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Bounthong Bouahom¹ and Yasuyuki Kono²

1. Introduction

ASEAN's only landlocked country, Lao People's Democratic Republic (Lao PDR) is a mountainous country widely covered with tropical rainforests. Lao PDR embraces a rich natural environment, characterized by its abundant water resources derived from the Mekong River that flows through the country from north to south. Through economic reforms begun in 1986, designated the "New Economic Mechanism," Lao PDR has pursued a policy of economic liberalization and a market-oriented economy.

Laos is looking to transform itself from a landlocked country to a land-linked country through regional infrastructure development. Significant investments include the Laos-China railway, the East-West economic corridor, the Vientiane-Vang Vieng Expressway, dry ports, bridges and key road networks. The challenge is to ensure that Laos can fully benefit from this improved connectivity, not only as a transit country but also through increased economic activity and export volumes, value-added services, and the creation of new and better jobs.

In 2020, Laos was the number 113 economy in the world in terms of GDP, number 105 in total exports, number 121 in total imports, number 141 economy in terms of GDP per capita and the 104th most complex economy according to the Economic Complexity Index (ECI)³.

However, Lao investments in infrastructure development face risks. The cost of these investments is high, and Laos will only benefit from improved connectivity if it can successfully undertake complementary policy reforms and improve connective road infrastructure. Business and investment environment reforms must be accelerated to capture the full benefits. In addition, the railway poses macro-fiscal risks associated with

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³ <https://oec.world/en/profile/country/lao>

contingent liabilities and will also present social and environmental risks if management is not sound.

The construction of the first high-speed 414-km rail line between Kunming, southern China, and Vientiane, the capital city of Lao PDR, as part of the Kunming-Singapore railway, is now completed and began operation in December, 2021. The railway will be the “leap towards full connectivity with the region.”⁴ For the first three months of 2022 approximately 2.25 million passengers and 1.31 million metric tons of cargo were transported on the line following its opening on December 3⁵.

As the Lao economy begins its recovery from the effects of the worldwide slowdown caused by COVID-19, World Bank Key Findings in the April 2022 Lao PDR Economic Update ⁶ warned that the country faces challenges caused by long-standing macroeconomic vulnerabilities, fiscal deficit, increasing public debt levels, and by new pressures, including rising global commodity prices and sharp exchange rate depreciation. The government needs to prioritize appropriate measures and actions in order to resolve these long-standing issues.

Agriculture and forestry are a cornerstone of the development strategy of the Lao PDR, employing over 60% of the population (ILO, 2022). Despite this, agriculture makes up just 16% of the country’s GDP due to low productivity, small-scale production, as well as a lack of competitiveness and modernization (World Bank, 2022). Laos is heavily reliant on imports of machinery, animal feed, fertilizer and other agricultural inputs needed for production. The growing demand for the foreign currencies needed to import goods and repay debts is causing the kip (LAK) to weaken further.

The agriculture sector trend is characterized by an aging population as youth increasingly migrate in search of better prospects. Persistent poverty, food insecurity and a lack of opportunities in rural areas figure strongly in these decisions. To counter these trends, both private and public investments are needed to raise agricultural productivity and incomes. To achieve the first two Sustainable Development Goal’s (SDGs) of ending poverty and hunger and improving food security and nutrition in the Lao PDR by 2030, there is a need for additional investments in the sector (FAO, 2015)

⁴ ASEAN’s Future Cities: High-speed rail on track to connect Vientiane to the region. (March 23, 2017) *My HSR*. Retrieved January 25, 2021, from <https://www.myhsr.com.my>; Lao PDR Economic Monitor. (January 2019). *The World Bank Group*. Retrieved January 25, 2021, from <http://documents.worldbank.org>

⁵ <https://asianews.network/china-rail-line-linking-laos-sees-passenger-cargo-growth/>

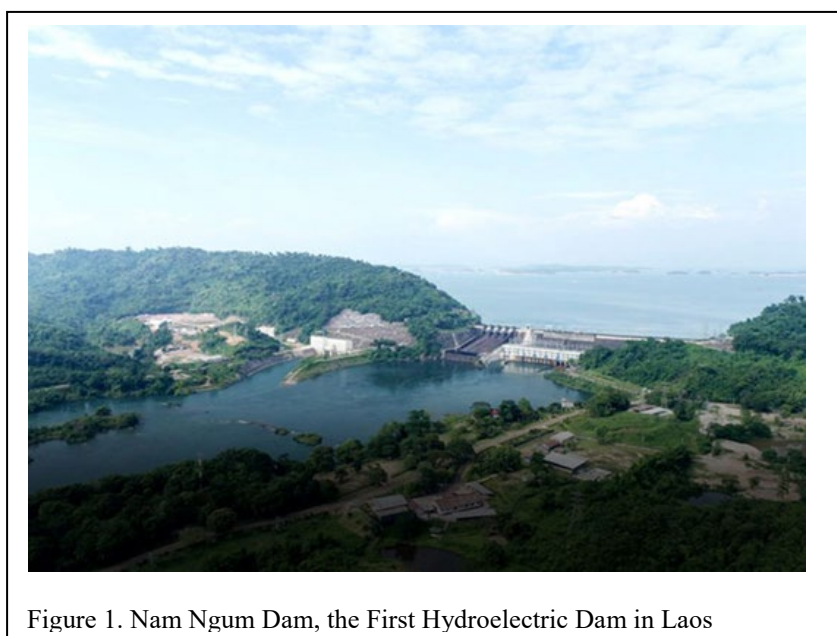
⁶ <https://www.worldbank.org/en/news/feature/2022/05/12/lao-pdr-economic-update-april-2022-restoring-macroeconomic-stability-to-support-recovery>

Reliable infrastructure will help farmers access the market. Agribusiness and the natural rubber industry are an important part of the development that can create more jobs and employment to produce commodities for the improvement of local people's livelihoods.

Small and medium enterprise (SME) development is one of the current key priorities of the Lao Government. The government desires to develop entrepreneurship in Lao PDR by creating an enabling system for registering SMEs and improving SME access to finance. The government has injected substantial funds for promoting SMEs. According to the survey of the Department of SME Promotion in 2022, there are a total of 133,997 micro, small and medium enterprise (MSME) units, of which 94.2% are microenterprises, which have less than five employees. At present, the SME fund has released LAK428 billion for the following sectors: agriculture production, commerce, services, handicraft, and processing industries (MOIC, 2021).

Growth was driven by the expansion of infrastructure-related construction activities and electricity exports. The country hopes to make hydropower the largest source of state revenue by 2025 and thus become the “battery of Southeast Asia” (Flintrop, P. 2019). However, the plan is not yet fulfilled. Nam Ngum 1 Hydropower Plant, completed in 1971 with Japanese aid, supplied the majority of electricity used in Laos until the end of the 20th century and also exported energy to Thailand (Figure 1).

Electricite du Laos (EDL) is a monopoly company which should generate a significant amount of revenue from its dominance in the energy market, but the fact is that it has been operating at loss for many years and has accumulated huge debts.



While debating the government's move to reform state-owned enterprises at the ongoing National Assembly session in July 2022, EDL's Managing Director outlined the main reasons for the company's continuing losses and the kind of reforms needed to turn things around⁷.

In April 2022, the government set up a committee to overhaul the operations of EDL as part of efforts to strengthen business operations across all state-owned enterprises. The committee will recommend measures that will enable EDL to earn more revenue and pay off the debts it has accumulated. The state owns 178 enterprises, nearly all of which have recorded losses over many years.

2. Natural Rubber Industry development and value chains in Laos

The Association of Natural Rubber Producing Countries (ANRPC) has reported that the global outlook for the natural rubber (NR) market is that it will remain positive in 2022. World rubber production is expected to grow by 1.9% to 14,107 million tons, while world consumption is expected to show moderate growth at 1.2% to 14,232 million tons during 2022.

The Monthly NR Statistical Report for July 2022 released by ANRPC forecasts that the global production of natural rubber is estimated to expand by 3.9% year-on-year to 1,283 million tons, while the global demand is expected to grow faster, at 8% year-on-year, to 1,266 million tons. During the same reference period, the prices on the NR market have edged lower as compared to June 2022 amid a gloomy global economic outlook, as released by the International Monetary Fund (IMF), of 3.2% growth for 2022, 0.4% points lower than the earlier forecast in April 2022⁸.

2.1 Rubber Industry development in Laos

In Laos, natural rubber is currently produced and undergoes preliminary processing for 100% export and is not yet a processing and manufacturing industry in the country. There is no synthetic rubber production in Laos.

The rubber tree (*Hevea brasiliensis*) originally came from Brazil. During his second journey to Central America in 1493, the explorer Christopher Columbus was the first

⁷ https://www.vientianetimes.org.la/freeContent/FreeContent2022_EDL129.php

⁸ <http://www.anrpc.org/>

European to come across rubber. The Maya, who had been living in the Amazon region for centuries, had long been extracting the white sap from these slender trees, which can grow up to thirty meters tall. At the time of Columbus, they were using it to make balls and toys⁹.

A major breakthrough occurred in 1770, when chemist Joseph Priestley noticed that lines drawn with a pencil can be removed using rubber. That is how the name ‘rubber’ – derived from the English verb ‘to rub out’ – came to be used.

In 1839, Charles Goodyear discovered that the properties of rubber can be greatly improved by heating it with a small percentage of sulfur. This process is called vulcanization. When rubber is vulcanized, it retains its elasticity but becomes stronger and less sticky. Goodyear discovered the process of vulcanization by accident when a mixture of rubber and sulfur happened to land on the stove in his workshop and he noticed the result. Following his discovery, rubber trees were planted on a large scale in countries all over the tropics. Thanks to these plantations, rubber products became available worldwide. Goodyear applied for a patent for his discovery in June 1844.

Rubber (*Hevea brasiliensis*) tree plantations were first introduced into Lao PDR by the French in 1930 at Banchiang District, Champasak Province, but this never caught the attention of policy makers, traders, business groups or other stakeholders until the end of the 1990s.

The high income, due to the high price of rubber, from latex sales in 2003 by small Lao producers marked a turning point in rubber production in Lao PDR.

Since 2004, based on the government policy on investment promotion, many foreign companies have been investing in rubber tree plantations in Lao PDR through concessions. At the same time, this policy attracted more Chinese state-owned and private enterprises to follow the “Go Global” strategy by the Chinese central government, who have invested heavily outside China, including in Laos¹⁰. Vietnam also has a policy to promote rubber production in Laos. While rubber cultivation is expanding rapidly in Lao PDR, policy, regulations, planning, institutional arrangements, and information that supports these enterprises has not kept pace with developments.

⁹ <https://www.risrubber.com/en/the-history-of-rubber/>

¹⁰ <https://geoyi.org/2016/01/09/the-natural-rubber-value-chain-and-foreign-investments-in-thailand-how-can-we-achieve-sustainable-and-responsible-rubber-cultivation-and-investment-2/>

The history of rubber production in Lao PDR is relatively short, with expansion of the industry having occurred in the last few decades. What began as a modest supplemental farm enterprise to enhance livelihoods for upland farmers in Lao PDR has grown into a rapidly expanding agro-industry that is becoming shrouded in mounting concerns over a lack of governmental regulation and controls (Douangsavanh et al., 2008). The interests of investors and small farmers are different. Investors prefer the concession arrangement as a way to protect their investments; smallholders are concerned that these arrangements limit their access to knowledge, land, and profits.

