Final report

Changing of Land Use and Land Tenure Influenced by Rubber Plantation in Namo District, Oudomexay Province, northern of Lao PDR

Submitted to

Thailand Research Fund

By

Mr. Sikham Sipachane
Mr. Soupany Sylipoungno
Mr. Phonepaserth Souvanavong
Dr. Linkham Douangsavanh

March 2012

สัญญาเลขที่ **RDG 5310012**

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Sponsored by Thailand Research Fund (TRF)
(Any opinion in this report belonged to researcher , it needs not to be agreed by TRF)

Abstract

Project Code : RDG5310012
Project Title : Modification of the Model of Land Use and Land Tenure Influenced by Rubber Plantation in Namo District, Oudomxay Province, Northern of Lao PDR
Director of the Project: Associate Professor Linkham Douangsavanh , Ph.D
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Project Duration : April 1 , 2010 – March 31 , 2011

Because of the forest strategies to 2020 ,the significantly increasing of rubber plantation over the country since 2003 was the result. This caused the changes in not only the forest area ,but also the livelihoods in rural area, natural resources, and biodiversity.

Objectives of study were to identity problems in investment and provide advice for improvement according to community needs; to support the information to policy makers. Target areas of study consisted of 5 districts of Oudomxay province ; Namo , Xay , Ngar , Beng and Houn. Data used are both quality and quantity data collected through questionnaire .

Results of Study showed that there were 5 types of investment model on rubber plantation within Udomxay : (1) joint venture between company and farmers , (2) the concession of the Government land , (3) the release of fund of the company to farmers and contract of marketing, (4) Government to promote farmers to plant by themselve, (5) investment of farmers to the plantation. The majorities models to share their collected resin and some model to share the rubber plants in the garden such as 50 : 50 between farmers and the company which has a longterm contract. It was found that farmers lose implicitly their right in land tenure and lead to the risk to lose their right in land tenure in the future. There was sign of rice shortage since the agricultural land was substitued by the rubber land.The Nahom village has to worry about the production for food security and an annual plants as commercial product to supply income to the current household because almost of the land used for rubber plantation.it could be concluded that an economic and livelihood of rural people depend on land for production. So to insure that each household have sufficient land for production , allocation of land is needed to be considered.

Recommendations are that the goal of policy on rubber plantation in central and local level should be clearly specified including an appropriate allocation of land and forest, and licencing the rubber garden, the legal rigth of land tenure and land use in agriculture land to farmers. Also , supporting farmers to access to the agricultural credit is needed. Moreover , a preliminary environmental evaluation report before permitting the rubber plantation is necessary.

บทคัดย่อ

รหัสโครงการ	:	RDG5310012
ชื่อโครงการ	:	Modification of the Model of Land Use and Land Tenure Influenced by Rubber Plantation in Namo District, Oudomxay Province, Northern of Lao PDR
ชื่อผู้ดำเนินการ	:	Associate Professor Linkham Douangsavanh , Ph.D
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เนื่องจากกลยุทธ์การใช้ประโยชน์จากป่าไม้ถึงปี 2563 ได้ทำให้การปลูกยางพาราขยายเพิ่มขึ้นอย่างมากทั่วประเทศมาตั้งแต่ปี 2546 ซึ่งทำให้เกิดการเปลี่ยนแปลงทั้งพื้นที่ป่า วิถีชีวิตของคนในชนบท ทรัพยากรธรรมชาติและความหลากหลายทางชีวภาพ

วัตถุประสงค์ของการศึกษา คือ เพื่อระบุปัญหาในการลงทุน เพื่อนำไปสู่ข้อเสนอแนะที่จะทำให้ความต้องการของชุมชนดีขึ้น และเพื่อสนับสนุนข้อมูลให้กับผู้กำหนดนโยบาย พื้นที่ศึกษาประกอบด้วย 5 อำเภอของจังหวัดอุดมชัย นั่นคือ นาโม เซ งา เบ็งและฮวน ข้อมูลที่ใช้ในการศึกษามีทั้งข้อมูลเชิงคุณภาพและเชิงปริมาณที่เก็บผ่านแบบสอบถาม

ผลการศึกษาแสดงว่า การลงทุนปลูกยางพาราในจังหวัดอุดมชัยมีอยู่ 5 รูปแบบ คือ (1) การลงทุนร่วมระหว่างนักลงทุนกับเกษตรกร (2) การให้สัมปทานของรัฐ (3) นักลงทุนออกทุนให้กับเกษตรกรและมีสัญญาด้านการตลาด (4) รัฐสนับสนุนการปลูกยางพาราให้กับเกษตรกร และ (5) เกษตรกรลงทุนเอง สำหรับผลประโยชน์นั้น มีสัญญาการแบ่งผลประโยชน์ในระยะยาวกันระหว่างเกษตรกรและนักลงทุน ในอัตราส่วน เช่น 50 : 50 การศึกษาพบว่าเกษตรกรจะสูญเสียสิทธิในการใช้ที่ดินในระยะยาว การศึกษายังพบอีกว่า มีสัญญาณของการขาดแคลนข้าวบริโภคในพื้นที่ศึกษาเนื่องจากที่ดินทางการเกษตรถูกทดแทนด้วยที่ดินปลูกยางพารา เช่นในหมู่บ้านนาโฮม ที่ต้องเป็นกังวลเรื่องการปลูกพืชอาหารเพื่อความมั่นคงด้านอาหารเนื่องจากพื้นที่เกษตรเกือยทั้งหมดถูกนำไปปลูกยางพารา ซึ่งทำให้วิถีชีวิตของเกษตรกรเปลี่ยนแปลงไป ดังนั้น เพื่อให้แน่ใจว่าครัวเรือนเกษตรกรมีที่ดินที่เพียงพอต่อการทำการเกษตร จึงจำเป็นต้องพิจารณาเรื่องการจัดสรรที่ดิน

ข้อเสนอแนะคือ เป้าหมานเชิงนโยบายของการปลูกยางพาราทั้งในระดับประเทศและในระดับท้องถิ่นต้องชัดเจน รวมทั้งการจัดสรรที่ดินและป่าที่เหมาะสม และการจดทะเบียนสวนยางพารา สิทธิที่ถูกต้องตามกฎหมายและที่ดินทางการเกษตรสำหรับเกษตรกร ควรสนับสนุนเกษตรกรให้สามารถเข้าถึงแหล่งทุน ยิ่งกว่านั้น การประเมินผลกระทบด้านสิ่งแวดล้อมเบื้องต้นก่อนการอนุญาตให้ปลูกยางพาราเป็นอีกอย่างที่ควรนำมาพิจารณา

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Chapter 1

Introduction

1.1 Background

The Lao Government had issued the policy to turn the land into assets for fundamental National socio-economic development according to the National Growth and Poverty Alleviation Strategy. In the past, the government had implemented the land and forest allocation polity. This was the starting point for land development planning by identifying village boundary, surveying, allocating, land use and forest planning. These activities were aimed to solve forest problems, stop forest destruction, stop shifting cultivation, improve land quality and rural livelihoods, increase production diversification and solve other social problems.

In parallel to the land and forest allocation polity, the government also issued the forest strategies to 2020 which to support investment on land and forest. Thus, in 2003, industrial tree plantation and commercial agricultural production are one of the major courses for rapid forest changes in the Northern of Laos. The major issue is the significantly increasing of rubber plantation over the country since 2003 after seeing the positive outcome in Hatgnao village, Luangnamtha province. The production investment systems are also different such as private companies, local companies, and private villagers. The government also promoted the rubber production in some place. As a result, the rubber plantation will expect to increase gradually until 2010. (Sounthone Ketphan, 2006)

According to researches by related institutions and originations, the promotion of rubber plantation did not transplant. For example: land use boundary identification, land tax collection, support funds for poor villagers. Therefore, this causes the changes in forest, which affects the livelihoods in rural area, natural resources, and implementation. Wealthier households had more opportunity to access to the land (Sithong Thommanivong, 2008). Moreover, turning from natural forest land to rubber trees will cause biodiversity and Non-Timber Forest Product significantly and progressively declining (Steven Sipany, 2006)

Odomxay province is one of the Northern Provinces that many Chinese companies are interested to invest in rubber plantation in a large area. In fact, the province has the suitable land for industrial tree plantation only 51,309 ha (Bounthong Bouahom, 2006). More

recently, land for rubber plantation is highly demanded for different investment firms such as national and international companies and private villagers. This is the major cause for tension and changes in land tenure, agricultural production systems, land and forest allocation, and use of resources in the area. In addition, it also affected villagers' livelihood and environment. Namo is one of the 4 target districts that investors are interested to invest in rubber plantation which includes Nahom village, Pangthong area. The target research area in this study is also one of the effected rubber plantation expansion, due to that the villagers be still based on agricultural and forestry production as the basic economy. They make their livings by implementing upland rice cultivation, planting crops, and collecting NTFPs. The possibility of forest destroy will progressively increase, because they turn to plant more rubber trees. Therefore, this study is targeted to find out:

1) How does the rubber plantation investment policy which had been implemented in Oudomxay Province influence the target villages? And how it is different?

2) How does the land use for rubber plantation influence the changes in agriculture and forestry production systems of the villagers?

3) How does the rubber plantation influence land tenure of the villagers? And how do they adapt to the change?

1.2 Research Objectives

The target of this research is to identity problems in investment and provide advice for improvement according to community needs; to support the information to policy makers. Therefore, the specific ofjectives are:

1. To investigate the forms of farmer organizations existing in the three parts of Lao PDR and describe how the they develop;

2. examine the problems and impacts of the existing farmer originations in relation to food security issues;

3. describe the external supports from the Government and international organizations?

4. provide recommendations on how to formulate effective and sustainable farmer organization in relation to food security in rural areas.

1.3 Research Methodology and Design

Research Scope

This research will start with authorities responsible for rubber plantation in Oudomxay Province and 5 districts. Finally it will conduct in-depth research in the village level by focusing on one representative village in Pangthong Village Cluster, Namo District. The research will focus on: (1) observing the difference in implementing rubber plantation policies in different forms such as investment types, benefit sharing, resource use, investment, implementation, progress, contribution to the government, project promotion and other issues; (2) investigating village history, socio-economic, changes in allocated land, resource use, and environment according to the land and forest allocation policy in the past year; (3) in dept qualitative and quantitative data collection in all households in the target village by emphasizing on land tenure of 3 different household types, land selling and purchasing, rubber plantation investments, rice production, income, occupation, resource requirement, adaption in agriculture and forestry production and lives, and difficulties and problems in rubber plantation investment. For the district levels, the study will conduct the research in 5 districts such as Namo, Xai, Beng, Hun, and Nga. The study will just collect related information with concerned offices. The research will implement for 14 months including the preparation stage, field data collection, report writing as shown in the diagram below:

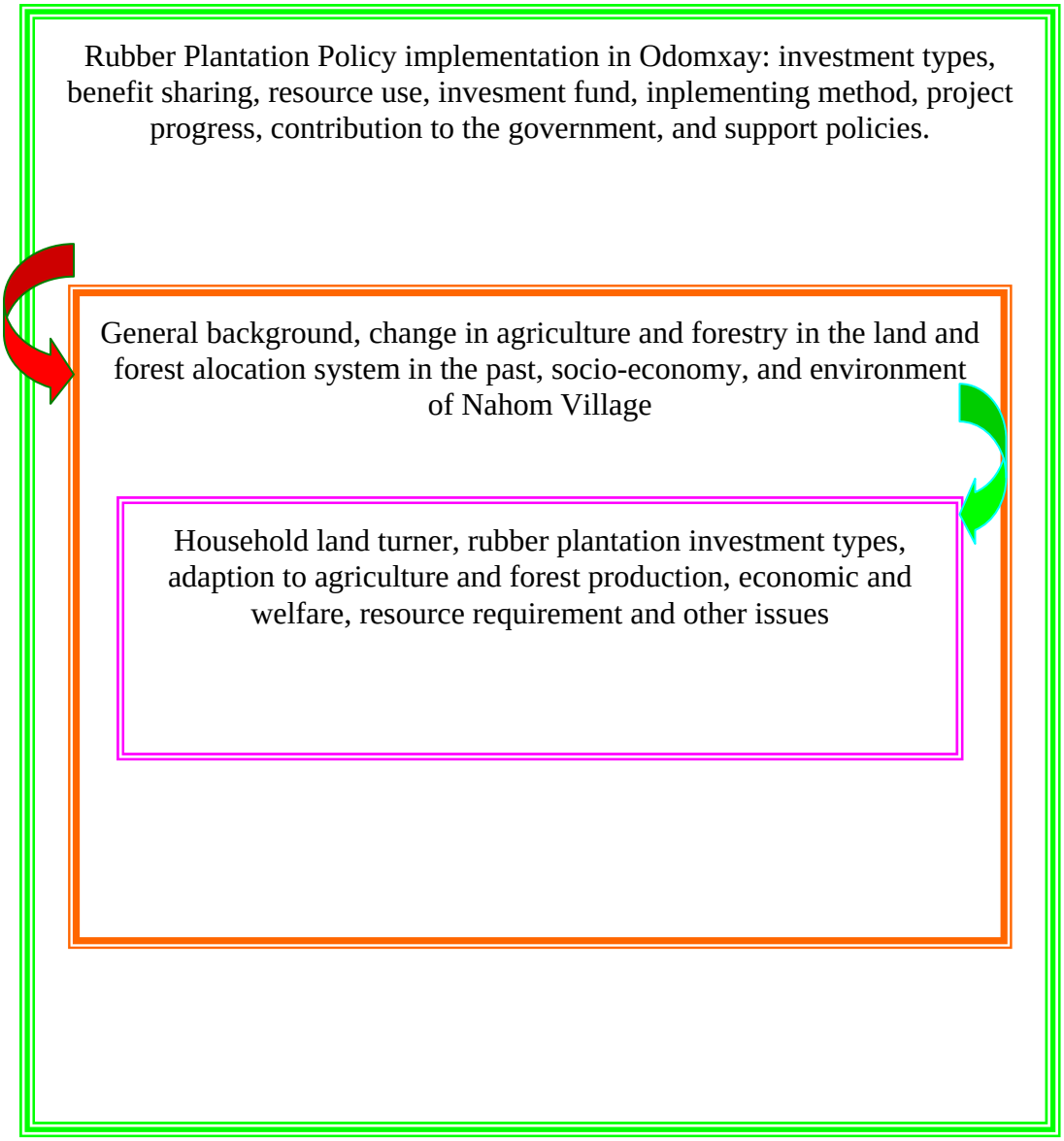


Figure 1: The Research Scope

Research Process

The data collection method will be applied to obtain reliable information is integrated between different techniques. It will include collecting all related secondary information and records such as documents, maps, and other printing materials which include:

1). Two data types will be collected such as demographical data and socio-economic data. The demographical data includes land and forest allocation map in 1999 and land use and administrative map in 2009. The socio-economic data consists of statistical data on economy,

social, and environment such as number of households, village history, population, land turner, land and forest resource use. The information will be obtained from two main sources: 1). reports or related documents from related agencies in different levels such as provincial, district, and village levels; and 2) field survey such as household, population, land use statistic, agricultural production, household status, occupation, income sources, rubber plantation and village map.

