Understanding the Oil Palm Change in Nong Khai Province: the Farmers Perspectives and the Policy Processes of the Oil Palm Plantations

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Abstract

Since 2005, the Thai government has, as a matter of policy, been seeking to increase production of biodiesel from oil palms. As a result, the number of oil palm plantations in the Northeast region has been growing, particularly in Nong Khai province. Nong Khai is a relatively remote, predominantly agricultural area and is the field site for this research. However, oil palm production is a complex and hotly contested issue both globally and in Thailand and it has ardent critics and supporters. For example, expanding oil palm production could, on the one hand, contribute to deforestation and a range of social problems that threaten traditional livelihoods, whilst on the other hand it could offer a source of renewable energy, alleviate poverty, and lead to a higher standard of living for farmers. The ultimate purpose of this study is to understand the changeover to oil palm production, specifically in the Thai context, through the development and application of a distinctive analytical approach. This approach is a synthesis of: the eight elements of farmers' decision-making (Ohlmer et al., 1998), the IDS Knowledge, Technology, and Society (KNOTS) team's framework on policy processes (Keeley and Scoones, 1999; 2001; 2003; KNOTS, 2006).

This analytical approach is used to investigate factors influencing farmers' decisions to take up oil palm cultivation, and the rationale behind the government's oil palm policy and how it is implemented in the Northeast Thailand. Approximately nine months were spent carrying out the research in three selected villages in Nong Khai province, using qualitative methods including semi-structured interviews, purposive sampling and snowballing techniques. The results show that economic security is an important factor for farmers in deciding to change over to oil palm cultivation. However, it has emerged that what farmers really want is to achieve a comfortable lifestyle and to live in the same locality as their children, which implies urban to rural migration. Other critical factors are characteristic of oil palm cultivation, such as long life-span and short harvesting period, governmental projects supporting oil palm production, the roles of inspirational local leaders and large-scale oil palm producers, the price of oil palm fruits, the links between farmers and local buyers, and the experiences of oil palm growers in the southern region of Thailand, as well as the low productivity and high production costs involved in rice cultivation, and the success of rubber plantations.

The findings also suggest that the oil palm policy processes in Nong Khai province do not have policy space for farmers to participate in the networks, or to design the oil palm policy that directly affects them. The policy was made in top-down in which the government only transferred oil palm knowledge through seminars and trainings. There were also issues concerning inequality amongst farmers and how that affects participation in the oil palm projects. Indeed, the OPPSP favours rich farmers, as they need a significant amount of capital to prepare for and maintain oil palm crops. Implementation of a 'farmer-first' approach is recommended in order to push the policy forward to serve resource-poor farmers properly. New behaviours and attitudes must be encouraged in most of the professionals encountered in this research.

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List of Abbreviations

BAAC	Bank for Agriculture and Agricultural Co-operatives (Thailand)
BB	Bureau of the Budget (Thailand)
CAQDAS	Computer-Assisted Qualitative Data Analysis Software
CH_4	Methane
CIFOR	Centre for International Forestry Research
CNS	Council of National Security (Thailand)
CO_2	Carbon Dioxide
CPO	Crude Palm Oil
DEDE	Department of Alternative Energy Development and Efficiency (Thailand)
DOA	Department of Agriculture (Thailand)
DOAE	Department of Agricultural Extension (Thailand)
DP	Democrat Party (Thailand)
DTE	Down to Earth
EIA	U.S. Energy Information Admistration
FAO	Food and Agriculture Organisation
FFB	Fresh Fruit Bunches
FOE	Friends of the Earth
GDP	Gross Domestic Product
GHG	Greenhouse Gases
GPP	Gross Provincial Product
IDS	Institute of Development Studies
IEA	International Energy Agency
IFPRI	international Food Policy Research Institute
IPCC	Intergovernmental Panel for Climate Change
JICA	Japan International Cooperation Agency
KNOTS	Knowledge, Technology and Society Team
LDD	Land Development Department (Thailand)
MOAC	Ministry of Agriculture and Cooperatives (Thailand)
MOEN	Ministry of Energy (Thailand)
MPOC	Malaysian Palm Oil Council
MRR	Minimum Retail Rate
N_2O	Nitrous Oxide
NCB	Nuffield Council on Bioethics
NESDB	Office of the National Economic and Social Development Board (Thailand)
NESDP	National Economic and Social Development Plan (Thailand)
NESO	Northeastern Region Economic and Social Development Office (Thailand)

List of Abbreviations (2)

NGO	Non-profit Organisation
NKO	Nong Khai Oil Palm Research Centre (Thailand)
OAE	Office of Agricultural Economics (Thailand)
ODI	Overseas Development Institute
OPPAEP	Oil Palm Plantations for Alternative Energy Project (Thailand)
OPPSP	Oil Palm Plantations Supporting Project (Thailand)
ORRAF	Offices of Rubber Replanting Aid Fund (Thailand)
OTOP	One Tanbon One Product Project (Thailand)
PAD	People's Alliance for Democracy (Thailand)
PAE	Phon Phisai Agricultural Extension Office (Thailand)
PPP	People's Power Party (Thailand)
R&D	Research and Development
SAE	Seka Agricultural Extension Office (Thailand)
SIFO	Small Industry Finance Office (Thailand)
SML	One Million Baht Microcredit Scheme (Thailand)
SPAE	So Phisai Agricultural Extension Office (Thailand)
STO	Surat Thani Oil Palm Research Centre (Thailand)
THN	Theory of Human Need
TOT	Transfer of Technology
TRT	Thai Rak Thai Party (Thailand)
UDD	United Front for Democracy against Dictatorship (Thailand)
UN	United Nations
UNDP	United Nations Development Programme
VOCs	Volatile Organic Compounds
WeSD	Research Group on Wellbeing and Sustainable Development (Thailand)

Chapter 1:
Introduction

The aim of this thesis is to understand the factors shaping the decision-making of farmers in switching from rice to oil palm plantations specifically in Nong Khai province, which is located in the Northeast region of Thailand. In order to understand this change to oil palm cultivation, I developed the research's analytical framework based on the two main analytical approaches namely the eight elements of farmers' decision-making (Ohlmer et al. 1998), and the IDS Knowledge, Technology and Society (KNOTS) team's framework on policy processes (Keeley and Scoones, 1999; 2001; 2003; KNOTS 2006).

1.1 Introduction to the Problem

Since 1961, Thailand has embarked on a mainstream, state-led development path of capitalist economic growth based on industrialisation, export-oriented trade, foreign investment, private sector investment, and infrastructure development. Although this strategy of development has led to rapid economic and material progress, as well as a reduction in poverty, it has also led to increased socio-economic inequality, environmental deterioration, a rural-urban divide, and general unsustainable development. Strong economic growth and rapid industrialisation are also considered as both cause and effect of Thailand's huge expansion in energy consumption, which has been rising dramatically since the 1980s. In the last few decades, the country has paid more attention not only to the problems of environmental sustainability but also to national energy security, not forgetting that energy consumption costs the country a huge amount of foreign currency.

Lacking an abundant supply of domestic energy resources, Thailand's energy sector is heavily dependent on imported energy and is the second largest in terms of energy consumption amongst Southeast Asian countries. In 2008, Thailand's dependence on imported energy (the ratio of imported commercial primary energy to the total energy consumption) stood at 58 percent, with the total value of the imported energy at 1,178 billion Baht, equivalent to 12.8 percent of Gross Domestic Product (GDP). Out of this total, 88.7 percent was spent on importing crude oil. Crude oil is a form of fossil fuel from non-renewable sources, which will eventually run out. The serious problem of being heavily dependent on imported oil has led the Thai government to pursue alternative energy strategies. Thailand has paid greater attention to the development of renewable energy since the oil price rise beginning in 2004, setting a target of increasing the share of renewable energy from 6.5 percent of commercial primary energy in 2008 to 20.3 percent in 2022 (DEDE 2008; MOEN 2009).

