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**ANALYZING IMPACT OF RUBBER PLANTATION ON POVERTY
REDUCTION, LAND OWNERSHIP AND NATURAL FOREST RESOURCE
IN NORTHERN LAO PDR**

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I. INTRODUCTION

Sustainable forestry and land use to promote social and economic development is a key component of development policy in many developing countries. Putting in place the right combination of resource use, industrial development policies to meet these goals is a complex policy challenge. This thesis, in general, aims to examine the economic impacts of rubber plantations on rural people's livelihoods and local land and forest resources. In particular, the specific objectives of this research are to:

1. Investigate impacts of land conversion for rubber on improving rural livelihoods in the northern part of Lao PDR.
2. Evaluate the contribution of rubber expansion on natural resources accessibility and utilization and on the sustainability of environmental condition.
3. Give recommendations to multiply the contribution and avoid negative effect of rubber investment on local livelihood and natural resources.

To achieve these objectives, specific research questions were developed as follow:

1. If and how does rubber plantation reduce rural poverty? How do smallholders meet their food and income needs during the non-productive period of rubber planting?
2. What is the impact of rubber plantation on land ownership? How does rubber plantation become a barrier of poor households to access and utilize the natural forest product resources?
3. What is the impact of rubber plantation on natural forest resources?

The site of the study was deliberately select as a case study of the present thesis. Sing district was selected for not only a large investment on rubber

plantation taking place but also easy access to the site. Sing is located in the north-western side of LuangNamTha Province, sharing borders with Xishuangbanna, China, to the northeast, Myanmar to the north and northwest, Muang Long district on the west and LuangNamTha district to the south. The political and administrative centre of the district is Muang Sing, a small town made up of a cluster of several villages. According to the population census conducted in May 2005, the district has a total population of 30,548 distributed in 96 villages. However, only three the most involved and affected villages were selected as samples in consultation with the Provincial Agriculture and Forestry Office. This includes Had Nyao, Dong Jai and Oudomsin villages

II. METHODS

2.1 Data collection

The data that form the basis of the present study were obtained from collection of secondary and primary data. Secondary data was collected through a desk review to collect government regulations and policies on rubber plantation development. These documents were obtained from the Department of Forestry (DoF) of Ministry of Agriculture and Forestry and the Land Development Department (LDD) of the Ministry of Natural Resource and Environment. A local policy and regulation on investment in rubber plantation were also collected at LuangNamTha provincial and district offices of Agriculture and Forestry, Investment and Cooperation, and Natural Resource and Environment. In addition, research results of others and experiences of other countries related to rubber plantation were also collected via electronic search and through personal contacts with researchers.

Meanwhile, collection of primary data was carried out through semi-structure and in-depth interview approaches. Semi-structure interviews were mainly used with decision makers and rubber planters. First, the Lao

government at national, provincial and district line agencies were interviewed and discussed to obtain the government policies, lesson learnt, minimizing obstacle mechanism and future expectation and other related studies. These include the Provincial Department of Planning and Investment (DPI) and their counterparts at the district level, the Rubber Unit of the Provincial Agriculture and Forestry Office (PAFO), District Agriculture, Forestry and Extension Offices (DAFEO), and the Provincial Customs Office.

In-dept interview were mainly conducted with the local villagers with a list of discussed topics developed and used to guide the discussion.

2.2 Data processing

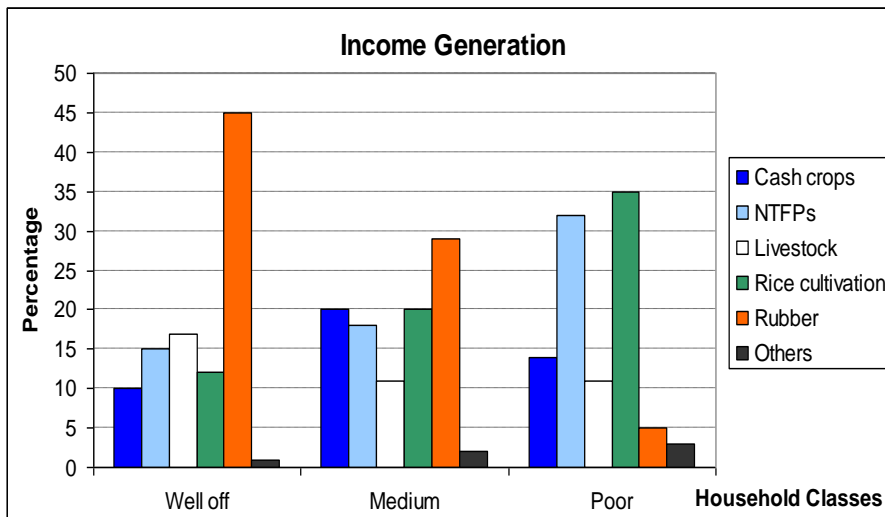
Interview with 6 informants at the central level, 4 at the provincial level, 1 at the district level and 120 of villagers formed the core of the data. These were compiled and synthesized along with field note. An annalistic induction method (Minichiello et al., 1995) was used to seek recurring themes from across different accounts to generate a broader theoretical understanding derived from the specific data. Inductive analysis involved linking the individual account to gain a broader perspective of how the experience of rubber plantation developed in their territory within the context of livelihood and land use. An ordinary excel computer program was used to compile and analyze the data.

III. RESULTS

3.1 Impact on Poverty Reduction

The field indicated that rubber investment has only contributed more income among well-being households, who have more opportunities in terms of financial security and land property. See Figure 1 below:

Figure 1: Main income sources of visited villagers, categorized by socioeconomic status.