2). Demographical data analyzing: the village land and forest allocation map which basically used is 1:10.000. The demographical condition and land use had been changing. Thus, this step is important to produce a reliable map which needs to be use Pantograph step by step. Firstly the map will reduce to 1:25.000 and then to 1:50.000. after that, the information and data of each type of land and forest change will be integrated into the map accurately. Finally, a new map will be produced. After completing the new map, it will be used to compare the changes of different types of land and forest between 1999 and 2009 to see the degree of influence by rubber plantation.

(1) Imputing the data into a computer: the map will be scanned and stored in a computer. After that the map will be integrated with digitizing different land use types by using MapInfo.

(2) Validating and checking the data: the data used for Digitizing usually generate some errors from the data processing. Thus, the validating and checking the data is important in order to produce reliable and accurate data. Most errors exist because Polygon is not closed or Polyline is not connected as the reality or over lines. After checking and validating and improving the data, it can be used to integrate with their Attributes such as type of land use, village location, road, and changing characteristics of different land.

1.4 Data collection and analysis for investment policy implementation

This data collection is divided into 2 levels.

1). Data collection from different government levels: starting from revising documents and interviewing concern organizations in provincial and district levels which are responsible for implementing policies and rules and regulation for supporting rubber plantation such as land

law, forest law, national and international investment promotion laws, degrees, and regulations. In addition, the rubber investment documents of concerned companies in the province will be studied about the types of investment, benefit sharing, contracts, and resource use. The documents include project documents, contracts, reports, investment statistics, planting areas, and socio-economic and natural environment which are affected by the rubber plantation. The research will also interview different line agencies in provincial and district levels such as different departments, office, divisions: PAFO, Department of Planning and Investment, Provincial Land Management Authority, and other related departments in the provincial level. In district level, the study will interview DAFO, Office of Planning and Administration, District Land Management Authority, and other related offices. The interviews will emphasize on the implementation of land use and land administration polities, technical support, rubber plantation technicians, other industrial trees and other agricultural productions, collecting statistical data, after that start to discuss with the concerned staff about the strengths and weaknesses, problems in promotion, and improvements. The discussion will be interaction. During this step they will also asked about the steps, process, implementation techniques, coordination, participation in decision making process which related to the land use and rubber plantation promotion in district and provincial level.

1). Data collection in the field: includes two techniques:

(1). Interview: village and households in the target village by using interview form.

a). interviewing village authorities will include village history, population, household number, household ranking, occupation groups, rice production, tree plantation such as rubber and other industrial trees, crop productions, rubber plantation characteristics which includes area, land use, and forest resources according to land and forest allocation policy which include selling and purchasing, land changing to other purposes, environmental issues, and important invents during the past 10 years.

b). interviewing village households will include all 100 percent of village households by dividing them into 3 economic ranking types according to the village authorities such as wealthy, medium, and poor. The interview will find the details such as household members, labor, primary and secondary occupation, income and income sources, rice production, tree plantation including rubber and other industrial trees, crop production, livestock production,

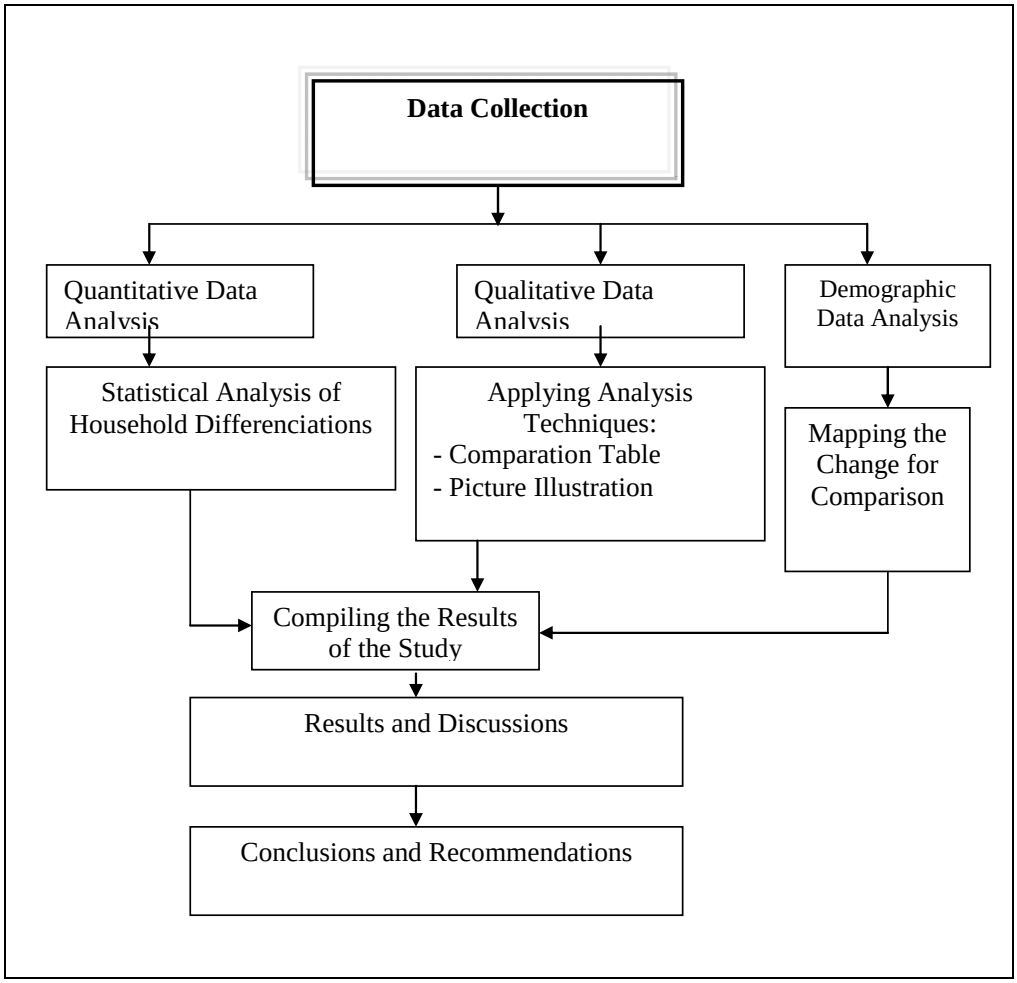
rubber plantation investment type, plantation areas, land use and forest resources according to the land and forest allocation which include land turner, access land for rubber plantation, land selling and purchasing, changing land and forest for other purposes, need for area expansion, adaptation to agricultural production, living, and other problems of the households.

(2). Observation: beside the interviews, the research staff will survey and observe with villagers and village authorities to know about the rubber plantation area situation, integrated crops with the rubber, additional crop production before harvesting the rubber, growth and maintenance of the rubber trees. During the observation some important remarks will be also discussed to make more understanding and identifying problems, and also problem solving of the villagers. The observation survey is to record the evidences of land change which were identified in the past by consolidating between the information from the discussion and actual areas. Moreover, some photo will be taken and participatory resource use mapping with villagers will be made.

Data analysis

The data will be compiled such as maps, interviews, statistical data, and other qualitative data will recoded into quantitative data for analyzing and comparing the land use and forest change in the past 10 years by based on the data of land and forest allocation, land turner of 3 types of households, land use, income and income sources, adaptation to agricultural production and living, resources needs, and rubber plantation investment types. The results will be discussed and illustrated by comparison tables, maps, and graphs as the process below.

Numerical data analysis: Using Microsoft Excel to build database and tables of the raw data. After that different functions such as Pivot Table and Pivot Chart Report will be used to find the mean and other statistical indicators. Finally the results will be discussed and lustrated. The process of the data analysis will be as the follow chart.



1.5 Anticipated Outcome of the Study

The expected outcomes of this study are to understand some basic socio-economic data of the farmers, information on backgrounds, characteristics, structures, governance, available institutions, and development of the farmer organizations that exist in Lao PDR.

The result of this study can provide useful information to the Ministry of Agriculture and Forestry, Ministry of Industry and Commerce, Ministry of Justice, Provincial Authorities, and concerned organizations in order to provide supports and improve the farmer organizations more effectively and efficiently by helping them to identify suitable policies for development and governance of the farmer organizations in Lao PDR in the future.

In addition, the research activities will also be participated by some staff and some final year bachelor degree students in the Faculty of Agriculture and Faculty of Social Science, National University of Laos. They will receive on-the-job training in conducting the research. This will increase their research skills.

Finally, the research process and results can be used to teach students in different faculties in NUOL and other universities in Lao PDR.

Time Schedule

This research project is expected to start in January 2010 after it is approved by the funding agency. The project will be implemented for one year until December 2010.

During February 2010, research tools will be developed according to the final approved research proposal. The tools will be applied for data collection in the field during March to June 2010.

The data will be analyzed in July and August 2010 and the results will be discussed in the draft report during October 2010. The final report will be submitted during December 2010. The detail of the research schedule is in the Annex 1.

Chapter II

Literature Review

2.1 What's land concessions?

Land concessions mean an agreement between the government and the concessionairs. In this case the government gives some area of land to people who need the land for running some legal business. The concessionairs have to paid for the concession and any other fees for the government according to the rules of law (PM Office, 2005).

2.2 Rubber farming system in Lao PDR

Since 1990, the Lao goverment has had an open policy on investment in Laos as a mechanism to push National economy development. From 2000 until now the number of interested international investors running investments in Laos is increasing. For the past seven years rubber plantation investment has been a popular business that interests both domestic and international investors. There are several different types of farming systems: (1) international and domestic company invest with farmers 2+3 farming system; (2) international and domestic company join each other in investment 1+4 farming system (land concession from the government); (3) government provides funds for farmers to plant; (4) contract farming; (5) smallholder (THONGMANIVONG, et al. 2007).

2.3 What's land rights?

The land rights means the rights of being the owner of land in legal or Lao customary use. Futhermore, the state protects the legal interest of the landholder and ensuring the protection right, use right, usufruct right, and transfer right and inheritance right (NA, 2004).

2.3.1 Rights on land use in Lao PDR

According to the legal and customary land use management, land owneship is divided into two types; (1) permanent, when the government gives land to families, state organisations, national defence and security units for permanent agricultural production: rice growing, garden, tree planting and constructional land; (2) temperary, is state land which the

government give to families, private companies both international and domestic, rental and concessionair foreigners who need the land for running some legal business (NA, 2004).

2.3.2 Land and forest tenure for Lao

The state is aware of traditional customary practices related to use of land and forest by all Lao citizens. This includes recognizing their rights to use agricultural land for tree planting and livestock raising with maintenance, expansion and development normally and in the long term period without land certificate; rights to non-prohibited timber for general construction: house construction, fence; rights to collect forest products for personal such as food, medicines, decorations and also collecting products to sell. Furthermore, the village authority can set up the rule of land and forest use; allocate or determine the land as cultural land such as spirit forest, cemetery based on local customs. But in the legal use, all multi-ethnic Lao have equal rights in using the forest and land which is managed by the state through centralization throughout the country. Land and forest possessors have: the right to use land, right to usufruct, right to protect land, right to transfer the land use right, right relating to inheritance of the land use right. Whether or not the rights of the land ownership will be used depends upon the land classification in the village. (NAFRI, 2005)

2.4 Land rights reform in Lao PDR

There are many different types of land rights reform in Laos. Land rights reform started from the customary use rights (from the old farminig system practice:shifting cultivation, garden,...). In the past people didn't have any land certificate for legal landuse rights, but now the the landuse planning policy of the government is issuing temporary land certificates to these villagers. These certificates are valid for three years then change to real land certificates for long-term landuse rights. In addition, the type of land rights reform consists of contracts for lease or transferring the landuse rights directly to others; in this case it caused the rights in using natural resources by the villagers and made the cycle of swidden shorter (NAFRI, 2005).

2.5 Land and forest classification in Lao PDR

2.5.1 Land classification and land use planning

According to the use and the management of lands, land is classified into eight categories: (1) agricultural, (2) forest, (3) land around water resources, (4) industrial, (5) communicational,

(6) cultural, (7) land for national defence and security, and (8) constructional. These lands types were classified, managed and developed into agricultural, forest and wet lands by Ministry of Agriculture and Forestry (MAF).An effective communication system needs to be developed at all levels so that allocation and classification of each landuse is clearly and suitably defined around the whole country at both macro and micro levels (MAF, 2005).

2.5.2 Land and forest allocation

There is a need to make the system of management of agricultural and forest landuse more convenient and effective. With the intention of improving the allocation of village natural resources, and ensuring the sustainability in protection, reforestation and development of forests, forest land, watershed, biodiversity and the environment. As a step towards more effective management the forest is classified into five categories: (1) conservation forest , (2) protected forest, (3) production forest , (4) regeneration forest, (5) agricultural land (MAF, 1996).

