). Small-scale and diverse rubber systems can also reduce the detrimental effects of monoculture rubber plantations on species diversity and ecosystems. Species diversity is higher in agroforestry systems than in monocultures, and studies have shown that agroforestry systems can play an important role in the conservation of primary forest species (Cotter et al. 2008). Finally, mixed cropping systems, such as a tea–rubber intercropping system in Xishuangbanna, China, have been shown to sequester atmospheric CO<sub>2</sub> and increase soil organic carbon better than monoculture rubber (Zhang et al. 2007).

## 5.2 Governance mechanisms for promoting green rubber

There are a number of different governance approaches and mechanisms through which the types of green rubber systems described in Section 5.1 could be promoted in Laos. In this section, we focus on three broad avenues for promoting green rubber: traditional state-led regulatory mechanisms, community-based mechanisms, and novel or emerging regulatory mechanisms. All three mechanisms face challenges in the Lao governance context, but nonetheless should be promoted and could be more effective if promoted concurrently.

### 5.2.1 Traditional state-led regulatory mechanisms

Traditional state-led regulatory mechanisms are discussed first as they are likely to have the largest impact, considering the powerful role of the government in influencing the direction of the rubber sector. The Lao government can have an impact on greening the rubber sector in four ways: i) devise and implement legislative and policy reforms that support smallholding production over large-scale concessions, ii) implement participatory land use planning to zone out land socioecologically suitable for rubber production, iii) provide better financial, credit and extension services to support smallholder rubber production, especially more technically advanced agroforestry models, and iv) support the establishment of smallholding rubber cooperatives.

The Lao government needs to carry out a number of different reforms in the creation and implementation of legislation and policy that promote smallholding rubber over large-scale concessions, including the prohibition of land concessions for rubber plantations, regulation and enforcement of fair procedures and rules for contract farming, and the strengthening of rural land tenure.

The Lao government should prohibit, or at least limit, rubber concessions due to their heavy negative social and environmental impacts upon rural populations and ecosystems in comparison with contract farming or independent smallholding production. The ban on concessions by governors in the northern provinces, although not completely successful at eliminating all concessions from the north, has been highly effective at promoting alternative forms of production, even if some types of contract farming, such as tree-sharing models, mimic concessions in certain ways. Furthermore, smallholders can become an effective base of the rubber sector as evidenced by their predominance in the rubber landscape of the major rubber-producing countries. Prohibiting rubber land concessions would create important political pressure to ensure the success of the Lao rubber sector by supporting smallholders.

The government can also play an important role in ensuring that rubber contract farming is fair and beneficial for smallholders, increasing its potential for lifting farmers out of poverty. Although independent smallholder production is the ideal form of green rubber production, if land concessions are prohibited it is likely that rubber capital will go into contract farming arrangements with smallholders, which therefore need to be regulated. Such regulation should first entail the restriction of tree-sharing contracts as they reproduce the problems of concessions and fail to achieve goals of poverty alleviation and farmer empowerment. Latex-sharing contracts can be permitted, but other

contracting forms should also be explored, such as input and marketing contracts whereby investors provide inputs and are guaranteed rights to purchase the latex. An important component of ensuring that contracts are fair is that a process of free, prior and informed consent (FPIC) must be carried out prior to signing the contract to ensure that farmers are fully aware of the arrangement beforehand and choose to get involved. Ideally farmers would also have the option to choose among different investors to sign a contract that best fits their needs and interests. Finally, contracts should include a price floor so that if rubber prices crash, farmers are guaranteed a minimum price.

The state should additionally promote smallholding rubber production by strengthening rural land tenure, as farmers and communities without strong land tenure face a number of different challenges for growing rubber. At a most basic level, farmers without secure land tenure face difficulties securing access to loans and finance and thus become more dependent on growing rubber in contract with investors. If farmers are not confident that they will have long-term access to land, then they may not wish to cultivate a long-term crop due to the risk of losing the land and trees at a later point in time, especially if they are deemed to not have legitimate long-term land use rights. Finally, land tenure security can protect farmers against expropriation of their land for concessions or concession-like investments. Farmers' and communities' land tenure security needs to be strengthened for all types of land including swidden fields and fallows, communal lands and lands held under customary tenure. Strengthening land tenure can create an essential basis for encouraging farmers to engage in growing long-term crops such as rubber.

The second important role that the state can play in greening rubber, socially and environmentally, is in implementing participatory land use planning (PLUP) for the purposes of zoning areas of land that are socioecologically suitable for rubber production. PLUP is already an important program led by the government with the support of development agencies, NGOs and donors. The program is effective at delineating village boundaries, enhancing tenure by mapping out village agricultural and forest areas, and conserving forested landscapes. It does so by establishing rules for use and empowering villagers to protect such lands from degradation because of the participatory role that villagers play in this process. PLUP could be used as a basis for ensuring that rubber is planted on lands that are ecologically suitable for production, but also that reduce the extent of deforestation, biodiversity loss, and landscape and watershed damage that occurs as a result of converting land use to monocrop plantations. The participatory nature of the surveys would help to ensure that the targeted lands are not so important for village livelihoods that the community would prefer not to convert them.