With a large agricultural sector and the fact that oil palms are the main oilseed crop for biodiesel production in Thailand, it was not unforeseen that Thailand would be one of the first Asian countries to have a policy to encourage production and utilisation of biodiesel from oil palms, one of the key elements in the country's development of alternative energy. Since 2005, the Thai government has pursued a biodiesel development strategy in order to increase the energy security of the country, to generate rural economic development and to mitigate climate change.

On the demand side, the consumption of biodiesel has increased drastically from 0.02 million litres per day in December 2006 to 1.80 million litres per day in December 2009. This resulted mainly from two government measures: one was to mandate biodiesel B2 (a blend of 2 percent biodiesel and 98 percent conventional diesel) as the standard grade for diesel oil in February 2008; the other measure was to subsidise the retail price through excise tax reduction and exempting it from State Oil Fund[1]. However, limited availability of oil palms, on the supply side, was the main obstacle to acceleration of oil palm based biodiesel development in Thailand. In order to cope with the rising demand for biodiesel, a major oil palm expansion policy was promoted in the Northeast region of Thailand, including Nong Khai province. This is a relatively remote, predominantly agricultural area, and was the field site for the research. Oil palm plantations in Thailand have increased significantly from 2.41 million rais in 2004 to 4.08 million rais in 2010, an increase of more than 1 million rais in the last seven years[2] (OAE, 2010a).

Oil palms have not typically been grown in the Northeast region. The Southern provinces of Thailand have the most suitable climate and soil conditions for oil palm cultivation, account for approximately 90 percent of Thailand's total oil palm planted area. However, the Southern region, which has only 19.86 million rais of agricultural land compared to 57.65 million rais in the Northeast, is running out of available agricultural land. Thus, prominent areas of oil palm expansion are found in some provinces in the Northeast region, including Nong Khai province, where the the area of land under oil palm cultivation has rapidly increased from none in 2004 to 24,848 rais in 2010 (see Chapter 2 for further details) (OAE, 2010b). From my experience at the field site, it appears that the oil palm plantation areas may have reached even higher levels than the government's official figure, as I interviewed numerous oil palm farmers who have not been recorded in the government's statistics.

[1]The State Oil Fund in Thailand was established in 1979 by the Thai government to safeguard the country from being affected by future global oil crisis. It comprises of monetary reserve that will be used to maintain domestic retail price level at a set ceiling in times when the global petroleum prices sore by subsidizing domestic oil producers and importers.

[2] Land in Thailand is measured in Rai, Ngan and Wah. 1 sq. Wah = 4 sq. m. 1 Ngan = 100 Wah (or 400 sq. m.). 1 Rai = 4 Ngan (or 1600 sq. m.). 1 Acre = 2.5 Rai (approx.) or 43,560 sq. ft. 1 Hectare = 6.25 Rai or 10,000 sq. m.

Oil palm production is a complex and hotly contested issue, however, with strong critics and supporters. On the one hand, land-use changes driven by the expansion of oil palm plantations for biofuels production have been criticised in many parts of the world for contributing to deforestation; loss of biodiversity; forest fires; land competition; and a range of social issues that threaten traditional livelihoods. On the other hand, they have also been seen as a major driver of rural economic growth, which could alleviate poverty and lead to a higher standard of living for farmers as well as a source of renewable energy (see Chapter 2 for further details) (Astyk, 2006; Barison, 2007; Cassman and Liska, 2007; FAO, 2008a; CIFOR, 2009). There have been urgent calls for a rapid research response to determine the options for small-scale farmers to use oil palms as part of a farm diversification approach, and identify choices on the management spectrum (CIFOR, 2009). What are the needs of these farmers, how can they be met, and what are the consequences of their beginning to farm oil palms?

In this era of rapid change and urbanisation, Thailand's economy has been transforming, so that agricultural activities are no longer a major driver of economic growth. In 2009, Thailand's agricultural sector only accounted for 8.5 percent of GDP, but employed 40 percent of the labour force on average (NESDB, 2010). Nonetheless, things are different in Thai culture when it comes to agriculture, particularly rice. Rice cultivation, which occupies most of the cultivated land area, has shaped a way of life, faith, belief, politics, economics and cultures in Thailand. Thai people have a long tradition of consuming rice, which is grown throughout the country, and it has always been a vital or fundamental part of the agricultural sector. Indisputably, rice is not just a food for Thai people, it is perceived as a symbol of independence as well as of the precious cultural heritage of the ancestors (Kwanchai, 2001; Vanichanont 2004). In the Northeast region, rice cultivation occupied more than 50 percent of the land available for agricultural activities in 2009 (OAE, 2010a) and it is no surprise that the majority of Thailand's rice production is from this region.

Given this background, this research has been developed to fill in some of these gaps by providing crucial analysis of the key factors influencing the rapid spread of oil palm cultivation among small-scale rice farmers in Nong Khai province, which is in the Northeast of Thailand. Once a predominantly rice-growing region, the number of oil palm plantations in Nong Khai province has risen significantly, as mentioned earlier. Thus, Nong Khai province offers an ideal location in which to assess the dynamics of oil palm policy impacts and outcomes.

In summary, based on a rapid expansion of oil palm cultivation in Thailand (and particularly in Nong Khai province); and the controversial issues regarding oil palm plantation; this research has sought to understand the reality of change to oil palm cultivation in Nong Khai province by exploring the decision-making of farmers; and oil palm policy processes. The research findings will be potentially useful to policymakers in understanding the challenges surrounding oil palm cultivation and will assist them in thinking about how to further develop oil palm policy in ways that bring greater benefits to the poor.

1.2 Research Objective and Research Questions

The specific research objective of this thesis has been to understand changes in oil palm cultivation in Nong Khai province, by determining the critical factors shaping the decision-making of farmers in adopting oil palm cultivation, and by examining the oil palm policy processes specifically in Nong Khai province. After studying relevant literature (see Chapter 2), obtaining insights from the fieldwork, and discussing ideas with my supervisors on developing the analytical framework for the research, the main research question and sub-questions were specified more tightly. The resulting main research question for this thesis, and its three sub-questions, are outlined below (see Chapter 3 for further details).

The Main Research Question

- What are the critical factors shaping the change towards oil palm adoption of small-scale farmers in Nong Khai province (in the Northeast region of Thailand), and what are the implications for Thailand's oil palm policy development?

The Two Sub-questions

- What are the key factors affecting the farmers' decision to adopt or not to adopt oil palm cultivation?

- What is the rationale of the oil palm policy and how is it implemented?

1.3 Research's Analytical Framework and Its Rationale

In order to analyse the change to oil palm cultivation specifically in the Thai context, I have developed an analytical framework which draws from two main analytical approaches, namely: the eight element model of farmer decision-making (Ohlmer et al., 1998); and the IDS KNOTS team's policy processes framework (Keeley and Scoones, 1999; 2001; 2003; KNOTS 2006) (see Chapter 3 for further details). These two different analytical approaches were drawn on in order to encompass the oil palm issues fully, as exploring only one particular perspective could not fully reflect the oil palm issues in Nong Khai province.

Because of a substantial increase in oil palm plantations in Nong Khai province in particular, mentioned earlier, it was necessary to understand the rice farmers' rationale for engaging in oil palm production. The adaptation of the eight elements of farmers' decision-making theory will be discussed with the aim of understanding the change to oil palm cultivation from the bottom-up, as well as identifying the factors which influenced the local farmers in choosing whether or not to move to oil palm cultivation. Comprehending the decision-making of oil palm farmers provides a fundamental insight for further analysis of oil palm policy processes, namely to investigate whether the change to oil palm farming was significantly influenced by the oil palm expansion policy and, if so, in what ways.