2.5.3 Forest classification by forest law

To protect and develop the forest, the forest is divided into 3 categories: (1) conservation forest , (2) protected forest, (3) production forest following the revised issue of forestry law of Lao PDR (NA, 2008).

2.5.4 The classification of land and forest use in Oudomxay province

The land and forest use in Oudomxay province was surveyed and classified by Oudomxay provincial authories and the National Agriculture and Forestry Institute, and the Ministry of Agriculture and Forestry. The land and forest area is classified into the following 9 categories: (1) local production forest area; (2) watershed protection forest area; (3) grazing land, commercial forest planting area; (4) new rice expansion area; (5) crop and fruit tree planting area; (6) presently paddy field area; (7) present crop and fruit tree areas; (8) residential area; and (9) conservation forest area (MAF, 2003).

2.6 Determination of the scope of agricultural and forest landuse rights in Laos

The state authorizes individuals and families to use agricultural land in accordance with the plan on shifting cultivation eradication and stabilization. The allocation plan is an effective strategy for maximizing land use and the areas are determined as follows:

1.) Using land for cultivating rice, raising livestock, the maximum area is 1 hectare per one labour force in the family.
2.) Using land for growing cash and annual crops, the maximum area is 3 hectares per one labour force in the family.
3.) Using land for fruit tree plantation, the maximum area is 3 hectares per one labor force in the family.
4.) For those using deforested land or grassland for planting crops or growing grass (for livestock feeding) , the maximum area is 15 hectares per one labor force in the family.

The maximum area of agricultural and forest land approved for individuals and families for deforested land or degraded forest land for agricultural and forest use is 3 hectares per one labor force in the family. Any person who wishes to use a larger area than the amount of agricultural l and forest land determined has the right to apply for leasing or concession of the land from the state and the decision shall be based on the conditions and actual capacity of the concerned organization (NA, 2004).

2.7 Agricultural production system

The agricultural production system is the farmers' way of deriving social and physical benefits from the environment through a unique relationship. Furthermore the agricultural production system values the limited productive nature of the environmental cycle and the need to maintain a balance within the ecosystem. The relationship of the agricultural system components are: natural resources (soil, climate, crops, insects...); and human resources: such as population, culture, social-economic conditions and farmers technical knowledge using. This agricutural production system can be divided into 3 categories:

1.) Regional level: the production system is integrated with many systems that have similar social-economic and agro-ecology conditions.

2.) Farm level: the production system incorporates various manufacturing tools for conducting cultivation and livestock systems to help achieve the farmers' goals. For example, hire labourforce, tractors for the production in 1 ha. of irrigation area and in the paddy field area, and annual crops, vegetables, etc.

3.) Plot and herd level: the cultivation and livestock system uses the analogous management method on technical, tools, input factors. For instance, growing cereal crops in the paddy field, and the slash and burn farming system (NAFRI, 2005).

2.8 Trees planting extension policy in Laos

To reach the trees planting extension goals according to the social-economic plan in each period of government the follwoing policies were introduced:

2.8.1 Land and forest allocation

The objectives and the main tasks of the policy on land and forest allocation are land use planning with the purpose of (1) propping up the multi-ethnic people to reduce the practice of shifting cultivation in the upland zones where the risk of soil erosion is high. (2) encourage the practice of stable agriculture via cultivation, livestockraising and forest protection. Furthermore this policy be assist trees planting development as (1) farmers are given temporary rights to do agriculture in agricultural land; (2) to create maximum efficiency land investment was promoted to villagers; (3) expand the area for growing rice; (4) encourage commercial agricultural production; (5) promote villagers participation industrial trees planting for goods (NAFRI, 2005).

2.8.2 Reforestation extension

After independence in 1975 reforestation extension policy became one crucial priority for the government. The ministers congress issued the legislation No. 74 for reforestation promotion in the bare land in 1980. The government determined that on June 1st every year this would be National tree planting day. The government has spread tha policy on planting trees for commercial use and recieved strong promotion when implementing the national social-economic plan for 5 year period (2001-2005). The MAF also issued the legislation No.196/2000 on development and promotion of tree planting for the long term, and issued No.1849/MAF.2000 on forest land registration and this is the order from the Prime Minister

on forest business and management. This was concerned about the importance and need to support tree planting (No. 11 / PM 1999; 10/PM.2000; 15/ PM.2001; 18/PM.2002; 28/ PM.2003 and 25/PM.2004). Futhermore the forest law is clearly determinded about tree planting extension as the government has the policies in pushing to reach the goals in tree planting. These policies consist of land allocation or land lease for tree planting, rights to use the planted trees, tax exemption for registered forest, seedling distribution to villagers, free tree planting, use the customs fee collected from timber and NTFPs to fund and promote tree planting and reforestration, obtain bank loans for the industrial tree planting implementation project and cooporate with international agencies for tree planting promotion (2005).

2.8.3 The promotion on development of the use of the land and forest

The government encourages all social-economic components to take part in land development by (1) issuing policies, measures and rules to protect and improve the land, (2) promote investment on labours, materails, technologies, infrastructure construction and (3) good management of land authorities to make the land better quality and increase costs; particularly training on land study, setting up funds, etc. The government has a central policy, equal rights and it is suitable in using the degraded or bare forest and land according to the ability of the labour force and funding for plant trees, reforestration or NTFPs recovery as below:

1) Land using area: the area of land for use in the family is not greater than three hectares per one labor force. Anyone who wants to use more than the amount determined, and or use for run business could apply for leasing or concession the land from the state.

The forest land could change into another land type if it would carry out the maximum benefit for the public and people livelihood in the long term. In addition, it will running the activities that rely in the national social-economic plan and located within the arrangement places. Lastly, each action must pursue in steps and practice these following conditions: (1) Study the social-economic, natural resouces and other suitable information; (2) create economic-technique analysis report which was approved from the concerned organisations; (3) study the impact of the environment and society, then write the report on the environmental impact assessment including the suitable concrete measures for problem solving that agree from the concerned sectors; (4) create the

implementation plan for watershed management and environment protection, prevent illegal land expansion; promote village development, encourage villagers involvement in production processing, technology use, etc .and benefit sharing; (5) strict practice of legal rules and laws.

2) Approval area

a) The determination of the lease or concession of the degraded forest land for reforestration, tree planting, industrial trees and NTFPs have details like this: (1) the capital or province authority have rights to approve the lease or concession of land having an area not exceeding 150 ha per project and the maximum period shall not exceed 30 years, but could be extended; (2) the government has rights to approve for the lease or concession of land having an area between 150- 50,000 ha. per project and the maximum period is longer than thirty years but shall not exceed 40 years, but could be extended; (3) for the lease or concession of land having an area exceeding fifteen thousand hectares, approval is required from the National Assembly.

b) For the approval area of the lease or concession of the bare forest land for reforestration, trees planting, industrial trees and NTFPs: (1) the capital or province authority have rights to approve for the lease or concession of land having an area not exceeding 150 ha per a project and the maximum period shall not exceed 40 years, but could be extended; (2) the government has rights to approve for the lease or concession of land having an area between five hundred to three thousand hectares per a project and the maximum period is longer than 40 years but shall not exceed 60 years, but could be extended depending on each case; but (3) for the lease or concession of land that is situated in the rural areas, the determination of the lease or concession period is exceeding 40 years but the maximum period shall not exceed 70 years, but could be extended depending on each case (NA, 2008).

2.8.4 Investment promotion in Lao PDR

The law on the promotion of foreign investment No. 11/NA 2004 and the law on the promotion of domestic investment No.10/NA 2004 on tax and duty policy for promotion of foreign and domestic investment in Lao PDR the proposal for the policies on taxes and duties are detailed below. These activities and investment areas were determined by the government in the national social-economic plan.

1. The policy of foreign investment promotion

The government determined 3 investment zones according to the infrastructure access conditions and other convenient aspects in each zone:

(1) First investment zone: this area which is situated in the rural area , has difficult road access, no electricity or water supply. The investment in this place is exempt from profit tax for a 7 year period and then the investors will pay only 10% of their profits in tax.

(2) Second investment zone: this area is situated in the suburbs or small towns, and has convenient road access but lacks some conditions: electricity or water supply. The investment in this area is exempted from profit tax for 5 years, then 3 years for reducing the fee of the profit tax at half of 15% of total benefit and the fee for profit tax will increase to 15% of the full benefit afterward.

(3) Third investment zone: is placed in the town or city that has good infrastructure such as: road, electricity , water supply. The investment here is also exempt from profit tax for 2 years, then the rate of profit tax is 10% for 2 years after, and then rises to 20%.

2. The policy of domestic investment promotion

The government will reduce or except the taxs and the duties of the following:

(1) Foreign investments shall pay a Lao PDR import duty on equipment, means of production, spare parts and other materials used in the operation of their investment projects or in their productive enterprises at a uniform flat rate of one percent (1%) of their imported value. Raw materials and semi components imported for the purpose of processing and then re-exported shall be exempt from such import duties. All exported finished products shall also be exempted from export duties.

(2) The investments that are conducted in the towns pay profit tax at 20% of the net benefit annually.

(3) The investments that are conducted in the rural or flat areas pay 5% of the net benefit annually for the profit tax.

(4) The fee of the duty for the investment which is conducted in the mountainous rural areas will be reduced or exempt for paying profit tax for 2-5 years.

(5) For tax and duty fee reduction and exemption from profit tax this is determined in accordance with the tax and duty laws of Lao PDR (NA, 2004).

2.9 The importance role of land and forest on national and rural social Economic

The government has a policy of turning land into capital because land plays an important role in the national social and economic livelihood of the Lao people. But, landholders in rural areas are experiencing a lack of funds to follow the government policy on poverty eradication, for making land development continual. The government wants to develop land in other sectors for raw materials, to create jobs for local people and motivate domestic and international investment from both individuals and organisations,. Importantly, the land and forest are also play a crucial role for in the livelihood of the local people. Agricultural land is used for food security, commodity production; and the forests are a major source of wood supply they are NTFPs for family consumption and include household income. Morover, the land and forest are very important for environmental protection and biodiversity in the region, the nation and the world. (MAF, 2005)

2.10 The important role of rubber on economic and people livelihood

Rubber plantations are a vital commercial crop that have been promoted by the government of Laos. This is a alternative way of supporting the government plan on national social-economic development for the next 5 years as we move from subsistence to commercial agriculture: replacing slash and burn farming practice, helping poverty alleviation and contributing jobs for society. When the government encouraged (1) the demand of rubber is strong from the international market, (2) the foreign investment and (3) the achievement of the rubber plantation in the case study area, Hadyao village, Numtha district , Luangnumtha province. Otherwise, to respond the government policy on transfer to modern industry for national basic economic contribution: bring money into the country, enhance the people' income and improve their livelihood. This is a good version eventhough it lacks technical knowledge on technique, economic, marketing and social (MAF, 2006).

2.11 Rubber development concepts in the northern of Laos

Eighty-five percent of Northern Laos is moutainous with limited land for agriculture and a high risk of soil erosion. Moreover people rely on forest resources for their livelihood. The development of rubber plantations in Northern Laos should focus on the groups of people who live in poverty, with low incomes and no job security. The rubber plantation type should

avoid monoculture as it is better to intergrate with other crops, to get short-term income (from crops and NTFPs selling) and ensure food security. Futhermore, rubber development needs clear policies and support mechanisms and the most important thing is a good organisation system for pushing the small enterprise. Also, promoting the participation of poor people in rubber production for involvement in the government policy on poverty eradication. To reach the government goal on poverty eradication, the rubber farming system should not only have the land concession from the company, it should open a chance for poor villagers (the smallholder) to engage in rubber production. Moreover, the villagers should receive integrated farming system supported. It's because of to avoid the slogan: "don't put all your eggs into the one basket" and the rubber plantation should not be depend upon only investment from foreigners (Lisbetbostrand SIDA representative in Laos, 2006). Furthremore, it is necessary for rubber development to have a clear strategy and more open discussion with any stakeholders in the province level and others people who paticipate in rubber development mainly:

1.) Determine the alternative ways and rubber farming system that reflect lots of varieties, good conditions for people's livelihoods and Lao multi-ethnic customs.

2.) Follow the present land use planning: do not practice rubber plantation in the forest conservation, protection forest areas or other areas that are not suitable for rubber planting.

3.) Provide advice for rubber plantation and clear standards on contract farming to certify the honesty of contracts signed and ensure the partners in contract will furnish the benefits in economic, environmental and social sections, Ulrichsabel Keschella director of rural development in the mountianous areas agenda from GTZ (MAF, 2006).

2.12 The development of land for rubber plantation in the northern Laos

Rubber plantation is a cause of land and forest changes both at the regional and national levels as in the case of replacing forest by rubber. Although the rubber garden is planted by integrated farming system, but landuse planning for rubber is nesscessary and assists in:

1) The selection of rubber plantation area will help to reach the maximum effectiveness production.
2) Be considering the road access and the marketing for help the farmers have high profit with reduce capital.

3) Land use planning will reduce access to forest protection areas, preventing people from stealing natural forest resources, preventing the impact on water and help in decision on natural resources management. This is from the lesson learned from Vietnam, land tenure certification will be the essential inspiration of planting the long-standing tree and or long-term crops and help in making sustainable landuse. On the other hand if the villagers don't have land certificates, they will face the difficulty in loan access from the banks and this leads to diificulty with decision making for the long term. Both of these are necessary for rubber plantation (MAF, 2006).

Chapter III : Reseach area

3.1 Reseach area selection

To achieve the aims and the expected outputs. There are 5 districts: Namo, Xay, Ngar, Beng and Houn in Oudomxay province, central provinces in Northern Laos were choosen to be the target districts for this study. The criteria of the research area came from the following reasons: these places had many different types of rubber farming system, the places have convenient access and the five districts are the focus districts within 47 poorest districts of Laos. Morethan this, the area of this research is specific at Nahom village, Pangthong village cluster, Namor district, the research area of the Swedish International Development Cooperation Agency (SIDA project). This village was selected for the reason that villagers there plant a lot of rubber with many types of rubber farming systems (Picture 2). There are 5 villages (Ban Pangthong, PangDue, HouaySang, Mute and Ban Nahorm) in the Pangthong village development cluster and all are engaged in rubber plantation.