The third major role of the state in regulating the rubber sector to promote greener forms of production is in providing better financial, credit and extension services to smallholding rubber producers. Countries with a strong smallholding rubber sector, such as Thailand and China, provide strong financial and technical support to smallholders, including minimum price supports, while countries without a strong smallholding sector such as Laos and Cambodia (Fox and Castella 2013) provide only minimal amounts of such support. These are necessary conditions for promoting small-scale over large-scale rubber plantations, because without this type of support, it is challenging for farmers to grow rubber on their own, thus increasing the likelihood that they end up in contract farming arrangements. Rubber is a significant investment for poor farming households – without credit it can be difficult for them to purchase seeds or seedlings and tools, and also have the means to survive the pre-harvest years without an income. In addition to credit, the government could provide tax breaks or subsidies to farmers that cultivate rubber in line with green rubber goals, although criteria and indicators would have to be developed for green rubber production, as discussed in Section 5.2.4. Importantly, the state can provide some degree of price support to farmers as a safety net when prices bottom out, which as the current crash shows is a major problem. Rubber production can also be technically demanding and thus smallholders require extension support – they may be able to figure out how to grow rubber on their own with the help of personal contacts, but they will need greater support to cultivate a highly productive rubber tree. This is even more critically important if agroforestry or mixed cropping models are to be pursued, as they require a higher level of technical knowledge that most farmers do not possess. Technical extension support can also be used to help farmers trade their crop at a decent price by helping farmers connect to market information.

Finally, the state can play an important role in promoting and establishing rubber cooperatives at the village level, or among a few villages. As discussed in Section 5.1, cooperatives can be an effective approach for providing households with the assets that they may be in short supply of, such as land, labor and capital, so that all households in the village can engage in production. They are also particularly useful for marketing products collectively so that the community can negotiate a higher sale price than a single household could independently. In some cases, such as Had Nyao village, these types of cooperatives might emerge organically or informally, but in many other cases the government could play a role in supporting their establishment. Setting up a cooperative in a way that is appropriate for villagers' livelihoods and that has a fair and democratic governance structure is challenging and requires external guidance, carried out in a participatory way that ensures that villagers' inputs are incorporated and that they provide their free, prior and informed consent throughout the process. The Department of Agricultural Extension and Cooperatives (DAEC) under the Ministry of Agriculture and Forestry (MAF) is the appropriate government body to work with to support cooperative groups.

### 5.2.2 Community-based mechanisms

Communities can also play an important role in the governance of how rubber is produced, including decisions as to whether rubber should be grown at all on their lands. They should also play an important role in some of the state-led regulatory mechanisms mentioned in Section 5.2.1. However, the opportunities for communities to play a strong role in the governance of rubber production in Laos is somewhat limited due to the top-down processes through which policy is implemented, cash crops are promoted, and investment projects are approved and established (Fullbrook 2009). The role of communities, however, can also be limited, particularly in their capacity to initiate governance transformations, and thus such initiatives require support from external governmental and nongovernmental institutions in order to be effective.

The main focus at the community level should be increasing community rights and power to self-govern land, forests and other resources, and the cultivation and sale of cash crops. The government should play a guiding and supporting role, allowing communities to participate in the whole decision-making process and ensuring that FPIC is followed. Many of these aspects are covered in Section 5.2.1 such as decision-making concerning fair rubber farming contracts, strengthening of rural land tenure, PLUP, and the establishment of cooperatives. In this subsection, three of these are elaborated upon in terms of the role of communities: rural land tenure, PLUP and establishing cooperatives.

While a number of legislative and policy reforms are necessary to strengthen rural land tenure, these changes will not be effective without the strong input, participation and demands of rural communities. One effective tool for empowering communities to protect their access to lands and resources, especially in the face of large-scale land concessions that could expropriate such lands, is legal education. NGOs, working in collaboration with provincial and district governments, have been successful in strengthening community negotiating power to prevent land dispossession by carrying out legal education concerning community rights to access, use, and manage lands and forests. In many cases, communities do not fully understand the law or even remember what they were taught clearly, but the legal education shows them that there are laws protecting their land and resource rights, and as a result they are more confident to refuse to concede land without negotiation and due process.<sup>14</sup>

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14 Personal communication and interviews with NGOs working on land rights in Laos.

Despite being a mechanism implemented by the government in cooperation with development organizations, PLUP is in many ways a community tool, as it is supposed to give the community the primary role of making decisions about land use boundaries and the management of village lands and resources (MAF 2010). The use of PLUP for zoning areas for rubber production should include close community involvement – the community should be the primary decision-maker for determining where to grow rubber. They are in the best position to decide which types of land are most socially and ecologically suitable for conversion to cash crop production, albeit with support from technical agencies regarding the environmental dimensions of land use conversion. Communities should be given the rights to make informed decisions as to whether to grow rubber, how much to grow, and upon what lands, and they can do so through PLUP as well as through any other mapping or zoning mechanisms utilized.