1.4 Research Methodology, Research Sites and Sampling Selection

According to Kanbur (2001), there have been various debates regarding the strengths and weaknesses of quantitative and qualitative research. Perhaps the most notable element in the distinction between these two methods is that the quantitative method is defined by the use of numbers, which can be more easily aggregated, but can hide texture such as in-depth details that could be derived from the qualitative research. In order to gain data in relation to the farmers' lives and attitudes, such as their reasons for growing oil palms, it is important to apply qualitative research methods to the study, as they are geared towards tackling issues of a subjective nature. Thus, I chose to adopt the qualitative approach to understand the reality of the oil palm issues because the focus of the thesis is on understanding the social and political context of oil palm farmers in the villages rather than on generating a model as a means to test a theory.

Purposive and snowball sampling methods (Coleman, 1958; Patton, 1990; Salganik and Heckathorn, 2004; Bryman, 2008) and semi-structured interviewing (May, 2001; Bryman, 2008) were the types of social research methodology that were used in the study. I was seeking to sample the research sites and participants in a strategic way, so that those samples were relevant to the research question and sub-questions. Research sites and people within the sites were selected for their relevance to understanding a social phenomenon, i.e. the change to oil palm cultivation. The snowballing technique was used in the thesis to identify key actors as it allowed me to make initial contact with a small group of people who were relevant to the research topic, and then use their community knowledge to establish contacts with others, whilst the semi-structured interview was chosen because it enabled me to direct the structure of the interviews whilst at the same time maintaining a degree of reflexivity to react to the interviewees' positive answers and pose further questions in response.

As mentioned earlier, Nong Khai province was chosen to be a research site because it was considered to be one of the areas with the most suitable climatic and soil conditions for oil palm cultivation in the Northeast region, and also the ideal place to build up understanding of food and energy trade-offs. I narrowed down the scope into three districts in Nong Khai province, which were Phon Phisai, So Phisai, and Seka. One village in each district was selected as a research site, using knowledge gained from various local government agencies and members of the community (see Chapter 3 for further details). However, I have altered the villages' real names so that the respondents in the research can remain anonymous. The following names have been given to the three selected villages:

1) Baan Tarn for a village in Phon Phisai district,
2) Baan Sa Ard for a village in So Phisai district, and
3) Baan Hat for a village in Seka district.

I decided to interview all the small-scale oil palm households in the selected three villages, resulting in 14 households being interviewed in Baan Tarn, 23 households in Baan Sa Ard and 8 in Baan Hat. I divided the rice farmers who have not yet adopted oil palm cultivation into two groups. In the first group were the rice farmers who had more than 20 rais of rice paddy fields and could be described as relatively large-scale rice producers, whilst in the second group were the farmers who devoted less than 20 rais of land to rice cultivation. This was because I intended to investigate whether the amount of rice paddy fields they had was a significant factor for the rice farmers in choosing not to get involved in oil palm cultivation. Three households were selected in each category, i.e. a total of six households in each village (see Chapter 3 for further details).

Applying the snowball sampling method, the study identified 15 key actors including private seedling suppliers; private buyers of oil palm fruits; various local government agencies; central government offices; large-scale oil palm producers; inspirational local leaders; and a large-scale palm oil refinery in Chonburi province. In total there were 78 interviewees in the study (63 oil palm and rice farmers and 15 key actors). I conducted semi-structured interviews during 6 visits to the research sites which ranged from 8 to 12 days per visit. I also conducted several interviews with the key actors in Chonburi province and Bangkok over a period of approximately 9 months, from 25th April 2010 to 15th January 2011.

1.5 Structure of the Thesis

The thesis consists of three main parts. The first part includes a brief rationale of biofuel development, oil palm basics and the structure of the oil palm sector in Thailand (particularly in the Northeast region), and a discussion of whether oil palm plantations can be economically viable in the Northeast region. The second part presents the analytical framework used to analyse oil palm issues specifically in the Thai context; research methodology; research designs; and some reflections on the author's research experiences. The final part provides the analysis of the thesis using the in-depth data obtained from the field sites in order to comprehend the change to oil palm farming in Nong Khai province. The three main parts are divided into seven chapters as follow:

Part One: The Expansion of Oil Palm Cultivation

The second chapter focuses on biofuel development and specifically on oil palm based biodiesel development and the controversial issues associated with oil palm plantations. This chapter begins with a discussion of the drivers of the biofuel development. These include energy security, economic development, and climate change mitigation. The second section then focuses on biodiesel derived from oil palms and its relevant literatures. Current oil palm debates and concerns, which involve many controversies such as the issues of deforestation, greenhouse gas (GHG) emissions, small-scale oil palm production, land tenure, and food versus oil palms, are also discussed in this section. Thereafter, I narrow down the scope to focus on the basics of oil palms and oil palm cultivation specifically in Thailand and the Northeast region, in order to lay down the fundamental knowledge to analyse specific oil palm issues there. The chapter ends with a review of the literature on whether oil palm plantations can be economically viable in the Northeast region.

Part Two: Analytical Framework of the Research, Research Methodology, and Research Designs

The third chapter outlines the analytical framework, logic, and research methodology for the thesis. It provides the justifications of their roles in developing a holistic approach to understanding the change to oil palm cultivation in Nong Khai province. The chapter starts with a discussion of the analytical framework used in the thesis. The choice of methodology, logic, and research designs of the study are then explored. This includes research site and sampling selection, and the logic of data collection and data analysis. The ethical issues in the fieldwork are then investigated in the final section of this chapter.

Part Three: Analysis and Discussion of the Thesis

The third and final part consists of chapters 4, 5 and 6. The fourth chapter analyses the key factors affecting the farmers' decisions in relation to oil palm adoption. In accordance with the analytical framework used in this research, this chapter is divided into eight sections, reflecting the eight elements of the farmers' decision-making approach. The first six sections examine the key factors affecting the farmers' decisions to adopt oil palms. The seventh and eighth sections are the analysis of the socio-economic consequences of establishing oil palm plantations and the farmers' satisfaction with having done so.

The analysis in the fifth chapter focuses on the oil palm policy processes in the Nong Khai province mainly through the IDS KNOTS team's policy processes framework, which consists of policy narrative, actors/networks, and politics/interests. The chapter is divided in accordance with these three themes of policy processes analysis. Through the examination of these three themes, policy space will then be identified so that it can be made use of for advocating different ways of doing things with regard to the oil palm issues.

The final chapter presents the summary of the key findings of the thesis with reference to the main research question and sub-questions. Policy implications and future research into oil palm issues are also explored in this chapter.

Chapter 2:
From Biofuels to Oil Palm Based Biodiesel Development and the Oil Palm Expansion in the Northeast Region of Thailand

The rapid expansion of oil palm plantations particularly in Southeast Asian countries is generating considerable concern and debates: it still remains uncertain whether oil palm plantations will lead to sustainable development or be a costly route to environmental ruin. This chapter discusses oil palm development and the controversy surrounding it in order to get a clearer understanding of oil palm issues. It is presented in four sections as follows.

The chapter begins with the drivers of biofuel development, which are energy security, economic development and climate change. The second section then focuses on biodiesel derived from oil palms and its relevant literatures, and the current oil palm debates and concerns will be discussed. This section is divided into two sub-sections, of which the first highlights the impacts of oil palm expansion on the environment (such as contributions to deforestation, loss in biodiversity, and GHG emissions), whilst in the second sub-section attention will be drawn to a range of social issues that threaten traditional livelihoods (such as the impacts on local communities and small-scale oil farmers, land tenure, and food versus oil palms).

Thereafter, I will narrow down the scope to describe the basics of oil palms and oil palm plantations specifically in Thailand. This section includes the literatures on debates and discussions as to whether oil palm plantations can be economically viable in the Northeast region of Thailand, where Nong Khai province (the research's field site) is located. The chapter ends with some brief concluding points.

2.1 The Rationale for Biofuel Development

Biofuels, which are fuels made from locally grown renewable resources such as agricultural crops and waste, have become a focus of interest over the last few decades. Governments in many countries, including Thailand, have aggressively pursued biofuel development ever since a sharp increase in crude oil prices during the 1970s. Biofuel development appeared to provide an alternative to expensive and non-renewable fossil fuels obtained from beneath the earth's surface. The development of biofuels was thus driven by three main factors: first, the nations' worries about energy security, second, the benefits in rural economic development including creating or sustaining jobs in the agricultural sector and, third, the need to reduce greenhouse gas (GHG) emissions (Wakker, 2006; Koh and Ghazoul, 2008).