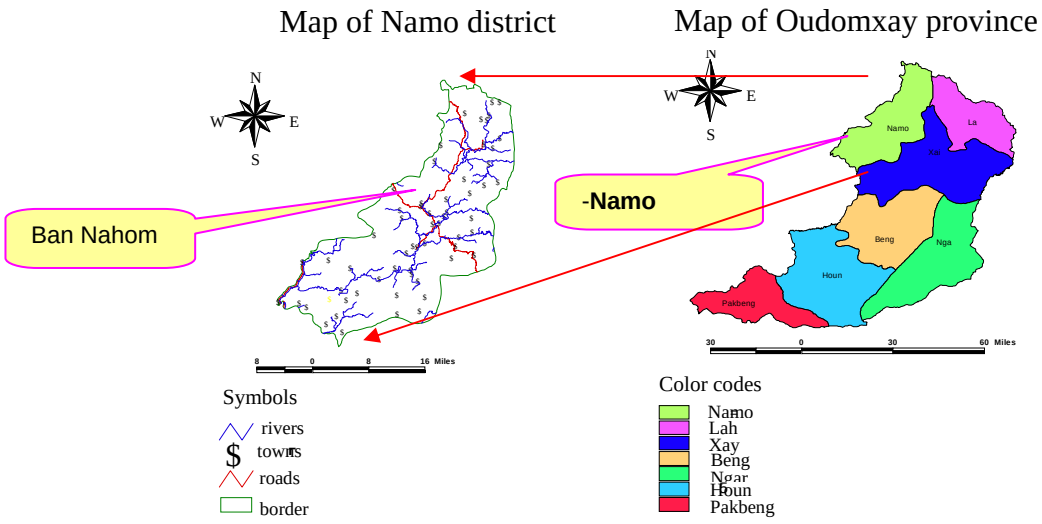


Figure 2. Map of Study Area

3.2 Background information of Oudomxay province

Oudomxay is a province located in the centre of all northern provinces and linked with other provinces by the national public way (No. 13th north road), through this route it reachs to China (which has the immigrant check point in the Namo district) and some other countries that have borders with: Vietnam, Thailand and Myamar. Around 80% of Oudomxay citizens

are engaged in agriculture and forestry. Administration is centralised, Oudomxay is divided into 69 village clusters with 7 districts: Namo, Xay, Lah, Ngar, Beng, Houn and Pakbeng.

Oudomxay's social-economic development is continuously growing as well as many domestic and international investors interested. Futhermore, there are rich natural resources that motivated for investors esspecially the investing in land. In addition, the Mekong river takes advantages for communication and natural tourism (sightseeing along Mekong river bank) mainly at Pakbeng district.

However in past year almost all districts in Oudomxay faced problems with flood. The result of this destruction cost 55.9 thousand million kip, this involved 7.1 thousand million kip for irrigation, lowland rice 29 thousand million kip, other crops 18.3 thousand million kip, livestocks 1.3 thousand million kip and agricultural machines 0.2 thousand million kip, 24 thousand million kip for destroy irrigation at Kornoy the rubber plantation area in Xay district; 5 thousand million kip in Namor district, in the area of 13 villages at Houayxang, Pangthong. Besides Beng, Houn and other districts were destroyed, but the Kornoy rubber plantation area of SINO-Lao company in Xay district was destroyed the most. It has taken a lot of economic negative results. Therefore this is a reminder that the study of environmental factor within the rubber allocation area should be considered in doing the rubber planting to avoid further bad events.

Table 01. Household and population distribution of Oudomxay province

No.	District name	Household amount	Number of poverty household	Population amount	Remark
1	Namo	5,415	1,408	34,418	Planted rubber
2	Xay	11,467	1,546	69,269	Planted rubber
3	Lah	2,87	880	16,763	Has a plan to plant
4	Ngar	4,676	2,41	28,340	Planted rubber
5	Beng	5,819	2,738	34,745	Planted rubber
6	Houn	10,803	2,686	66,313	Planted rubber
7	Pakbeng	5,194	2,749	27,112	No plant
	Total	46,244	14,417	276,96	

Source: Department of Planing and Investment of Oudomxay, 2009

3.2.1 Geography and location

Oudomxay is the province located in the central of all northern provinces. The North is linked with Phongsaly and Luangnumtha provinces and has the same border with China, the South is linked with Sayabouly, the East is linked with Luangprabang, and the West is linked with Luangnumtha. The total area is 1,535,000 ha and 85% of the area is mountainous. Oudomxay has 22 conservation forests with 121,500 ha, 6 national protection forests with 342,550 ha, forest and agriculture area that suitable for growing annual crops 133,290 ha, and the suitable area for growing industrial trees is approximately 51,309 ha.

3.2.2 Population

Oudomxay has 276,960 population with 138,139 are females. There are 473 villages in over the province meanwhile 244 villages or 58% which has 14,417 people or around 32 % are poverty. There are 3 main ethnic groups in Oudomxay: Kmu 60%, Lao loum 25 % and Hmong 15%. The density rate is 18pers/km^2 . Almost of all citizens are in the town, in the flat areas, and along the roads such as: in the national public way, near the borders with other districts and or provinces, in the focus rural development areas and along the river banks: Nam Beng, Nam Kor, Nam Phak, Nam Xea, Nam Ngar and Mekong. But there some small ethnic groups live in the rural areas.

3.2.3 Education

All education systems from ordinary school has been developed over Oudomxay province. Nowaday Oudomxay has many educational institutes both state and private owners: ordinary schools, vocational schools and colleges with several fields (business, financial and banking, cultivation and livestock raising) for example Vilaykhon college, Xaiphatthana college, International college and Ratthana college.

In 2009, the number of total school was 522; kingdergarden shcool 33, primary school 449 and 40 secondary schools. The total student amount was 68,917 (31,613 female); 1,162 students (619 female) studied in the kingdergarden, 51,734 students (24,339 female) studied in the primary, 16,021 students (6,655 female) studied in the secondary.The rates of people went to study in each level are 8.7% for the kingdergarden (increased 3.3% if compared with last year), 133% for the primary (female 126.8%) it reduced 12.9% in total compare with last

year, 44.6%female 52.4% for the lower and upper secondary schools (reduced 23.5% compare with last year).

3.2.4 Public Health

Previously, the province authorities and the concerned units were cared about the healthy service for all muti-ethnic groups in whole of the province. Hopitals at district and province levels were improved by quickly services and modern technologies. As the same time the public health net work was spreaded to all the development focus areas in the rural areas within province, mainly the dispensaries contruction, village doctors; injection, vaccination and clean water supply. Besides, the number of pharmacies and clinics are on the increase.

3.2.5 Economic and Investment

Oudomxay is the province that has rapidly social-economic development with the highly rate growth at 14% in 2008 and this rate is double higher than the goal rate that government expected. The main economic structure are: (1) agricultture and forest 47.3%, increase rate 5.8%; (2) industry34.1%, increase rate 10.5%; (3) services 18.6%, increase rate 27.5%. The gross domestic product (GDP) is 1,227 thousand million kip, income per capita is 447 US$, if compares with the action plan it means they can follow the plan at 98.4%. In last 5 year period there were many investors within domestic, from international and included the state invested in Oudomxay.

In the present the investment in agriculture and forestry that effect to the land and forest is covered 60% of all investments; largely the investment of private sectors both domestic and international. From the data in 2008, the cost of the investment in Oudomxay is 10,919,703 US$. It has 16 projects with many types of investment: 7 projects with cost 3,027,208 US$ are the 100% of domestic investment, 8 projects with cost 7,655,865 US$ are the 100% of aliane investment, and 1 project with cost 236,630 US$ is the combination. These investment projects are engaged into many sections; in agriculture and forest 6 projects cost 6,577,070 US$, in energy and mining 3 projects cost 1,256,630 US$, in industrial and commercial 4 projects cost 2,105,963 US$, in services 2 projects cost 905,040 US$, and one project cost 75,000 US$ in education.

Besides, it has 81 projects cost 131,332,90 million kip are owned by the state. This consists of domestic fund 12,760 million kip and international fund 118,572,90 million kip. Fortyfive percent of these projects are related to the agriculture and forest fields.

3.3 Background information of Namo district

Namo is a seven district of Oudomxay province. It's located up to the north which 52 kms far from the Oudomxay town along the 13th north road. The North has border with China and Numtha district, Luangnumtha province, the South has border with Xay district, the East has border with Lah district, and the West has border with Nalea district, Luangnumtha province. There are 64 villages with 34,418 population and 16,931 female, the density is 9 people per km^2. It contains 12 small ethnic groups that reside in the towns, along the the roads and the river banks.

The total area of Namo is 379,000 ha; this includes 40% of forest area or covers 1/3 of the whole area, 22.1% or equal 83,900 ha of national protection forest area, 0.7% (2,840 ha) of district protection forest area, 13.7% (52.118 ha) of national production forest area, 3.5% (13,300 ha) of regeneration forest area. Almost of all citisens are engaged in agriculture and forest: cultivation, livestock raising, NTFPs collecting; regarding to 87% of an area is mountainous. Most of citizens are interested in rubber and industrial trees plantation; and these activities are also promoted from the government in many types of farming systems: state join with farmers, smallhoders, land concession for companies. Besides, Namo has a strong priority in mine resources that has the aspect to develop into the industrial district, particularly cement production factory, zinc production factory. Futhermore, due to the Namo has the way linked to China and has the same borders with Luangnumtha and Phongsaly provinces. Therefore it becomes to the interesting point for investors to invest in many fields about landuse planing except in rubber planting only.

3.4 Background information of Ban Nahom

Nahom is located on the national public way, the 13th north road. It's up to the north which 23 kms far from the Namo town. This is the village that was seperated from Namphengyai, the Kmu village in 1990 then there was more people from Hmong village called Tinhsanh moved into this village in 1994. Therefore, this village consists of two ethnic groups, Hmong 74% and Kmu 26%. At the begining the name of this village was Namphengnoy until 1997 it

changes into Nahom; in that time it had 50 households in this village then after ten years, the household amount was doubly increased. These are caused from (1) people move in the village, (2) government plan on village merging, and (3) population expansion within the village. Nowaday Nahom has 110 households with 908 people, 380 female. Among of these there are 10 wealthy households (9.0%), 73 medium households (66%) and 27 poor households (25%). Almost of 100% of the villagers are engaged in agriculture as detials: 69 households or 63% are engaged in upland rice growing, 29 households or 26% are engaged in lowland rice growing and 11 households or 10% are engaged in both upland and lowland rice growing. And the villagers lives are rely on natural forest resouces, this is for food and income (from NTFPs sale).

From the landuse planing was implemented in 1999, the total area of village is 3,262 ha which has ninety seven percent is mountainous; the area of rice lands consists of the lowland rice fields 21.20 ha, it could produce 84.8 Ton of rice yield (at the productivity is 4.0 Ton/ha); and the upland rice fields 75.50 ha could produce 98,15 ton of rice yield (at the productivity is 1.3Ton/ha). From the data in 2008, an average of rice for eat is 200 kg per capita in a year with 4 months of riceshortage. Eighty one percent of the income source are from agriculture and forest such as: maizes, jobstears, vegetables, livestocks and NTFPs; these income could average 4,880,545 kip per houshold. Since 2003 morethan 80% of the villagers are engaged in rubber plantation, although they do not get any reward from rubber in the present but the village expect that the rubber will be thier major income source for the village in around the next one to three year. As we can clearly see today the development of social-economic has better changing from subsitance agriculture to comodity commercial (maize, jobstear, etc). So the labour hiring is occured, for example farmers now hire labour forces in rubber planting practice. Meanwhile the village recieved some negative impacts in doing these activities due to the problem of flood at the Nampheng river bank during last year.

However the rubber plantation in the village target area caused the main factor which is results to the land tenure of villagers, system of land and forest use included forest backgrond, and the environment rapidly changes. In this case it is necessary to find out the causes of Nahorm village.

Chapter IV
Methodology

The method of the study was datum aggregation from several tools that were created for use in this study such as: questionairs for household, village, district and province interviews, maps. The methodology details are shown as below:

4.1 The study process

The first step of the study was gathering the concerned informations, maps and other documents which are related to this study and the research area.

1.) Types of data collection

Two types of datum were collected; geographic and social-economic datum.

Geographic data: Map of Nahom landuse management from land and forest allocation in 1999 and map of Nahom landuse management in 2009.

Social-economic data: Number of population, households; village history; land tenure and land and forest using informations; etc.

Most of data sources were asked from the concerned state authorities at the province, district and village levels (reports, documents on summary works, activities reports, action plans,...); and from the household survey in the reseach areas esspecially the data on population, wealth rankings of households, jobs, income sources, rubber planting, statistics on landuse, agricultural production, and village maps.

2.) Analyse geographic data

Due to the scale of village landuse management map was 1:10,000 and the actual landscapes now was changed. So the map was regenerated by using machine to zoom out the map (Plantograph) step by step; for instance firstly zoom out the maps then recreate it with the new scale 1:25,000 and finished it by the 1:50,000. Next, use the new data from the real survey to determines the new points of each area on the map appropriately for creation new map. Lastly, observes the changing of land and forest use in each category by compared the

new map with the old maps in 1999 and 2009, to find out which types of land were affected by rubber.

(1) Data input: the geographic data was inputed after the map was scanned on computer. Afterthat, digitize landuse areas for comparing the changes of data by using program Mapinfo.

(2) Data editting: normally the geographic data that was digitize are mistakable and or erroneous; this caused was from the data input process. So that checking and editting data are important and necessary. Most of data errored were caused from Polygon didin't close or Polyline didn't link or longer than the actuality. So when the data are completly checked it linked with other data attributed such as: types of use areas, village locations, rivers, roads and the change of lands areas.

