

Poverty - Environment Initiative (PEI) Lao PDR



Assessment of Economic, Social and Environmental Costs and Benefits of Dak Lak Rubber Plantations: Case Study in Saravan Province



Photo: NERI

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Data used in this research is obtained from official statistics, published literature and field surveys carried out between May and December 2010, with reasonable efforts to ensure that these are factually correct.

The views expressed in this report are those of the authors and do not necessarily reflect the view of the Ministry of Planning and Investment of Lao PDR.

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Acronyms and Abbreviations

IUCN	International Union for Conservation of Nature
FDI	Foreign direct investment
GoL	Government of Lao PDR
GDP	Gross Domestic Product
Ha	Hectare
LAK	Lao Kip
MPI	Ministry of Planning and Investment
NERI	National Economic Research Institute
NTFP	Non-timber forest product
PEI	Poverty-Environment Initiative
PAFO	Provincial Agriculture and Forestry Office
PDIC	Provincial Department of Industry and Commerce
PDPI	Provincial Department of Planning and Investment
PLMO	Provincial Land Management Office
UNDP	United Nations Development Program
USD	United States Dollar
WREO	Water Resources and Environment Office

1. Introduction

1.1. Rationale and project background

Saravan Province's natural resources, including forests and fertile land, have attracted increasing investments over the last decade. Between 2006 and 2009, the accumulated value of investment in the province was about USD 142.3 million, with 43.4% of this amount coming from foreign direct investment (FDI).¹ The province's natural resource sectors have attracted the most investment, with most FDI occurring in the agriculture and forestry sector (about 52%, followed by the industrial sector at 44%).

Previous studies and available information on investment in Saravan Province are limited, and do not provide sufficient information regarding the economic, social and environmental impacts of investments, especially at the local level. Therefore, IUCN Lao PDR, NERI and the Saravan provincial authorities, with support from the Poverty Environment Initiative (PEI) in Lao PDR, conducted case studies focusing on evaluating the economic, social and environmental impacts of investment at the community level in villages surrounding two key investment areas. These case studies provide local-level information to support the overall assessment of the costs and benefits of investment in Saravan Province, carried out by IUCN Lao PDR and NERI in 2010. The two case studies selected are:

- Caosu Dak Lak Rubber Plantations in Laongam District;
- Three wood processing facilities located in Saravan and Laongam districts.

The findings of the first case study are presented in this report, which examines the economic, social and environmental costs and benefits associated with an investment by Caosu Dak Lak Rubber Company in plantations in Laongam District of Saravan Province. The case study covers three villages of the district: Songhong Noi, Songhong Nyai and Vangkhanan villages.

1.2. Research objectives

The case study aims to examine the following impacts of the investment:

Economic impacts: this section aims to clarify how the rubber plantations create employment and income generation activities for local people, as well as how they contribute to community development and to government revenues;

Social impacts: this section intends to examine how the investment affects the livelihoods of local people, as well as what are the social benefits, risks and threats related to the industry for local people;

¹ Saravan IPD. 2010. *Investment datasheet*.

Environmental impacts: this section explores the plantations' impacts on local forests, non-timber forest products (NTFPs), water resources and biodiversity, paying attention to the interlinkages between social and environmental impacts in the Lao context.

1.3. Research methodologies and activities

To achieve the research objectives outlined above, as well as to promote local involvement and inter-agency cooperation in the project, a research team was formed in Saravan Province, comprising researchers from NERI and representatives from the key provincial departments and agencies involved in investment promotion and management, including the Provincial Department for Planning and Investment (PDPI), the Provincial Agriculture and Forestry Office (PAFO), the Water Resources and Environment Office (WREO), the Provincial Land Management Office (PLMO), the Provincial Department for Industry and Commerce (PDIC), the Governor's Office, and so on. While the research conducted in the province was led by NERI, the team worked together to gather all the necessary data from various sectors in the province, as well as to carry out the case studies.

- *Literature review:* The research team collected documents including previous research publications related to investment, social and environmental issues, as well as monthly, quarterly and yearly development reports and data from several government departments, for Saravan Province and the case study district, as well as for the plantation industry.
- *Village profile surveys:* were carried out to collect information, statistical data and views at the community level in three villages located around the Dak Lak plantations, i.e. Songhong Nyai, Songhong Noi and Vangkhanan villages. The survey used the information collection form attached in Appendix 1.
- *Focus group discussions:* to collect qualitative information, the research team organized a number of focus group discussions with stakeholders, including: (1) the Caosu Dak Lak plantation farm management team; (2) village authorities and organizations in each sampling village; (3) respected persons; and (4) women. Each focus group consisted of between 6-10 people.
- *Individual interviews:* were conducted to collect more in-depth information. In total, the research team interviewed 4 people in each sampling village. Two people who have benefited from and two people who have suffered from the establishment of the plantations were interviewed in each village.

In order to provide a comprehensive picture of the economic, social and environmental impacts of the plantation investment, this report will first provide an overview of the Caosu Dak Lak

Rubber Company. It will then provide background information on the case study villages, and assess the associated economic, social and environmental impacts based on the findings of the research.

2. Overview of the Dak Lak Rubber plantation investment in Saravan Province

The main report on the impact of investments in Saravan Province², conducted as part of the PEI project on the province, reviewed the status of natural resources, socio-economic development, investment management system and agriculture production in Saravan. The review showed that the socio-economic situation in Saravan Province has changed rapidly in the last few years, as a large amount of capital has flowed from foreign countries into the province. In particular, investment has centered on the agriculture and forestry and agricultural and wood processing sectors.

However, the review could not present an accurate picture of how the investment flows in the province are affecting the economic, social and environmental conditions of communities at the local level. Therefore, this in-depth study will provide further analysis of the economic, social and environmental impacts of rubber plantations in three villages in the concession area of the Caosu Dak Lak Rubber Company. The villages studied are Songhong Nyai, Songhong Noi and Vangkhanan villages, which are all in Laongam District

2.1. Caosu Dak Lak Rubber plantations in Saravan Province

The Dak Lak Rubber Company is a state-owned enterprise based in Dak Lak Province of Vietnam, and is involved in number of industrial sectors related to rubber production, including rubber cultivation, processing and export. Following the Lao-Vietnamese high level official visit in 2004, Dak Lak Rubber Company expanded its business activities into Lao PDR. It established Caosu Dak Lak Company in Champassak Province, and in 2005, it started to grow rubber in Champassak (Farms 1 and 3) and in Saravan (Farms 2 and 4). In Saravan Province, Caosu Dak Lak Co. was granted a land concession of 7,000 ha for a period of 50 years in Laongam District by the central Government of Lao PDR (GoL).³ In addition to establishing plantations, the company is preparing to construct two rubber processing facilities, one in Champassak Province and one in Saravan Province. The maps below show the concession areas of Caosu Dak Lak Co. rubber plantations in Laongam District.