For many countries, seeking energy security was the initial primary driving force in developing biofuels. Because economic progress must be facilitated by reliable and affordable sources of energy, sovereignty and control over energy supplies in order to meet rising energy demand were clear motivations for many governments. In order to enhance energy security, governments set out to diversify their national energy portfolios towards alternative fuels, including biofuels. According to the European Commission (2000: 4)'s Green Paper, energy security can be understood as "the uninterrupted physical availability of energy products on the market, at a price which is affordable for all consumers". The importance of energy security has seldom been disputed, but many debates have focused almost exclusively on fossil fuel scarcity or disruptions to fossil fuel supplies from international markets, which could affect the price of energy and disrupt the provision of energy to consumers. Although lower energy demand and consumption is a primary goal to secure energy security in the long-run, the expectation of continually rising future demand for transport fuel and the envisaged negative effect of another such price hike on the economy have made biofuels a promising candidate in the search for alternative fuels.

It is generally believed that imported energy is inherently less secure than domestic-based sources of energy. In other words, the countries that have no reliance on imported sources of energy, which are typically from geopolitically unstable regions and/or inherently and harmfully volatile in price, are more secure in terms of energy. The production of fossil fuels is dominated by a few major producers, many of them in politically less stable regions, for example the volatile Middle East. Any disruption of supply due to geopolitical tensions, war, etc. could very possibly mean that energy prices would drastically increase overnight (IEA, 2008). Therefore this is used by many governments to argue for increasing biofuel production from local sources. However, energy security, in reality, depends on both domestic and international factors which threaten it in numerous ways.

A lack of investment in domestic energy infrastructure such as power stations, refineries and storage facilities could potentially pose a risk to energy security. Technology and infrastructure failures resulting from faults or external stresses either inside or outside the country in question (for instance, extreme weather) could also pose a serious threat to energy security. Although biofuels might present fewer risks in terms of spills and toxic leaks than the traditional crude oils, severe weather could still affect crop yields and destroy harvests, which in turn would reduce the availability of feedstock and drive up biofuel prices. However, the impact of energy insecurity could be uneven so that the fuel-poor households or energy-intensive industries would be particularly vulnerable to the effects of the elevated fuel prices (Wicks, 2009; NCB, 2011).

The advantage of rural economic development is the second main driver behind the biofuel development particularly in developing countries, which generally experience a higher level of poverty and a lower standard of living. There is an expectation that investment in biofuels will contribute significantly to the economic development of a country, including creating new jobs and providing income-generating opportunities for farmers in rural areas. For example, because crop growing and harvesting require extensive labour and manual work, biofuel development could create new local employment, as well as encourage smallholders' participation in biofuel crop production (IEA, 2004; Dufey, 2006; Demirbas, 2009; Yan and Lin, 2009). Many developing countries such as India and China, which often lack indigenous sources of energy and are inefficient in their utilisation of energy, have established biofuel strategies with the aim of diversifying their agricultural products and increasing the security of income from local agriculture, and also of increasing national exports, which will lead to greater contribution in global economic activities (NCB, 2011).

Certainly, awareness of the potential consequences of climate change has spurred interest in biofuel development. Although there are some disputes within the scientific research community regarding the average global temperature, and the magnitude and impact of climate change, most climatologists have concluded that climate change could lead to severe economic, social and environmental consequences globally (IPCC, 2007). Thus, climate change mitigation is recognised as one of the greatest global challenges of the 21st century, and there is general consensus that reducing greenhouse gas (GHG) emissions is one of the highest priorities in tackling climate change. However, there are several routes to lowering GHG emissions, the development of biofuels being one of them. In view of increased energy security and further economic development, biofuels are expected to be alternative fuels which will not require changes in vehicle technology and have the potential to reduce GHG emissions in the transport sector, which is heavily reliant on traditional fossil fuels.

Biofuels are considered to contribute to mitigating climate change in terms of reducing GHG emissions by replacing fossil fuels. In other words, they have the potential to achieve net zero carbon emission over their life cycle because the carbon released in combustion is equal to the carbon that the crop previously sequestered from the atmosphere during photosynthesis (Somerville, 2007). For this reason, biofuels have been proclaimed as an immediately available technology that might make a significant contribution to GHG emissions savings.

Three major reasons (energy security, economic development and climate change mitigation) for the development of biofuels as an alternative to fossil fuels have been briefly described here. Definitely, biofuels offer no perfect solution, as warning voices have been raised from an early stage about their potential problems. However, there is a range of biofuels, including biodiesel and bioethanol, produced from various feedstocks such as oil palms (the focus of this research), sugarcanes, soybeans, maize and sorghums. Comparing these types of biofuels is complex and difficult as each has specific advantages and costs (Scharlemann and Laurance, 2008). In the next section I will recount the story of current biofuels, specifically biodiesel from oil palms, and lay out the controversial issues which have been raised during their development.

2.2 Oil Palm Based Biodiesel Development

The current oil palm debates and concerns involve many controversies as to whether oil palms are a valuable route to sustainable development or a fast track to environmental ruin. As mentioned earlier, the expansion of oil palm cultivation, which is one of the main agricultures in biofuel development, is a major driver of rural economic growth and a source of renewable energy, but could also contribute to deforestation, a loss of biodiversity, forest fires, and a range of social issues that threaten traditional livelihoods. This section describes the current literatures on the ongoing expansion of oil palm cultivation, particularly in Southeast Asia. The first sub-section focuses on the impacts of oil palm plantations on the environment, including debates on GHG emissions, whilst the second sub-section highlights the issues of livelihoods, such as food versus oil palms, land tenure, and small-scale oil palm production.

2.2.1 Impacts on the Environment

The expansion of oil palm plantations has triggered an outcry from the environmental sector for numerous reasons. Much of the controversy is about deforestation to make way for the oil palm plantations, which has generated widespread negative publicity (Murphy, 2007; Naylor et al., 2007; Gouverneur, 2009; McCarthy, 2010). However, quantifying the specific contribution of biofuels, including oil palms, to deforestation remains challenging (Gao et al., 2011). Clay (2004) has concluded in his research that there is a direct relationship between the growth of oil palm estates and deforestation in Indonesia and Malaysia. Oil palms continue to be widely connected with the loss of natural forests and habitats, despite some claims that much forest destruction is attributable to previous impacts and uses, for instance, logging and oil palm plantations (Hansen, 2005; Silvius, 2006; Abdullah and Nakagoshi, 2007; Yusoff and Hansen, 2007). In Malaysia, the Malaysian Palm Oil Council (MPOC) insists that primary forests should no longer be cleared for oil palms. Oil palm expansion only occurs on land that has already been used for cultivation. However, the accusation of destruction of forests is far from reaching a conclusion and there is still a debate over the issues of converting degraded and secondary forests (Tan, Lee at al., 2009). Although the Malaysian oil palm companies claim good practice locally, they are accused of being behind a major forest conversion in Indonesia (Greenpeace, 2007).

Likewise, many Indonesian biofuel companies, and also the government, deny any link between oil palms and deforestation. Nonetheless, oil palm plantations are believed to be a major cause of fragmentation and loss of natural forests in Indonesia (Buckland, 2005; McCarthy and Cramb, 2009; Silvius, 2006; Koh and Wilcove, 2008). There is widespread debate on the definition of ‘forest’ and ‘deforestation’: oil palm plantations could be considered forests, in the view of many pro-oil palm commentators. The clearance by fire of land for plantations, including oil palms, could have negative impacts on biodiversity, natural habitats, global warming, and even human health (Tacconi, 2003; Murdiyarso and Adiningsih 2006; Simorangkir, 2007). Burning, which was part of traditional land management practice throughout Southeast Asia, is still considered the simplest, quickest, and cheapest method to clear land for plantations (Guyon and Simonrangkir, 2002). Prohibiting the use of fire would not be straightforward, as smallholders could not typically afford the initial outlay for heavy land-clearing machinery (Carson et al., 2007).