4.2 Collection and analysis the data on investment policy implementation

The investment policy implementation data was collected from 2 stages:

1) Stage one

The secondary data was collected in kind of literature review and discussion with concerned authorities both at the province and the 5 target rubber pantation districts of Oudomxay; who are responsible for implementation policy and legislation for support rubber plantation investment such as: land law, forest law, law on the promotion of foreign and domestic investment in Lao PDR, articles and other regulations.

Besides, any concerned documents on rubber investment (social-economic analysis reports, contracts, summary reports, rubber investment statistical, rubber area includes background of social-economic and environment in the province that affected from rubber plantation) in Oudomxay province were used for studying the similars and differences on rubber investment types: capital source, benefit sharing, contract period, natural resources using.

Futhermore, the interviews were conducted with the concerned offices both at district and province levels. At the province level, interviews were conducted with the Provincial Agriculture and Forestry, Provincial Planing and Investment, Provincial Land Management Authority Offices and other concerned sections. At the district level, District Agriculture and

Forestry, District Planing and Investment, District Land Management Authority Offices, and other concerned sections were interviewed. The purpose of the interview was focused on the implementation of the policies supply in land use and management; technical support in rubber plantation, other industrail trees, crops production, and statistical data. Afterthat, leisurely discussion was opened talking on positive and negative of the policies implementation in presently, and the things that should be improved or solved. This research was also studied about steps, processes, implement methods, work coordination, decision-making participation, and other aspects that related to landuse, and rubber plantation promoting at district and province levels.

2) Stage two (Raw data collection)

Two methods of raw data collecting were used; interview and observation as shown in details below:

(1) Village and household interview followed the questionnair

a) Village authority interview

For the village authority interview, village history, census population, household amount, wealth ranking, jobs, rice production, trees, rubber, crops, other industrial trees planting, types of rubber farming system, rubber plantation area, land and forest resource use, buy-sale land, land and forest reform, environmental problems, and other significant events that had happened in the village in last 10 year period were collected.

b) Household interview

Three target groups (devided by household wealth ranking: well-off, medium and poor) that covers 100% of all households in the village were interviewed. Each interviewee was asked about information concerning basic household information: number of population, labours force, major and minor jobs, income, sources of income, rice production, trees plantation (rubber and other industrial trees), crops plantation, large livestocks raising, type of rubber farming systems, rubber field areas, land and natural forest use, land tenure, source of rubber land area (how did they get the land), buy-sale land, land and forest use reform, the need of more production land area, an adaptation to agriculture production, livelihood and the household difficulty.

(2) Observation: besides the interview, the observation with villagers and the village authority was also practiced, in term of deeply know and understand the real situation on rubber plantation areas, integrating crops with rubber in rubber areas, planting others crops in the rubber garden in the period of waiting for rubber production, rubber maturity and its maintenance. The advantages of the observation and the discussion both in the village and in the field survey were very helpful to (1) undrestand more the problems, limitations and how to solve the conflicts of local villagers in landuse; (2) could know well about people livelihood; and (3) got a lot informations, due to many important datum were taken note while walking for field survey (i.e the landuse changes in each area compares today with in the past). Futhurmore, taking photoes and participate creation the diagram ”the natural resources using of the village in the present” were included in this step.

4.3 Data Analysis

Every aggregate geographic, qualitative and statistics datum that were obtained from the field were analysed; in order to assessment and comparison the change of land and forest use management in last decade. The process of the assessment and comparison was based on land and forest allocation data, land tenure of household in each group (all 3 wealth ranking groups), income, source of income, rice production, agriculture and livelihood adaptation, demand on natural resources use, and the difference of rubber farming system. The way of the analyse were included description , tables and maps for comparison, and relationship figures . For the analyses types and its processing were shown as below:

- Analyse quantitative data

The quantitative data was processed by using simple statistical analysis in Mirosoft Excel as such seted up database then inputed quantitative datum into the database in rows and columns, next analysed data by using Pivot Table and Pivot Chart Report. Finally, explained the results according to the graphs, charts and tables that were created.

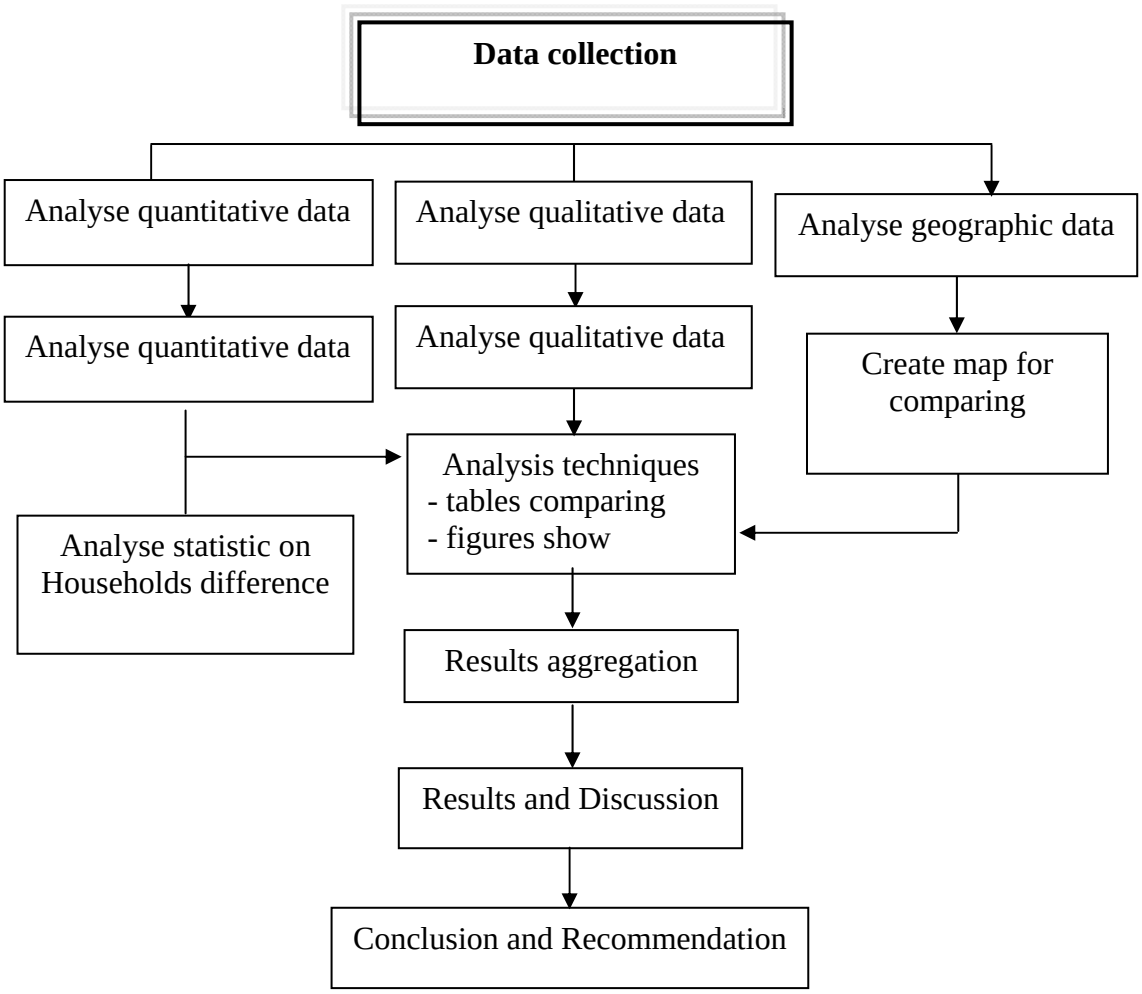


Figure 3. The data analyses processing

Chapter V

Results

Through the project analyses in each step of the process of questionnaires, objectives, sites, areas and methodology review of the following data analysis results:

5.1 Implementation of Udomxay province policy on rubber plantation

In general, the policy on rubber plantation is not clearly determined by the government from central to local level. Therefore the implementation of rubber plantation in each district within Udomxay province is quite different such as the model of investment, the benefit sharing between the investor and the farmer.

However, the higher authorities are summarized the lessons from the neighbouring countries, to propose the guideline and to apply these lessons into the rubber plantation development in Lao PDR. At the same time, after the conference on rubber plantation development in Lao PDR on the 9th of May 2006, Udomxay province has determined its own policy on rubber plantation. But, until now it is not obtain for use and there was not the special team who has responsible in this matter.

The results of documentation study and an interview in the studied areas which is implementing the rubber plantation according to Udomxay province policy, it is quite clear for all of the investors they prefer to invest with farmers with the model 2+3[1], for the model 1+4[2] (the concession model from Government, less than 100 hectare a project) to be the company demonstration and the important factor for farmer investing with such as land and labor, the credit model to farmer planting and marketing. But in practicing, it depend on local situation. Although these models were progressed by companies, but some companies (SINO rubber company and Chongsay company) still practice their benefit sharing by 50% of rubber planted with farmer according to the contract.

This method leads to lost of land tenure and landuse of farmers for a long time. In fact, the implementing method of companies have different advantages and disadvantages points, it

is too fast to conclude that which model and method as an excellent model or excellent experience for the rubber plantation investment in Udomxay province. But, it is necessary to find an appropriate method for the real situation of the province, the model and method of implementation which have an effective result because these problems are related to the farmers benefit and the national economy forever (*cf.* Table 2 and Figure 4).

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[1] model 2+3: the joinventure investment between farmer or state with investor or company, the part of farmer is 2: land and labour, the part of company is 3: fund, technology and market.

[2] model 1 +4: joinventure investment between farmer or state with investor or company, farmer or state has land and company has fund, technic-technology, market and hired labour.

Table 2. Model and policy on rubber plantation investment of Udomxay province

No.	District / company	Model of investment	Policy and benefit sharing	Funding and condition of joinventure	Responsibility	Land use
1	Namor district (1) Yiujiupa	2 + 3 1+4	Joinventure with farmer: farmer earn 60%; company earn 40% of resin saled in the market.	- farmer: land, labour - company: seed supply, technic, material, fertiliser, pesticide, fund and to build the road to the site.	- Fee - Concession fee of demonstration plot (3 USD/ ha/year)	- Agriculture land - Protection forest - Utilisation forest - rehabilitation forest
2	Xay district (1) SINO rubber (2) Chongsay	2 + 3 1 + 4 2 + 3 1 + 4	Joinventure with farmer: farmer earn 50%; company earn 50% of rubber plant after the plant has the second class of leaves and buy the resin for to sale with the market price.	- farmer: land, labour - company: seed supply, technic, material, fertiliser, pesticide, fund and to build the road to the site, to pay 50% to the farmer for to look after the plant, the resin collection and to supply the rubber seedling. - these companies have the same condition.	- Fee - Concession fee of demonstration plot (3 USD/ ha/year)	- Agriculture land - Protection forest - Utilisation forest - Protection forest of the village
3	Nga district (1)Taling Yunnan	2 + 3 1 + 4	Joinventure with farmer: farmer earn 60%; company earn 40% of resin saled in the market.	- Farmer: land, labour - Company: sedling, technic, mater ial, fertiliser, pesticide, fund, road construction and vegetal seed supply.	- Fee - Concession fee of demonstration plot (3 USD/ ha/year)	- Agriculture land

4	Beng district (1) Jianfong	2 + 3 1 + 4	Joinventure with farmer: farmer earn 70%; company earn 30% of resin saled in the market.	- Farmer: land, labour - Company: seedling, technic, pay for pit diged, material, fertiliser, pesticide, fund, market and seedling supply	- Fee - Concession fee of demonstration plot (3 USD/ ha/year)	- Agriculture land - rehabilitation forest
	(2) Siphansalika	Credit lease	- credit to farmer for 15 years -farmer earn: 90% of resin production in 15 years and after that they earn 100% - company earn: 10% of resin production in 15 years and all of capital	- Farmer: land, labour - company: seed supply, technic, material, fertiliser, pesticide, fund and to build the road to the site, to pay for rubber plant take care, seedling supply, market insurance and topay for the resin collection	- Fee - Concession fee of demonstration plot (3 USD/ ha/year)	- Agriculture land - Utilisation forest - rehabilitation forest

5	Houn district (1) Jianfong	2 + 3 1 + 4	Joinventure with farmer: farmer earn 40% and 1,890,000 Kip for labor/Ha; company earn 60% of resin saled in the market.	- Farmer: land, labour - company: seed supply, technic, material, fertiliser, pesticide, fund and to construct the road to the site, to pay for rubber plant take care (1,890,000 KIP/Ha), pay for pit diged (2000 KIP/pit), marketing and seedling supply	- Fee - Concession fee of demonstration plot (3 USD/ ha/year)	- Agriculture land - Utilisation forest - rehabilitation forest
	(2)Lao-china siantlee	2 + 3 1 + 4	Joinventure with farmer: farmer earn 70%; company earns 30% of resin saled in the market.	- Farmer: land, labour - Company: seedling, technique, material, fertiliser, pesticide, market, fund: access road to the garden, other infrastructure, seedling supply and small animal breed	- Fee - Concession fee of demonstration plot (3 USD/ ha/year)	- Agriculture land - rehabilitation forest

	(3) Somchanh-Chanhpheng	2 + 3 1 + 4	Joint venture with farmer: farmer earn 60%; company earn 40% of resin saled in the market.	- Farmer: land, labour - Company: seedling, technic, material, fertiliser, pesticide, market, fund and seedling supply	- Fee - Concession fee of demonstration plot (3 USD/ha/year)	- Agriculture land - rehabilitation forest

Sources of Data: Planning Division of Udomxay province (2009).