² IUCN and NERI. 2010. *Report on Economic, Social and Environmental Impacts of Investment in Saravan Province*. [Final Draft].

³ Information provided by Governor of Saravan Province, and documents on cooperation agreement between Saravan Province and Caosu Dak Lak Company in 2005.

According to the information provided by the farm management team in Laongam District, the company has already planted 3,083 ha of rubber. The remaining 3,917 ha of the concession area is considered not useable, according to the farm management team, although 5,024 ha in total were surveyed successfully (see Table 1).

Table 1: Status of rubber plantations of Caosu Dak Lak Co., 2010

Description	Area (ha)
Total Land Concession	7,000
Land successfully surveyed	5,024
Planted by the company	3,083

Source: Saravan PLMO

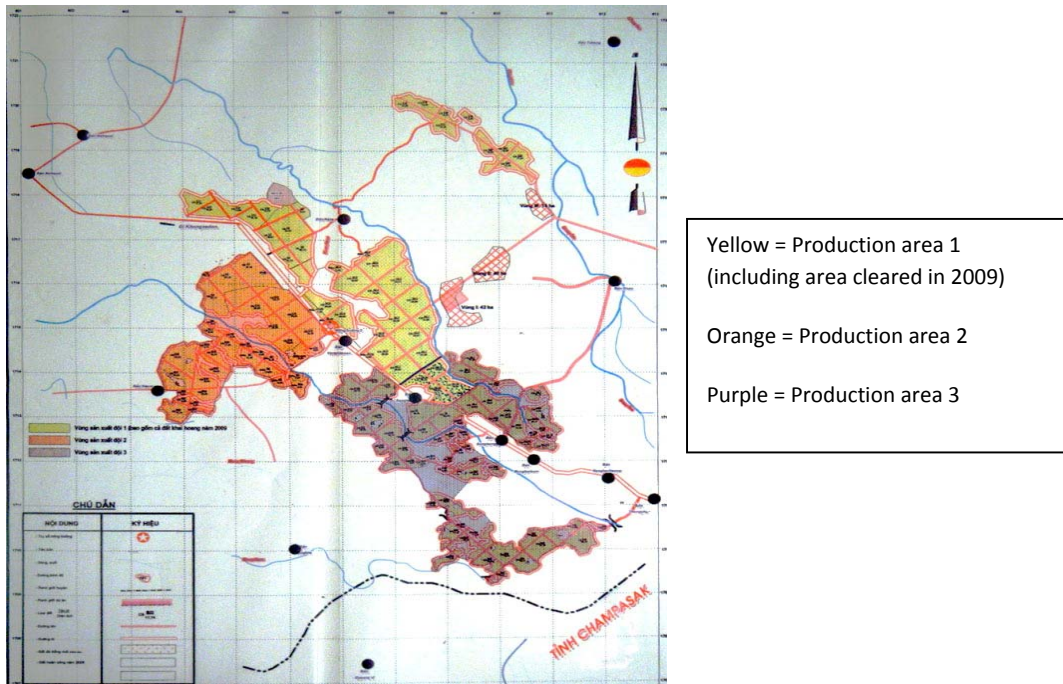
2.2. The case study area

2.2.1 Geography, landscape and natural resources

Geography: The case study area covers three villages: Songhong Nyai, Songhong Noi, and Vangkhanan. The three villages are located in Laongam District, Saravan Province. The first village, Songhong Nyai, is located about 70 km west of the Saravan town center; Songhong Noi is about 72 km west of the town center; and Vangkhanan is about 74 km west of the town center. Map 1 below shows location of the case study area in detail. The area is located in the center of the Caosu Dak Lak rubber plantations and is about 23 to 27 km from the Laongam District center⁴. As this area is considered an undeveloped zone, the company receives a 10 year tax holiday for investing here. As further incentive to invest in the area, the company granted Dak Lak Rubber Company a 50 year concession, despite the fact that at the time of approval, only 30 year concessions were allowed in Lao PDR⁵.

⁵ According to information obtained during village profile survey

Map 1: Case study area



Source: Photo taken by research team of map at Dak Lak Office

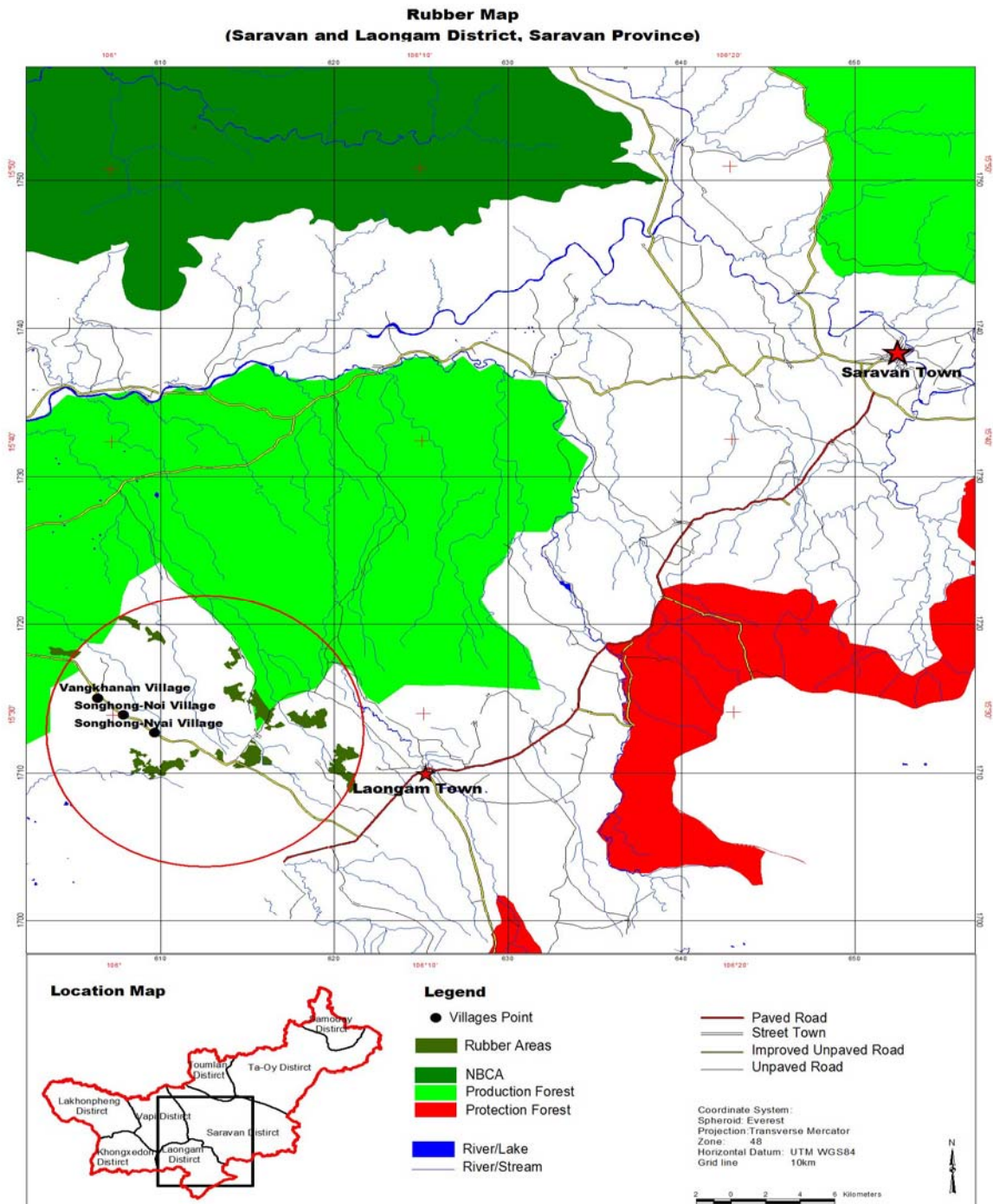
Landscape and natural resources: In total, the three villages cover a total land area of 1,628 ha: this includes 16 ha of residential areas; 1,579 ha of agricultural production areas; and about 39 ha of forest area (as shown in Table 2)