Both Malaysia and Indonesia established a strict ban on the use of fire in relation to the clearance of land during the 1990s. Malaysia has no severe smoke and haze problems, but its success in reducing fires might be related to the fact that most of their oil palm plantations were already established and did not require the same degree of land clearing for replanting. Indonesia's oil palms, in contrast, were often associated with fire because many oil palm plantations were just being established and fire was the easiest way to clear the land (Simorangkir, 2007). Oil palm companies, particularly in Indonesia, are often suspected of setting fire to natural forests intentionally in order to obtain land-use permits from the government (Casson, 2003). Moreover, forest degradation, including fragmentation from planting oil palms, increases the likelihood that a forest will dry out sufficiently to cause fires. Development of oil palms often brings an increase in both the degradation of surrounding forests and the types of human activities that might result in afire being started either intentionally or accidentally. Thus, many fires which occur in the areas surrounding oil palm plantations are likely to be attributable to the oil palm plantations whether as a direct or indirect consequence (Laurance, 2003, CIFOR, 2009).

Another factor contributing to deforestation in relation to oil palm expansion in Indonesia is land clearance fraud. According to the work of Casson (2000), Casson (2003), and Casson et al. (2007), some investors use oil palms as a means to gain access to timber because it can be easier to obtain land clearing permits than logging permits from the government. This explains why oil palm permits have been issued for 5.3 million hectares in West Kalimantan, whilst less than 1 million hectares of land has actually been planted with oil palms. In other words, the tropical forests were cleared, but oil palms were not planted. Thus we can deduce that, although 12.5 million hectares of degraded land was available in 2003, most oil palm plantations were established in natural forests. The gain from selling timber could offset the costs of establishing the oil palm crop, which otherwise take several years to repay.

Because biodiversity loss is directly related to deforestation, there is a concern about this issue particularly in Southeast Asia, where the lowland forests are amongst the world's most species-rich environments. Loss of these forests could threaten the region's exceptional conservation value (Tinker, 1997; Curran et al., 2004; Sodhi et al., 2004; Sodhi et al., 2006; Phalan, 2009). Research carried out in oil palm frontier areas on the island of Sumatra has concluded that oil palm plantations result in a significant biodiversity loss, whether the plantations replace primary and secondary forests, agroforests, or even degraded forests (Gillison and Liswanti, 1999; Maddox, 2007). Not surprisingly, several NGOs have campaigned against the oil palm plantations on the basis of the threat posed to endangered species such as the orangutan and the Sumatran tiger (FOE, 2004; Brown and Jacobson 2005). The work of Maddox (2007) also suggested that Indonesia's large-scale oil palm monocultures, which usually result in the near total clearing of former vegetation, are very poor habitats for most terrestrial mammal species.

The work of Aratrakorn et al. (2006) also showed that converting forest to oil palm plantations led to a 60 percent reduction in species richness, especially forest-dependent birds. Other endangered species are also threatened by oil palm expansion, as they are often captured or killed when the areas are opened up to establish the plantations. Sumatran elephants are considered to pose a threat to the oil palm industry because they often destroy the plantations and feed on the oil-rich palm nuts (Susanto and Ardiansyah, 2003). Orangutans have been known to become violent around the oil palm plantation areas because their food sources are threatened (Brown and Jacobson, 2005; Buckland, 2005), whilst Sumatran tigers are often killed if they are considered to pose a risk to oil palm workers (Brown and Jacobson, 2005). Indeed, it has become apparent that the impacts of oil palms are not only forest loss, but also the increases in human access and population, and their closeness to forest edges. The decline in biodiversity occurring around the oil palm plantations might not solely be from habitat changes, but from direct human impacts (Maddox, 2007).

However, the study of Turner et al. (2008) suggests that it would be possible to enhance biodiversity in oil palm plantations by altering vegetation characteristics at the local level or by increasing natural forest cover at landscape level. It is worth noting that the benefits in biodiversity resulting from these practices are relatively minor compared to the losses that can occur when the natural forests are cleared. On the positive side, oil palm plantations could be considered to pose less risk to the environment than most other alternative crops, simply because more oil palm crop can be produced on less land. Improving farm management, better yields from improved varieties and planting on degraded land could improve yields significantly without further deforestation (Hardter et al., 1997).

Because oil palm plantations consume large quantities of chemical fertilisers in order to increase and maintain yields, the oil palm industry was responsible for some of the 1900 percent increase in fertiliser use in Asia in the last four decades of the 20th century (Zhao et al., 2006).Chemical fertilisers increase eutrophication in water bodies and wetlands affected by runoff. In Malaysia, chemical runoff and palm oil mill effluents have entered rivers on which local communities depend and have created problems for the aquatic ecosystems (Kittikun, 2000; Johnstone, 2008). Additionally, pesticides and herbicides also increase pollution in general, especially with repeated use (Hartemink, 2005). The Malaysian government banned the use of hazardous herbicides and the oil palm industry then had to seek alternatives. Integrated biological pest management, such as using snakes to control rat populations (Fee, 2000), could offer an alternative to the use of pesticides. It was believed that many of the negative environmental impacts of oil palm plantations and palm oil production could likely be reduced significantly by good management (Yusoff and Hansen, 2007).

Nonetheless, most positive reports on the environmental impacts of oil palm plantations have been generated by oil palm companies and their collaborators, or by government agencies, which could then lack credibility, whilst most negative stories came from NGOs. A systematic assessment of these environmental issues by unbiased researchers is necessary and would be valuable for future oil palm development.

Undeniably, there have been considerable debates over the life-cycle analysis of GHG emissions. Amongst the most common biofuel crops, oil palm has the highest potential for carbon offsetting (Gibbs, 2008). A review of literatures soon showed that there are many different ways to assess the carbon emissions balance, which allow those for or against oil palms to find calculations to present the benefits or the drawbacks as they wish (Hill, 2007; Righelato and Spracklen, 2007; Danielsen et al., 2008; Searchinger, 2008; Butler et al., 2009). In brief, oil palms are claimed to have a positive net energy balance when compared to the use of fossil fuels. During palm oil production, carbon is lost when lands including natural forests are converted to oil palm plantations and when fossil fuels are used in management, processing, or transport. Net carbon gains are achieved when the total amount of carbon emitted from palm oil production is less than that emitted by burning an equivalent amount of fossil fuels. Estimating this net carbon balance requires an analytical tool generally known as the 'life-cycle' or 'well-to-wheels' approach.

According to Frondel and Peters (2007), each tonne of petroleum diesel releases approximately 3.57 tonnes of CO_2 into the atmosphere. However, the figures for oil palm based biodiesel are harder to estimate and would vary considerably with the context. The estimation depends on various factors, for instance, the fertilisers and irrigation system used in growing and harvesting oil palms, crop locations, conversion technologies, and processes of storing, distributing and retailing the palm oil (Udo der Haes and Heijungs 2007; von Blottnitz and Curran 2007; Liska and Cassman 2008; Börjesson 2009; Yee, Tan et al. 2009; Yu and Tao 2009). Besides, the impact of converting natural habitats to produce palm oil could have a substantial influence on the GHG balance. Replacing one hectare of primary forest with oil palms releases around 250 tonnes of aboveground carbon. This figure might be reduced to 160 tonnes of carbon per hectare when the oil palm trees reach maturity due to their containment of 90 tonnes of carbon per hectare (Tomich et al., 2002; Casson et al., 2007; Yusoff and Hansen, 2007). But not all forests are the same and certainly there is a considerable variation across locations.