The land concessions, normally only applied to state land, are negotiated by senior government officials and large tracts of land are left under direct management by a company with limited interactions with local populations. In some cases, companies are allocated rights to prospect and negotiate with villagers for land deemed physically appropriate and accessible, but whose availability is uncertain and subject to local approval. The resulting model of rubber development is then a joint venture between foreign investors and farmers in a contract farming arrangement. Inputs and profits are supposed to be shared as determined by negotiations among investors, district authorities, and village representatives.

Two main kinds of contracts can be identified:

- 1) a '2+3' model where farmers provide land and labor, and the company provides capital (in the form of seedlings, fertilizer and other equipment), technology, and access to markets; benefits are shared according to conditions agreed upon in the initial contract. Under '2+3,' 70% of the benefits usually go to the farmers and 30% to the company, and

- 2) a '1+4' model where farmers provide land and the company hires labor (generally the landowner becomes the contracted farmer), providing capital, technology, and market access. When the trees become productive, approximately seven years after planting, benefits are shared according to conditions agreed upon in the initial contract. Under '1+4,' 30% of the benefits usually go to the farmers and 70% to the company; sometimes benefits are split equally.

The government, eager to support the emergence of a smallholder-based rubber industry, has actively promoted the '2+3' model, while investors, eager to secure their investment and profits, have pushed for the '1+4' model. If farmers become too indebted while waiting for their trees to become productive (seven years), investors can acquire the farmers' land tenure rights and convert them into concession-type tenure.

In Northern Laos, rubber trees were first planted in 1994 at Had Yao Village, in the district and province of Luang Namtha. The rubber trees matured and their tapping began in the early 2000s. Cash income received from the consequent latex sales demonstrated the financial profitability of rubber production and Had Yao Village became well known as the first major rubber cultivating village in Northern Laos (Alton et al., 2005; Manivong V. 2007; Shi W. 2008).

Two main factors that contributed to Had Yao's success were key groups and individual farmers who worked on the rubber plantations and strong leadership. The other important factor was the support from provincial authorities through the provision of funds to subsidized loans for rubber tree cultivation. In fact, in 1994, the villagers received their first loan of LAK12.9 million with an interest rate of 2% and a seven-year payment period. At present, the farmers in the surrounding areas have planted more rubber trees and have joined the Had Yao rubber pioneers to form the first rubber cooperative in the country

Problems associated with land concessions to private investors mean that this mechanism may not always result in equitable distribution of benefits to both state and citizens, thus forcing the Lao PDR government to impose a moratorium on the granting of concessions for plantation crops. Moreover, the development of contracts between private investors and farmers may not have legitimate and may in some cases prejudice the grower. There is a need for the development and enforcement of institutional policies that protect the rights of growers from investors and secure benefits for the state. In order to promote the establishment of a vibrant smallholder rubber sector in Lao PDR there is a need for the government to establish institutional structures that provide low interest loans to farmers and cushion the impacts of wild fluctuations in rubber prices, common to the industry. It is important that the development of rubber does not compromise or negatively impact other economically viable sectors that support poverty reduction. In this respect, ecotourism may be a more viable and sustainable livelihood option in certain cases.

Field findings from the case study (Linkham et al., 2008) indicated that: (i) the rubber smallholders' self-investment type of model provided the highest net benefit, followed by cash crop/NTFPs (non-timber forest products), and rubber smallholder contract farming.

2.2 Rubber producers

Starting in 2004, based on the government policy on investment promotion, many foreign companies have been investing in rubber tree plantations in Lao PDR through concessions.

The concessions mean that the government grants the land for foreign companies to invest in agriculture, mining, and hydropower. However, most of the concessions, thousands of hectares, have been taken from local communities with inappropriate compensation; the local people have lost the land, or access to the land, or the right to use it. This has had a negative impact on the livelihoods of especially the poorest communities and the poorest within communities. At the same time, this policy attracted more Chinese state-owned and private enterprises, who have heavily invested in northern Laos. Vietnam also has a policy to promote rubber production in southern Laos.

Rubber production also causes many issues concerning land, labor and environment, such as conflict over land use with local communities, limited labor and unskilled local labor, and forest degradation. Therefore, the government has since been undertaking a ‘Quality of Investment Review’ by issuing the Prime Minister Order No. 13, 2012 on suspension of all new land-based investment projects associated with mineral exploration, rubber and eucalyptus plantations (PM Order No. 13, 2012, ‘PMO13’).

At present there are about 300,000 ha of rubber plantations in Laos. of which about 60% of the total area is in the North, 17% in central Laos, and 23% in the south (NAFRI, 2011). The majority, about 70%, of the rubber production areas in Laos are concessions by foreign companies (concessions plus contract farming arrangement), and only 30% are owned by smallholders (Figure 2). Smallholder rubber farmers are currently continuously planting rubber on their own land.

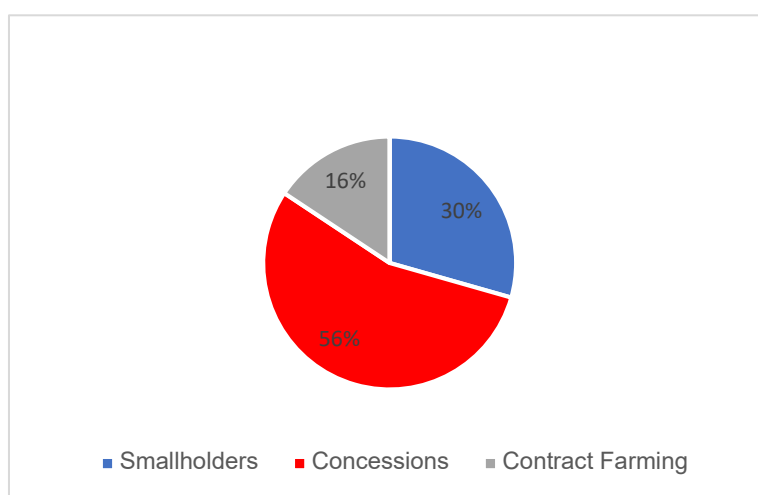


Figure 2. Rubber plantation ownerships in Laos

Source: NAFRI (2015)

The average yield of rubber in Laos is 1.77 ton/ha, the yield in the northern provinces being 1.58ton/ha, 1.88 ton/ha in central provinces, and about 2 ton/ha in southern provinces (NAFRI, 2015). It is estimated that by 2021 about 80% of rubber trees were currently being tapped. Natural rubber production was estimated to have been around 400,000 tons in 2021.

2.3 Smallholder rubber farmers in Laos and neighboring countries

Some 85% of the natural rubber grown globally is produced by small, family-run enterprises in Asia and whose plantations cover just a few hectares. This means that the sustainability of an industry linked to deforestation, pollution and human rights abuses lies in the hands of hundreds of thousands of individual farmers.

Smallholders produce 93% of rubber in Malaysia, 90% in both Thailand and Myanmar, 89% in India and 85% in Indonesia, 83% in Indonesia, and 32% in Vietnam and Cambodia (Rubber Board, 2005).

Laos differs from other countries in that only 30% of total rubber production is carried out by smallholder rubber farmers. The majority of rubber plantations are managed by foreign companies. Therefore, the sustainability of the rubber industry is linked to both smallholders and most importantly to foreign investors, whose plantations in the country cover more than 70% of total rubber production area by land concession.

Manivong and Cramb (2008) showed that the Discounted Cash Flow (DCF) analysis for a typical hectare of rubber in Had Yao using a discount rate of 8%, an estimated wage rate of LAK17,000, and the 2005 market price of cup-lump rubber of LAK7,800/kg indicated that investment in rubber was clearly worthwhile, based on conventional investment criteria. The result is plausible and helps confirm the farmers' assessment that smallholder rubber is a profitable investment, thus helping to explain the expansion of rubber planting in the study village.

The results of the study showed that in terms of output, in 2012 the rubber farms obtained on average a net revenue of over USD2,850/ha—or, excluding the cost of family labor, which smallholders do not need to pay, almost USD4,360/ha. Such relatively high profits are consistent with those found in Laos (Manivong and Cramb, 2008), Thailand (Viswanathan, 2008), India (Nath and Bezbaruah, 2011), and other rubber-planting

regions in South and Southeast Asia. Hence, it is not surprising that rubber areas have expanded rapidly.

Rubber is one of the industries posting a favorable performance despite many sectors struggling due to the COVID-19 pandemic.

In Thailand, smallholders are the major planters of the so-called Para rubber tree. One challenge they face is having to overcome the disadvantages of rubber processing and marketing. Therefore, the organizing of smallholders into cooperatives has been a major policy objective of the government. The Thai government established smallholders' cooperatives in the 1990s and granted them smokehouses for processing latex into ribbed smoked sheets (RSSs)¹¹.

The case study by Suttipong Angthong and Koichi Fujita (2019) in Chumphon Province, Thailand showed that the profit per unit area (rai = 0.16 ha) from rubber production was significantly higher for cooperative members than for non-members, which was primarily due to the higher prices of rubber offered by these cooperatives. The regression analysis showed that cooperative membership ensured a higher profit per rai of 1,407 baht. It was also found that member households earned a 50% higher total household income than non-members.

Studies have shown that diversifying the range of crops a farmer produces could also help them to improve their livelihoods. A study of rubber plantations in four areas in Thailand and India showed that monoculture systems produced the least income compared to other systems that also grew different combinations of fruits, rice, and livestock¹².

A study in Hainan Island, China, in 2019, found that farmers with intercropped plantations earned twice as much per hectare compared to those with pure rubber plantations, with no significant difference in the cost of their inputs¹³.

Data collected in a comprehensive survey of 612 smallholder rubber farmers in Xishuangbanna, (Shi Min, et al., 2017) quantifies economic aspects of rubber farming

¹¹ https://www.jstage.jst.go.jp/article/asafas/18/2/18_135/_article/-char/en

¹² https://www.researchgate.net/publication/46536828_Emerging_Smallholder_Rubber_Farming_Systems_in_India_and_Thailand._A_Comparative_Economic_Analysis

¹³ https://www.researchgate.net/publication/333192516_Realizing_the_values_of_natural_capital_for_inclusive_sustainable_development_Informing_China's_new_ecological_development_strategy

including land use, inputs and outputs, household income composition, and risks. In particular, the authors compare differences in these parameters associated with ethnicity and elevation. The results suggest that rubber has taken over the rural economy in the rubber-planting region of Xishuangbanna, where almost 80% of agricultural land is devoted to rubber. On average, rubber farming provides over 40% of smallholder incomes. While smallholder rubber farming is generally highly profitable, it is also highly vulnerable to price fluctuations. Rubber expansion has also reduced diversification and thereby increased household income risk. Most importantly, the analysis shows that the economic performance of smallholder rubber farming differs for different ethnic groups and at different elevations. The results of this study provide important quantitative information on smallholder rubber farming that can inform policymaking and guide future research (Shin et al., 2017)

Smallholder rubber production is a viable and effective proposition in moving households and communities out of poverty. By contrast, in countries such as Laos, Cambodia, and Myanmar many farmers are struggling to maintain their lands and forests in the face of growing pressures from investors and government institutions to impose concession arrangements¹⁴.