Table 2: Land area and forest area of the three villages

Villages	Total area (ha)	Residential area (ha)	Production area (ha)	Forest area (ha)
Songhong Nyai	466	9	451	6
Songhong Noi	262	2	259	11
Vangkhanan	900	5	879	22
Total	1,628	16	1,579	39

Source: Village profile surveys, 2010.

Map 2: Caosu Dak Lak Rubber Plantations

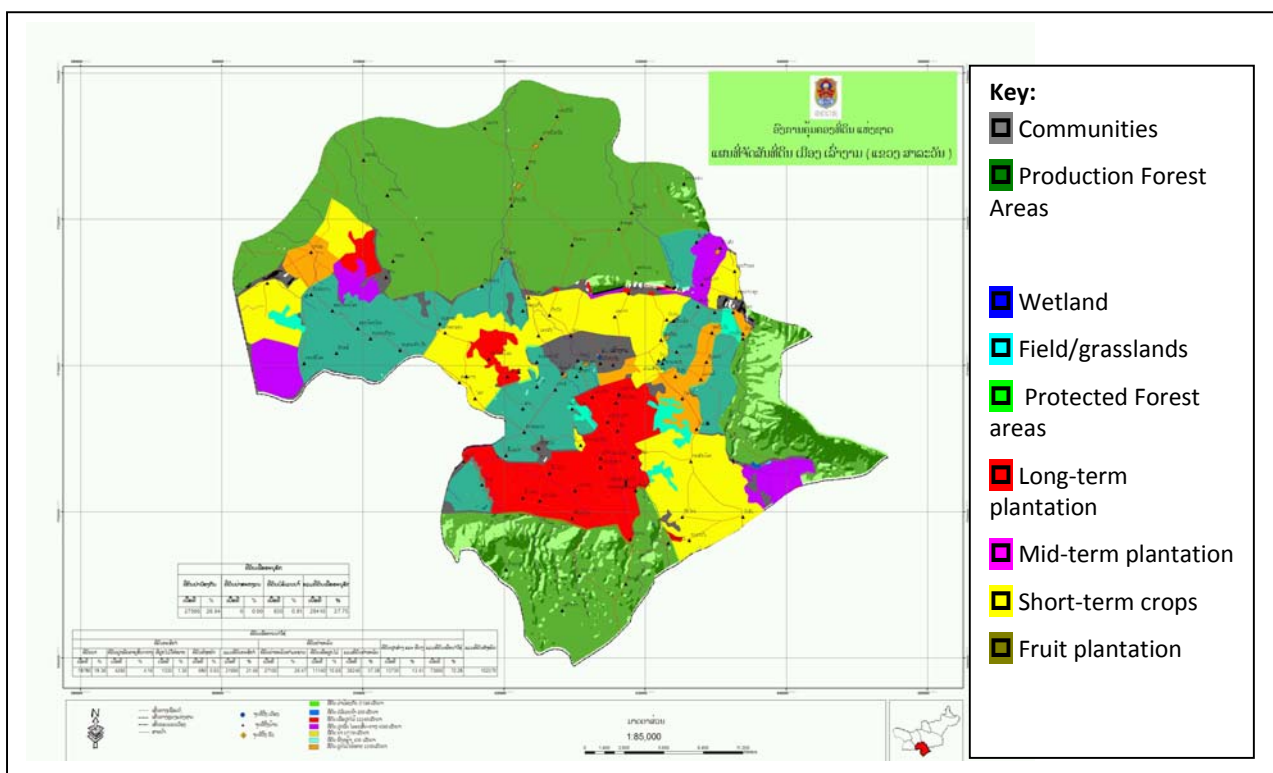


Source: Prepared by National Agriculture and Forestry Research Institute (NAFRI, based on data gathered during case study)

The case study area is a flatland area with fertile volcanic and clay soil. Local people have had farms of various types there for more than 30 years. The area is near the provincially managed production forest area of Laongam District, which still has many NTFPs such as bamboo, mushrooms, crabs, and fish. As the table above shows, the villages currently have access to only a small area of village-managed forests.

The fertile land of the area constitutes an important natural resource and source of livelihoods for the villages; however, this land is now within the rubber plantation concession boundaries, and is thus being used for large-scale, commercial rubber production. Therefore, land use, production patterns and the livelihood of local people in the case study area are changing, which will be discussed further in the following sections. Map 3 below shows land uses in Laongam District more broadly.

Map 3. Land uses in Laongam District



Source: Saravan PLMO

2.2.2 Socio-economic development in the case study area

Population and labor force: The total population of the three villages combined is 1,341 people. About 48.3% of the population is of working age (15-60 years old) and about 33.3% is 14 years old or younger.⁶ Therefore, the age structure of the local population can be considered good for investments since it provides a sizeable work force both in the present and in the future. Table 3 presents more detail on the age structure of the population in the case study area.

Table 3: Age structure in the case study area, percentage shares

Age group	Percentage for case study area	Songhong Nyai	Songhong Noi	Vangkhanan
<14	33.33	30	40	30
15-60	48.33	45	45	55
>60	18.33	25	15	15
Total	100	100	100	100

Source: Focus group discussions.

Education: Although a significant proportion of the local population is in the labour force, a large share of this population has a relatively low educational level; they also have little to no experience with employment in industrial agricultural production. About 55% of the population has not completed primary school and only 6% of the population has completed upper secondary school or higher.⁷ Table 4 provides more detail on education levels in the case study area.