Many researchers believe that producing and using oil palm based biodiesel from converted natural forests caused greater GHG emissions than refining and using an energy equivalent amount of fossil diesel, at least in the short term (Fargoine et al., 2008). In contrast, planting oil palms on degraded or open land could contribute to a positive net carbon total (Hartemink, 2005; Gibbs et al., 2008). The study of Reijnders and Huijbregts (2008) found that one tonne of palm oil could be linked to the emitted CO_2 ranging from 2.6 to 18.2 tonnes (3.57 tonnes for petroleum diesel). Based on a compilation of published data, Venter et al. (2009) estimated that each hectare of Southeast Asian tropical forest replaced by oil palms released an average of 698 tonnes of CO_2 over 30 years. However, the environmental impacts of oil palm plantations on non-CO_2 GHG emissions, such as methane (CH_4), volatile organic compounds (VOCs), and Nitrous Oxide (N_2O) are poorly understood and remain to be examined (Murdiyarso et al., 2002; Wuebbles and Hayhoe, 2002; Wilkinson et al., 2006).

Indeed, biodiesel from oil palms could release less carbon per unit of energy released than fossil fuels and still result in increased net carbon emissions in the short or medium term. This was because of the significant amount of carbon that was lost in the original land-use conversion, which would counterbalance any carbon benefits that oil palm based biodiesel might offer for a significant period. Estimates of the time required for oil palms to make carbon gains vary from 71 to 93 years for converting forests to oil palms and more than 600 years for peat-swamp forests (Danielsen et al., 2008; Gibbs et al., 2008). In contrast, oil palms planted on degraded lands might take only 10 years to become carbon positive (Danielsen et al., 2008) or, in some cases, they might become carbon positive immediately (Gibbs et al., 2008). Fargione et al. (2008) also found similar results, as the study showed that it could take 86 years to recover from the carbon debt of replacing normal forests with oil palms from biofuel production and uses, and 420 to 840 years if converting peatlands to oil palm plantations. Overall, it is believed by many researchers that oil palm plantations could contribute to global warming in the short term, if they replace vegetation with higher carbon content, such as tropical forests.

2.2.2 The Issues of Livelihoods

Research on the impacts of large-scale oil palm plantations on local communities vary greatly and are specific to local conditions (Giller et al, 2007; Phalan, 2009; Hought et al., 2012). Different regional characteristics including climate, political and institutional structures, and types of feedstock used suggest that the local context must be considered when evaluating the environmental and socio-economic impacts of farmers' adoption of oil palms. As mentioned earlier, most messages are highly conflicted and are disseminated by oil palm companies or NGOs based on a small number of selected case studies. In Malaysia, large-scale oil palm production benefits many rural people by providing income and employment, and thus enhances the quality of life of local people. The oil palm industry is seen as one of the country's largest employers (Barison, 2007). In Indonesia, the number of people who worked in the plantation sector was 1.7 to 2 million people (Wakker, 2006; Zen et al., 2006). Goenadi (2008) estimated that the oil palm industry profited around 6 million people, many of whom were rescued from poverty. At the national level, oil palms earned Indonesia export revenues of more than 12 billion USD in 2007.

According to Zen et al. (2006), oil palms have brought benefits to oil palm workers in terms of secure incomes, access to healthcare, and education. At times, oil palm companies have successfully engaged with local needs and investigated how local people would benefit from the plantations (Zen et al, 2006). However, some negative findings emerged. The first criticism was the exploitation of labour forces. It was alleged that 90 percent of the plantation workers in Sabah (in Malaysia) were Indonesians, who were employed for harvesting, weeding and other maintenance works, and essentially did not receive the rights and protection that a Malaysian worker normally obtained for hard and long hours of work (CIFOR, 2009). Women workers, who were preferred by oil palm companies as they were considered to be better at applying pesticides and fertilisers, often experienced serious health and safety problems for various reasons such as a lack of safety equipment or protective clothing (Marti, 2008).

Significant erosion of local culture and institutions has been reported by several commentators (Belcher et al., 2004; Sheil et al., 2006; Marti, 2008; Van Noordwijk et al., 2008, Borras Jr. et al., 2010). Conversion of forests to plantations has a substantial impact on forest-dependent people, who typically rely on forests for their diets, which include a wide range of wild plants and animals. Correspondingly the lifestyles of these people are difficult to reconcile with the more repetitive and orderly works and landscapes required for development of large-scale oil palm monocultures. There are also accounts of abuse of local people by oil palm companies because of the frequent conflicts (FOE, 2008; Marti, 2008). Friends of the Earth (2008) stated strongly that the unsustainable expansion of Indonesia's palm oil sector has left many indigenous people and communities without land, water, or sufficient livelihoods. Some communities were being denied their human rights, such as the right to water and health and the right to be protected from ill treatment and arbitrary arrest.

In the case of small-scale palm oil production, oil palms are attractive to farmers because they offer good returns from a low outlay (Belcher et al., 2004). The average net incomes of Indonesian small-scale oil palm farmers in 1997 were seven times higher than those of subsistence farmers (Hardter et al., 1997; Hartemink, 2005). Generally, smallholders achieve lower yields than large-scale oil palm producers: 66 percent less according to Hasnah and Coelli (2004)'s study in Indonesia. Research suggests that small-scale oil palm production has gained a significant role in the palm oil sector and the yields would rise rapidly, particularly in Indonesia, if the smallholders had sufficient training, support, and good planting materials (Hartemink, 2005). Indeed, oil palms are rapidly becoming a smallholder crop, especially in Indonesia. In 2006, in both Malaysia and Indonesia, small-scale oil palm producers accounted for approximately a third of the palm oil production and 35 to 40 percent in terms of area cultivated (Vermeulen and Goad, 2006).

Small-scale oil palm farmers typically function in one of two ways: supported or independent, each of which has its own risks and benefits. Supported farmers share risks with either oil palm companies or the government but they lose their independence and have less flexibility in how they manage their land. In return, they might have a guarantee that the prices will be more stable than in the local markets. Independent farmers, on the other hand, face other risks, such as being susceptible to the theft of ripe crops. Access to capital is an important issue for most small-scale oil palm producers, who might have trouble getting loans or face arduous repayment schedules. Both types of smallholders are tied to a long-term crop and exposed to significant financial risks, for instance, poor harvests due to natural disasters, fluctuation in palm oil prices, and pests and diseases (Vermeulen and Goad, 2006).

Although expansion and improvement of small-scale oil palm production presents a major opportunity for meeting the rising demand for palm oil, it is important to note that small-scale oil palm farmers are notorious for poor management of their plantations (Hasnah and Coelli, 2004; Hartemink, 2005). As mentioned earlier, smallholders almost always use fires to clear land, thus causing environmental degradation. This is because the farmers are unable to afford expensive land clearing machinery and because they are accustomed to using fire in the land preparation process. These small-scale famers rarely follow the regulations and often clear the land without the appropriate permits (CIFOR, 2009).

Moving to the issue of land tenure, oil palm expansion has called critical attention to potential conflicts between land use and food security, especially in the case of large-scale projects where land tenure is poorly defined (Tauli-Corpuz and Tamang 2007; Cotula et al., 2008). According to Hall et al. (2012), the dramatic expansion of export-oriented crops including oil palms and conflicts over land use could lead to different forms of exclusion in Southeast Asia. The exclusion from land use of some is a necessary condition for the use of land by others. According to the case study of palm oil in Malaysia (Hall et al., 2012: 21), as the booming crop has spread rapidly, 'volatile exclusions' have emerged, which have fostered "a strong tendency for people to make more individualized claims to land". McCarthy (2010) explored the consequences of massive plantation investments in the oil palm sector in Indonesia. He found that the social, political, and economic conditions on the ground affect outcomes in widely divergent ways depending very much on the 'terms' under which incorporation into the oil palm economy occurs, such as the workings of land tenure systems and the informal land market. This research found that displacement and dispossession are crucial parts of the oil palm narrative and are the parts that those with a positive vision of biofuel development are keen to hide.