Source: a field visit in randomly villages, 2010

However, almost of the poor are much more dependent upon the traditional shifting cultivation and non-timber forest products (NTFPs). 39% of villagers (who are poor) have a lack of spare land and finance to invest in rubber. There are some long-term loans available but they could be a high risk for them to increase loan debts due to insufficient technical input for rubber plantation. Furthermore, villagers cultivate rice and vegetables for household consumption, meanwhile sugar cane for sale to China. Livestock raising such as buffalos, pigs, cattle and poultry are common additional economic activities.

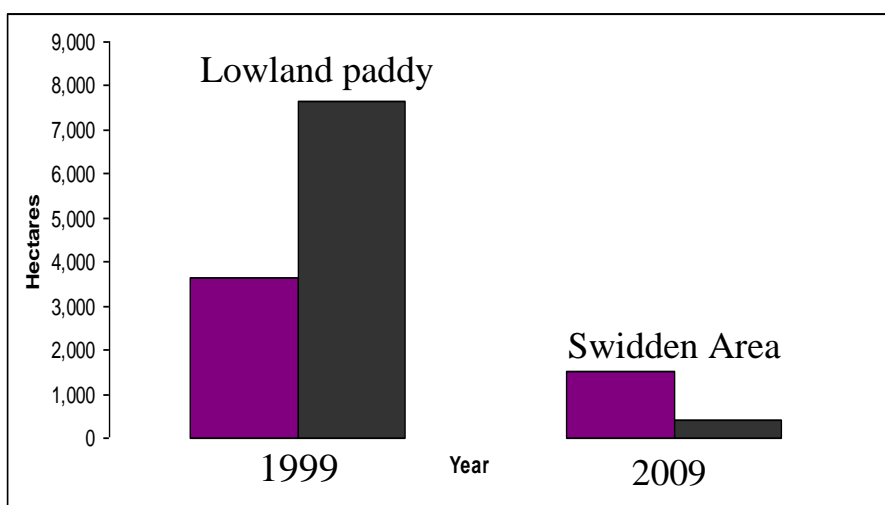


Figure 2: An increase in rice areas in Sing district in 1999 and 2009

Source: field visits, 2010

Growing rubber is strengthened as a key strategy to reduce poverty and stabilize shifting cultivation as well as to combat poppy production and increase forest covers. Both domestic and foreign investors are opened and encouraged to facilitate this strategy. Most rubber plantations in the North of Laos are invested through concessions or contracts with Chinese or Vietnamese investors. However, there is a controversy from local and international NGO staff, researchers and public related to its benefits, whether it could drive a better livelihood of local villagers.

It is understandable that it would take longer time to gain economical benefit return from the rubber investment for local households. At least five to seven years, rubber will be able to produce a good quality of product. Meanwhile, intensities of labor and finance will be put into a single growing stage; including maintaining and protecting from weed invasion, plant diseases and predators. Nevertheless, income from rubber is normally reduced by several costs; including village administrative cost, contracting a trader, preparing transport document, transport and charge for village development fund. The figure illustrates that transport costs is very expensive (138,000 kip or ~15\$/tone) due to bad road condition and limited vehicles, followed by the contribution to the village fund which is about 64,000 kip or 7\$/tone, as shown in Figure 3:

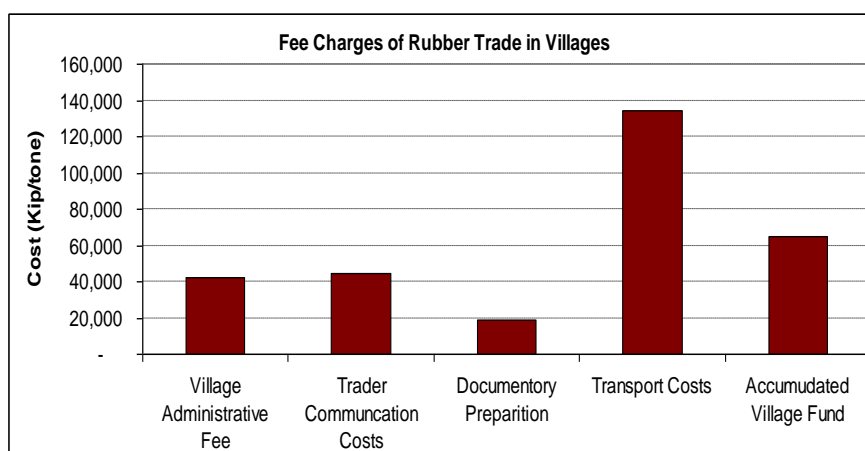


Figure 3: Cost of rubber products before exporting

Source: field visits in 3 villages, 2010

The chart above represents the fee charges of rubber products that local farmers have to pay. A village administrative group is established to manage and control the trading procedures within their village and seek for better offered buyers. However, comparing between rubber traders and producers, the income is gained by the trade blockers the most. In one tone of rubber cost, approximately 10% is going to village development fund, 51% for rubber planters, whereas over 38% of the income will be paid to rubber blocker. See below:

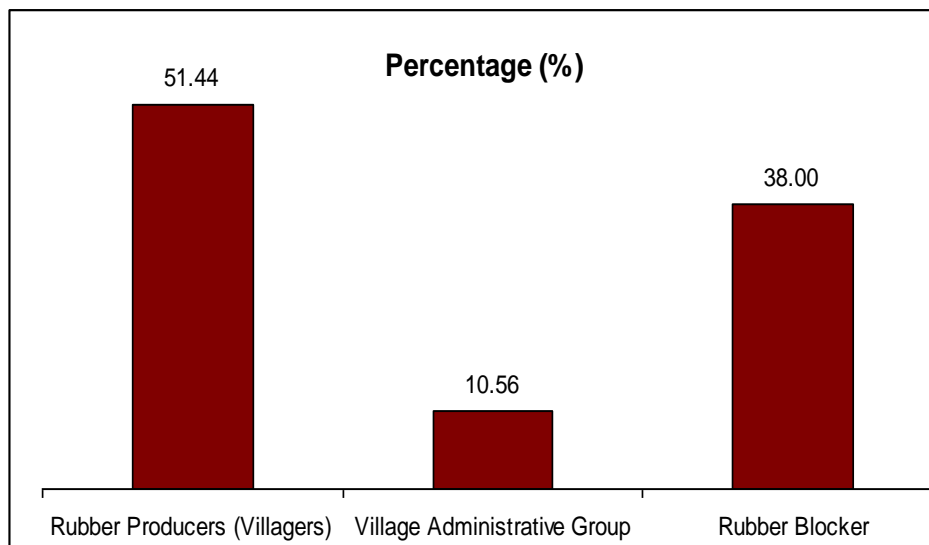


Figure 4: Comparing rubber incomes among three different groups

Source: field visits in 3 villages, 2010

It is acceptable for local rubber producers to gain about 51% of economic benefits of their money invested in rubber plantation in their own land. This excludes a cost of own labor, mechanical inputs and others. It could represent that the income from rubber investment is relatively high, but it could be maximized by reducing administrative and transport costs. However, if looking at the whole, only rich and middle classes of household have more chances to invest and grow rubber. Poor families are not much encouraged to get more involved.

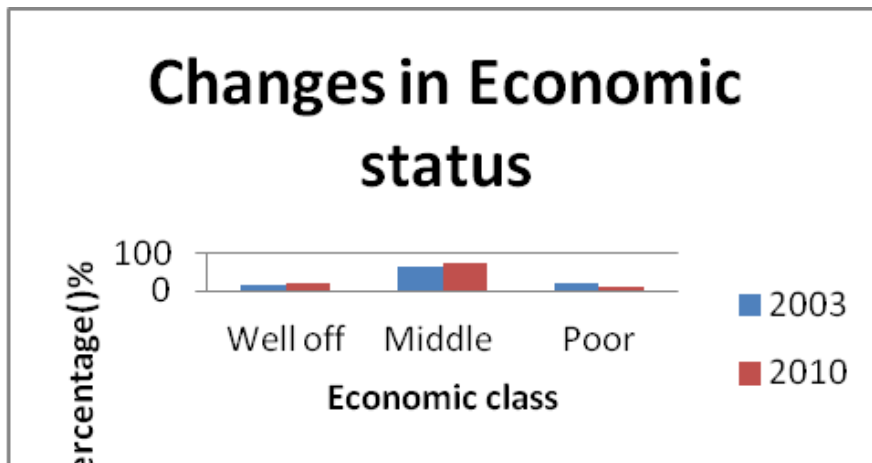


Figure 5: Livelihood improvement resulting from rubber plantation expansion

Sources: field visits in three villages, 2010

Evidence from the interviews and data collection from the village head of the three villages studied shows that expansion rubber plantation contribution to the improvement of local livelihood. As can be seen in Figure 5, the well off and middle households are increasing almost 20% from 2003 to 2010. Importantly, the number of the poor has reduced from 19% in 2003 to only 8% in 2010. While factors contribution to the change may from various reasons, villages head value high on the significant contribution to this improvement.

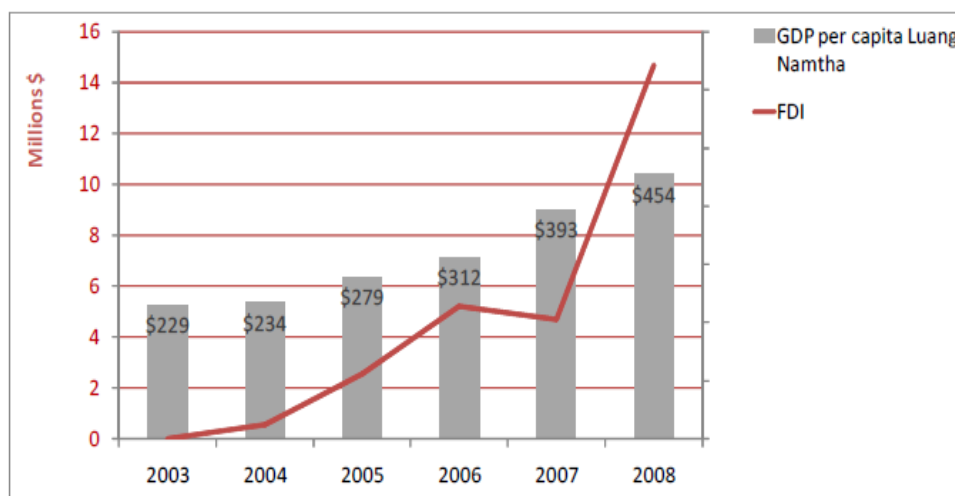


Figure 6: Comparing GDP growth in Luang Namtha province, 2003 to 2008

Source: GTZ, 2010

Interestingly, the GDP per capital in LuangNamtha province has been increased significantly inline with the foreign direct investment (FDI) during five years. Almost of foreign financial incentives have been focused on promoting agriculture commodity, especially rubber plantation. In 2008, the FDI increased rapidly. Land and forest areas have been approved and given concession for rubber plantation. It would reboot and surplus the provincial GDP in a long-term. In order to follow up the direction of government of Laos to increase forest cover, by rubber plantation, and improve livelihoods of ethnic groups, it requires promoting poor families in terms of both financial support and technical advice.