Table 4: Educational attainment in the case study area, percentage share

Education level	In-depth study area	Songhong Nyai	Songhong Noi	Vangkhanan
Illiterate	15	10	21	15
Less than primary school	40	40	55	25
Primary school	30	30	19	40
Lower secondary school	9	10	3	15
Upper secondary school	4	5	1	5
Higher education	2	5	1	0
Total	100	100	100	100

Source: Focus group discussions.

⁶ Focus group discussions.

⁷ Focus group discussions.

The relatively low level of education among the population in the case study area constitutes a barrier for attracting investment, especially in terms of reaching agreements and ensuring compliance with agreements for contract farming. Investors may be hesitant to enter into contract farming arrangements with farmers with limited education since the farmers may not be open to trying or able to use modern techniques and technologies.

Occupational structure: The majority (about 62.4%) of the labor force in the case study area is engaged mainly in agricultural production, which is generally small-scale, family-operated and subsistence production. About 25.2% of people in the case study area are employed on the rubber plantations. The majority of them are day laborers (meaning employees who are only engaged on a day-by-day basis); only six people, representing about 1% of the total labor force, are fulltime, permanent employees.⁸ Table 5 shows the occupational structure in the area by main occupation.

Table 5: Main occupations of people in the case study area (%)

Occupation	Case study area	Songhong Nyai	Songhong Noi	Vangkhanan
Agriculture	62.4	60	75	60
Trade	7.8	5	5	10
Construction	4.6	5	20	0
Plantation employees	25.2	30	0	30
Total	100	100	100	100

Source: Village profile surveys

According to focus group discussions in the three villages, the occupational structure and livelihoods of people have already changed and further change is expected in the future. Traditional production modes and livelihoods are being replaced by industrial production, and employment of this nature is expanding in the case study area. As shown, about 25.2% of the labor force is already employed as laborers on the rubber plantation.⁹

Infrastructure development and integration: The case study area has relatively good infrastructure, linking it with other towns in Saravan Province, with other provinces and beyond. All three sampling villages are located about 20 to 24 km from the main road (Route 20), which can be used all year round. This road connects the villages with the center of Saravan Province, Vientiane Capital and other socio-economic centers in Lao PDR. Although the key road in the area is not yet a standard paved road, it is usable most of the year and it is important for the

⁸ Village profile survey. 2010.

⁹ It should be noted that workers in just two out of the three villages work on the plantation. No one from Songhong Noi village works on the plantation.

transportation of products to nearby Savannakhet and Champassak provinces. The electricity network covers all sampling villages. According to focus group discussion, the Caosu Dak Lak Company contributed financially to electricity network development in the areas. More details are provided in the next section. The telecommunications network, and television and radio signals cover the entire area as well.

Income structure: Incomes in the case study area are relatively low. According to the village authorities, the gross domestic product (GDP) value of the case study area is estimated to be LAK 6.951 billion in 2009 (equal to about USD 800,000). The average GDP per capita is estimated to be LAK 4.8 million or about USD 578.3 per person for 2009.¹⁰ This is about 17.3% lower than the GDP per capita for the whole province (which is in turn lower than the national figure of USD 880 in 2009¹¹). Although the not all roads are paved and the public transportation available in the area is not convenient, the case study area is still relatively well integrated with the Laongam District town center, as well as Vapy and Lakhonpheng districts, creating potential for greater economic development in the future.

Table 6: Income in the case study area

Villages	GDP (million kip)	Per person (million)	
		kip	Per person (USD)
Songhong Nyai	2,731.00	5.4	651.8
Songhong Noi	834.5	4.3	518.2
Vangkhanan	3,386.00	4.7	567.3
Average	6,951.50	4.8	578.3

Source: Village profile surveys

(Remark: the exchange rate used is LAK 8,300 to 1USD)

As mentioned above, subsistence agricultural production, including farming and livestock production, remains the main income source in the area. Subsistence agriculture and livestock account for about 57% percent of income in the case study villages. This is followed by earnings from daily labor (wage labor and construction) which represents about 23% of GDP in these villages, and trade and services which represent about 19% of household income in these villages. Table 7 provides more information on sources of income.

¹⁰ Village survey and focus group discussions in July 2010.

¹¹ Gross National Income per capita in 2009, using Atlas method. The World Bank. 2010a. <http://data.worldbank.org/indicator/NY.GNP.PCAP.CD> (accessed December 2010).

Table 7: Main income sources in case study area, percentage shares

Income Source	Case study area	Songhong Nyai	Songhong Noi	Vangkhanan
Crop farming	45.7	60	40	40
Livestock	11.6	10	20	10
Trade	19.6	5	10	30
Construction	6.3	5	30	0
Wage labor	16.8	20	0	20
Total	100	100	100	100

Source: Data collected during village surveys in July 2010.

Poverty: Based on the findings from the participatory assessment, 39 households are identified as poor in the case study area.¹² This corresponds to about 15% of total number of households in the area. This is a higher incidence of poverty relative to the province as a whole (8.1% of households in the province in 2009) and Laongam District as a whole (9.25% of households in 2009). Table 8 provides more detail on poverty in the case study area. Songhong Noi Village has the highest poverty incidence of the three case study villages (29% of households) and Songhong Nyai Village has the lowest incidence (10% of households).¹³

Table 8: Poverty rates in the case study area

Villages	Number of HH	Number poor HH	Poverty incident (%)
Songhong Nyai	121	11	10
Songhong Noi	41	12	29
Vangkhanan	105	16	13
Total	267	39	15

Source: Focus group discussions/Participatory assessment

¹² Village authorities provided this information during surveys in July 2010. ¹² The WHO defines the poverty line based on calorie consumption. According to the Organization, there are two kinds of poverty lines, i.e. food poverty and general poverty line. The food poverty line means consumption of less than 2,100 calories per person per day and the general poverty line means food poverty plus 20% of the local price of 2,100 calories. Based on that, the GoL developed a Lao national poverty line. The food poverty line in Lao PDR is understood as consuming of less than 16 kilogram rice per person per month and the general poverty is understood as food poverty line plus 20% of local price of 16 kg rice. That means households consuming and spending less than the line are identified as poor household. In general poverty in Lao PDR is understood as inability to satisfy basic needs including food consumption, clothing and housing.

¹³ Focus group discussions/Participatory assessment

3. Economic, social and environmental Impacts of the rubber plantation investment

In the sections above, the status of natural resources and socio-economic development in the case study area was reviewed, along with background information on the Caosu Dak Lak Co. and its plantations in Saravan Province. The following section will examine the economic, social and environmental impacts of the rubber plantations in the case study area.