Contested tenure has affected most large-scale oil palm development to some degree. Every oil palm company in Sumatra had land disputes with local communities during 2000 (Vermeulen and Goad, 2006) and these land tenure disputes often led to conflicts, injuries, intimidation, arrests, tortures, and even deaths (DTE, 2000; Nicholas, 2005; McCarthy, 2009; Hall, 2011). According to Colchester et al. (2006)'s study in Indonesia, procedures for gaining land titles are ambiguous, absent, defective, or rarely applied, though the rights of traditional communities to their lands are recognised in law. Interestingly, potential title disputes might be one of the reasons why oil palm companies prefer to develop in forest areas rather than cleared or degraded areas. On cleared land, many individuals might move into the areas and claim ownership. The oil palm companies would then have to negotiate with more stakeholders than in forested areas, which are often within the claim area of a single village, or only a few. Negotiating with a large number of parties increases the costs to the companies and potentially delays the establishment of the plantations (CIFOR, 2009). In Indonesia, Matri (2008) also reported that there were social conflicts between oil palm companies and small-scale producers, as some smallholders had a desire to plant other crops on their lands, but were contractually obliged to plant oil palms on the majority of their land holding.

The current 'first generation' biofuel technologies are based on conventional agricultural commodity crops, which are land-intensive and have been widely criticised (Murphy et al., 2011; NCB, 2011) Increasing the land devoted to biofuels could possibly mean a reduction of land for food and feed crops. Hence, there is an ongoing debate on land competition between food and biofuels (FAO 2008a; FAO 2008b; NCB, 2011). The sharp rise in the price of crude oils has meant that grain, sugar, and oilseed crops including oil palms are increasingly being planted in order to produce biofuels. Using food to produce biofuels might place a further tension on already tight availability of arable land, thus pushing up food prices and raising concerns over food security. Palm oil is the cheapest food oil in many countries and it is feared that palm oil production would link the price of palm oil and food prices more closely.

Biofuels, including biodiesel from oil palms, have received enormous criticisms for being one of the major factors in increasing food prices. The rising demand for biofuels and the ensuing increase in food prices will negatively affect the food security of the poor, especially in the least developed countries, who are net buyers of food and have to buy food through international markets (FAO, 2005; Worldwatch Institute, 2006; Cassman and Liska, 2007; Fresco, 2007; Naylor et al., 2007; IFPRI and Rosegrant, 2008; Msangi, 2008; Royal Society, 2008; FAO, 2008a; FAO, 2008b; Zhou and Thompson, 2009; NCB, 2011). Mendoza (2007) once stated that biofuels were the greatest threat to food security particularly in the low-income countries because of their influence on the supply and price of staple foods.

However, many blame the rise in food prices on quite separate issues. Cassman and Liska (2007) suggest that even without land competition, food prices will rise with increased fuel costs resulting from the increased costs of management, agricultural inputs, processing, and transport. Speculators turned away from the relatively risky stock market and property sectors to invest in food commodities, and their activities are also important drivers for a rise in food prices. Higher prices for cooking oil and other staple foods such as soya, rice and beans are also attributable to severe weather and floods in major food producing areas (CIFOR, 2009).

Although there is general evidence that biofuel production has contributed to the volatility of food prices, which adversely affects the poor that rely on food imports, it is clear that biofuels are only one factor. According to von Braun (2007), the world food situation is already changing rapidly due to a range of powerful forces, for instance, income growth, urbanisation, high energy prices, globalisation, and climate change. These completely transform food consumption patterns, production, and markets. Even without biofuels, world food and energy prices and fluctuations are increasingly linked. There have been calls for an urgent research response to examine the role of these relationships and processes. Cassman and Liska (2007) suggested that the critical challenge was not only to produce enough food to meet rising demand from population increase and expansion of biofuel production, but to do so in an environmentally sound and socially sustainable manner.

In short, biofuels including oil palms are seen as a renewable source of energy, with the potential to contribute to energy security, reduce GHG emissions, support sustainable development by providing increased employment and income to some rural populations, and to contribute to poverty reduction (Clancy, 2008; Reddy et al., 2008; Sukkasi et al., 2010). However, it is as yet unclear whether biofuels will alleviate or aggravate poverty in the long term, particularly amongst the most vulnerable rural smallholders (Arntdt et al., 2010). The report from the Nuffield Council on Bioethics (2011) concludes that many biofuel policies fail to take account of important ethical issues, for instance, protecting human rights, environmental sustainability, climate change mitigation, just reward, and equitable distribution of costs and benefits. Evaluating potential advantages and disadvantages of biofuels was specific to local conditions.

2.3 Oil Palm Basics and Oil Palm Plantations in Thailand

Following on from the literatures mentioned earlier, this research was shaped by curiosity as to why small-scale oil palm farmers choose to undertake oil palm cultivation and whether the oil palm plantations specifically in the Northeast region of Thailand have had an impact on their environment and livelihood, and if so in what ways. This section, then, focuses on the background and structure of the oil palm sector in Thailand and the Northeast region in order to set forth the fundamental knowledge required to analyse oil palm issues. This includes the ongoing debates as to whether oil palm plantations can be economically viable in the Northeast region.

Agriculture is indisputably the major economic activity of the Northeast region. The region had 57.6 million rais of agricultural land areas, the highest number of the country, which accounted for 43.7 percent of Thailand's agricultural lands in 2008. Rice paddy field occupied the majority of the land areas at 37.7 million rais, 65.3 percent of the Northeast's agricultural lands during the same period (OAE, 2010a). Although the region has the highest number of agricultural households and farm labour (see Table 2.1), the Northeast has reputation of infertile sandy soils, water shortages, poor irrigation systems, and low socio-economic indicators comparing to other parts of the country. The average farm income of farmers in this region was the country's lowest figure at 62,227 Baht per year, far below the average of 132,184 Baht nationwide in crop year 2008/2009 (OAE, 2009).

The Northeast typically faces shortages of irrigation water during many months of the year, especially in the dry season and also suffers from severe flooding during periods of heavy rainfall in the rainy season. This results from the fact that rainfall in the region is not equally distributed in space and time and the sandy soils at the surface are not able to capture the available water long enough for the crop use (Moroizumi et al., 2009). In addition, the irrigated area in the Northeast was only 3.78 million rais in 2008, equivalent to 6.6 percent of the Northeast's agricultural lands (OAE, 2009). Consequently, low crop productivity happens throughout the region (Phien et al., 1980; Wijnhoud et al., 2003; Moroizumi et al., 2009).

Table 2.1: Socio-Economics Indicators of Farm Households in Thailand (2008/2009)

Indicators	Crop Year 2008/2009				
	Country	**North**	**Northeast**	**Central**	**South**
1. Incomes (Baht/Household)	**219,912**	**208,440**	**152,447**	**369,043**	**296,935**
- Farm Incomes	132,184	142,263	62,227	254,378	210,493
- Non-farm Incomes	87,728	66,177	90,220	114,665	86,442
- Ratio of Farm to Non-farm Incomes (%)	60.11	68.25	40.82	68.93	70.89
2. Number of Farm Households (Million Households)	**5.86**	**1.34**	**2.74**	**0.85**	**0.93**
3. Household Size (Persons/Household)	**4.19**	**4.03**	**4.15**	**4.29**	**4.12**
4. Agricultural Labour Aged 15-64 (Million Persons)	**16.08**	**3.91**	**7.55**	**2.43**	**2.30**
5. Occupied Lands (Rais/Household)	**22.62**	**23.57**	**21.52**	**27.77**	**18.05**

Source: OAE (2009)

Oil palms need tropical, humid conditions to thrive, with an ideal annual rainfall of 1,780 to 2,280 millimetres and a temperature range of 24 to 30 ^{o}C (NewCrop, 1996). Thus, the conditions in Southeast Asia are ideally suited. Oil palms can also be productive on a wide range of soil types including 'problem soils' (Auxtero and Shamshuddin, 1991), as long as the plantations are well watered. Seasonal droughts greatly reduce the yields of oil palms as water-stressed oil palm trees produce fewer female flowers and thus lower yields (Barison, 2007). Direct sunshine also benefits oil palm yields, which explains why yields are higher in Southeast Asia than in West Africa, which has a greater incidence of cloud (Dufrene et al., 1990).