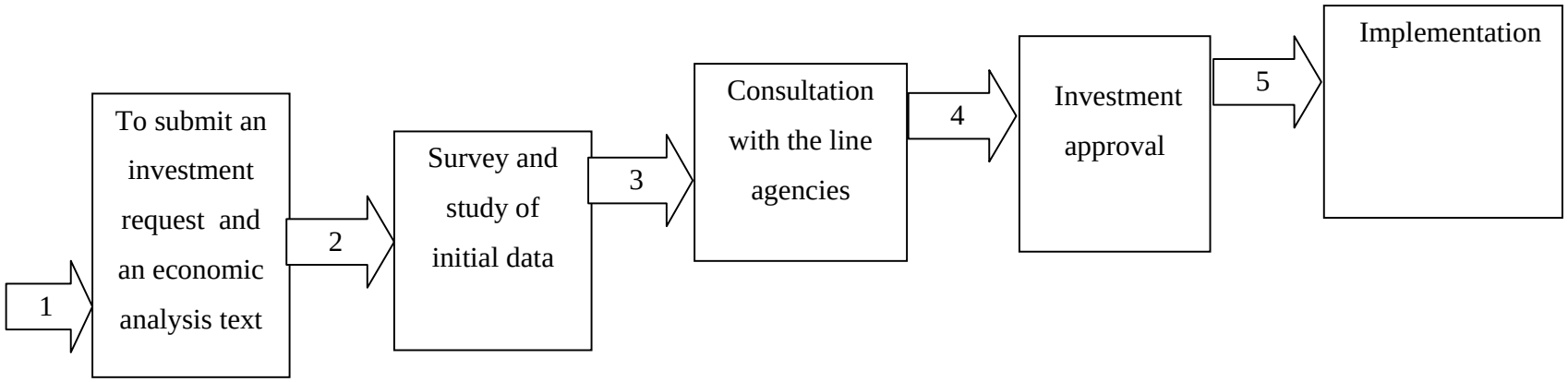


Figure 4. Steps and process of investing approval in rubber plantation of Udomxay

Influence of Policy and different model in rubber plantation investment shown that the implementation on rubber plantation planning of the investors in rubber plantation was not accieved their annual plan because of some main factors such as the allocation of rubber land was not support the need, lacked of local labours, and landuse conflicts at local level. Another problems were the principles of interest sharing, the policies supported to the implementation of the project were different for all of investors. The joint venture company: Jianfong + farmers in Houn district with the model 1+3 had a benefit sharing of 40% for farmers and 60% for Jianfong. The Siphansalika company was invested by releasing the credit to farmers who planted the rubber in Houn district has a higher success and complite the plantation over 1.895 Ha. The Jianfong company can share 70% and 60% of their benefit to the farmers because the company has to pay for labour of farmers who have participated from the beginning of these activities. This amount is the necessary income for the poor household and to solve many problems of their livelihood. For Siphansalika company, although farmers have not payed immediately for their labour but they feel they are the real owner of their land and farmers they are satisfyed to plant rubber by themselves. Besides that, the company has provided rice without interest to the household who were insufficient in rice. When they are completed the plantation as their income they will pay for rice they were borrowed or they can prolong their debt up to the period of resin collection. The company has also the policy to support farmers to plant an annual plants for solving their problems on food security (*cf.* Table 3).

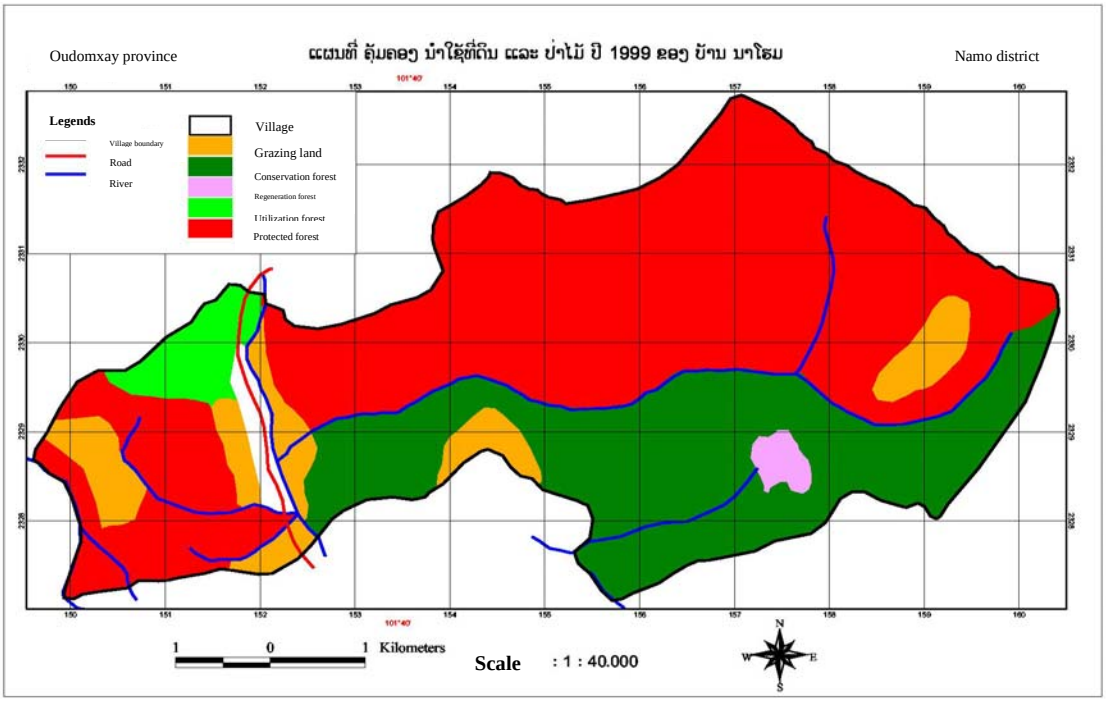
Table 3. Investment data of rubber plantation within Udomxay province

No.	Company/area	Investment cost (USD)	Total area (ha)	Investment duration (year)	Planted area (ha)	Problems and obstacle of implementation
1	Yiujiupa/Namor district	3,000,000	2,500	30	308	Not enough allocated land, lack of labour, can not reach the plantation plan
2	SINO rubber/ Xay district	1,000,000	5,100	30	550	Not enough allocated land, lack of labour, can not reach the plantation plan
3	Chongxay/Xay district	3,000,000	2,000	30	120	Not enough allocated land, lack of labour, can not reach the plantation plan
4	TalingYunnan/Nga district	5,000,000	3,500	40	75	Coflict of land use in the village level, can not reach the plantation plan
5	Jianfong/Hoon district	1,000,000	6,666	15	1,895	Not enough allocated land, lack of labour, can not reach the plantation plan
6	Jianfong/Beng district	2,500,000	6,000	30	503	Not enough allocated land, lack of labour, can not reach the plantation plan
7	Siphansalika/Beng district	1,000,000	10,000	15	1,034	Not enough allocated land, lack of labour, can not reach the plantation plan
8	Lao-China Xiantali / Hoon district	3,000,000	2,000	40	60	Not enough allocated land, lack of labour, can not reach the plantation plan
9	Somchanh-Chanpheng/Hoon district	150,000	100	40	52	Land preparing too late, lack of labour, can not reach the plantation plan
	TOTAL	19, 650,000	37,866		4,597	Without farmer plant by themselves

Sources of Data: PAFO of Udomxay province 2009

5.2 Modification of Agro-Forestry land which has influenced by rubber

The problems of landuse are related to many programmes such as the programme on shifting cultivation eradication and occupation allocation, programme on resettlement and development, programme on opium elimination and other programmes. So in practice of the line agencies in local level who have responsible of these programmes are very important, it is necessary to study them in detail, to systemise them and to use them carefully. The data analysis in Nahom village, Pangthong sub-district, Namo district, Udomxay province and the other data in the level of the province, district and village to inform in the same way that the survey of 110 households was nearly 100% practice the old system of agro-forestry production. The modification of agro-forestry production system leads to diminish the cycle of landuse in upland rice cultivation and other plants production until some households didn't have land for production. Besides that, no fencing in rubber plantation is affected directly to the large animal raising such as cattle and buffalo must move to the another place too far and many households sold all of their large animals due to the limited area, difficult to look after them and risk to the damage. The use of wood and non timber forest products reduced and some disappear. This modification caused by people turn their landuse to rubber plantation and to take over the protection forest, the conservation forest and the utilisation forest of the village for the shifting cultivation: upland rice plantation, other plants and rubber. It is possible that in the future the upland rice will be extended to the protection forest and the rubber will be extended to the conservation forest. So the land and the forest which surveyed and allocated following the land allocation policy of the Government in Nahom village in the year 1999 was affected clearly when we use the landuse map of the year 2009 as a reference and we can compare exactly the difference. (*cf.* Figure 5 and 6).



- Figure 5. Management map of land-forest using in Nahom village, 1999

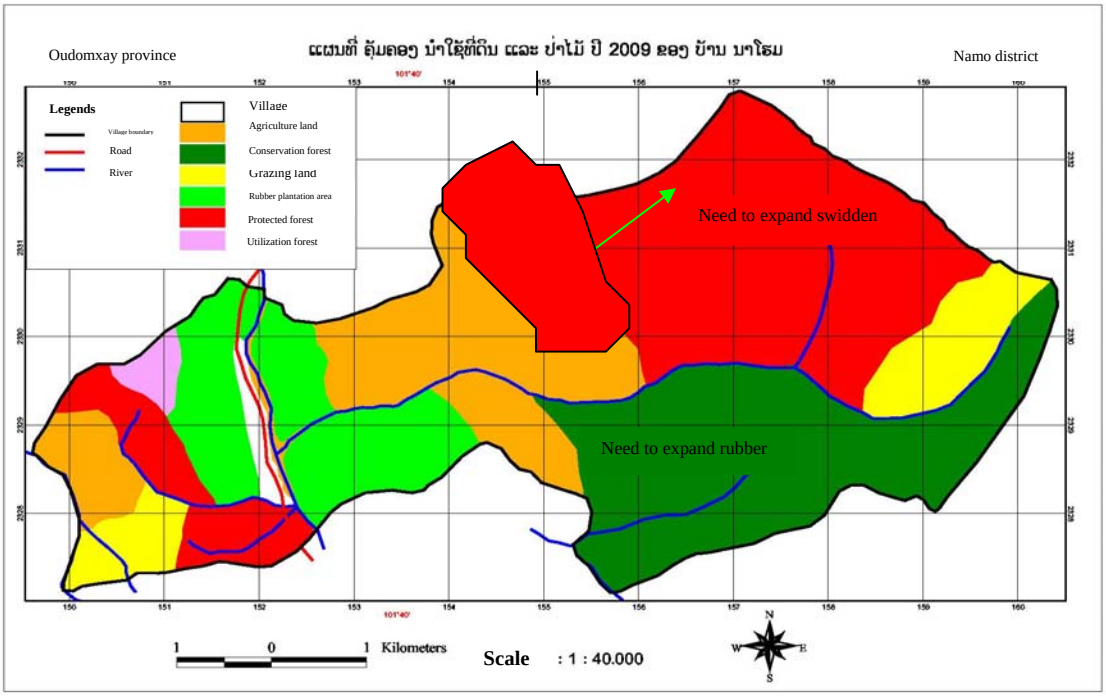


Figure 6. Management map of land-forest using in Nahom village, 2009

When we revise the data on management of land and forest using of Nahom village according to the policy on land and forest allocation in 1999. If we compare with the land use situation in 2009, we can see the modification in 10 years, the allocated area was used in five categories of forest of land and forest allocated policy dated 01/1996. At that time, in the map of the year 1999, nearly the total area was replace by the rubber garden. Also the upland rice area of farmers located in the agriculture zone and the forest zone (protection forest, utilisation forest and conservation forest). Each category was change but an agricultural area was modifyed with the higher rate. See table 4.

Table 4. Data management of Nahom land use from 1999 -20009

No.	Type of forest	1999 (ha)	2009 (ha)	Variable data	Remark
1	Conservation forest	996.00	909.6	- 86.4	Rubber, plants
2	Protection forest	1,909,00	1,483.0	- 426.0	Rice field, pasture, rubber
3	Using forest	126.00	70	-56	Rubber
4	Rehabilitation forest / rubber garden	6.00	233.4	+ 227.4	Rubber, plants
5	Agriculture area/pasture	218.00	548.4	+ 330.4	Rice field, pasture, plants
6	Village and other area	7.00	14.9	+ 7.9	Village enlargement
7	**TOTAL**	**3,262**	**3,262**		

5.3 Modification of Agro-Forestry system of farmer

From the modification of the area of land and forest as mentioned above, we know the rubber plantation was exactly affected to this modification. This situation leads to the fastest modification between the years 2003-2009 due to the demand to plant more rubber of farmers but at the same time they need the land for their rice production and their animal raising because 98% of the total household (108 households) is still produce rice for consumption, 37 households (33.6%) are lack of rice for 3-4 months when comparing to the year 2007, the household who lack of rice increase 19 households, 13 households raise the large animal for other households, 25 households are lack of land for upland rice production (poor: 8 households, medium: 17 households), they must hire the land of other households for their production and they oblige to plant an economic plants for solving their livelihood according to recently demand or according to the government policy, So that 80 houselods

or 72.7% of all households in the village need to claim govenment to redistribute the land for agriculture. In addition, to stop raising the large animal leads to the traction force shortage, farmers must use tractors and who didn't have tractor must hire tractor from other farmers (*cf.* table 5).