3.2 Impact on land ownership

According to a discussion with local authorities, there have been some certain levels of land use conflicts among local communities and rubber investors due to several factors. A reason of this issue is unclear zoning. It is suggested that the land and forest allocation (LFA) programs have been uncompleted in some villages in Sing district. The record shows that there are conducted (LFA) programs in about 36 villages from 2002. Although numbers of implemented villages are shown, visual signs and location marks to indicate boundaries of villages are not yet put in those areas. As a result, it is hardly to indentify individual land and forest zone, it is even more difficult for villagers to permit rubber plantation in those villages. Until now a spread of rubber plantation areas is not very understandable.

Another reason is the increase in local population within a limited land. Heads of many villages agreed that a land scarcity in their villages has a result of rapid immigration and their own population. From time to time, people from outside villages have come and settle in this region, looking for a better life as well as settlement program of the local government to reduce the shifting cultivation problems and find a permanent occupation. Meanwhile, a lack of knowledge on family planning and maternal literacy

brings a growth of new populated generation. There are more people who have an uncertain or unofficial proof of land tenures. It is very difficult to manage.

Table 1. Hardyao Village Land Zoning, 2005 and 2011

2005 Data <u>Land zoning</u>	2011 Data <u>Land zoning</u>
76.38 ha Conservation Forest	61 ha Conservation Forest
195.75 ha Protection Forest, consisting of:	67 ha Protection Forest
Protection Forest (15.75 ha)	
Regeneration Forest (159.75 ha)	
Utilization Forest (20.25 ha)	
527.87 ha Agricultural Production Area	672.96 ha Agricultural Production Area
Paddyrice (11.03 ha)	Rubber zone (73 ha, of which 22 ha planted already)
Upland rotational swidden (345 ha)	Utilization Forest (17 ha)
Garden (29.72 ha)	8.04 ha Other
Reserved land et al. (168.10 ha)	
826.00 ha Total	826.00 ha Total
<u>Population</u>	<u>Population (2011)</u>
80 families	113 families
453 people (224 women)	730 people (363 women)
Agricultural land per <u>family</u> (average): 6.6 ha	Agricultural land per <u>family</u> (average): 4.5 ha
Agricultural land per <u>person</u> (average): 1.2 ha	Agricultural land per <u>person</u> (average): 0.7 ha

Source: DAFO and Hardyao village statistics (2011)

The case of Hardyao village has witness three types of impacts of the rubber plantation project on land use and tenure in Sing District.

1) Because the rubber project attempted to gain land access without providing compensation to earlier land users, it caused a rush of land sales from the poor to local elites. These sales have brought citizens into conflict with the local government authorities over land ownership and the right to compensation and, in so doing, exacerbate the distinction between the poor and the elite by creating what looks like a two-tiered system of land ownership – one tier for the poor, who cannot get compensation their land when faced with government-supported investment projects; and one tier for the elite, who can.

2) In targeting land that was used for shifting cultivation, the rubber project has begun to either displace agriculture to other areas or contributed to a larger trend of livelihood de-agrarianization.

3) By re-zoning some protected forest areas as areas for rubber production, the project has *regularized* – although it probably did not *cause* – the breakdown of the zoning system established under the LFA program.

The “to use it or to lose it” rule of land use in concession area is economically coercive because the project was not offering compensation – either cash or land-for-land elsewhere. This rule thus gave a strong incentive to participate: not participating meant losing the right to use scarce land that had been earlier allocated through LFA. Land was already scarce in the three studied villages, and land had been getting scarcer over time. According to the village committee, land scarcity had emerged in Hardyao village over a decade and a half ago, and was largely due to a combination of expanded cash cropping. According to land use and population data for Hardyao village (Table 1), agricultural land (whether measured per household or per person) had decreased by roughly a third in less than a decade.

While regrettable, this dispute is not surprising. Even if labor inputs were carefully accounted for and agreed upon (not a trivial matter), there remained the fact the rubber project had made two commitments that conflicted with respect to location and landownership. On the one hand, villagers were told that trees would be divided based on labor inputs, which suggests that *all* original land use rights were to be given up. On the other hand, they were told that only *non-participating* villagers would have to give up their land use rights, suggesting that households that participated would be able to keep their original plots. Reconciling these two commitments may be possible in theory, but is probably quite difficult in practice, especially given the advantages of certain plots over others due to accessibility, soil quality, and so on.

A final factor of land use conflict is a result of inadequate land use and management skills and poor investment understandings. It is obviously that there is a lack of a concrete or standardized land use management plan in each village. Investment mechanisms are more likely influenced by investors. Inadequate marketing knowledge and educational skills of local villagers are insufficient to defeat the manipulated information or contracts. Sometimes, full understandings of concessional agreements/contracts are not yet made before those contracts are signed. Thus, those above three main reasons are determined factors of land use conflicts. Some villages claimed that they lost their land due to a long term rubber investment contract. Others complained that rubber plantation replaced a part of their agriculture land. Because of land concession is allowed officially by the local government, but without acknowledgement their land tenure rights.

3.3 Impact on Natural resources

Based on the forest information available in Sing district, it was found that the forest cover has been changed over time since 1990s. The figure

indicates that there was about 56% of dense forest in 1991, however it declined to roughly 40% in 2004. On the other hand, secondary forest has been increased about 20% to 34% in 1991 and 2004 respectively.