Contracts between foreign investors and farmers are often vaguely written or non-existent, and pose a major concern for farmers, since it is unclear who will benefit from the profits of rubber planting. The notion of a contract and its sanctity are not well understood by either investors or farmers in Laos. For example, some contracts are not legally binding due to a lack of jurisdiction. In development projects involving land concessions, several undesirable aspects have emerged: E.g. uncompensated loss of assets, both private villager assets and state/public assets; uncompensated loss of resource entitlements by villagers (e.g. non-timber forest products) and of public goods (e.g. watershed protection services) by the state; and configurations of resource use that secure resource control but decrease net benefits, and in doing so fail to capitalize effectively on the overall comparative advantages of the country (Baird I.G., 2010).

Productivity increase is the biggest challenge that small farmers face. Smallholder rubber farmers in Indonesia have low yields, about 1,000 kg/ha, providing an income of about

¹⁴ https://www.researchgate.net/publication/228485418_Expansion_of_Rubber_Hevea_brasiliensis_in_Mainland_Southeast_Asia_What_are_the_Prospects_for_Small_Holders.

1,080 USD/ha. Private company rubber yield is around 1,450 kg/ha. The initial cost (for the first six years) is about 1,800 USD/ha (Dwi Wulan Sari, 2020).

Sustainability in rubber should be expressed in wording and language that are “easily understood by farmers.” In recent interviews conducted by the Global Platform for Sustainable Natural Rubber (GPSNR), a non-profit organization set up to ensure the sustainable production and supply of natural rubber, smallholders from some of the world’s top rubber producing countries, including Indonesia, Thailand, and Vietnam, pointed to the many challenges preventing them from adopting more sustainable practices. To begin with, many smallholders do not know what sustainable natural rubber really means.

“There’s a need to define exactly what it is to be sustainable. What are the rules for being sustainable? What do I have to do to be sustainable?” Should the banks extend loans to smallholders to finance sustainability improvements? Will rubber buyers pay a higher price for sustainable rubber? are questions asked by most rubber smallholders. “Rubber producers can help the environment by implementing sustainability standards on their farms, but we need to know what they are first.”¹⁵

2.4. The first Natural Rubber Cooperative in Laos

Had Yao Village, Luang Namtha district and province is a resettled village to which Mong people relocated from a mountainous area in response to the government policy of stabilizing shifting slash-and-burn cultivation. The policy of the provincial authorities was to promote community paddy rice production as permanent employment, but the people do not have land suitable for, nor the experience of paddy rice production. The province also promotes livestock raising and cash crop cultivation for commercial production.

Had Yao villagers consulted on how to choose alternatives to the shifting slash-and-burn cultivation led by the village authority of which Mr. Laoma was the head of the village. The outcomes of the community effort are as follows:

¹⁵<https://www.eco-business.com/news/smallholder-farmers-if-you-want-to-save-forests-pay-more-for-sustainable-rubber/>

- From 1980-1985, some families tried to raise cattle, but could not manage the livestock well and the income received was not sufficient for their livelihoods.
- In 1985, representatives of the village went to learn from Thailand, where the local people planted ginger and maize. On returning, they decided to plant these crops, but the return per hectare was still low, at approximately LAK1 million, and the fields had to be replanted each year
- In 1993, the leaders of the village visited their relatives in Mouang La, Xishuangbanna, China, to learn how the farmers plant cash crops and rubber trees. From the visit, they learned that when a rubber plantation is established, after the initial period of six to seven years had passed they can tap the trees for about 30 years to receive regular income. The management of the rubber trees was also not very difficult. Therefore, after returning home, the leaders of the village gathered and explained the cultivation method to the community, who all agreed and decided to plant rubber trees as an alternative to shifting cultivation.
- In 1994, the villagers petitioned the provincial authority for land allocation and the financial support in obtaining credit from the bank for rubber planting. The villagers as a group began by planning the area of land on which each family wanted to plant rubber trees and the credit needed for rubber seedlings, barbed wire, and necessary tools. Finally, Had Yao villagers' group received a loan from the Agriculture Promotion Bank to the amount of LAK40 million with an interest rate of 7% and a payment period of 15 years (1USD = LAK720). The farmers group began by planting rubber trees on 344 ha of land.
- In 2001, the villagers commenced tapping the rubber for the first time. The villagers had to seek expertise in tapping from their relatives in Xishuangbanna for training and for purchasing the tapping knives from China.
- On June 5, 2002, the first rubber tapping ceremony was officially organized. After that rubber production by smallholders increased and more rubber plantations were set up by foreign investors through concessions in all parts of the country due to the high price of rubber in this period
- On October 23, 2012, the Had Yao Natural Rubber Cooperative was founded together with the smallholder rubber producers to strengthen entrepreneurship. Initially, 122 producers within Had Yao Village voluntarily applied to join the cooperative.

At present, farmers in the surrounding areas have planted more rubber trees and have joined the Had Yao rubber pioneers to form the first rubber cooperative in Laos. Had Yao

Natural Rubber Cooperative has 482 members, including 200 members from Had Yao Village and other groups of rubber smallholders from five neighboring villages, namely Ban Bomphieng, Ban Namhoi, Ban Viengthong, Namchang 1 and Namchang 2. The total rubber area covered by the cooperative is 1,345 ha, with a rubber production of about 2,400 tons per year. At the time of the interview (2020), the rubber price per kilogram was LAK5,500. The total income from rubber sales was LAK13.2 billion, or about USD1.5 million. The average income per household was LAK27 million, or USD3,000. This income was greater than the Lao GDP per capita.

The advantages of the Had Yao Natural Rubber cooperative

1. The people voluntarily applied to be cooperative members and complied with the cooperative regulations,
2. The cooperative has access to credit and was able to pay back the loan on time due to the active participation and sense of responsibility of the members,
3. Technical exchange among the members and training for the cooperative by related projects and organizations were possible,
4. The cooperative has more bargaining power when selling the rubber, receiving a better price through transactions with several buyers and companies. This is the strength of the cooperative. The cooperative is able to choose to sell the rubber to a company that offers a better price, or not to sell to companies who offer lower prices,
5. The cooperative constructed common infrastructure, such as a bridge (Figure 3), and roads in the village. The members of the cooperative have better livelihoods, being able to buy motor vehicles and send their children to school.



Figure 3. The bridge built by the Had Yao Rubber Cooperative

Lessons learned from Had Yao Natural Rubber cooperative

1. Leadership plays an important role in cooperative establishment and movement. The leader should be able to bear responsibility and work for the community,
2. Access to credit, appropriate interest rates, and effective use of credit is crucial,
3. The cooperative should be well organized and follow the regulations; members should be voluntarily and active,
4. Learning by doing is a vital principle of the cooperative,
5. The cooperative has bargaining power particularly with regard to the sale of rubber at a reasonable price to different companies or buyers,
6. Support from the government at different levels plays an important role in cooperative development,
7. The lessons from Had Yao Village Natural Rubber Cooperative should be disseminated to other areas within Luang Namtha Province and nationwide.

At present, the villagers of Had Yao Village have found that rubber production is an alternative to slash-and-burn shifting cultivation in response to government policy. The people have better livelihoods, better houses, can send their children to school, and have reasonable incomes. The lessons learned from Had Yao Village for cooperative development should be expanded to other areas in the province and nationwide. The government policy is to promote and empower smallholder organization in groups and cooperatives to enhance productivity, processing and marketing capacity. However, after more than ten years following the establishment of the first rubber cooperative, there are no more rubber cooperatives.

2.5. Rubber latex processing

At present there are no regulations specific to rubber latex processing. The Law on Standards (No. 55/NA 2014) is relevant with respect to the development of standards in rubber processing. In 2013, draft standards for rubber-based products were developed. The Ministry of Science and Technology issued a Decision on the Adoption and Proclamation of National Standards on Rubber Products No. 0538/MOST, dated 16 May 2017 and a second (No. 1171) in November 2017 (in Lao). The Ministry of Science and Technology was dissolved by the government in 2021. However, foreign companies processing rubber have used the standards current in their own countries for export and/or re-export to third countries.

Processing factories are mainly owned and run by Chinese and Vietnamese companies. The capacity of each of the processing factories is around 10,000 tons per year. At present, there are 21 registered processing factories (Table 1) which purchase cup lumps from smallholders in addition to their own latex for rubber block production. There is one factory in Saravanh Province that produces ribbed smoked sheets by using fresh latex from their own plantation.

Table1. List of registered rubber processing companies in Laos

Province	Processing Company	Total	Remark
Bokeo	Yunnan Rubber	3	Chinese
Luang Namtha	Yunnan Rubber	3	Chinese
Oudomxay	Chong Ou Rubber	1	Chinese
Luang Prabang	Chong Heu Rubber	1	Chinese
Sayaboury	Chun Thong Rubber	1	Chinese
Vientiane Province	1.South Land 2.Thai Hua rubber	2	Chinese Thailand
Borikhamxay	1.Thaphabath Rubber 2.Deuk Hien Rubber 3.Coeco Rubber	2	Lao & Vietnamese Vietnamese Vietnamese
Khammouane		2	Vietnamese
Savannakhet	1.Quasa Geruco Joint Stock	1	Vietnamese
Champasak	1.Dak Lak Rubber 2. Lao Viet Rubber 3. Dao Tien Rubber	3	Vietnamese
Saravanh	1 Binida Co., Ltd.	1	Vietnamese
Attapeu	1.Houang Ang Ngalai 2.Quang Min Rubber	2	Vietnamese
Total		22	

Remark: Factory capacity is around 10,000 tons of rubber blocks per year. The list is incomplete.

Source: Ministry of Industry and Commerce, 2021

At present there are two channels for farmers to sell rubber to processing factories. The first channel is for rubber smallholders sell rubber latex (liquid latex, cord latex, concentrated latex, etc.) to traders at the temporary and/or permanent rubber collection points. Large and small traders then collect the latex for sale to processing plants. Under this system, the traders generally buy cup lumps from farmers at the collection points once every two weeks.

In the second channel, rubber smallholders whose plantation is close to the processing factory take the cup lumps to sell rubber latex directly to the processors using their own hand tractor or pickup transport.

2.6 Natural rubber price in Laos

As of June 2022, the average global price of rubber was UDD2.03 per kilogram. The average annual price of natural rubber at the Singapore Commodity Exchange, one of the key global commodity exchanges for rubber, reached a high of USD4.82 per kilogram in 2011. Since then the price has decreased, and in 2021 the average price was USD2.07 per kilogram¹⁶. As with other internationally traded commodities that have relatively low market prices, low rubber prices have a negative impact on the rubber producers themselves. The resulting issues of poverty for natural rubber producers has led to the creation of the Fair Rubber Association (FRA), which is a multi-stakeholder association that aims to improve the lives and working conditions of the primary producers by utilizing Fair Trade principles.

There has been price volatility in natural latex, reaching a high of over USD6/kg in¹⁷ 2011 and a low of under USD1.50/kg in 2015. Forecasts based on Malaysian rubber are for a steady price increase to over USD2.4/kg by 2030.

Rubber price is an important factor that influences the income of the rubber farmers who depend on middlemen representing the processing factories. The peak of the latex in Laos was 2011-2012, when the price rose to LAK18,000/kg of cup lumps. The rubber price then declined to less than LAK4,000/kg in 2016, after which it began to rise, reaching LAK12,000/kg in 2022 (Figure 4). The increase in the price of rubber in 2022 is also related to the devaluation of the kip.