Finally, communities should play the primary role in the establishment of cooperatives. Although the state and development organizations are important for providing guidance as well as financial and technical support for the establishment of cooperatives, the community should themselves decide whether to establish the cooperative, and if so under what conditions and arrangements. Through direct participation in decision-making, the communities can ensure that the cooperatives are appropriate and suitable for their culture, location, land use and governance structures, thus ensuring that the cooperative will be successful in producing and selling rubber that can alleviate poverty, empower households, and maintain or even enhance ecosystems.

### 5.2.3 Novel or emerging regulatory mechanisms

There are some novel and emerging regulatory mechanisms that could potentially play an important part in the process of moving the Lao rubber sector closer to ‘green’ systems. These include sustainability initiatives led by the private sector, payment for environmental services (PES) schemes, and the program for Reducing Emissions from Deforestation and Forest Degradation (REDD+). Such mechanisms would be most effective if integrated with state-led and community-based mechanisms described in Sections 5.2.1 and 5.2.2.

Guidelines are slowly being developed for the global rubber industry to rein in the worst social and environmental impacts of rubber plantations, with the establishment of the Sustainable Rubber Initiative, which was endorsed by the World Rubber Summit in Singapore in May 2013. The aim of the initiative is to define a set of sustainability standards for rubber production to be implemented by all industry stakeholders along the supply chain. Also, some tire companies, like Michelin, want to minimize the risks associated with sourcing natural resources such as rubber and have developed independent sourcing policies applied throughout their supply chain (Global Witness 2014).

PES and REDD+ are two other novel schemes (regulatory and voluntary) that could potentially address some of the problems faced by farmers and communities engaged in rubber production or impacted by land concessions for growing rubber. PES can provide income to farmers who maintain or enhance ecosystem services through improved cultivation practices. In cases where investors use farmers’ or communities’ lands to plant rubber, payments could be made to farmers and communities for ecosystem services foregone, such as the collection of non-timber forest products (NTFPs), firewood and construction wood. Payments as part of REDD+ could potentially be used to dissuade farmers and rubber companies from converting intact primary forest to rubber plantations if there was a great enough financial incentive. There are doubts, however, as to whether REDD+ could be devised in a way that effectively motivates farmers to maintain or increase natural forests, as the payments to farmers may be too small to motivate them to switch from rubber (Fox et al. 2014; Wong et al. 2014). They could, however, encourage rubber cultivators to target less sensitive areas.

#### 5.2.4 Implementation and evaluation of green rubber governance

In order to implement and evaluate traditional state-led regulatory mechanisms, community-based mechanisms, and novel or regulatory mechanisms, it is important to develop specific criteria for measuring 'green' rubber in comparison with non-green rubber. Some of the broad dimensions of green rubber systems have been outlined Section 5.1, including:

- smallholder or collectively organized rubber production systems that enable producers to earn the majority of revenue from production and increase their income
- agroforestry models, which a) diversify income and increase farmers' socioeconomic resilience, and b) enhance soil quality, better sequester atmospheric CO<sub>2</sub> and better maintain species diversity
- land use and landscape zoning measures, which ensure that rubber is planted on ecologically suitable lands and do not lead to the clearance of dense forest areas.

These aspects of green rubber are not definitive by any means, and are open for debate and discussion. It is important to arrive at a consensus as to how rubber can and should be 'greened,' based on the perspectives and inputs of key stakeholders. Once the broad dimensions of what constitutes green rubber production have been agreed upon, it is necessary to detail specific criteria and indicators for green rubber systems, which can be used to measure the effectiveness of various governance approaches for developing green rubber.

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Over the past decade, rubber cultivation has expanded throughout the Mekong region, from established centers of production in Thailand, China and Vietnam to new sites in Laos, Myanmar and Cambodia. Rubber has brought opportunities for increased incomes and livelihood improvement as well as social and environmental risks. The 2012 drop in rubber prices has sent the sector into disarray, halting the expansion of rubber and constraining the ability of farmers and companies to profit. This study examines how rubber production in the Lao PDR is governed, especially the socio-ecological dynamics of varying forms of production: smallholding, contract farming and large-scale estate plantations. Based upon an analysis of secondary literature and interviews with key stakeholders, it was found that rubber production in the Lao PDR is for the most part not 'green,' meaning that it has not reduced poverty and protected ecosystem services and forested areas. The price crash has prevented most smallholding farmers from increasing their income. Wages on large-scale plantations have been low and only a limited amount of work for Lao people is available. Large-scale estates have been developed on land expropriated from communities and have replaced forested areas that provide important ecosystem services to local communities. The paper argues that if rubber is to be truly green, then significant changes to production and trade must be made, including minimum price supports from the state, appropriate land use planning measures, the establishment of cooperatives, the protection of community land rights, and the implementation of agroforestry rubber production models.



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