3.1. Economic impacts

The Caosu Dak Lak Rubber Co. plantation has both positive and negative economic impacts in the case study area; they include:

Creation of employment and income generation activities for local people: This appears to be the most important economic benefit that local people receive from expansion of rubber plantation in their location. According to village profile survey, about 338 people, corresponding to about 25.2% of total labor force in the case study area, are employed by the rubber plantation. However, over 98.3% of them are daily workers; only 1.7% of them are permanent staff (working as supervisors). The daily workers earn about LAK 25,000 or about USD 3 per day. This is a little bit higher than the national minimum wage of about LAK 22,000 or USD 2.7 per person per day (as fixed in the Agreement Number 1450/MLSW dated April 30, 2009). The permanent workers earn on average LAK 1,000,000 or about USD 125 per person per month. The income from employment in rubber plantations accounts for about 16.8% of total household income in our case study area (as shown in Table 9 above).¹⁴

Contribution to community development: This is another important benefit that local people receive from the Caosu Dak Lak Company project. According to focus group discussions organized during the case study, the company contributes significantly to community development. For example, Dak Lak has carried out the following projects:

- Building an electric transmission line to Na Xea and Songhong Noi villages. The transmission has total length of about 20 km and the project cost about LAK 537 million (about USD 64,700). Dak Lak company also installed household electricity in Vangkhanan Village which cost about LAK 18 million (USD 2,170);
- Construction of community roads. Recently the company constructed two dirt roads linking Songhong Nyai and Yan villages and Vangkhanan and Na Xea villages. They have a total length of 10 km and cost about LAK 128 million (USD 15,400 in total).
- Construction of schools. The company constructed two primary schools in Songhong Noi and Vangkhanan villages at a total cost of LAK 287 million (USD 34,580). In addition,

¹⁴ Village profile surveys.

the company cleaned schools in Songhong Nyai and Yan villages at a cost of about LAK 10 million or USD 1,200;

- Construction of three bridges in Songhong Noi, Na Xea and Na Om villages. costing, LAK 120 million or USD 14,460;
- Construction of one community health station in Vangkhanan village; the project cost LAK 124 million or USD 14,940.
- In total, Dak Lak Company has contributed over LAK 1,224 million or USD 147,470 to community development.

Picture 1: Rubber plantation in the case study area



Source: Photographed during field survey

Loss of land and other natural resources: This is one of the main negative impacts of agribusiness expansion in Saravan Province. Because of the high demand for land, large land areas were converted into plantations for industrial crops including rubber, cassava, etc. In the case study area, over 1,573 ha of community land, including farmland and production forest areas, were converted into rubber plantation over the last five years. Table 9 below presents more details on community land losses.

Table 9: Decreasing land size managed by village (ha)

Village	Present (ha)	Before (ha)	Decrease (ha)	Percentage lost
Songhong Nyai	15	466	451	97

Songhong Noi	13	262	249	95
Vangkhanan	27	900	873	97
Total	55	1,628	1,573	97

Source: Village profile surveys

According to the table, about 97% of land managed by the sampling villages has already been converted into rubber plantation. The areas were previously farmland and forest areas, in which villagers practiced livelihood activities, including NTFP collection, growing rice and other food crops, hunting wild animals, and so on. Now, the land has been granted to the company for growing rubber. At present, people living in this area can not earn any extra income from NTFPs, as forest areas have now been converted to rubber plantations and there are fears of chemical contamination. Local people now have to travel long distances and spend more time looking for NTFPs.

However, despite the loss of access to these natural resources, the overall living situation of people in the case study is not very different from that of five years ago. This is because even though the rubber plantation now covers land that was previously farmland, people are still able to intercrop other crops between the rows of trees during the first 3-4 years of rubber cultivation (see Pictures 1, 2 and 3). The village focus group discussions commonly noted that they will face difficulties in the coming years when they can no longer intercrop between the rows (usually after the trees reach 4-5 years of age). Because agricultural land is now very limited, local people fear that food security will become tenuous in the future.¹⁵ . According to the findings of the case study, this situation applies to the whole of Khum Ban Phattana No. 5, where the plantations are located.

In addition to experiencing a significant decrease in the amount of farmland available in the three villages, the villagers indicated that there have been misunderstandings and conflicts over implementation of the plantation project. The villagers claim that they have been given inaccurate information, and have been confused by the content of contracts between villagers and the company. For example, before signing any contracts with the company, the villagers understand that a “2+3” contract farming model would be offered, where the villagers provides land and labour and the company provides the raw materials, technology and market for the rubber. But in practice, the contracts offered by the company were actually for labor supply; instead of being for contract farming, they oblige the villagers to take care of the company’s rubber trees in return for wages. Due to their lack of experience, the farmers signed the contracts with company without properly reading or understanding them.

¹⁵ Village profile surveys.

In the case of Vangkhanan Village, there are 10 pilot households that signed a labor supply contract with Caosu Dak Lak Rubber, but the contract failed to be implemented, sometimes because of a lack of interest on the part of the villagers, sometimes because the company failed to pay the money. In the case of other contracts, these are implemented but because it is not properly followed, progress has not been good.

Overall economic impacts: The establishment of rubber plantations in the case study area has contributed to changes in household economic structure and the livelihoods of people. Income that used to be derived from collecting NTFPs, for example, has declined while other income generating activities, such as trade and wage labour has increased. Changes to livelihoods in the case study villagers will be further discussed below.

With regards to comparing the overall costs versus benefits of the rubber plantations, the results from the participatory assessment show that, overall, two out of the three villages involved in the study feel that the impacts on the community will be more positive than negative. Based on individual interviews and the opinions expressed in the focus group discussions, people felt that the plantations have approximately 40% negative impacts and 60% positive impacts. This was especially the case in the villages that experienced more improvements to infrastructure from the project.

Picture 2: Cassava intercropping with rubber



Picture 3: Peanut intercropping with rubber



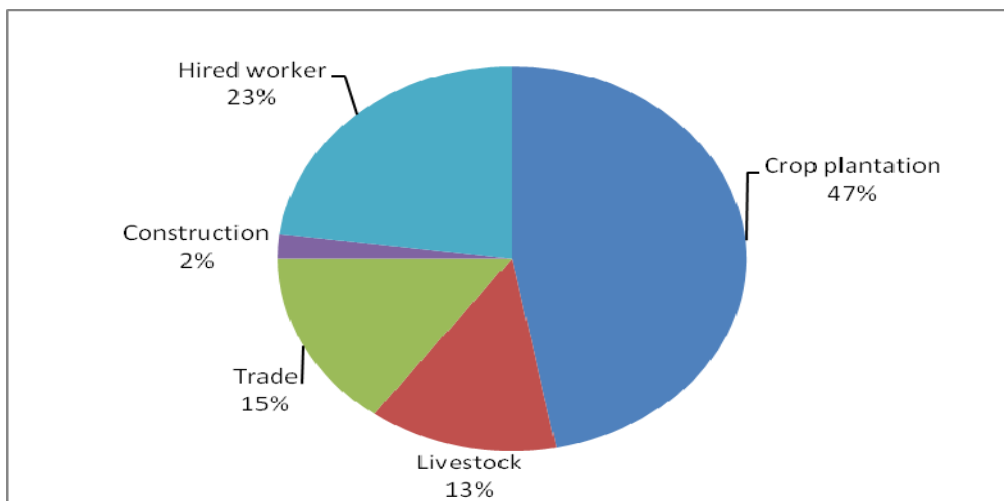
(Photos: Research Team)