A case study in Luang Namtha Province (Vongvisouk, T. and Dwyer, M., 2017) showed that the drop in prices paid to Lao rubber growers has been precipitous. From highs of around CNY14/kg of cup lumps (*yang korn*) in 2011, prices fell by half, then by half

¹⁶ <https://www.statista.com/statistics/727582/price-of-rubber-per-pound/#:~:text=The%20average%20annual%20 price%20 of,2.07% 20U.S.%20 dollars%20per%20kilogram>

¹⁷ <https://www.statista.com/statistics/469630/rubber-price-forecast/>

again, reaching a low of around CNY3.5/kg in 2014. Prices during the authors' fieldwork were just slightly higher (at around CNY4/kg) and have since fallen even lower (to around CNY2.5/kg). Prices received by Lao growers are substantially lower (about half) than those received by Chinese growers (Figure 5).

Responses from the government and smallholders varied when the rubber price fell. Government institutions responded by forming provincial and district level committees on rubber to broker rubber sales at prices slightly higher than those being offered by rubber-purchasing companies. In some cases, committees formulated policies such as waiving companies' tax requirements in return for higher prices, decisions to not enforce minimum "floor" prices that were allegedly written into company contracts, and undertaking diplomatic efforts to place rubber (both processed and unprocessed) on the list of freely exportable goods to China and Vietnam.

Most of the smallholder's responses were to tap using their own labor or to stop tapping altogether. For larger rubber farmers who owned plantations of more than 10 ha, and who depend on hired labor, may also have been to stop tapping. Another response from smallholders is to cut some of the rubber trees for firewood; wait for prices to rise (i.e. by not tapping); take collective action to attract slightly higher prices; and selling out by smallholders to "large-holder" production arrangements or leasing plantations to wealthier actors who either maintain them or convert to current boom crops such as bananas, which has been an increasingly common feature of the northern Lao landscape in the last few years.

It is not low prices per se that have caused many producers to pull their plantations out of production, but rather the relationship between low prices and the labor regimes necessary to tap the current configuration of plantations, including many larger ones in the tens of hectares and multiple thousands of trees per owner.

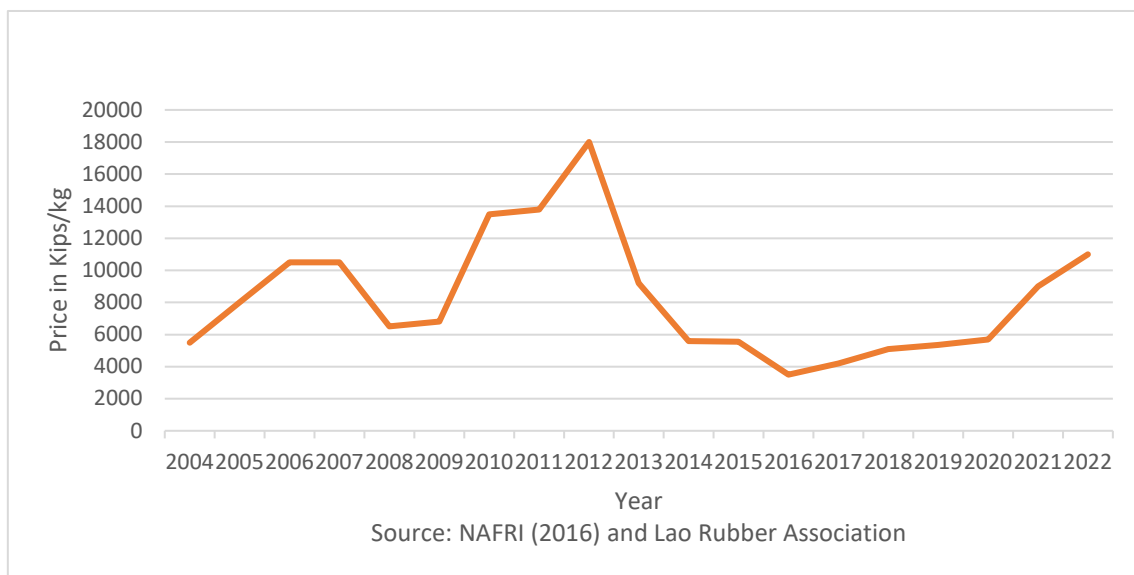


Figure 4. Natural rubber price in Laos from 2004-2022

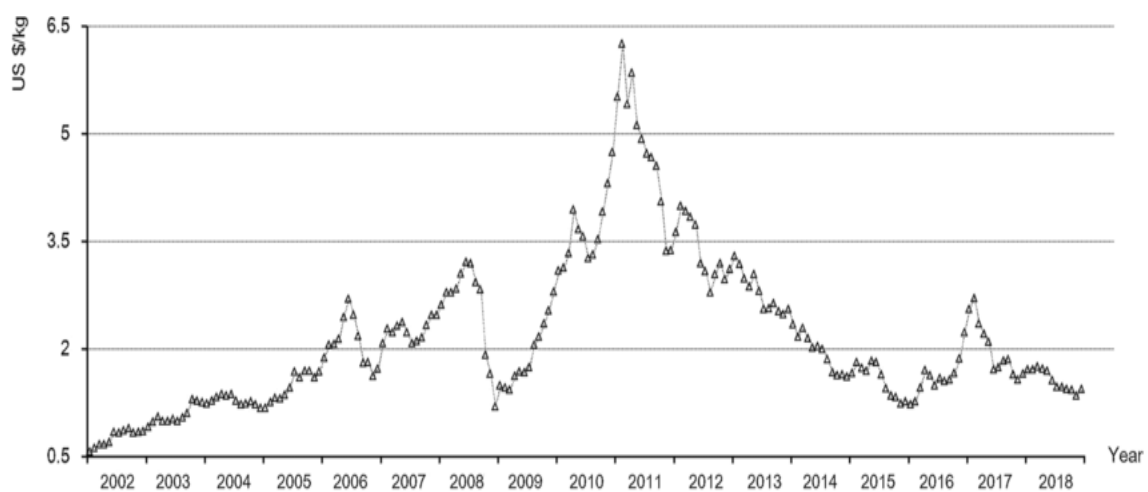


Figure 5. Monthly natural rubber price in USD per kilogram at the Singapore Commodity Exchange, 2002–2018

Source: www.indexmundi.com

2.7 Rubber exports

Rubber produced in Laos currently is exported mainly to China and Vietnam in both rubber cup lumps and blocks by Chinese and Vietnamese investors.

Based on available information, there is no Forest Stewardship Council (FSC) or Program for Endorsement of Forest Certification (PEFC) certification for rubber smallholders in Laos. It is currently an important sign that some companies are working on these certifications due to the sustainable development policy and demands for certification from buyers, end users and import countries. This is a difficult issue for rubber sustainability.

At present, the total land area of rubber plantations in Laos is about 300,000 ha and it is estimated that about 80% are currently tapping. There are three kinds of rubber plantations in Laos: Concessions by foreign companies (46%), contract farming (24%), and local smallholders (30%) (NAFRI, 2006). While the government has suspended the land concessions for rubber plantation since 2012, the percentage of concessions has been stable, but small farmers continue to plant rubber on their own land. It is estimated that in 2021 tapping areas were about 80% with an average yield of 1.5t/ha. If so, the total latex production in Laos may be calculated to be around 352,000 tons.

Chinese companies have mainly invested in the north of the country, Thai companies have invested in the central provinces, and Vietnamese rubber companies have invested mainly in the southern provinces of Laos. The foreign companies who invested in rubber plantations also owned primary rubber processing factories for production of rubber blocks for export to their own countries according to their own standards.

Two kinds of rubber are exported from Laos to China and Vietnam, namely (i) rubber cup lumps, (ii) rubber blocks. Information from the Department of Agriculture showed that in 2021 around 20% of rubber exports from Laos across border checkpoints were in the form of cub lumps and around 80% in rubber blocks.

Rubber exports from Laos come from two sources: Processing plants operated by foreign companies and cub lumps collected from smallholders by company representatives at various purchasing points.

Trade data on rubber exports from Laos varies from different sources. Laos exports rubber mainly to China and Vietnam, as well as to other countries, namely India and Malaysia. According to information from the Department of Import and Export, Ministry of Industry

and Commerce, the total export of rubber in 2018 was about USD168,159,284 and was expected to increase to USD214,520,297 in 2020.

In 2021, rubber export data from border checkpoints reported by the Department of Agriculture, Ministry of Agriculture and Forestry amounted to around 208,973 tons, with a value of USD260,986,000 according to the Department of Import and Export, Ministry of Industry and Commerce¹⁸(Table 2). Exports from Laos represent 1.5% of world exports for natural rubber, ranking ninth in world exports.

Table 2. Rubber exports from Laos (USD)

Year	2018	2019	2020	2021	Remark
Total exports	168,159,284	217,486,398	214,520,297	260,986,000	DIE, MOIC
to Vietnam	88,563,078	119,881,783	105,905,436 160,400,000	167,698,000 188,100,000	DIE, MOIC Source: Vietnam Rubber Association
to China	79,120,023	96,660,103	108,614,861	93,288,000	DIE, MOIC

Source: Department of Import and Export, Ministry of Industry and Commerce

Rubber exports from Laos to Vietnam increased from USD88,563,078 in 2018 to USD105,905,436 in 2020, and USD167,698,000 in 2021. However, the Vietnam Rubber Association reported that rubber imports from Laos to Vietnam were expected to increase significantly from 98,800 tons in 2020 to 140,500 tons in 2021 with a value of USD160.4 million and USD188 million, respectively (Table 2).

Data show that rubber exports from Laos in 2018 were valued at about USD168.2 million, USD217.5 million in 2019, and USD 214.6 million in 2020, according to the United Nations COMTRADE database on international trade¹⁹ (Table 3).

¹⁸ <https://www.laotradeportal.gov.la/index.php?r=site/display&id=2526>

¹⁹ <https://comtrade.un.org/pb/downloads/2021/VolII2021.pdf>

Table 3. Top 10 export commodities 2018 to 2020, Value (million USD)

HS Code	4-digits heading of Harmonized System, 2017	2018	2019	2020
	All commodities	5814.8	5809.3	5086.9
2716	Electrical energy	1398.4	1326.9	830.9
2603	Copper ores and concentrates	707.5	589.4	436.7
7403	Refined copper and copper alloys	749.6	433.8	205.5
7108	Gold (including gold plated with platinum)	155.6	192.3	457.1
2202	Water with added sugar	246.2	229.2	213.1
8525	Transmission apparatus for radio-telephony	254.2	210.2	146.3
4001	Natural rubber	168.2	217.5	214.6
0102	Live bovine animals	90.3	226.7	250.1
0803	Bananas	112.2	193.9	227.4
4703	Chemical wood pulp	284.7	121.8	28.0

Source: UN Comtrade 2021 International Trade Statistics Yearbook, Vol. I

3. Foreign Direct Investment - FDI

FDI has become an important source of private external finance for developing countries. It differs from other major types of external private capital flows in that it is motivated largely by the investors' long-term prospects for making profits in production activities that they directly control²⁰.

Developing countries, including Lao PDR, are becoming increasingly attractive investment destinations, in part because they can offer investors a range of “created” assets. While FDI represents investment in production facilities, its significance for developing countries is much greater. Not only can FDI add to investible resources and capital formation, but, perhaps more importantly, it is also a means of transferring production technology, skills, innovative capacity, and organizational and managerial practices between locations, as well as of accessing international marketing networks. But developing countries need to be well prepared for FDI, particularly in terms of national policy and legal framework.