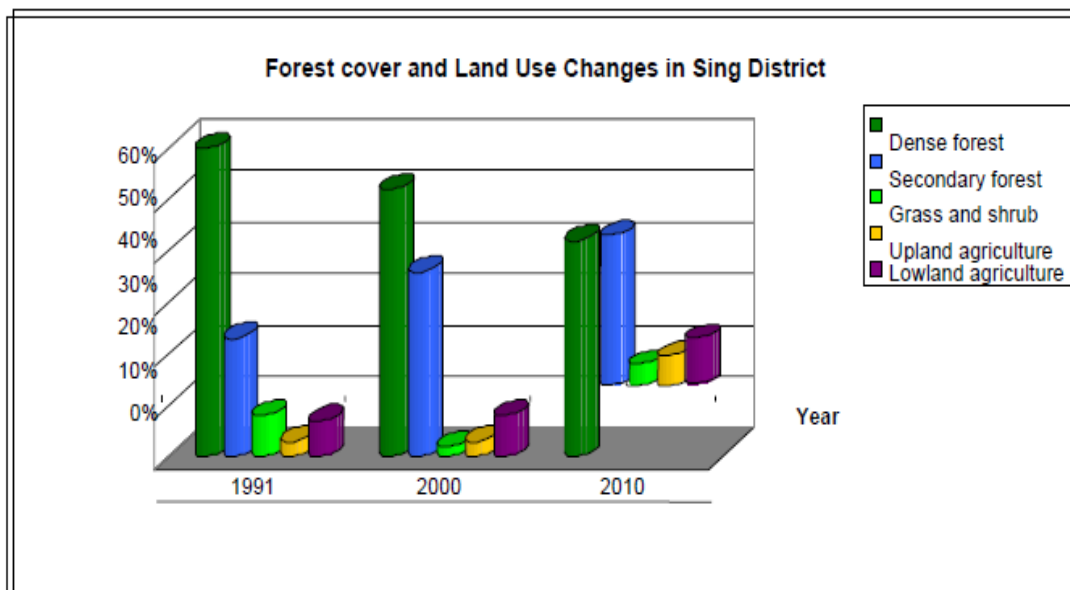


Figure 7: Percentage of forest and land use changes between 1991 and 2004, Sing district

Source: District Forestry and Agricultural Office, Sing 2010

In generally, shifting cultivation and rubber plantation have a high potential to replace those dense forest areas. This has a result from rapid high demand of rubber and its double prices. Several villages in the Southern part of China (Yunnan province) and some of North Lao villages located along a border had initiative grown rubber trees. Local farmers have started to plant rubber in small quantities over the last several years in LuangNamtha province. Most of them are wealthier farmers, who have the money and the labor investment or even land. As it is shown in a chart below, rubber plantation areas have been shortly increased double since 2006. About 7,500 ha of rubber areas were planted in 2010.

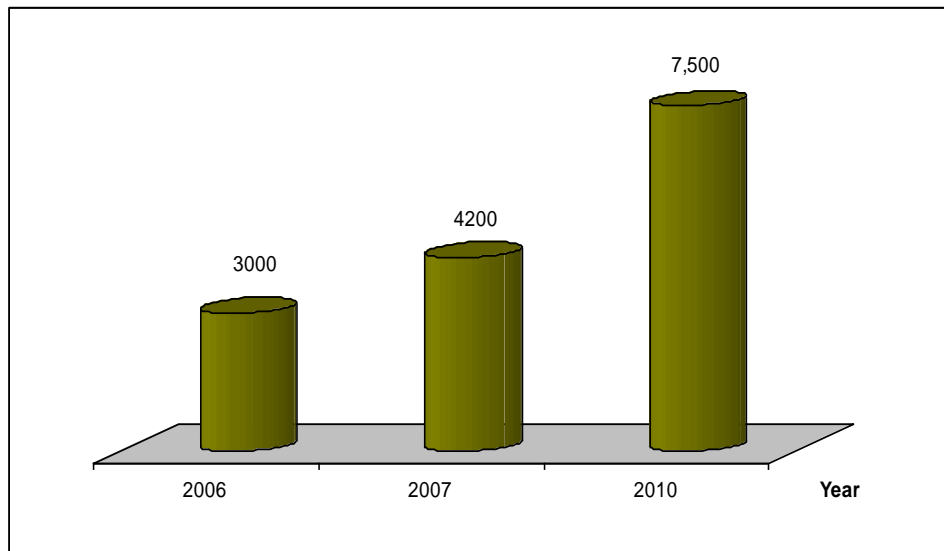


Figure 8: Rubber Plantation Area in 2006, 2007 and 2010 (Planned), Sing district

Source: District Forestry and Agricultural Office, Sing 2010

The figure above shows the increase in rubber plantation area in Sing district. Sing is the second highest rate of rubber plantation growth after Namtha district. These two districts had an early start in planting rubber, resulting from investment promotion policy of the Lao government, strong influences of Chinese rubber market and local villagers' motivations.