3.2. Social impacts

Changes in livelihoods: In the past, after finishing farming, people in the case study area earned extra income or secured extra food by collecting NTFPs and/or cutting wood in nearby forests. However, since the establishment of the rubber plantations, these activities are rarely done as a substantial forest area has been converted to rubber trees. Further, the use of chemicals in the rubber plantations is another factor making NTFPs collection more difficult at present (discussed

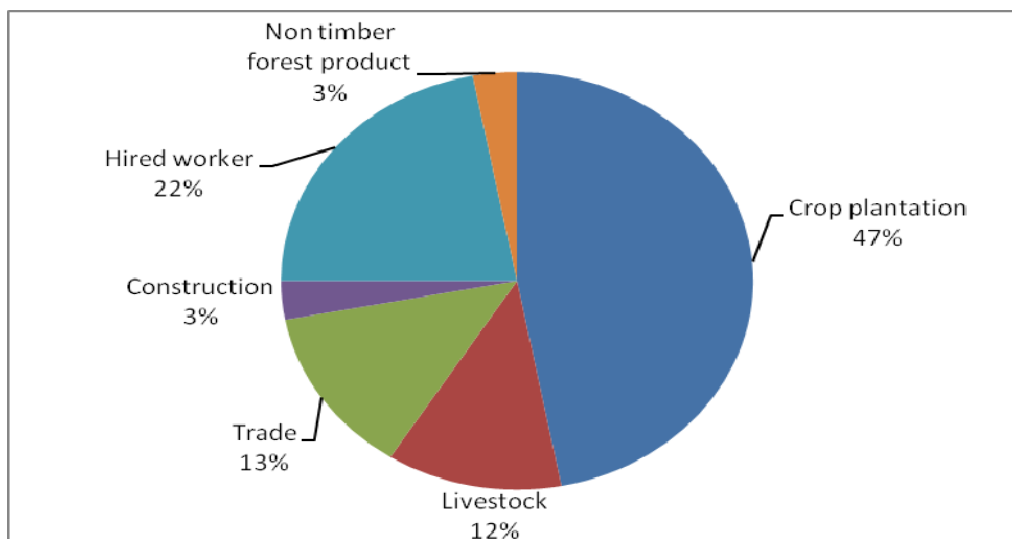
in more detail in the “environmental impacts” section below). Now, after finishing work on the family farms, people in the case study area are likely to work on the rubber plantations as daily laborers. Thus the villages are experiencing a shift from traditional livelihoods, based on subsistence agriculture and natural resource use, to a more industrialized livelihood, based on employment in plantations under the control of the company and its rules. Figures 1 and 2 below presents more details on changing livelihood activities in case study area.

Figure 1: Present income sources in case study area, by activity, 2010



Source: Based on data gathered from focus groups

Figure 2: Sources of income, by activity, in 2005



Source: Based on data gathered from focus groups

These figures show that livelihood activities have changed from income structure change. According to Figure 2 above, NTFPs collection used to be important livelihood activity and additional income source of villagers before expansion of rubber plantation in our case study area. The activity contributed about 3% of total household income in the case study area. However, due to loss of forestry and chemical contamination the activity is not able to be practiced recently. Another observation is increasing income from wage labor. According to both figures, before expansion of rubber plantation, wage labor used to contribute about 22% to household income. After expansion of rubber plantation, the contribution share from wages has been increasing to 23%. The figure of 47% of income attributed to crop plantation activities remains the same. This does not refer to the rubber or other large-scale plantations but to household and small-scale local plantations for crops such as cinnamon, sweet potato, coffee and rice. Village discussions indicate that the share remains the same because they can still plant other crops between the rubber trees at this early stage of their growth. In several years time, this will no longer be possible. The income structure change indicates that traditional livelihood of local people has changed slightly due the presence of the plantation. According to focus group discussion/participatory assessment, the villagers themselves expect that the trend will accelerate in the future.

Health and safety: The major health impact of the plantations, as identified by the villagers, is the use of chemical herbicides. These can be dangerous if applied without proper information and protective gear. The villagers in the area have already noted some ill effects after spraying the chemicals, such as itchy skin and red spots, although symptoms usually disappear in a few days with treatment. Caosu Dak Lak Co. has helped people by providing treatment at the company clinic. Other concerns regarding chemical use will be discussed in the section on environmental impacts below.

According to focus group discussion conducted during field survey, the company provides some information, training and protective equipment to people spraying the herbicides in its plantation. However, the effort seems to be insufficient. People spraying pesticides in the plantations seem not to fully understand the dangers posed by the chemical materials for their health. During the surveys, the research team observed numerous people spraying herbicides without using adequate protective gear (i.e. no boots, masks, gloves, etc.)

Labor requirement: The labour requirements for the rubber plantations will be uneven over the life of the plantation, and in the case study area, some villages are benefiting more than others from employment opportunities.¹⁶ For example, only a small proportion of the locally hired workers are permanent staff, and Songhong Noi Village currently doesn't contribute any daily workers to the plantations. New rubber plantations require labour for planting and for weeding

while the trees are still young. However, the number of workers needed by plantation will decrease as the trees grow, as people can be replaced by machinery. Labour needs will increase again when the rubber is tapped. For the case study area, tapping will start in approximately two years, requiring a large workforce. According to the farm management team, the company will need one person per every two hectares, amounting to approximately 3,500 workers. (The total population of the three villages studied is just over 1300 people). Tapping of the rubber may therefore require some importation of labor from other areas or even Vietnam.

Disputes over land: All three villages studied have seen a substantial proportion of their land given over to the rubber plantations. Although exact figures are not available, the villages in the case study estimate that village-managed lands of approximately 1,628 ha previously has now been reduced to only 55 ha. This represents a loss of 97% for the case study area as a whole. Table 9 below provides more information, including the losses for each village. The establishment of the rubber plantations has also resulted in conflict over land, and there are several cases that have not yet been resolved. The villages expect to solve these cases through negotiation among villagers, village authorities and the company. Other conflicts have also occurred – for example, one case involves a dispute between the company and villagers who grew cassava between the rubber trees. Before the cassava could be harvested, the company destroyed the cassava plants. In other cases, villagers have found other areas for farming crops, but when the rubber plantation expand into these areas, land has been cleared without informing the land holder or even before getting approval from the village authorities. Furthermore, there has been no compensation paid yet for the villagers who have lost land to date. The Caosu Dak Lak Co. claims that as the land has been granted to them by the GoL in a concession, the company will only pay compensation for crops lost, not for the loss of the land itself. The villagers have no power and no knowledge of supporting instruments to take action or make complaints against the concession.