Developing countries have, during the past decade or so, begun liberalizing their national policies to establish a hospitable regulatory framework for FDI by relaxing rules regarding market entry and foreign ownership, improving the standards of treatment

²⁰ <https://www.imf.org/external/pubs/ft/fandd/1999/03/mallampa.htm#>

accorded to foreign firms, and improving the functioning of markets. These “core” policies are important because FDI will simply not take place where it is forbidden or strongly impeded.

China continues to be the largest investor in Laos, with a cumulative investment of about USD16.4 billion in 833 projects, according to the Ministry of Planning and Investment²¹. Areas of Chinese investment are diverse, with the country plowing money into small, medium and large enterprises, state-owned enterprises, and private companies.

A large chunk of investment money has funded the Laos-China railway, the Vientiane-Vang Vieng expressway, the Saysettha Development Zone, the Boten-Bohan Special Economic Zone, power transmission lines, and hydropower plants, which have delivered significant benefits to both Laos and China. At a meeting of Lao and Chinese government officials and business operators in July 2022, the Ministry of Planning and Investment highlighted that there is a need to discuss ways to promote and manage private sector investment in Laos.

Thus far, 214 Vietnamese-funded projects have been approved, with a total investment of about USD5.38 billion, making Vietnam the third largest foreign investor in Laos after China and Thailand.

Investment in Laos has really been booming for the past two decades through land concessions. Officially recognized land-based investments in the agriculture and forestry sectors in the Lao PDR accounted for 593,357 ha, or 15.6% of arable land, in 2017 (Hett *et al.*, 2020). Investor-controlled land therefore represents a significant proportion of the country’s productive capacity. With the country’s predominantly rural population, these investments contribute to employment opportunities, improve the livelihoods for local people, but cause big ripples in communities, and thus there is a pressing need to increase both the quantity and quality of investments. In the early 2000s it emerged that many large investments were non-compliant.

Concessions or leases have been granted under agreements with National, Provincial, District and sometimes village authorities. The rules are currently set out in the Law on Investment Promotion No. 14/NA 2017, the Forestry Law No. 64/GOL 2019, and Land Law No. 04/NA 2003. Presidential Decree No. 135/PM on State Land Leases and Concessions issued in 2009 established a set of general principles for the granting of leases or concessions of state lands, and Presidential Decree No. 02/NA 2009 provided a

²¹ https://www.vientianetimes.org.la/freeContent/FreeContent137_Chinese_y22.php

range of land rates for concessions. The approval for concessions of state land can be granted by the National Assembly, with agreement by the government, or at the local level (Provincial Governors or Capital Mayor). A supervising committee, chaired by the Ministry of Planning and Investment (MPI), has oversight of the concession or lease process (Prime Minister Decree No. 135/PM, 2009).

The inflow of FDI to Lao PDR has increased in recent years, from USD300 million in 2013 to reach USD1.7 billion in 2017. Infrastructure, particularly electricity generation, remains the largest recipient of FDI in Lao PDR. Inflows in this sector increased from USD1.1 billion in 2016 to USD1.7 billion in 2017. The 2018 ASEAN investment report showed that this is followed by construction (USD413 billion), and mining and quarrying (USD207 million).

The country has also opened up a number of special economic zones to encourage investment inflows. These include the Savan-Seno Special Economic Zone, Boten Beautiful Land Specific Economic Zone, Golden Triangle Special Economic Zone, Thatluang Lake Specific Economic Zone, Thakhek Special Economic Zone, Long Thanh – Vientiane Specific Economic Zone, Dongphosy Specific Economic Zone, Phoukhyo Specific Economic Zone, and the Pakse-Japan SME Special Economic Zone²².

Over time, more concerns have emerged regarding policy implementation and the governance of land-based investments, including rubber. The limited revenue to the government budget derived from these investments, as reported by the 2006 GTZ study, did not correlate with the skyrocketing number of land deals, which increased fifty-fold between 2000 and 2009 (Schönweger et al., 2102), and there were increasing concerns about environmental and social impacts of large-scale land acquisitions (Barney, 2007; Baird, 2014).

Decree No. 135/PM triggered reviews of existing concessions, and with support from donors, MONRE undertook a nationwide examination of concessions and leases (Schönweger et al., 2012). That review resulted in a new suspension order on all new investment projects associated with mineral ore exploration, and rubber and eucalyptus plantations (PM Order No. 13, 2012, ‘PMO13’). The government of Laos has since been undertaking a Quality of Investment Review.

²² *Investment Promotion Department, Ministry of Planning and Investment*. Retrieved January 25, 2021, from <http://www.investlaos.gov.la>

The results of the nationwide inspection of the land concessions by the Ministry of Natural Resources and Environment showed that hundreds of land concession projects will be revoked. Land lease and concession agreements that were approved for hundreds of development projects have been revoked as many of the projects could not be identified, while others had not been carried out, the government was told at the 3rd Ordinary Session of the National Assembly's ninth legislature.

Investigations into state land lease and concession agreements found that 74 projects were in fact so-called “ghost” projects and appeared not to exist even though land concessions had been granted²³. In addition, land lease and concession agreements for 170 schemes that were not implemented as agreed, and projects whose timeframe had expired, were also withdrawn. Agreements on another 13 projects that did not involve a state land lease or concession were also revoked. The inspection also found that three projects had resulted on land disputes that needed to be resolved, and two cases in which state land was transferred to private ownership.

So far, the inspection has determined that land lease and concession agreements were granted to 2,045 projects covering a combined area of 927,457 ha. But only 582,320 ha of this land has actually been used or developed. Of these projects, 438 were ineffective or were approved unlawfully.

The important thing is how the government will take the measures to deal with the noncompliant companies based on the conclusion of inspection to ensure that Laos becomes a “rule of law state.”

The empirical results demonstrate the positive effects of FDI and trade openness, and the negative effects of human capital and institutional quality on the economic growth of the Lao PDR over the 1993 to 2020 period. The positive effect of FDI on GDP found in this research accords with the findings of the study by Saignaleuth, S. (2013), who found that FDI positively affects the economic growth of the Lao PDR differently across sectors. Nolintha, V., and Yee, L. (2015) found that FDI inflows in the natural resource sector positively affect the economic growth of the Lao PDR.

Foreign investors weigh their investment decisions in the Lao PDR more on human capital and trade openness factors than the institutional quality factor. The FDI trend and sectors that received the most FDI in Lao PDR provide some supporting evidence for these results. Over the period 1993 to 2015, the natural resource sector received the most FDI inflows, with an increasing trend over the years. Resource-seeking FDI would be less

²³ https://www.vientianetimes.org.la/freeContent/FreeContent2022_Hundreds130.php

concerned about institutional quality, paying rather more attention to the lower cost of labor and the host country's trade liberalization and trade partners²⁴.

Apart from the contribution of FDI to the employment opportunities of local people and general socio-economic development, there are also many challenges that the government needs to give attention to.

Empirical studies by the Japan Bank for International Cooperation (JBIC) in 2002 concluded that the host countries will not be able to capture the full benefits associated with FDI until they reach a certain threshold level in terms of educational attainment, provision of infrastructure services, local technological capabilities, and the development of local financial markets. The results of recent empirical studies based on microeconomic (firm- or plant-level) data indicate that the “spillover” effect of FDI on the productivity growth of local firms does not occur automatically, highlighting the complex nature of interactions between multinational enterprise (MNE) affiliates and local firms. The role of FDI in development goes beyond the traditional areas of growth, trade and technology transfer to cover emerging areas of policy concern, such as mergers and acquisitions, privatization, corporate governance and “policy competition.” Further research along these lines is certainly warranted to meet the future challenges of improved regulation and policy making²⁵. Only in those countries with a sufficiently developed financial system did FDI boost the growth of GDP per capita.

The quality improvement of FDI is equally important in sustaining long-term growth. Therefore, the government of the Lao PDR needs to continue to implement investment policies that attract better quality and more sustainable FDI, and refrain from implementing over-generous FDI promotion schemes which could lead to a substantial opportunity cost at the macroeconomic level (Nanthalath, P. et al., 2019), especially in increasingly sensitive hydropower schemes (Blake, D.J. et al., 2018), not least when dams fail (Olson K.R., et al., 2018).

During the 3rd Ordinary Session of the Ninth National Assembly in July 2022, the newly-appointed Governor of the Bank of Laos reported that sources of foreign exchange have decreased significantly, with the amount of foreign currency in the country unable to meet

²⁴ <https://koreascience.kr/article/JAKO201915658234600.pdf>

²⁵ https://www.jica.go.jp/jica-ri/IFIC_and_JBICI-Studies/jica-ri/publication/archives/jbic/report/paper/pdf/rp15_e.pdf

demand. Meanwhile, mismanagement of foreign currency is rife, with large amounts disappearing or failing to enter the system.

Between 2016 to 2020, exports netted the country approximately USD26.44 billion, however, the amount of foreign currency received via the banking system was only USD5.76 billion. “From the start of 2021 to the first quarter of this year, Laos should have received USD9.81 billion, however, only 32% of this entered the banking system of our country,” the Bank of Laos Governor told the National Assembly. Mining exports should have brought in more than USD2 billion but only 1.35 billion entered the system, according to the central bank governor. A similar issue was found with electricity exports, whereby USD2.58 billion should have been received, but less than USD1 billion could be accounted for. The management of FDI was also poorly implemented and unsustainable, while the debt-to-equity ratio had increased. It is believed that this trend occurred in the rubber industry as well.

Foreign currencies have been used indiscriminately, particularly in Special Economic Zones and border areas, while unlicensed exchange service providers were also a serious problem.

External debt is on the rise, with payments in foreign currencies pressuring the country’s limited foreign exchange reserves and affecting the country’s macroeconomic sustainability.

The Minister for Finance reported to the 3rd Ordinary Session of National Assembly (July 2022) that the public debt was accommodated and sharply increased during the years 2006 to 2010. In 2010 debt payment was USD160 million per year and increased to USD1,200 million in 2019, and USD1,400 million per year in 2021. Public debt levels have increased considerably since 2019, increasing to 88% of GDP in 2021, with the energy sector accounting for over 30% of the debt stock. Foreign currency reserves remain low. In 2020, the external debt of Laos increased to USD10,610 million from USD9,935 million in 2019²⁶.

²⁶ Source: Bank of the Lao PDR

Many questions have been asked about why Laos has such a large amount of debt while many FDI projects operate in the country. One of the answers could be the weak government financial management.

Following disruption to supply chains and production, combined with soaring fuel prices, the cost of petrol, food and consumer goods in Laos has skyrocketed, while the value of the kip has depreciated significantly.

The report recommends restoring macroeconomic stability, chiefly by increasing both revenue collection and spending efficiency. The country also needs to strengthen debt management and transparency, to improve the stability of the financial sector through legal and regulatory tools, and to scale up targeted cash transfers to the poor²⁷.

The inflation forecast for Southeast Asia for 2022 has been raised significantly from 3.7% to 4.7%, according to the latest report from the Asian Development Bank. Laos has one of the highest inflation rates in the region, with price rises recording 23.6% year-on-year in June, according to ADB's Asian Development Outlook (ADO) 2022 Supplement²⁸. Meanwhile the inflation rate reported in other ASEAN nations for the same month included Thailand (7.7%), Vietnam (3.4%), Philippines (6.1%) and Indonesia (4.3%).

The rapid economic growth over the last decade has been driven by the exploitation of natural resources and development of hydropower, with both sectors largely led by foreign investors.