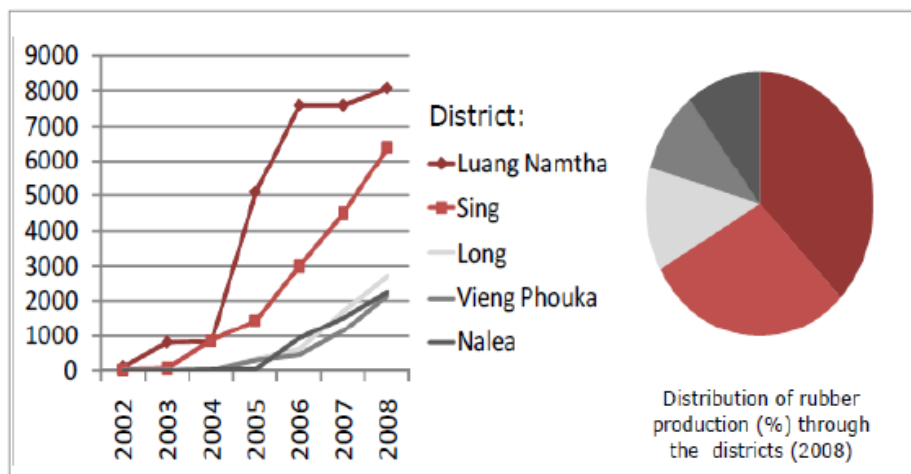


Figure 9: Comparing Rubber Plantation Area in different districts, 2002 to 2008

Source: GTZ, 2010

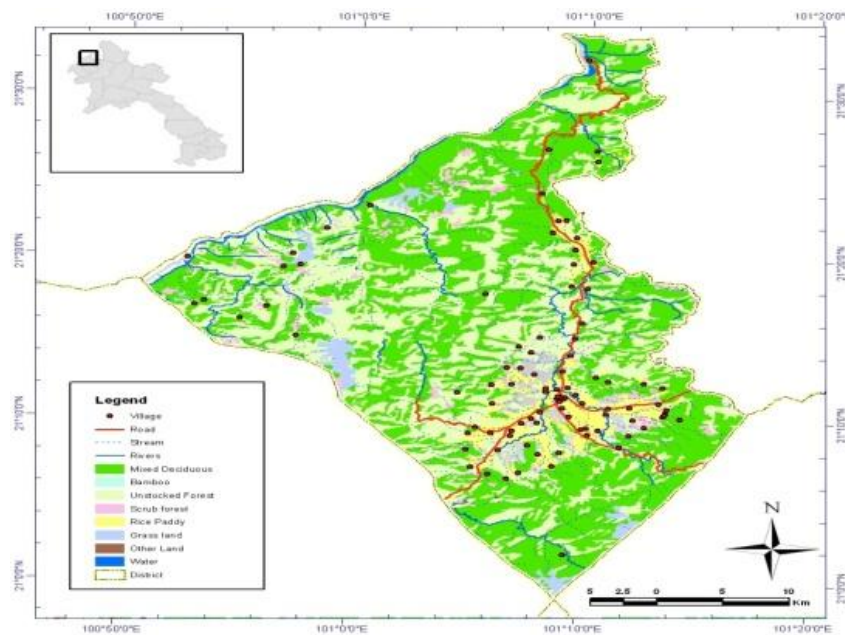


Figure 10: Map of Sing's Land Use and Forest Cover 2002

Source: Division of Forest Inventory and Planning, Department of Forestry

In 2006, the Sing district government decided to make an attempt to plant rubber on an area of nearly 3,000 hectares. The district officials purposed the proposal rubber planting to the provincial authority office. After that the province authority allows technicians from both Chinese rubber company and district officials to conduct a survey or look for suitable land and make a contract. Then, contract or land concession of nearly 6,500 hectares of land areas was planned for rubber, approved by a chief of the district authority, in 2008. This land area was covered 20 villages in Sing district. In 2010, more contracts have been approved and signed between the provincial authority and a rubber company from China. In a whole the province, about 21,000 hectares in LuangNamtha will be provided for rubber plantation expanding. It is obviously found that existing dense forest areas have been converted rapidly into monoculture tree species. Searching and locating a suitable boundary for rubber plantation is still not very cleared among local government officials (DAFO) and villages. Figure 10 illustrates high forest fragmentation in Sing district due to the land conversion for rubber plantation and other agricultural land uses. The

remaining forest cover is mainly concentrated in the high mountain or steep areas.

Another recent research found that although district statistics in Sing district indicates a dramatic decline of upland rice production area from over 1,500 ha to 400 ha between 1999 and 2009, an increasing numbers of farmers were converting swidden and fallow forests into permanent agricultural land. In Sing district, farmers converted swidden and fallow forests especially along the road into sugarcane and rubber plantations (Thongmanivong 2009, DAFO 2010). In addition to this, the land and forest allocation (LFA) program has not been completely implemented in some villages, it is impossible to know exactly how land zoning and locating rubber were made in those villages. Therefore, the rubber plantation areas are not very well understandable.

3.4 Reason of negative impacts

As presented in the above section, impacts of rubber plantation development at Sing district have been not significantly improved the poor as expected in the policy goal. Ironically, it has caused major conflicts over land use of the local as well as deterioration of biophysical environment. The results of the present study asserts 5 main reasons:

Reason 1: Rubber plantation investment has failed caused by the local institutional weakness

Many flaws found in the investment proposal, endorsement has made due to weakness of the concerned sectors recognizing these flaws. The endorsement procedures begin with approval from the village head and district governor. The proposal is then distributed by the investment office to the concerned sectors such as Provincial Land Authority and the PAFO for commends. If there is no other thing else, the endorsement is made by the provincial governors. The village head and district governor and provincial investment office will not refuse the investment. In contrast,

it is their virtuous contribution to the investment promotion policy and so does the provincial governor. Provincial Land Authority has just established few year ago with unwell equipped with human resource, necessary utility to complete their job as well as their vagueness of role and responsibility. Thus, they regret to have negative comments on the proposal. Agriculture and forestry sectors also have an unclear mandate on the investment on land. They may have somehow recognize the flaw for example no suitable and available land in the district, but their voice seems not strong enough to refuse the proposal.

Reason 2: The failure of rubber investment associates with inconsistent market price and long term return

The policy on industrial plantation of the province aims to pursue its economic growth as well as to increase the forest cover up to 70% within 2020. The policy would be exceptional to use if a careful tangible analysis has put into a serious consideration. About 40% of over 83,000 ha in the provincial area is in the industrial tree plantation investment plan, which is included swiden areas of villagers. In Hard Yao village, 500 ha or more of agricultural land is in the plan for rubber plantation. All plantations are a long-term investment, which takes years to get return. For instance, the rubber plantation will take about 6 to 14 years to be able to harvest rubber resin. To ensure full participation of the villagers and avoid potential adverse impacts and symptoms described in Section 3.4, it needs a clear view on sustaining livelihood of the local during this interim phase of 6 to 14 years whether to seek or accommodate alternative income or job. In addition, there needs a fix rubber price mentioned in the investment contract that the investors would buy from the farmer. For example, a fix rate of 2 US\$/kg should be specified in the contract. The current contract specifies to depend on the global market price in the mid of high uncertainty and booming of rubber plantation in other part of the world.