3.3. Environmental impacts

Impacts on forest and water resources: The negative impacts of the rubber plantations on forests and water resources in the case study area have been identified as the most serious impacts of the investment. According to information from the three villages, village production forests, along with farmland and gardens, have now been converted to rubber plantations. As mentioned above, the exact figures on how much forest has been converted are not known, but the 97% of land given over to plantations referred to in Table 9 refers to both farmlands and village-managed production forest. The conversion of forest (other than degraded forest land) is considered illegal under the Lao PDR *Forest Law* (2007). The villagers also noted that the company has planted rubber as close as about 150 meters from the road and village areas In the

case of Songhong Noi Village, which is located between the other two villages; the village is now surrounded by rubber trees. The villagers also speculate that the plantations have affected local water resources. According to focus group discussions, almost all the streams and ponds in this area that used to have water all year round have now become shallow and dry.

Chemical use and contamination: According to discussions with the villagers and village authorities, it is believed that chemicals from the rubber plantations are causing the death of livestock, as well as the disappearance of shrimp, snails, crabs, fishes and other aquatic species in the case study area. The villagers in the area no longer consume natural water (from the river) and no longer collect NTFPs. As a result, the daily expenditure of villagers on water (for digging and using wells) and food is increasing. The villagers reported that several people have become ill after eating NTFPs collected in areas nearby. The health impacts of the chemicals have already been discussed above.

Box 1: No land left

A villager from one of the three villages participating in this case study told the research team that he had lost land to the rubber plantations. Fong* said that before the company planted rubber in his area, he had four hectares of farm land. Now all of his land has become part of the concession. Fong tried to buy some agricultural land in another village far from his own village, in order to plant some crops. However, now this land has also been cleared by the rubber company. Moreover, the person who cleared the land said: "I didn't know that the land was yours, my boss told me to clear the land, so I had to clear it".

Fong made a request to the village authority and to the Laongam District authority to help him and other villagers to address this problem. For many months, Fong has been waiting for solution. However, there has been no response from the relevant agencies. He believes that conflicts with the company are becoming more frequent and more serious.

**Not his real name*

4. Conclusion and recommendations

Significant amounts of investment have flowed into Saravan Province during the last decade, likely attracted by the province's rich natural resources. Though the province has a ways to go, the investment flows have helped to stimulate economic growth and poverty reduction. However, based on the findings from this case study on Caosu Dak Lak Rubber Company's investments in Laongam district, investments have also contributed to negative social and environmental impacts, especially damage to forests and local agro-biodiversity, watersheds, health, and so on. An important finding is that the rubber plantations in this case study were established without proper regard for legal requirements: the project appears to have been approved without an ESIA, and village production forest has been converted into plantations.

Importantly, the investment flowing into Saravan Province is changing traditional livelihoods into industrial livelihoods yet without necessarily improving the people's quality of life. To date, these changes in livelihood have been relatively minor since villagers are able to continue planting food crops between rubber trees during the first few years of rubber cultivation. However, in a few more years, villagers will no longer be able to intercrop food crops with rubber trees resulting in major changes to traditional livelihoods. This poses a major threat to the villagers' food security. Consequently, this study cannot say that the benefits from investments are sufficient to cover the costs. The results from this case study also supports the argument that the investment management system in Saravan Province needs to be improved in order to mitigate negative impacts and ensure that local communities benefit from investments.

Based on the focus group discussions and interviews held for this case study, the people in the case study area are not certain whether the Dak Lak rubber plantation has ultimately helped or harmed their community. Regardless, the changes that have occurred in these communities are permanent; it is not possible to return to the lifestyle that they had before the company established the plantations and factory. Therefore, to reduce the costs and increase benefits from the investment, the participants from the three villages suggested the following:

- Additional land should be made available for resettlement, and this should be divided among local people in order to plant crops that will insure food security once intercropping ends.
- As noted by the focus groups, presently the Caosu Dak Lak Rubber Co. only wants to hire workers less than 45 years of age. Since their food crop lands have already been taken away, villagers worry that once they can no longer intercrop, and once they reach 45 years of age and can no longer work on the plantation, they will have no way to support themselves and their families. As a result, they suggest that the company also hire employees up to 55 years old.
- Investigate chemical use on plantations, as well as its impacts, further. Villagers have lost access to safe water sources, have decreased livestock production and NTFP collection, which used to be important income sources, and have suffered adverse symptoms. Therefore, the villagers have asked the company to reduce or stop using the chemical pesticides. The company should provide adequate information and protective gear to people using chemicals on the company plantations, and prepare a pollution mitigation plan as well. This is especially important, given the plans to build a processing facility, which will require an effective wastewater treatment facility.

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Annexes

ANNEX 1: INFORMATION COLLECTION FORM AT VILLAGE LEVEL

Form ID: _ _ _ _

General Information

Province:

<input type="checkbox"/>	<input type="checkbox"/>
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District:

<input type="checkbox"/>	<input type="checkbox"/>
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Interview Information

No	Interviewee's name	Age	Ethnicity	Gender 1=Male 2=Female	Position	Duration of living in the village	If some position, describe year of begin
1							
2							
3							
4							
5							
6							
7							

Interviewer

Interviewer's Name: Signature: Interview Date: ____/____/2007 (dd/mm/yy)

Quality Control Record

Supervisor's Name:.....	Signature:	Checking Date:.....
Questionnaire needed to call back:		
Supervisor's remarks:		

I. General information related to socio-economic development status of in-depth study area

1.1. Year of establishment?

<input type="checkbox"/>	Before 1975
<input type="checkbox"/>	After 1975, what year? _____

1.2. Population and labor force

No	Item	Current	Five years ago
2	Number of villages		
1	Number of HH		
2	Number of population		
3	Number of males		
4	Number of females		

1.3. Age group

Age/year	Male	Female	Total
< 10			
11-14			
15 – 60			
60 – 64			
65<			

1.4 Education structure of population aged 15 and over

No	Education level	Number of persons	Percentage
1	Illiteracy		
2	Lower than primary school		
3	Primary school		
4	Lower secondary school		
5	Upper secondary school		
6	Vocational training		
7	University		
8	Higher education		
9	Other.....		
Total			100

1.5 Main employment structure of population aged 15 and over

No	Areas	Employment		Production value	
		Number of persons	Percentage	Value/million LK	Percentage
1	Crop production				
2	Livestock production				
3	Fishery				
4	Trade				
5	Construction				
6	Transportation service				
7	Hotel/restaurant service				
8	General worker				
9	Unemployment		0	0	0
10	Other.....				
Total			100		100

1.6 Access to land

No	Items	Current (ha)	Last 5 year (ha)	No	Item	Current(ha)	5 year ago(ha)
1	Total land area			5	Irrigated area		
2	Residential area			6	Areas unused		
3	Agricultural production area			7	Other (wetlands)		
4	Forestry area			8	Other		

1.7 Heavy agriculture production/equipment

No	Items	Current/number	Five year ago/number	No	Items	Current	Five year
1	Tractor			5	ຈັກຟາດເຂົ້າ		
2	Hand tractor			6	ຈັກກຸ່ວເຂົ້າ		
3	Rice mill			7	ເຄື່ອງດຳນາ		
4	Agri. Animal			8	Others.....		