4. Rubber sector governance

While rubber cultivation is expanding rapidly in Lao PDR, policy, governance, regulations, planning, institutional arrangements, and information that supports these enterprises has not kept pace with developments.

However, the Lao legal sector is underdeveloped and lacking in capacity. The government aimed to become a “rule of law state” by 2020 and continues to work with many international donors on a comprehensive legal sector reform plan. From 1975 to 1991, Laos did not have a constitution, and government decrees, issued by many ministries and officials, provided the country's legal framework. While there have been dramatic

²⁷ <https://www.worldbank.org/en/news/press-release/2022/05/12/lao-pdr-economic-recovery-challenged-by-debt-and-rising-prices>

²⁸ https://www.vientianetimes.org.la/freeContent/FreeContent2022_Laosamong145.php

improvements in the legal system in recent years, there are relatively few lawyers, inexperienced judges, and laws often remain vague and subject to broad interpretation²⁹

The governance of the rubber sector is complex and expansive because its production chains straddle the mandates of several government ministries (Table 4). The various government organizations involved in the plantation sector in general were described in Smith et al. 2017a, Smith et al. 2017b, and Smith and Alounsavath 2015. Other papers (Lu and Schönweger, 2019) and reports (Hett et al., 2015) also describe elements of rubber sector governance. Governance in the rubber sector in Laos was well described by Smith et al., 2020, building on previous information. The report describes specific authority and functions associated with investing in rubber cultivation and the processing and export of latex and rubberwood in the future.

Table 4. Governance of the Rubber Sector in Laos (Smith et al., 2020 tabulated by authors)

Organizations	Authority/mandates/responsibility	remarks
National Assembly	Approves investment activities on state land by concessions and leases including: 1. The use of protected forest zones, 2. The development of projects with significant adverse environmental or social impacts and 3. Projects requiring large areas of state land. The National Assembly's approval authority is delegated to Provincial People's Assemblies for certain smaller scale projects.	
Local Administration Provinces, Districts, and Villages	Manage the territory, natural resources and population and have authority to prepare a strategic plan incorporating socio-economic development plans, and to manage their own sector's responsibilities as assigned by the line ministry	
Ministry of Planning and Investment	Manages foreign and domestic investment, including plantation investment projects. The ministry's functions are primarily in the start-up and final approval phases through the Investment Promotion and Supervision Committee ³⁰ , which operates at central and provincial levels ³¹ .	

²⁹ <https://www.state.gov/reports/2017-investment-climate-statements/laos/>

³⁰ The Central Committee is chaired by the Prime Minister, with the Minister of MPI and Minister of MOIC acting as co-chairs, and at the provincial level the committee is chaired by the Governor

³¹ Law on Investment Promotion No. 14/NA 2016

Investment Promotion Department (IPD)	Administers the foreign investment system (the ‘One-Stop Service’ ³² and processes investment applications.	
Ministry of Natural Resources and Environment	Responsible for the implementation of land policies in Laos and for developing national land use master plans, with which forestry plans and the identification of land for plantations should be consistent. (Law on Investment Promotion No. 14/NA 2016 ³³)	
Department of Environmental and Social Impact Assessment	Reviews, confirms and approves the environmental and social impact assessments (both Environmental Impact Assessments (ESIA) and Initial Environmental Examination (IEE) of investment projects, including for tree plantations, before concession agreements are signed.	
Land Allocation and Development Department (LADD)	Responsible for the administration of land, land registration, surveys, and the issuing of land titles.	
Land Management Department (LMD)	Responsible for the land use planning process, consults with stakeholders to propose and issue land use permits, land transfers, lands leases or land concessions, and coordinates with related line agencies and local administrations.	
Provincial Office of Natural Resources and Environment (PONRE)	Plays a role in locating, mediating, and approving local access to land, and in approving contracts for land for investment projects.	
Ministry of Agriculture and Forestry (MAF)	Has broad ranging functions and responsibilities for rubber plantations due to their multiple uses in agriculture and forestry.	
Department of Policy and Legislation (DOPLA)	Responsible for the formulation of policies under MAF and the coordination and oversight of the development of relevant legislation.	Dissolved in 2021
Department of Forestry (DOF)	Develops and implement strategies, programs and policies on forestry activities, undertakes forest planning, zoning, surveys, monitoring, formulates forestry laws and other legal instruments related to forestry and operationalizes these through regulations, policy and technical instructions. Considers and comments on proposals for domestic and foreign investment in fields of agriculture, forestry and rural development, including rubber,	

³² <http://investlaos.gov.la/start-up-business/one-stop-service/>

³³ <http://investlaos.gov.la/start-up-business/one-stop-service/>

	and proposes the cancellation of these types of investments	
Department of Agriculture (DOA)	Sets technical standards for increasing productivity, following the directions of sustainable agriculture development, clean agriculture, ensuring food security	
Department of Agricultural Land Management and Development (DALAM)	Responsible for the implementation of surveys, classification and zoning of agricultural land, and for studying and collaborating with other parties to review the feasibility study reports and impact assessment reports for proposed investments, leases or concessions on agricultural lands. Undertakes field monitoring of the land areas used by investors and entrepreneurs to check compliance with contracts and laws.	
Department of Forestry Inspection (DOFI)	Responsible for the enforcement of forestry-related legislation and is empowered to conduct forest control operations, investigate illegal logging, and pursue prosecutions in the courts. Responsible for developing measures to prevent all forms of deforestation and forest resource degradation, including encroachment into forest lands and illegal forest clearing.	
National Agriculture and Forestry Research Institute (NAFRI)	Responsible for managing and implementing agriculture and forestry scientific and policy research activities for ensuring effective, highly efficient, and sustainable agriculture and forestry production. Two centers of NAFRI perform important roles for the rubber sector – the Forest Research Center and the more recently established Rubber Research Center, with a rubber testing facility to enable latex quality testing and rubber national standard development. To date, NAFRI research has focused largely on latex production; rubberwood has not been considered in any depth.	
Provincial Agriculture and Forestry Offices (PAFOs)	Responsible for implementing the functions of MAF to perform sectoral activities at the provincial administrative level. PAFOs have an important role in identifying and allocating land for rubber, implementing policy and administering and monitoring compliance with regulations in terms of the governance of the rubber sector and directly witness the outcomes and impacts.	
District Agriculture and Forestry Office (DAFO)	Undertakes functions that include the registration of plantations, providing advice on plantation management and planning, pre-harvest surveys, the approval and monitoring of harvesting operations	

	and the preparation of log origin documentation. DAFOs are responsible for finding land for plantation investors.	
Ministry of Industry and Commerce	The Ministry of Industry and Commerce (MOIC) regulates all types of industry and trade in Lao PDR. It oversees the trade, processing and export of latex and wood products. The relevant departments that fall under the MOIC include: Department of Industry and Handicraft; Department of Production and Trade Promotion; Department of Import and Export ³⁴ ; Department of Foreign Trade Policy; Department of Domestic Trade; Department of Inspection; Lao National Chamber of Commerce and Industry; Economic and Trade Research Institute	
Ministry of Finance (MOF)	Responsible for the collection of taxes and royalty payments. Within MOF, the Department of Customs is the agency tasked with determining and collecting the duties on goods exported from Lao PDR. The State Assets Department is responsible for the registration of assets that belong to the state as set out in the State Assets Law No. 14/NA 2012.	
Ministry of Labor and Social Welfare (MLSW)	Responsible for worker health and safety, labor skills development, recruitment, and labor protection.	

In summary, the rubber governance in Laos involved six ministries and 21 departments, and all provinces and districts involved in rubber plantation.

Regional and international bodies such as the Association of Natural Rubber Producing Countries (ANRPC), the International Rubber Study Group (IRSG), and the Global Platform for Sustainable Natural Rubber (GPSNR)) play important role in rubber governance for natural rubber producing countries, the investing companies, natural rubber import countries, the buyers, and the rubber-using companies

The Association of Natural Rubber Producing Countries (ANRPC) ³⁵ is an intergovernmental organization whose members are rubber producing countries. It currently has 13 members: Bangladesh, Cambodia, China, India, Indonesia, Malaysia, Myanmar, Papua New Guinea, Philippines, Singapore, Sri Lanka, Thailand, and

³⁴ <http://laotradeportal.gov.la>

³⁵ <http://www.anrpc.org/>

Vietnam. These 13 countries account for about 90 per cent of the global production of natural rubber. Laos is not a member.

The International Rubber Study Group (IRSG)³⁶ is an intergovernmental organization with the main objective of improving the transparency of the world rubber market and strengthening international cooperation on rubber issues, including the Sustainable Natural Rubber initiative. The Group has nine-member countries and more than 100 industry members. Laos is not a member country.

The International Rubber Research and Development Board (IRRDB)³⁷ is a research and development network which brings together natural rubber research institutes in almost all the natural rubber producing countries, covering 95% of world natural rubber production. Laos is not a member of the IRRDB.

The Global Platform for Sustainable Natural Rubber (GPSNR)³⁸ is an international, multi-stakeholder, voluntary membership organization, with a mission to lead improvements in the socioeconomic and environmental performance of the natural rubber value chain. Development of the GPSNR was initiated by the CEOs of the World Business Council for Sustainable Development (WBCSD) Tire Industry Project (TIP) in November 2017. Members of the platform include producers, processors and traders, tire makers and other rubber makers/buyers, car makers, other downstream users and financial institutions, and civil society. Representatives from each of these stakeholder groups have contributed to the development of the Singapore-based platform and the wide-reaching set of priorities that will define GPSNR strategy and objectives. GPSNR is not currently focused on rubberwood.

Certification Organizations

Two certification standards currently dominate the market – the Forest Stewardship Council (FSC) and Program for the Endorsement of Forest Certification (PEFC). The FSC uses a system of national and regional standards consistent with ten global principles that were developed by a partnership of stakeholders and apply to all tropical, temperate,

³⁶ <http://www.rubberstudy.com/welcome>

³⁷ <https://www.theirrd.org/irrd/frontpage/index.php?menu=about>

³⁸ <https://sustainablenaturalrubber.org/about-us/>

and boreal forests. All national and regional standards are derived in-country from the ten principles.

The PEFC is a mutual recognition mechanism for national and regional certification systems. PEFC's environmental, social and economic requirements for sustainable forest management (SFM) build on international guidelines, criteria and indicators derived from intergovernmental processes.

Forest certification is a system for verifying the sustainability of managed forests and branding products from these forests for markets. Products from certified forests can move into production streams through certification of the chain-of-custody that allows consumers to know that the product they are purchasing came from a certified forest.

5. Responsible investment in agriculture and forestry

5.1 The ASEAN Guidelines on Promoting Responsible Investment in Food, Agriculture and Forestry (ASEAN RAI)

ASEAN RAI is a roadmap that enables private investors and governments to ensure that investments in any ASEAN Member State are socially, economically, and environmentally sustainable and inclusive. ASEAN RAI includes ten social, environmental, and governance (ESG) principles regarding the avoidance of risks and has a positive impact specifically in the food, agriculture and forestry sectors. The document was formally adopted at the 40th Meeting of the ASEAN Ministers on Agriculture and Forestry (AMAF) in 2018, which means every ASEAN Member State is committed to translating this regional roadmap into national-level action and policy³⁹.