Reason 3: A lack of regularly monitoring and evaluating on the land investment implementation

Inconsistence of land investment and forest conversion process were found. The investment on land is based on the investment value. The investment cost below 3 million \$ is endorsed the provincial government regardless to the area of land. For instance, in LuangNamTha, a Chinese rubber plantation company received the concession from the provincial governor as the value of investment is 1 million US\$ with the concession area of 5,000 up to 10,000 ha. The provincial authority incorporation with District Authority seeks the land for this the company. In many cases, when available land was not enough, natural forest areas are subjected to convert for this plantation purpose. However, base on the Law on forestry, the conversation of forestland between 100 to 1,000 ha is required to consult with the Ministry of Agriculture and Forestry and the conversion beyond 1000 ha is subjected to be considered in National Assembly. In addition, based on the Law on Environment, any project with area of more than 1000 ha, is required environmental impact assessment. In actual practice of this land conversion, none of the land investment project has abided by the concerned laws.

Reason 4: The land investment proposal has a flaw

There is a flaw in the investment proposal as well. The proposal is usually composed with a suitable land availability survey, which almost relies on a topographic map with contour line with disregard to the existing land management scheme and social condition. A various report shows that the map overlapped with protection and conservation area and agricultural land. Therefore, villagers' agricultural land areas are already in the target for the plantation development. State land, community land and private lands are not mentioned in the map. The proposal often excludes social factors such as local capacity and willing to participate the investment

project. The proposal ends up with over estimation of available suitable lands. Thus, the profit they will get return are over estimated.

Reason 5: Fewer opportunities to receive support from the external aid for their livelihood development

There have been several international organizations such as German Agro Action (GAA) is helping to improve the local livelihood coupling with the forest resource conservation through an extension of animal raising and a variety of crop production. Security of the right on land of local is a prerequisite to ensure the achievement of the project implementation. One of the project priorities is to develop a land use map and planning within the village and to allocate the land to an individual household for agricultural production activities. The map signifies the area, location, owner and its development potential. However, the project activities will be unsuccessful and not be affective in the villages where the investment on plantation of the company takes place. This project development plan and effort seem to be ignored by the private companies. Thus, this type of village development project will try to avoid or not focus on the villages included in the state plan to grant those village lands for rubber plantation investment. Eventually, the poor will simply lose an opportunity to receive assistance from outsiders to develop their livelihood conditions.

IV CONCLUSION AND RECOMMENDATION

4.1 Conclusion

Rubber plantation investment is considered as a significant role in improving and bringing a rapid national financial return through the foreign and domestic investment mechanism, as well as to increase the forest cover over the country land. Several government policies are introduced and modified carefully to facilitate such kind of controversial investment. Those policies are aiming to create an attraction and

motivation for both outside and domestic investors. As a consequence, huge financial incentives have been invested and a large agricultural land has been also converted into monoculture tree species such rubber. In Sing district, similar to other North region, rubber plantation has become a crucial part of their diary economical incentives. An extremely wide area has been planted and occupied by rubber trees. People believe that planting a rubber tree would bring a better life in the near future, although knowledge and technical skills related to its successful investments are primary negligible. As a worse experience occurred in Sing, in 2000, almost 70% of rubber plantations were died out due to a poor maintaining and management, plus terrible weather conditions.

Looking closely, investment policies from the government, bordering market influences, including influence from China, Vietnam and Thailand and a high motivation for local farmer in itself are the main factors pushing a rapid increase of rubber investment in the North region. Those factors are obviously great combinations which facilitate a booming rubber plantation. However, several concerns related to this rapid increase in rubber areas. Ever though it is obviously shown that rubber investment creates more opportunities for country to gain more economical returns, local economics should not underestimated. For instance, the GDP per capital in LuangNamtha province has been shot up dramatically as well as the foreign direct investment (FDI) over the five-year periods. Meanwhile, in Sing, well-off households have a better chance to gain benefits from rubber investment, whereas poor ethnic minority groups, including Akha and Khmu who rely upon natural forest resource and upland agricultural system, are not well encouraged and more likely to loss their lands. Normally, better-off farmers use their knowledge, financial security and power to gain profits through land property ownership transforming and investment mechanism. The success of farmers in China has created and pushed more interests for North famers on rubber as an important income

generation channel. An increase in price of rubber also attracted upland farmers, although marketing information is still not very well informed. During 2007 and 2008, a drop in the price of rubber has not much influenced the farmers' effort and still continued to indicate an interest in rubber as a long-term investment. Another consideration is a benefit return. The rubber product prices are normally dependent upon the Chinese traders.

Another controversy is that rapid expansions of rubber plantation and shifting cultivation are more likely to increase a speed of forest loss and degradation. Though statistic of forest areas in Sing district is not frequently monitored, recorded and updated recently, more than 15% of forest covers have been lost during the thirteen-year periods; 1991 to 2004. The swidden, sugarcane and fallow forest areas have been simply converted into commercial agricultural land specifically rubber trees. This has a result from a high demand of rubber and the increasing in its double prices. Nearly 3,000 ha in 2006 and 6,500 ha in 2008 had been approved by the Sing district government to plant rubber on their areas. About 21,000 hectares of lands in the whole LuangNamtha province will be provided for rubber plantation expanding. It is obviously found that wide lands have been converted rapidly into monoculture tree species. The concern remained is that where those approved lands being located and expanded? Is it included in existed dense forest areas?