Table 5. Change of agro-forestry system of Nahom village

No.	Structure of production	Reason	Indicator of variance
1	Low land rice	Lack of buffalo	To buy the tractor, to hire the tractor. 19 households lack of rice (increase from 18 to 37 households when compare with the year 2007)
2	Upland rice	Move to rubber production, sale	Borrow-hire the land 25 households: poor 8 house holds, medium 17 households
3	Large animal (cattle-buffalo)	Rubber plantation, plants without fence, sale of large animal	Lack of buffalo, to move the pasture, 13 households stop raising their large animal (reduce from 22 to 9 households) comparing to the year 2007
4	Vegetation	Commercialisation of plants, intercroping in the rubber garden	Data of the yield, income from the cultivated crops and garden
5	NTFPS collection	Forest invasion to other objectives	No more cardamom and red mushroom since 2005. Bitter bamboo area decreased and each year the yield of bitter bamboo shoot decreased 20 tons from the year 2006 (from 55 tons/year to 35 tons/year), to collect at Nampheng village and to pay for the collection each day

Sources of data: Nahom village authorities interview 2009

5.4 The modification of land tenure of people affected by rubber

Two significant points were shown from the study of land tenure modification model of the household in Nahom village in this time; (1) the household who sale their land tenure to other person/inheritance; (2) the land tenure without the legal right. In general, the form of modification of the land tenure right is still in the cultural form, the intervention of the responsible authority to this modification is not significant when the demand of land for

rubber plantation is high and continuous, this situation leads to the land of farmers who didn't have condition to plant rubber to belong to the well-off and medium status household in their village by sale their utilisation right of the land. Also for some forest land of the community (especially an appropriate land for rubber plantation) and an agriculture land according to the status of the household, the factors of land tenure of farmer are:

5.4.1 Land tenure according to the group of household status

Influence of rubber plantation is quite strong as a main factor to speed up the modification of land tenure of farmers in Nahom village and make the situation the land tenure in three different status of household: well-off, medium and poor households. The 110 target households which we are analysed to show the land tenure is mainly belong to the well-off status household. An average between the well-off status household and the area of land from the statistic of land use to certify that 10 household as a group of well-off status household of the village to cover 9% of the total household have their land tenure 20.5% (8.23 ha/household), the group of 73 medium status household to cover 66% of the total of household and 66% of land tenure (3.6 ha/household), the group of 27 poor status household to cover 25% of the total household and 13.5% of land tenure (2.00 ha/household). The general view of land tenure in the three status household is quite similar but it is clearly different and decrease respectively in land tenure for each household mainly the group of poor household and the investment in rubber plantation is very difficult for them.

According to the government and local policy, the common target to find that rubber plantation is an option in providing new occupation to farmer for to be directed toward a stable form of production which has a higher economic, a regular income which can reduce the poverty and as a basic of export earnings for to bring a currency to the country and to create jobs for people in local area. But the lack of fund and lack of labour to become an obstacle and a main reason for poor people, they can not clearing their land for rubber plantation and also cannot practice the other production (cf. Table 6).

5.4.2 The land tenure according to the land using category of the household

Considering the land tenure right of the household in Nahom village as a resettlement village according to the plan of the Government. So the group of household who was resettled ahead has more land than other households. To base on the particular traits and tradition of this village, the categories of landuse are (1) construction land: that's quite a different matter in use and each household has their own land; (2) paddy land: they use the land for rice production 5.3%; (3) garden: the land for vegetable plantation is only 0.8% but in general farmer to use this land for vegetable plantation in dry season; (4) fruit tree garden: this land is not important, farmer use their land for fruit tree only 0.2%; (5) land for rubber plantation: rubber is the new plant which enter in the target village only 6 years but farmers use their land for rubber 58%, more than for rice plantation; (6) land for other industries plants: this land is only 1.3%; (7) land for commercial plants: this land is very important for farmers, they use their land for these plants 8.2%; (8) upland rice land: although this land is limited but farmers need this land and they use the land for upland rice 22%; (9) fallow: although land and forest of this village were allocated to farmes but according to the tradition farmers still have their own fallow, this land is covered 4.2%. (*cf.* Figure 6 and 7).

Table 6. Data on land tenure according to the type of land use for 3 status of household in Nahom village

No.	Land use type	Land tenure Group of household status (ha)			Total	Percentage of land tenure(%)
		Well-off (10)	Medium (73)	Poor (27)		
1	Lowland rice field	4.30	16.40	0.70	21.40	5.3
2	Vegetable	0.30	1.40	1.70	3.40	0.8
3	Fruit tree	0.50	0.50	00	1.00	0.2
4	Rubber	54.50	157.30	21.6	233.40	58
5	Other industry plannts	2.00	2.00	1.00	5.00	1.3
6	Commercial plants	6.70	18.70	7.50	32.90	8.2
7	Upland rice field	12.50	55.80	18.00	86.30	22
8	Settled land	1.50	11.60	3.60	16.70	4.2
9	TOTAL	82.30	263.70	54.10	400.10	100
	Group of status/area	8.23	3.61	2.00	2.64	

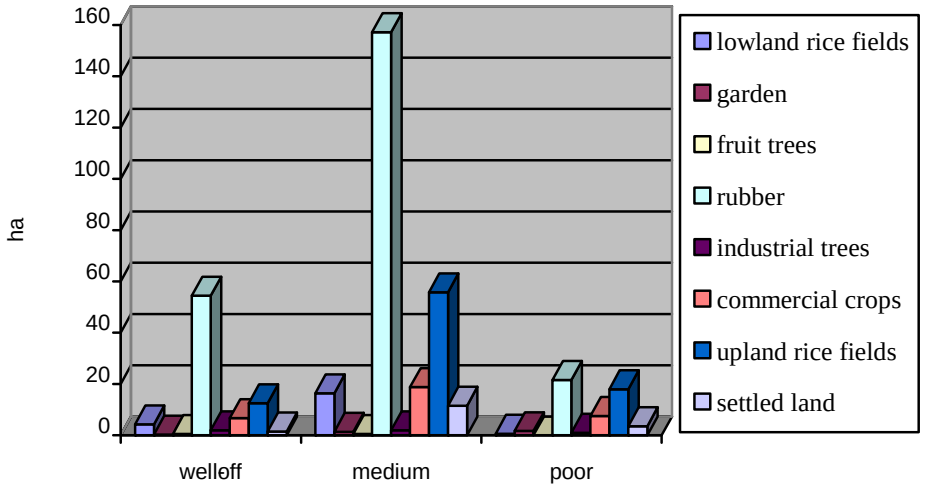


Figure 7. Land tenure according to the land use categories for 3 status of household of Nahom village.

As mentioned above in 5.4, the land tenure of people is the data which can certify the form of the current tenure of land of people in the analysed area is still illegal, it is in the ccultural form. The data analysis certify that the different categories of land tenure inside the village are: (1) construction land 100% has a land taxed circular ; (2) lowland paddy field 100% has a land taxed circular ; (3) families garden 26.6% has a land taxed circular; (4) fruit tree garden 33.3% has a land taxed circular ; (5) rubber garden: only 3.6% has a land taxed circular , 96.4% has not a document on land use right ; (6) garden of other industry tree: 20% has a land taxed circular ; (7) commercial plants land: 61% has a land taxed circular; (8) upland rice field and settled land: 100% has not a land taxed circular. The above ratio of each category of land tenure to show that the majority of land tenure is still illegal and has not a complete document on the right in land use such as 96.4% of rubber garden are not the above document. So, it is the main reason for Nahom village people who has planted rubber, 70% of them to propose to the district authority to make the legal document in land use for them (*cf.* Table 7).

Table 7. Data on certification of land use right of Nahom village

No.	Type of land use	Right certification (%)		Evidence of document of right certification
		Yes	No	
1	Construction	100	00	Land tax fee circular
2	Lowland rice field	100	00	Land tax fee circular
3	Vegetable	26.6	73.4	Land tax fee circular
4	Fruit tree	33.3	66.7	Land tax fee circular
5	Rubber	3.6	96.4	Land tax fee circular
6	Other industry plannts	20	80	Land tax fee circular
7	Commercial plants	61	39	Land tax fee circular
8	Upland rice field	00	100	
9	Settled land	00	100	

For the business on the land inside the village during the period of 5 years (2004-2009) in the research area of the village, it has 4 important categories needed to use such as rubber plantation is the 1st ranking: 33.8%, lowland rice production: 23.4%, vegetation planting: 13%, house constraction: 29.8%. These data are certified that the demand of land for rubber plantation is high and they are also need to plant rice and an economic plant. But the form of land tenure (to buy, to settle, to receive from the culture and to allocated by the village authority) is still illegal (*cf.* Table 8) .

Table 8. land buying in Nahom village in 5 years (2004-2009)

No.	Type of land use	Number of plots	%
1	Rubber	26	33.8
2	Lowland rice field	18	23.4
3	Vegetable	10	13.0
4	Construction	23	29.8
	TOTAL	77	100

From the data on land use and the above category on land tenure and the business on land in Nahom village, the tenure on rubber plantation land come from 4 categories of land tenure: sharing by village authority for the common land of the village including 69.1% is

the utilisation forest, protection forest an conservation forest, the resettled land from common land of the village (conservation forest): 3.4%, buy the land from other farmer 26.5% and handed down from their parents 1%. Altogether, their land tenure in rubber plantation for 3 categories of the household status is not different. The authority of the village to distribute directly the land to farmer without participation of the district, the district has only to recognise the land using right. For the invasion of common land which is a conservation forest, that is the village authorithy is responsible to this matter, to solve the problems, to penalise and to educate and than to report to the district. Most of problems are land business, farmers report to the village authority when they are finish to buy and to sale the land (*cf.* Table 9).

Table 9. land tenure of rubber plantation in Nahom village

No.	For of tenure	Househol according to the status (ha)			Total	%
		Well-off	Medium	Poor		
1	To settle the common land of the village	0	5.60	2.30	7.90	3.4
2	To give by the village authority	31.80	115.80	13.70	161.30	69.1
3	Come from their parents-their relatives	0	0	2.30	2.30	1
4	Buy	22.70	35.90	3.30	61.90	26.5
	TOTAL	54.50	157.30	21.60	233.40	100

5.5 Investment models in rubber plantation of farmer household in Nahom village

From the study in household level in Nahom village, Pangthong sub-district, Namo district in this time to show that the different models of investment in rubber plantation are the same direction in the district level of Udomxay province. These models of investment are investment by farmers, by the promotion of the Government, by joint venture with other parties: Jiuchiupa company to invest in rubber plantation to other area of Namo district. Although it is a small number but it can show that the investment in rubber plantation of the company has an influence to another villages which situated so far from his own investment area and this model trend to increase in the future because some households are

lack of fund and they can not invest by themselves. To consider to different models of investment in rubber plantation in Nahom village, to distribute to the household status, we know that in 27 poor households, only 5 households (18.5%) access to the fund which promoted by the Government. But contrary, the households which their status are good have more opportunity to access to the fund (60% of well-off status household) and 49% of medium status household access to the fund and they can invest more in rubber plantation (*cf.* Table 10).

Table 10. Rubber plantation investment according to the household status of Nahom village

No.	Model of investment	No. of households according to their status				%
		Well-off	Medium	poor	Total	
1	By themselves	2	24	13	39	35.4
2	By themselves and by Government promotion	5	35	5	45	41.0
3	Government promotion (100%)	1	1	0	2	2.0
4	Joint venture (company)	1	3	0	4	3.6
5	Not planted	1	10	9	20	18.0
	TOTAL	10	73	27	110	100

In the form of investment for household rubber plantation in Nahom village, in general, it has quite different: 9 households in the 10 well-off status households: 90% have to plant rubber, 63 households in the 73 medium status households: 86% have to plant rubber and 18 households in the 27 poor status households: 66.6% have to plant rubber. But the success model of the investment in rubber plantation in Nahom village is very different, the main model is the investment of farmers: 212.10 ha (90.8%), from the promotion of the Government: 16,80 ha (7.2%) and joint venture model: 4.50 ha (2.0%) only. From these analysis data, it is certified that farmers in this area are awaked to the rubber plantation and are self-supporting in general (*cf.* Table 11).

Table 11. rubber plantation of household of Nahom village

No.	Model of investment	Planted area according to the household status (ha)				%
		Well-off (10)	Medium (73)	Poor (27)	TOTAL	
1	By themselves	50.50	141.50	20.10	212.10	90.8
2	Government promotion	2.50	12.80	1.50	16.80	7.2
3	Joint venture	1.50	3.00	00	4.50	2.0
4	TOTAL	54.50	157.30	21.60	233.40	100
5	Planted area/household	5.45	2.15	0.80	2.12	

5.6 Adaptation of farmers who have affected by rubber plantation

5.6.1 To search for the source of supplement income

It is clear that the influence of rubber plantation to force to the people livelihood in Nahom village which is the aims of the research. In 110 households which we are surveyed, 99% tell that they are try to improve their livelihood by searching other income from difference sources, 32% of village household earn income from their labour: to dig a pit for rubber planting, to be a worker of the road cleaning, to work in the ware house at the Lao-China international check point (Boten-Bohan). In the pass, an important sources of income are NTFPs and the next is the vegetation plantation. So we must plant more economic plants and as a reason for farmers need more land for plants plantation when the land is lmited. The data analysis for this time to reflect the cause of the need of farmers to search the new way for their income. The main problem is an invasion of conservation forest of the village which is their source of food and, decrease their income from the collection of NTFPs such as cardamone, bitter bamboo shoot, red mushroom and other NTFPs. Some NTFPs such as red mushroom is very expensive (200,000 KIP/kilo dry mushroom in the year 2007 but farmer can not collect since the year 2005), the bitter bamboo shoot collection in the pass to years in their common land is not enough, they must collect in the land of Nampheng village in the form of payement for one day one labour. To consider the group of occupation and the source of income of household, the income from livestock and NTFPs decrease exactly, but contrary the income from plants plantation and other increase and an average income of Nahom village is 591,244 KIP/year/person, it is very low if comparing to the mean income of the province (447 USD/person/year) and an average income of the 3

status of household, it is so many different, the very low income is the group of poor household, average 2,144,444 KIP/household/year. At that time, an average income of the group of well-off status household is 12,650,000 KIP/household/year and the group of medium status household is 4,828,082 KIP/household/year. The decrease of income from NTFPs collection is mainly affected to the groups of por and medium status of household (*cf.* Table 12 and Table 2 of an annex 2).