The Guidelines are voluntary in nature and do not conflict with existing national laws and regulations or with binding international treaties. Nor do they replace the need for improved legal and policy frameworks at the national level. Indeed, a stronger and more equitable regulatory environment at the national level is the best guarantee to achieve social, economic, and environmental benefits from investment.

Properly enforced domestic laws are the best way for governments to help realize the positive impacts of food, agriculture and forest (FAF) investment, but in practice, contracts between a state and an investor, known as investor-state contracts, play a major role in ASEAN member states (AMS).

³⁹ <https://www.aseanraiguidelines.org/>

This is especially so in developing countries where the necessary domestic laws may not be in place or may not be sufficiently detailed (Smaller, 2014), or where there is insufficient capacity to monitor and enforce compliance with the laws that are in place.

Host states may lack the legal expertise and negotiating capacity to ensure they enter into contracts of sufficient depth and quality to protect the interests of the government, local community, and investors.

The aim of ASEAN RAI is to facilitate a measurable increase in responsible and sustainable private sector investment in ASEAN's food, agriculture and forestry sectors. Grow Asia, the ASEAN Secretariat (ASEC), the International Institute for Sustainable Development (IISD) and the Food and Agriculture Organization of the United Nations (FAO) are collectively implementing Phase 1 (2020 - December 2022) of a three-phase Action Plan to operationalize the ASEAN RAI by 2030.

ASEAN RAI focuses on four core pillars of work:

1. National Legal & Policy Services: Integration of RAI into national policies through expert technical assistance,
2. Learning & Accreditation Program: Training of 400+ experts to guide future investments through a six-month learning program,
3. Regional & National Capacity Building: Inspiring private sector RAI uptake through knowledge sharing and capacity-building in NGOs and farming communities,
4. Investor Engagement & Impact Management: Encouraging investors to adopt RAI by developing resources including case studies and practical tools; developing metrics to evaluate and monitor long-term impacts.

The ASEAN Guidelines for Responsible Investment in Food, Agriculture and Forestry are inspired by and grounded in the Committee on World Food Security's Principles for Responsible Investment in Agriculture and Food Systems (CFS-RAI)⁴⁰. These ten principles are also inspired by the United Nations' Sustainable Development Goals (SDGs) as follows:

1. Contribute to food security, food safety and better nutrition
2. Contribute to sustainable, equitable and inclusive economic development and poverty eradication

⁴⁰ https://www.aseanraiguidelines.org/_files/ugd/782512_4d80d9cf7767480a87d96c73b19d11aa.pdf

3. Contribute to equality, engagement and empowerment for women, young people, indigenous peoples and marginalized groups
4. Respect tenure of land, fisheries and forests, as well as access to water
5. Contribute to the conservation and sustainable management of natural resources, especially forests
6. Support sustainable and appropriate technologies and practices for resource-efficient, productive and safe FAF systems
7. Increase resilience to climate change, natural disasters and other shocks, while contributing to climate change mitigation and adaptation
8. Respect the rule of law and incorporate inclusive and transparent governance structures, processes and grievance mechanisms
9. Assess and address impacts of responsible FAF investments and promote accountability
10. Strengthen regional approaches to responsible investment in FAF in ASEAN

5.2 Responsible Investment in Agriculture (RAI) implementation in Laos

The rapid economic growth over the last decades has been driven by the exploitation of natural resources, the rubber and banana boom and the development of hydropower, with these sectors largely led by foreign investors. Foreign investment plays a significant role in sustainable development.

After ratification of the ASEAN regional initiative in 2018, several initiatives have been implemented by different stakeholders and development partners, such as NGOs with government-related authorities.

In 2020 the Food and Agriculture Organization of the United Nations (FAO) and the Government of Lao PDR launched a project named “Enhancing the Enabling Environment for Responsible Investment in Agriculture and Food Systems” in Lao PDR. Funded by the Federal Government of Germany, this project will strengthen the skills of policy makers and other key actors to support responsible agricultural investment. The launch workshop held on October 15, 2020 was attended by policymakers and representatives from relevant ministries and institutions related to agricultural investment, as well as the development partners. To increase responsible investment in agriculture, the project will support stakeholders in aligning the legal, institutional and investment-incentive frameworks to the ASEAN Guidelines on Promoting Responsible Investment in Food, Agriculture and Forestry.

The project will offer training for policymakers and work with civil society organizations and other stakeholders to identify the needs and priorities in the review of policies, laws and incentives that would encourage investment in agriculture.

In 2021 a capacity assessment workshop on Responsible Agricultural Investment (RAI) in Lao PDR was carried out in Vang Vieng. The three-day event was organized by the Department of Planning and Finance of the Ministry of Agricultural and Forestry (MAF) and facilitated by Helvetas as an activity of the FAO project “Enhancing the Enabling Environment for Responsible Investment in Agriculture and Food Systems” GCP/INT/920/GER⁴¹.

The capacity assessment workshop was attended by 43 participants representing six departments of MAF, four other ministries, six civil society organizations and two private companies. The participants carried out a series of group exercises and field visits with the aim of answering the following questions: What capacities are needed to implement the RAI principles and guidelines in Laos? What are the current gaps and priorities in capacity? What steps can be taken to close those gaps in the next few months?

As a result, the following points were stressed as conclusions of the event:

- A legal framework is already in place that covers the scope of the ASEAN RAI Guidelines, but there is weak implementation, particularly at the local level.
- Communities are not adequately consulted about planned investments, they have weak bargaining positions when contracts are negotiated, they are poorly equipped to protect their health and the local environment, and often lack the ability to take advantage of employment opportunities created by investment.
- At the same time, some investors do not comply with the terms and conditions of the approved business, particularly with regard to land use.

In support of implementing the ASEAN RAI in Lao PDR, particularly ASEAN RAI Guideline 3, FAO has been collaborating with Lao Youth Radio since September 2021 to raise awareness on the importance of youth in responsible investment in agriculture and food systems (RAI), engaging in agriculture-related activities, and improving their

⁴¹ <https://www.fao.org/in-action/responsible-agricultural-investments/news/detail/ru/c/1455582/>

marketing and social media skills, and to develop the capacities of youth to better engage in RAI⁴².

The 2021 National Multi-Stakeholder Dialogue (MSD) on Responsible Investment in Agriculture was co-organized by the Investment Promotion Department (IPD) from the Ministry of Planning and Investment (MPI) and the Department of Planning and Finance (DOPF) from the Ministry of Agriculture and Forestry (MAF) with the support of the Food and Agriculture Organization of the United Nations (FAO) in collaboration with Helvetas, and Deutsche Gesellschaft für Internationale Zusammenarbeit GIZ GmbH (GIZ) in the context of the “Promoting Responsible Governance of Investments in Land (RGIL)” project, which is part of the Lao-German Land Program implemented by GIZ and co-funded by the German Federal Ministry for Economic Cooperation and Development and the European Union⁴³.

6. Certification and the policy of the buyers/importers/end users

The challenge in sustainability concerns the importance of sourcing rubber and products from sustainable sources. In order to reduce the environmental, landscape, and social impact, developers and companies are encouraged to source materials from certified, sustainably managed forests. Many certification programs exist worldwide, but of these Forest Stewardship Council (FSC) and Program for the Endorsement of Forest Certification (PEFC) are the two most well-known programs. Certification, for instance, by FSC and PEFC would contribute to sustainable management, traceability, and finally responsible investments

What are the differences between FSC and PEFC?

FSC was established in 1993 as an international non-governmental organization with the objective of saving global forests through environmentally compatible and sustainable forest management. The FSC created a worldwide label certifying wood products from suitably managed forests. The FSC label is awarded to all types of wood products, such

⁴² <https://www.fao.org/in-action/responsible-agricultural-investments/news/detail/en/c/1471455/>

⁴³ <https://laofab.org/document/view/5090>

as furniture, timber, and paper products, and also to many other forest products such as nuts, honey, rubber and mushrooms in many tropical countries ⁴⁴.

FSC comprises two main areas of work; forest management and chain of custody. FSC forest management certification ensures that products come from well-managed forests that provide environmental, social, and economic benefits, and confirms that the forest is being managed in a way that preserves biological diversity and benefits the lives of local people and workers, while ensuring it sustains economic viability⁴⁵.

FSC chain of custody certification provides a credible assurance that products which are sold with an FSC claim originate from well-managed forests, controlled sources, or reclaimed materials. It must be possible to track an FSC certified log from the woods, through the manufacturing process, and to the final product that is placed on the retail shelf. This rigorous chain of custody process is part of what makes FSC unique among forest certification programs.

FSC is an international membership organization with members coming from diverse backgrounds including environmental NGOs, the timber industry and trade, community forest groups and forest certification organizations. FSC developed a set of ten Principles and 57 Criteria for forest management that are applicable to all FSC-certified forests throughout the world⁴⁶.

PEFC describes itself as an international organization dedicated to promoting SFM through independent third-party certification. However, PEFC is not a standard agency but a mutual recognition scheme. It not only focuses on the ethical aspects of SFM but also the processing of timber, resulting in a larger emphasis on the supply chain than FSC.

The vast majority of the world's natural rubber is harvested and supplied by small independent landholders. For too long, sustainable forest management certification was considered out of reach for many of these rubber smallholders. Thanks to PEFC's group and regional certification approach, however, sustainable forest management certification is now a reality for millions of rubber smallholders. Nevertheless, the smallholders rubber

⁴⁴ <https://tiergarten.nuernberg.de/en/zoo-more/protection-of-species-and-nature/climate-protection/shopping-with-the-climate-in-mind/forest-stewardship-council-fsc.html>

⁴⁵ <https://fsc.org/en>

⁴⁶ <https://www.nnrg.org/our-services/get-certified/fsc/>

group certification will only be possible with the support from the partners, companies and buyers through strong partnerships and fair benefit sharing.

PEFC now accounts for over 264 million ha of certified forests and its certification system is recognized in over 30 countries. Meanwhile, FSC has certified forests in over 80 countries with 7% of the world's forest area (180 million ha) carrying the FSC certification⁴⁷.

PEFC has achieved the highest ranking in the assessment against the ASEAN RAI Guidelines. PEFC Certification thus helps to demonstrate compliance with ASEAN RAI⁴⁸.

At present, Vietnam's rubber industry faces pressure to meet global standards when foreign buyers say they are willing to pay for transparency and sustainability. A lack of transparency threatens to undermine Vietnam's rubber industry as global buyers increasingly demand material that meets stringent ethical and legal standards⁴⁹.

FSC could offer Vietnam the ability to attract potential buyers as well as expand its share in the markets with a larger number of eco-conscious consumers. However, Vietnam faces enormous challenges in clearing up its “messy” rubber supply chain, according to a senior policy analyst at US-based non-profit organization Forest Trends. The supply chains are long, and, in many cases, it is impossible to trace the product back along the chains. Moreover, imports of unprocessed rubber from Cambodia and Laos are mixed in with domestically produced rubber. This is in part because many rubber companies do not pay sufficient attention to producing certified rubber due to a lack of information. Some companies only focus on export markets that do not require certifications, such as China⁵⁰.

⁴⁷ <https://www.raaft.co/insights/fsc-pefc-what-is-the-difference>

⁴⁸ <https://pefc.org/news/pefc-receives-highest-ranking-against-asean-guidelines>

⁴⁹ <https://asia.nikkei.com/Business/Markets/Commodities/Vietnam-s-rubber-industry-faces-pressure-to-meet-global-standards>

⁵⁰ <https://en.vietstock.vn/2022/07/vietnam-urged-to-upgrade-to-attract-big-rubber-funding-970-482607.htm>

Increasingly, however, major companies such as Nike and Adidas are prioritizing their sources of rubber to producers certified by the Forest Stewardship Council (FSC), the industry's gold standard in terms of meeting legal and environmental criteria.