While the rubber plantation is widely expanding, LFA program has been remained unfinished and then their villages' boundaries are unclear. As a result, it is hardly to visualize individual land zones and forest areas. Sometimes it is likely difficult for local communities to permit a location for rubber plantation in those villages. In some cases, a large area for private companies are decided and situated by themselves without a consultation and collaboration with local authorizes. Moreover, rights of

land ownerships are not yet determined for all. Those lead to land use conflicts among villagers.

4.2 Recommendation

Rubber plantation development in Laos has been promoted as a mean to contribute local livelihood and natural resource improvement. However, results of the present study found some shortfalls of such investment and need to be addressed to ensure the investment on rubber plantation meeting the national development goals. Following are recommendation drawing from field interviews and cutting edge knowledge to both national and local levels:

National level:

Realizing the need to develop and extend the policy to promote investment on land as one of the key mean to boost the local economic growth and develop local livelihood, the policy need to be revised. The policy on land investment encourages the economic growth of the province through the land tax and provides significant benefits to particularly foreign investors and well being groups, but improving the local villages' livelihood is still questioned. This research found several adverse impacts on the local families especially the middle and the poor for their losing right on land and facing food insecurity due to lower production and limited agricultural land. In addition, the village natural forest area is influenced as well. The local natural forest shifts to the mono specie plantation, which precisely and imprecisely undermines the local environment. Thus, revision of the policy to minimize these undesirable effects is strongly recommended.

Many government regulation and policies related to rubber investment in Laos are declared and cautious adapted into local conditions to multiply the benefits from the investment, however, it's very necessary to provide effective monitoring and evaluating mechanisms. This should be done frequently and effectively in collaboration with provincial and local

authorities, to ensure the implementations of those private enterprises are transparent without fake and manipulation approaches among businesses and rubber farmers. It would be helpful to especially vulnerable farmers who wish to involve in a contract farming and to avoid a worse consequence as experienced before. The rubber investment audit units at the provincial and village should be established in order to fulfill this requested monitoring task.

Finally, the good experiences of rubber tree plantation from other countries in the Southeast Asian region should be observed and careful applied in order to ensure its sustainability. It is necessary to consider their strategies used during their rubber tree plantation lifetimes and rubber latex processing before those lesson and experiences learnt could be introduced to Lao small farmers and private enterprises.

Local level:

The current wave of land investment in LuangNamTha goes forefront the land management plan of the province. The endorsement of the investment is based on the value of the investment rather than based on the management plan, which compromise for a private investment, food production of the local and environmental protection. In order to avoid the land use conflicts, it is necessary to continuous the uncompleted land and forest allocation program in those villages' boundaries. Financial budgets and labor are needed to from the government to fulfill this task.

In order to address a flaw in land investment proposal, a monitoring mechanism is required. This could be simply re-checked and evaluated by the involved institutions such the District Land Use and Planning Office (DLUPO), DAFO and PAFO. All of power belongs to these people. Whether the industrial plantation proposal will be approved, it is depended on them. Regularly monitoring and evaluating the influences of land investment on livelihood of local villagers in particularly land tenure and

social-economic conditions are very necessary to ensure and guarantee the better quality of them.

A wide speed of forest loss and degradation is the most concern of the Lao government and among environmentalists. It is the major source of food for the poor villagers. It is obviously that information and statistic of forest areas in Sing district is not frequently monitored and surveyed. Nowadays, a free Landsat satellite images and opened source of software are available online for free of charge. That would help to monitor and suspect the land and forest cover change in some certain level and improve and encourage the forest management decision. But question remains how to improve our provincial officials to use those available materials.

In addition, the wave also goes beyond the capacity of the local government to manage. Institutional framework needs to be revised for their consistency. There is a requirement to develop the human resources in terms of a number of knowledgeable staffs with high qualification and ethic engaging in the concerned sectors in order to deal with the clever and hungry investors to reap up the LuangNamTha natural resources. There needs to pause the wave until the land management plan is completed and capacity of the local government is ensured.

A lack of knowledge and technical skills of local rubber planters are determined their successful investments. Therefore, continuous improving and technical knowledge supporting are needed to avoid a previous worse scenario in Sing district. This could be done through the rubber planting model or establishing the information center within a district. This center could play an important role in generating a regularly information and technical services to local farmers. It could be a central focus for them to exchange information and experiences. As farmers' experiences, poor planting methods, maintaining skills and marketing strategies are keys of their successes.

From social-equal point of views, economic benefits from rubber investment are much more obtained by private investors and well-off families rather than poor villagers. Poorer farmers are less involved and more likely affected. Thus, there is a need to further analyze social economic returns between stakeholders, specifically the poor farmers. It is, of cause, very difficult to make a balance among rich and poor families. However, it is necessary to avoid an adversely impact from those investments by ensuring a food security within existing natural resources and making sure those have a equal right to access land and resources as others.

Prices of rubber products are much more dependent upon Chinese traders. It is necessary to create better marketing strategies, to ensure the satisfied economic returns. In some Sing villages, even though there is a rubber trade committee who act as a representative of farmers and to negotiate with traders, however, it is still necessary to empower this group of people to more powers, knowledge and needed resources. Marketing information and outside rubber situations are needed to provide and improve to this committee.

Those are tough tasks recommended to the local government to overcome the shortfall of the investment on land in LuangNamTha province. The natural resources within the province belong to the country in general and in specific belong to LuangNamTha people in the present and next generation. Natural resources fade totally depends on the central and local government commitment to sustain the existing natural resources for their current generation and conserve for next generation.

RESEARCH TOPIC RELATE TO THE PH.D DISSERTATION

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