1.8 Transportation equipment

No	Item	Current	Five year ago	No	Item	Current	Five year ago
1	Track			5	Bicycle		
2	Mini transporter			6	Boat		
3	Car			7	Other		
4	Motorcycle			8	Other		

1.9. Infrastructure connecting

No	Item	Distance /Km, please describe 0, if the item is located within the village	Type of road connecting: 0=the item is within the village 1=Paved road 2=Non paved road, but accessible although the year 3=Non paved and not accessible although the year 4=No road access	No	Item	Distance /Km, please describe 0, if the item is located within the village	Type of road connecting: 0=the item is within the village 1=Paved road 2=Non paved road, but accessible although the year 3=Non paved and not accessible although the year 4=No road access
1	Formal border gate			12	Electricity		
2	Informal border gate			13	Provincial hospital		
3	Local market			14	District hospital		
4	Provincial market			15	Clinic		
5	District center			16	Pharmacy		
6	Provincial center			17	Other health center		
7	Post			18	Primary school		
8	Bank			19	Lower secondary school		
9	Micro finance institution			20	Vocational training center		
10	Other financial institute			21	Other type of school		
11	Telephone service			22			

1.10 Source of use water:

No	Item	Current		Five year ago	
		Number of HH	Percentage	Number of HH	Percentage
1	Piped water				
2	Ground water				
3	Well				
4	Stream/River				
5	Other (specify)				
6					

1.11 Kind of house

No	Kinds of house	Current	Five year ago
1	Wooden house (two floors)		
2	Concrete house (one floor)		
3	Concrete house (two floors)		
4	Haft Wooden – Haft Concrete		
5	Villa house (one floor)		
6	Grass roof – bamboo wall		
7	Zinc roof – bamboo wall		
8	Others (specify) _____		
9	Total		

1.12. Income source of villagers

No	Economic activities	Currently (percentage)	5 years ago (percentage)
1	Agriculture		
2	Livestock production		
3	Fishery		
4	Trade		
5	Service		
6	General labor		
	Forest products		
7	Others.....		
8	Total	100	100

II. General information on land, forestry and water resource

No	Kind of land use	Currently	5 year ago
1	Agriculture production areas (ha)		
1.1.	<i>Rice production areas (ha)</i>		
1.2.	<i>Vegetable production areas (ha)</i>		
1.2.	<i>Fruit production areas (ha)</i>		
1.3.	<i>Other agriculture production areas (ha)</i>		
2	Plantation areas (ha)		
2.1.	<i>Rubber plantation (ha)</i>		
2.2.	<i>Sugar cane plantation (ha)</i>		
2.3.	<i>Jatropha / cassava plantation (ha)</i>		
2.4.	<i>Palm tree (ha)</i>		
2.5.	<i>Other plantation (ha).....</i>		
3	Forestry cover (ha)		
3.1.	<i>Protection forest (ha)</i>		
3.2.	<i>Production forest (ha)</i>		
3.3.	<i>NTFP area</i>		
3.4.	<i>Deteriorated forest (ha)</i>		
4	Wet land areas (ha)		
5	Residential area (ha)		

III. General Information on Investment

2.1. Number of investment projects located in the in-depth study area:.....projects.

2.2. Describe detailed information on the investment project in following table:

No	Name of the project	Investment sector: 1=Plantation 2=Processing industry 3=Service 4= Mining 5=Energy 6= Other.....	Year of establishment	Initial capital (USD)	Production area (ha)	Companies involving	Nationality of companies involving	Number of local labor	Number of migrant workers
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									

IV. Considering economic, social and environmental impacts of investment

4.1. State following **possible positive** impacts of investment in your location:

No	Statement on positive impacts of investment	Opinions 1=agree, 2=Do not agree, 3= Cannot say
1	Investment contributes significantly to creating jobs and income generation activities for local people	
2	Investment contributes significantly to improving live and economic well-being of local people	
3	Investment contributes significantly to reducing poverty in local area	
4	Investment transfers technology and builds up capacity/knowledge of local people	
5	Investment increases value of natural resources in your location	
6	Investment improves road or other transportation infrastructure	
7	Investment contributes to community development by providing financial resources	
8	Investment improves accessibility to information and communication in your location	
9	Investment contributes to improving public administration	
10	Investment improves life quality of people in your location	
11	Other specifies.....	

4.2. State following possible negative impacts of investment in your location:

No	Statement on negative impacts of labor migration	Opinions 1=Agree; 2=Do not agree; 3= Cannot say
1	Investment increases pollution	
2	Investment effects negatively forestry, water and other natural resources	
3	Investment changes traditional livelihoods	
4	Investment effects living quality of people in your location	
5	Investment increases poverty in your location	
6	Investment stimulates labor migration in your location	
7	Investment effects physical and mental health of people in your location	
8	Investment effects education negatively	
9	Investment increases living cost in your location	
10	Investment increases consumption of luxury items	

11	Investment limits access to land and/or common resources for people in your location	
12	Investment increases land conflicts in your location	
13	Investment increases corruption	
14	Investment increases social inequality in your community	
15	Investment effects negatively on living quality of people in your location	
16	Other negative impacts.....	

4.3. Three main negative and positive impacts of investment

Three positive impacts, please, describe three number from positive impact list	Three main negative impacts, please, describe three numbers from negative impact list.

4.4. Please, choose one of the three statements

- 1= Investment has more positive impacts than negative one on our local community.
- 2= Investment has more negative impacts than positive one on our local community.
- 3= the positive and negative impacts of investment are balanced.

4.5 Choose one of the three options:

- 1= Investment should be continuously legalized and liberalized finally.

2= Investment should be continuously limited and stopped finally.

3= Investment should be consequently stopped.

V. Comments for increasing benefits and limited negative effects of investment

1.

.....
.....
.....
.....
.....

2.....

.....
.....
.....
.....

3.....

.....
.....
.....
.....

Thank you for cooperation