The global buyers and brands are calling on rubber exporting countries such as Vietnam and others to increase transparency in their rubber supply chains. In another sign of change, in August 2021, Japanese giant Sumitomo Rubber Group released an updated Sustainable Natural Rubber Policy that includes a pledge to begin third-party auditing of suppliers in areas such as the environment, labor practices, and human rights.

Much of Japan's imported rubber comes from Vietnamese companies operating plantations in Cambodia and Laos. In an example of the industry's checkered history, state-owned Vietnam Rubber Group had the FSC accreditation for its Cambodian operations revoked in 2015 for evicting villagers from their land⁵¹.

7. Future of rubber wood

The rubber boom commenced in the late 1990s. At present, it is estimated that most of the rubber trees are about 25 to 30 years old. It is projected that in the next five years the rubber trees may be cut for wood for sale. However, rubber wood governance and the government's legal framework is not yet in place. There is an urgent need to have a policy and legal framework ready for rubber wood governance.

There is neither a special rubber wood processing factory, nor rubber wood furniture in the country. Some companies have started to cut rubber trees but face difficulties with the export of rubber wood.

Once the latex production of rubber trees starts to decline, the trees can be harvested and used for timber. The age at which this occurs varies; between 15 years and 30 years and up to 50 years, depending on the clone, site conditions, and management. In Northern Laos there are some rubber plantation areas that are entering this phase. In Luang Namtha,

⁵¹ <https://www.wrm.org.uy/other-information/vietnamese-land-grabs-in-cambodia-and-laos-for-rubber-plantations-secrecy-destruction-and-violence>

for example, trees planted in the mid-1990s are large in size and latex production is beginning to decline, but this wood is currently being used for fuel. In Southern Laos, companies are already starting to consider the harvesting of trees planted in the mid-2000s. One company reported that they are already exporting rubber logs from storm-damaged plantations. Some ply/veneer companies are considering the use of rubberwood as a substitute for other products and solid-wood product manufacturers are looking to rubberwood as a supply source while other plantation investments mature.

No studies that explore the recovery of wood from rubber plantations in Laos or the quality of wood produced have been found. Opportunities for the use of this wood are being examined through an ACIAR project (Belleville et al., 2020a and Belleville et al., 2020b), including engineered wood products using rubber veneer. Similarly, few studies in Laos have considered in any detail the contribution of wood to investment decisions or derived benefits from rubber plantations.

The literature review by Smith et al., (2020) identified the following useful knowledge on rubber wood:

- NAFRI (2003) reported rubber trees being sold in Mengla, China, for 80-100 CNY/tree (1,200 CNY/m³ of processed wood), which was being used to make furniture by companies such as Ikea.
- Alton et al. (2005) described some contracts for rubber between Lao Farmers and Chinese investors. In one case, in Muang Sing, Luang Namtha, “villagers get 40% of the rubber harvest/trees, but at the end of the contract the Chinese get all the rubber wood. The Chinese can sell their trees/harvest rights without any objection from the villagers.” They also reported that it is conventional to include the sale of rubber timber at the end of the production cycle. While there is a market in Xishuangbana, there has been no sale in Laos. A rubber timber price of CNY360/m³ (\$45/m³) is cited in Mengla and the authors estimate that the farmgate price in Laos would be about CNY280/m³ (USD35/m³). They estimated that 70 m³/ha would be available for timber sale (valued at USD2,450 or LAK25,350,000) and another 130 m³ of branched wood for charcoal (for a total valuation of USD1,300 or LAK13,390,000). It is estimated that 140-person days of hired labor would be required to harvest one hectare of trees.

Manivong (2007) considered the potential contribution of wood from rubber to the economics of smallholder growers in Luang Namtha, drawing on information from similar production systems in Indonesia. He estimated the benefit from rubber wood based on a predicted merchantable ‘butt-log’ volume of 64m³/ha with the remaining volume likely to be burned in the field. Using pricing from the nearest available market in Yunnan Province, China, and the 2005 price of rubber wood of 360 CNY/m³ (from Alton et al., 2005), he estimated the farmgate price in Laos to be about 280 CNY/m³ or LAK364,000/m³ (1 CNY = LAK1,300, August 2005). Manivong noted, however that the yield would be dependent on resource quality and could range from 34-68 m³/ha (see also Manivong and Cramb, 2007; 2008).

- Douangsavanh et al. (2008) describe the rapid increase in demand for rubberwood in Vietnam but did not draw on this to explore the opportunities for rubberwood in the then still emerging Lao rubber sector. They wrote, “In recent years, rubber wood products have developed so rapidly that they require more imported sawn timber. The replanting of rubber trees is considered an important source of raw material for rubber wood factories in the near future. According to the government’s strategy, Vietnam plans to reach 700,000 ha by 2020, in which smallholdings and the private sector would hold 50% of the total rubber areas and most new plantings would be set up in the suboptimal regions.” Other reports and papers touch briefly on rubberwood include:

- Hicks et al. (2009) briefly describe the emergence of certification for rubberwood.
- Douangsavanh et al. (2009) summarizes the benefit distribution under three rubber models, with reference to timber in which smallholders (self-financed, sometimes with credit from government) profit from latex and timber. Under contract farming, profits from latex and timber sales are shared among farmers and investors (investors purchase the products) and through concessions they infer that profits from latex and timber goes entirely to the company. The authors identify a lack of preparedness in a range of areas including technology and timber sales.
- TERRA (2009) notes the potential contribution of several non-latex products and the absence of Lao industry for rubberwood, for processed wood, construction materials, flooring, picture frame rubber bark, use in producing biological fertilizers, and roots for producing fiberboard.

- Nhoibouakong and others (2009) recognized the value of rubberwood and noted that due to its susceptibility to insect and fungal attacks, rubberwood has to be processed shortly after the trees are cut. They put forward the fact that many experts have argued that rubberwood cannot be economically produced from remote and fragmented smallholdings, even though smallholder resources are usually included in wood supply projections. Drawing on experience from Thailand and Malaysia, the authors indicate the potential for rubberwood but highlight environmental concerns.

- Kenney-Lazar (2012) describes the expectations of one Vietnamese company (Houang Ang GaLai) as including significant volumes of wooden products from rubber investments. It is not entirely clear if this refers to volumes from natural forests harvested in the clearing of land in preparation for planting rubber plantations or wood from the rubber plantations themselves.

TERRA (2009) Summary Report: Research evaluation of economic, social, and ecological implications of the program for commercial tree plantations: Case study of rubber in the south of Laos PDR, Center for Research and Information on Land and Natural Resources, National Land Management Authority, Office of the Prime Minister, Lao PDR; Faculty of Social Sciences, Chiang Mai University, Thailand; Foundation for Ecological Recovery, Bangkok, Thailand.

- Zurflueh (2013) describes Vietnamese rubber investments in Southern Laos and notes the Vietnam General Rubber Corporation (Geruco) interests in rubber latex and rubberwood.

- Vongvisouk and Dwyer (2016) consider rubberwood briefly in the context of tree ownership and the clearing of rubber plantations in response to falling latex prices. They report the wood from cleared trees is being sold for firewood. They also touch on this in discussions of different ‘product sharing’ arrangements under rubber investment models, describing the shift from ‘4+1’ to ‘3+2’ resulting in “slippage from dividing latex to dividing trees.” They do not, however, describe what this means for the rubberwood.

Research into the utility of spindleless lathe technology for peeling veneer from rubber is being undertaken by VALTIP3 (Belleville et al., 2020; Belleville and Chounlamountry, 2020). Product testing of the characteristics and quality of Lao rubberwood is occurring at the Faculty of Forestry, National University of Laos (NUOL). The rubber trees were

harvested from a 25-year-old plantation in a village, with diameters ranging from 22 to 50 cm. With industry development rubberwood could provide an important resource for processing and a significant income to smallholders. Investment in treatment and peeling technology is required. Extension material and training is also needed to increase farmer awareness of the opportunity to add value to their plantation through wood. Belleville et al. (2020) found that the forked form of trees created by the practice of tip cutting when rubber trees are young affected wood volume and characteristics.

Research on rubber in Laos to date has focused on the models of acquisition, ownership and benefit sharing associated with the land and latex, with little emphasis on the trees or the wood. Various typologies have been used to describe the ways in which farmers, companies, laborers, state agencies and others perform roles or functions associated with plantation investments. Castella et al. (2009) describe a typology of ownership and investment arrangements for rubber plantations and Bouahom et al. (2009a; 2009b; 2009c and 2009d) describe the ways in which these and associated institutions and policies have emerged.

Rubberwood undoubtedly will generate more income for rubber smallholders and rubber companies, employment opportunities, and contribute to export earnings if properly managed and regulated by the government. This is a good time for the government to prepare an appropriate legal framework and regulations.

8. Challenges and Ways Forward/Recommendations

The actors in the sustainable rubber industry development and responsible investment are smallholders, foreign companies, government-related agencies, the buyers/end users, certification bodies and related international rubber organizations (ANRPC, GPSNR, RSG) all of whom play an important role in the whole rubber value chain.

Challenges

- The rubber governance and legal framework in the country is underdeveloped for latex, and particularly rubberwood. How to integrate ASEAN RAI into national policies is a challenge now faced by Lao PDR.
- The responsible authorities related to rubber are not well developed, coordinated, monitored or evaluated in rubber sector investment. The rubber sector governance

is complex, and many organizations are involved in the early stage of the investment process, but lack careful monitoring and evaluation.

- Foreign investment as major rubber producers (70%) in Laos should be encouraged to implement sustainable rubber development and responsible investment.
- Empowerment of rubber smallholder farmers by integration into groups and cooperatives having access to group certification in partnership with processing companies and buyers/importers. Smallholders and SMEs can help support the implementation of the Guidelines by participating in opportunities for information, technology and knowledge exchange; engaging with business development and training programs; ensuring strong and inclusive producers' cooperatives and SME networks; and applying guidelines for larger investors to the highest degree possible.
- Mainstreaming the ASEAN Guidelines on Promoting Responsible Investment in Food, Agriculture and Forestry (ASEAN RAI) into the national legal framework.
- Development of a Lao Rubber Standard is vital to enhance sustainable development and provide access to better markets.
- Build the capacity of civil society organizations, for instance, the Lao Rubber Association, in order to support rubber smallholders and the implementation of the ASEAN RAI Guidelines by reflecting and implementing the Guidelines in their work streams and programs; assisting states in implementing aspects of the guidelines; partnering with other stakeholders to support 'on the ground' implementation of the Guidelines; using the Guidelines in campaigning, education and advocacy activities; and supporting communities with training and capacity development programs.
- The policies of importing countries, transnational companies and foreign companies are crucial for responsible investment in the sustainable rubber industry and market-driven mechanisms for sustainable development. Foreign investors can help support the responsible investment by respecting host countries' right to food when investing to export food and products back to the home country; building partnerships to promote sustainable investment; providing appropriate and responsible incentives to encourage sustainable investment; coordinating with the country to implement investment projects responsibly; and regulating the business activities of outward investors.
- Finally, we all, as consumers of natural rubber products such as car tires, should take a more proactive role in sustainability and demand certified products from the tire producers for responsible investment.

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