Table 12. household income of Nahom village

No.	Source of income	Status of household (KIP)			TOTAL	%
		Well-off (10)	Medium (73)	Poor (27)		
1	Agriculture	78,600,000	206,800,000	20,600,000	316,000,000	59
2	Livestock	2,200,000	10,050,000	2,200,000	14,450,000	3
3	NTFP	19,900,000	62,300,000	19,900,000	102,100,000	19
4	Other	25,800,000	63,300,000	15,200,000	104,300,000	19
5	TOTAL	126,500,000	352,450,000	57,900,000	536,850,000	100
6	Average /household	12,650,000	4,828,082	2,144,444	4,880,454	

5.6.2 Impact to the livelihood

With the livelihood, in spite of no change in this time but it is a sign of changing in the near future and to be unable to avoid this change such as what will they do for a living when the resin collection is coming, they must collect resin every day in early morning from two to three o'clock in the morning and than to sale it immediately, usually they leave their house to search food in the forest such as bamboo shoot, wild vegetable, mushroom and fishing in the lake etc.

From the studied data, we know that farmers are satisfied and get their hopes too high to the rubber because the plants are very good growing in their garden and they can start the collection resin of some plants since the year 2010, that's exactly the changing point of their life.

5.6.3 An integrated agriculture production

The study of the target group were show that 98% of household must improving and adjusting their system of production like wise their livelihood. They believe that the rubber plantation will affect to the household to develop their production on time of the current socio- economic situation. In other hand, the land for agriculture is limited, some household must hire the land for rice plantation. So people practice an integrated plantation which plant a lot of vegetation as a diversification of plants in the same plot such as grow rice in the rubber garden for two to three first years. Now they can not plant rice and the target area for rice plantation is protection forest of the village. The data on group of occupation of Nahom village we show that 63% of household are still practice the slash and burn cultivation for rice plantation and the economic plants for their short family income (*cf.*Table 13).

Table 13. Professional group of Nahom village households

No.	Professional group	No. Of household	%	Remark
1	Lowland rice	29	26	
2	Lowland + upland rice	11	10	
3	Upland rice	69	63	
4	Other	1	1	Working in the storehouse
	TOTAL	110	100	

Chapter VI

Results discussion and critique

When review the results whith the goal of this research, we find out many interesting subjects needed to have a straight and objective discussion and critique about the results. So some main subjects which we have summarised for the discussion and critique are:

1.) The different model of investment in rubber plantation of the companies within Udomxay province including model 2+3, model 1+4, model of agricultural credit release, model of state promotion and mode of farmers investment by themselves can also affect to modification of the area and local resources. These are also the factors which lead to the change of the right on land tenure of farmers including the successful of the implementation. The diverse model which use in the studied area to show that the rubber planted in this area was interested with a higher competition. We have faith in a better future as an option for to replace the slash and burn profession, to reduce the poverty of farmers and to be a solid basis of the national economic in the future because the rubber can produce resine for long time and have a higher demand of the market. But otherwise the investment in rubber plantation is still no common standard model and a precise implementation policy. So the results of the real implementation are reflected the different strengths and weaknesses points. But the main subjects are the profit sharing of SINO rubber and Chongxay companies by dividing 50% of rubber plants in the garden to farmers and 50% to the companies with the longterm contract farming. This situation can lead farmers to lose the right in their land tenure in the future. This model is the new form without land concession or land lease. For this case, in spite of farmers have their own land tenure and have to pay legally the tax for their land but they will lose the chance in development of their land and they can not use their land for other plantation. Besides that the form of land concession with very low cost (3 USD/ha) for longterm lead to make the conflict in land use in village level. With regard to these problems, we need to revise and adjust them to an appropriate form of legal and regulation. To do likewise, farmers will receive their interest forever.

2.) From the reason of the quickly modification of land use situation and forest in the rubber plantation zone due to lack of land use plan. So there are tendency to occur an unstable in resources use in the area and an unstable of food production. The trustworthy data to explain this matter in Nahom village, Pangthong sub-district, Udomxay province and to certify that

farmers change almost their land for upland rice and for other plants to the rubber plantation. There's the reason to believe that the change of the area of protect forest and conservation forest to rubber plantation is not suitable to the article 44 of forest law. In fact, should be have permission from central level by the respective proposal of the head of the village, district and province. We can use the land use map and forest map (to compare the map in land and forest allocation of Nahom village of the year 1999 and the year 2009) as an evidence to explain the situation. There are the good thing and appropriate to the government policy in the change for a better from conservation agriculture to other systems of agriculture which have an integrated plantation, a commercialisation of production and the utilisation of tractor as an equipment for agriculture production. But, if the production system has no good mechanism in management the for the resources using without plan, it may lead to the serious impact to the economic, to the livelyhood of farmers and to the environment of these areas. For this matter, should be consider every aspect of the problem before putting forward a solution for the impact which can lead to the modification of these areas such as the impact of the change of the area to the environment, to the bio-diversity, to the capacity in management of forest resource, to the return from forest comparing to the rubber plantation and other plants in the future.

3.) The modification of land use of farmers which has affected by rubber plantation lead to the majority farmers who have right in land tenure are the well-off and medium status household. An influence of rubber has a high pressure and lead to the quickly modification of land and forest use. This is an important reason lead to the need of farmers to adapt also their agriculture production practice and their livelihood. From the data analysis of Nahom village in period of the year 2004-2009, farmers to be alive and need more land to rubber plantation and to other commerce plants. It is regarded as land is the fund to be in a strong position for to realise the good foundation of the agriculture production and to support to the Government policy. From the demand of more land lead to the business of land whithin the village inside that the majority of land is for rubber plantation, cover 33.8% and 96.4% of land tenure is still illegal as has been stated in the land law. In general, farmers practice the business on land by themselve and has a risk to lose the right on land tenure to an exterior group of people and the forest land invasion is always increase. If we have not the good management and continuous measures for this matter, it will be affected to the adaptation of the agriculture production and the livelihood to the modification of land and forest using. From the data on rice production of Nahom village in 2009, the number of household who

has lack of rice increase and the income from other plants increase. But at the same time the income and the NTFPs decrease to the half of the amount in each year. But in the near future, rubber production is a new activity for farmers, they must get up early 3-4 o'clock in the morning for to collect the rubber resin and quickly to sale them. They need to take care of rubber all year by weeding, spraying insecticide herbicide and chemical fertiliser which is a chemical pollution to the resource of water, to the resource of food in the forest affected directly to the human health, animal health and an environment of the area as mentioned above. Bisides that, it has the trend to change the conventional livelihood of localpeople if there are not a good management and the promotion from the Government. In addition, the land clearing for rubber plantation in large area lead to the risk of inundation which to take a social-economic disaster to this area. This matter should be a subject to consider to research in the future.

Chapter VII

Conclusion and Suggestion

7.1 Conclusion

When revising the proposal goals and the results of this research we can conclude that we can reach basically our expected goals as follow:

1.) An investment model on rubber plantation within Udomxay province which is our research area to certify that the implementation of the policy on rubber plantation of the province have different models as summarised in the following form: (1) joint venture between company and farmers with the model 2+3, (2) the concession of the Government land with the model 1+4), (3) the release of fund of the company to farmers and contract of marketing, (4) Government to promote farmers to plant by themselve, (5) investment of farmers to the plantation. The different models of investment have a specific principle in interest sharing for each model. The majorities models to share their collected resin and some model to share the rubber plants in the garden. From different model, we have the different level successful in an implementation such as the interest sharing model base to the rubber plants in the garden: 50% for farmers and 50% for company which has a longterm contract. We found that farmers lose implicitly their right in land tenure and lead to the risk to lose their right in land tenure in the future.

2.) The modification event of land and forest area in the research area of Nahom village we explain clearly an influence of rubber plantation as a higher pressure lead to the quickly modification of the area in the pass 5 years since the year 2004-2009. Due to the need of land farmers for rubber plantation at the same time of land for rice production for their security of food by themselve (98%) and for economic plants plantation for to solve their current livelihood as a Government policy including 72.7% of household need an assistance of Government to settle the land for agriculture. The results of the modification are the rice shortage increase 19 households comparing to the year 2007, 13 households stop to raise a large animal and 25 households lack of land for upland rice production. This is a data to certify that the results of modification of land to affect to the agro-forestry production system of the village. So the clearly indicator is tractor to take place of buffalo, integrated plantation of other plants in the rubber garden, to commercialise the production, to borrow-hire the land

and to collect the NTFPs of other village by paying every day because some NTFPs were finished. From data collected, when compare the management of land use and forest map of the year 1999 and 2009 of the village, we have an evidence of the modification which has almost replace by the rubber garden in the agricultural land, in the protection forest land, conservation forest and utilisation forest. Besides that it still has aa upland rice area in these forests which has a modification by farmers.

3.) The form of modification of land tenure of farmers in this research area to show that it develop to the new model as different from the culture, it is the use of tea area to plant rubber according to the condition of longterm contract which has no interest according to the model of land lease and land concession as stipulated by law. But a remarkable problems in Nahom village which is a target village are the form of modification by sale the right of land tenure to other people and another form is the big amount of land tenure from the change of the area of protection forest and utilisation forest to the rubber plantation, rice production and other vegetation as a culture of the village. The land tenure is still illegal and inappropriate according to the article 89 of forest law and article 52 of land law because farmers have not document as a certificate of the right in land use however this village is already allocate the land and forest to farmers. But when we observe the land tenure of the different status household we can find out the deep different especially the group of poor household is still no certificate of land tenure.

4.) When we observe an investment model in rubber plantation at Nahom village which is a target village of the research, we find 3 models: (1) farmers plant by themselve; (2) promoted by the government; (3) joint venture with other people. An occasion to receive fund from the government is still very little for the poor status household, only 18.5%, but contrary for and the the well-off status household is 60% and the medium status household 49% and can invest more by themselve with the higher results (farmers plant by themselve 212.10 ha: 90.8%, government promotion 16.8 ha: 7.2% and joint venture with other people 4.5 ha: 2.0%). Now a day, Nahom village farmers invest for rubber plantation 90 households, cover 81.8%. If we divide from the household status we find the well-off status household is planted 90% of their group, the medium status household is planted 86.3% of their group and the poor status household is planted 66.6% of their group. According to the policy on rubber plantation promotion as an option for occupation settled for to solve the poverty of people and as a foundation of the exported industry and the job creation to the social in local level.

But an obstacle and the main reason which poor farmers can not plant rubber because they are lack of fund, labour and an opportunity.

5.) The Nahom village household which as an research area has to worry about the production for food security and an annual plants as commercial product to supply income to the current household because almost the land to use for rubber plantation although farmers can grow rice and the annual plants in the same area for 2-3 years. In the situation of the need for more land to the rubber plantation but in the same time the resources are limited and can lead to the food shortage and 81% of household still earn their income from agriculture and forest such as vegetation plantation, NTFPs collection and livestock which cover the main resources of their income and other income are labour hiring and trading (covers 19%). Now a day, 72.7% of household still need more land and to claim Government to adjust again an agriculture land. That's an indicator to tell that land is an important factor to the economic and the livelihood of farmers. We can conclude that an economic and livelihood of rural people depend on land area for the production because land is material of production. So to insure that each household have sufficient land for production and need to avoid problem of some farmers have more land and in the same time some farmers are still no land.

6.) This research we provide the basis data to tell us about the situation of the modification of an agriculture and forest land use and to see the alarm the threat from natural disaster. This data to show us an environment has also affected by rubber plantation. From land use data of 5 categories of land and forest allocation in the previous 10 years we can find the modification and an important factor is the land for rubber to replace other land using for other plants such as the slash and burn cultivation, protection forest, conservation forest, utilisation forest and rehabilitation forest. This situation to affect to the environment and to the socio-economic of Udomxay province citizen and also to the research area. We've known already in wet season of the year 2008, it occurs many time in each district the serious inundation from rapid flow of forest water causing by the heavy rain, the total cost of the damage is 55.9 billion KIP. For Nahom village as research area has also destroyed by the flood, the maize garden and the low land rice of 14 households were flooded with the area 13 ha and lost 45 million KIP.

This research to reach our goal and our expectation, but it has a weak point in the tool using for data collection and some important matter such as the data on household to sale land is no comment, but land buying is needed for rubber plantation, other vegetation and rice

plantation. So the next research must specific to the detail of land business and the study of modification of forest area, an environment, an other natural resouces including the influence to the health and the livelihood of local people in this area. However the data of this research is an important basic for whom it need to study in the next step.

7.2 Suggestion

1.) The implementation of rubber plantation in Udomxay province has to reach the goals and objectives to insure to maximise the farmer interest and the country for longterm:

(1) We should research and select the appropriated model of investment in rubber plantation and to propose the clearly policy on rubber plantation in central and local level as a scientific consensus on the implementation;

(2) We should quickly survey and allocate and plan to systemise the land using in the district which practicing the rubber plantation;

(3) Establish the special team belong to the PAFO who has responsible the rubber plantation and to propose a detailed and clearly assignment. To promote an appropriate mechanism in rubber plantation for to accomplish the goal of Udomxay province;

(4) Improve the policy draft on rubber plantation of the province and to promulgate in an appropriate occasion by relating with another policies, programmes, law and regulations. To specify the clearly goals according to the position of strength of the district.

2.) The rubber plantation target village of the targets villages which has analysed for this time, the line agencies should quickly to join together to implement the monitorig and evaluation, to continue an appropriate allocation of land and forest.

3.) Survey and licence the rubber garden, the legal rigth of land tenure and land use in agriculture land to farmers. To promote farmers to access to the agricultural credit. This case was practiced together with the land allocation by the special team.

4.) The bank should hae the policy on agricultural credit to assist widely farmers in rubber plantation as the short, medium and long term investment especially the poor farmers who have lack of fund to participate in the rubber plantation activities. This is an option of new occupation following the Government policy which can replace the shifting cultivation of upland rice plantation and opium plantaion.

5.) Government sector to mobilise and to impulse the development of rubber plantation should establish a special team, to specify the clearly role in the central and local level, to detach the specialist in rubber field to assiste entirely and regularly to farmers.

6.) Should have a preliminary text of environmental evaluation before to permit to plant the rubber by participation of the local people who have widely related.

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