Under appropriate management, each oil palm tree can produce 10 to 15 bunches of fruits per year, with an average weight of 15 to 20 kilogrammes per bunch. Total fresh fruit bunch (FFB) yields are thus 15 to 30 tonnes per hectare per year. These FFB yields often vary with the terrain, but patterns are unpredictable. For instance, the highest yields are generally from higher ground but sometimes also found in valleys (Balasundram et al., 2006). Lower FFB yields are attributable to, for instance, labour shortages, low-grade planting materials, oil palm trees being too old or too tall, inadequate fertiliser application, increased production costs, and pests and natural disasters (Casson, 2000). Under good conditions, these oil palm bunches are 52 percent dry weight and have an extractable oil content of 15 to 25 percent, depending on ripeness at harvesting time (Weng, 1999; Henson, 1999). Oil palm seedlings are typically raised in a nursery for a year before being ready to plant out. Oil palms mature rapidly and fruits can be harvested within 2 to 3 years of planting, although the trees are most productive when they are between 9 and 15 years old. After 25 to 30 years oil palm trees become too tall for the fruit to be harvested (Barison, 2007).

Most modern oil palm varieties belong to the Tenera group, which was developed by crossing the wild type Dura and the shell-less Pisifera. The Tenera varieties, which are widely cultivated in Asia (Wahid et al., 2005), are easier to process than wild oil palms (Poku, 2002). In recent years, yields and disease resistance have been improved by plant selection and breeding; selected varieties can produce 2 to 3 times higher yields than Tenera varieties. In addition, various genetically modified plants are being developed with the aim of producing shorter oil palm varieties that could yield fruits for longer than 25 years (Parveez et al., 2000). However, it remains to be demonstrated what improvements can be achieved in practice and how much is commercial ‘hype’. It is also important to note that oil palm fruits deteriorate very quickly once harvested and must be processed into crude palm oil (CPO) within 48 hours (Vermeulen and Goad, 2006).

In Thailand, oil palm plantations have increased significantly from 2.41 million rais in 2004 to 4.08 million rais in 2010, i.e. an increase of more than 1 million rais in the last seven years. Out of the total oil palm planted areas in 2010, 3.55 million rais were mature oil palms. The southern provinces of Thailand have the most suitable climatic and soil conditions for oil palm cultivation, and account for approximately 90 percent of the total oil palm land cover. Prominent areas of oil palm expansion were also found in the Eastern region, for example in Chonburi and Trat provinces, and in some provinces in the North and Northeast regions including Nong Khai province (the research’s field site), which had 24,848 rais of land planted with oil palms in 2010 (see Table 2.2). In the same year, 121,306 households were involved in oil palm cultivation, mostly on small to medium sized farms (OAE, 2010c). According to Dallinger (2011), small-scale farmers, i.e. those who own less than 50 hectares (325 rais) of land, account for approximately 70 percent of the total oil palm land in Thailand and a similar percentage of FFB production.

Annual FFB yields per rai in Thailand have increased significantly from 1,964 kiligrammes per rai per year in 1998 to 2,315 kilogrammes per rai per year in 2010, despite some fluctuations over the last 5 years (see Table 2.2). The overall oil extraction rates in Thailand ranged from 16.06 percent to 17.00 percent between 2006 and 2010. In terms of palm oil production, there were 14 biodiesel plants, 12 palm oil refineries and 60 oil palm crushing mills in operation in Thailand. In 2010, production of CPO reached 1,287,509 tonnes, of which 65,942 tonnes (5.1 percent) was exported. This figure is the normal proportion of Thailand's palm oil that is exported, as the average palm oil export was around 6 percent between 1990 and 2010 and it was only in a few specific years that the figure reached 20 percent of total CPO production. It is important to note that 380,000 tonnes of CPO, which accounted for 29 percent of total CPO production, were used to produce biodiesel in 2010.

Focusing on the oil palm expansion in the Northeast region, there is much debate and discussion amongst Thai academics as to whether oil palm plantations could become economically viable in the Northeast region. Pratummintra (2008)'s findings suggested positive outcomes in planting oil palms in the Northeast. Field site testing in collaboration with the Nong Khai Oil Palm Research Centre (NKO) confirmed that oil palms started to yield in the second year with an average production of 1.3 tonnes per rai per year and 22 percent oil content, significantly better than the standard yields of 900 kilogrammes per rai per year and 19 percent oil content. Besides, the survey and mapping analysis carried out for this study showed that the Northeast region has shallow groundwater levels, less than 1 metre below the surface, which is considered highly suitable for oil palm cultivation. This region also has a plain land with sandy soil and sandy clay loam, in which rice and cassava cultivation cannot offer high productivity as the topsoil does not retain water. Consequently, the study postulated that oil palms could be economically viable in the region and would be a good alternative for farmers.

Table 2.2: Oil Palm Planted Areas, Annual FFB Yields, and Oil Extraction Rate in Thailand, between 2006 and 2010

Country/ Regions	Oil Palm Planted Areas (thousand rais)					FFB Yields (kilogrammes per rai)					Oil Extraction Rate (percent)				
	2006	2007	2008	2009	2010	2006	2007	2008	2009	2010	2006	2007	2008	2009	2010
Whole Country	2,953.92	3,227.85	3,676.10	3,888.40	4,076.88	2,828	2,399	3,214	2,560	2,315	16.32	16.45	16.65	17.00	16.06
1. Central Region	228.89	291.66	381.24	411.95	446.53	2,321	1,825	2,956	2,440	2,069					
2. Southern Region	2,725.03	2,908.96	3,246.13	3,421.32	3,535.64	2,869	2,447	3,248	2,589	2,367					
3. Northern Region	-	2.15	7.02	8.39	19.68	-	-	373	474	412					
4. Northeast Region	-	25.08	41.70	46.73	75.03	-	-	508	702	824					
- Nong Khai (the field site)	-	17.16	18.98	21.90	24.85	-	-	29	569	512					

Source: OAE (2010c)

The work of Sakulareewattana et al. (2009) also confirmed the suitability of oil palms for the region. The study involved developing oil palm varieties in search of high yield varieties suited to the conditions in the Northeast. The results indicated that oil palms, especially the hybrid variety Surat Thani 2, could be grown and achieve reasonable yields in the region if they were planted in appropriate areas and had appropriate water and farm management. Additionally, Chaikiattiyos et al. (2008) pointed out in their study based on the evaluation of existing oil palm trees in the Northeast region that oil palm farming in the region made sense, but one of the most important factors in determining its success was the source of planting materials, such as the quality of oil palm seedlings.

However, some academics have suggested the opposite. The studies of Yingjajaval (2005), Yangdee (2007), and Esaan Alternative Agriculture Network (2010) found that planting oil palms in the region was extremely risky due to the environment being unsuitable. The chief factor in the unsuitability was intermittent shortages of underground water resulting from the uneven distribution of rainfall over a period of time. This region faces 115 days of water annually and 1,500 millimetres of annual rainfall, which directly affects yields and oil content. Hesakul (2009) also indicated that the crop was not worth the investment because of a lack of knowledge and skills in growing oil palms, including variety selection, maintenance techniques, and oil palm diseases. In addition, the nearest oil palm crushing mill is located in Chonburi province, a distance of 700 kilometres from Nong Khai province. Thus, the high transportation cost would make oil palm investment in this region infeasible.

2.4Conclusion

This chapter has discussed the relevant literatures on biofuel development, specifically in oil palm based biodiesel development and the controversial issues concerning its impacts on the environment and traditional livelihoods. Although biofuels are believed to offer benefits to many developing countries in terms of improving energy security, promoting rural economic development, and mitigating climate change, cultivating oil palms, which are one of the potential feedstocks for biofuel production, could result in negative impacts on the environment: loss of natural forests and biodiversity due to conversion of forest lands to oil palms, using fire in land clearing processes, land clearance frauds, large-scale monoculture, and chemical fertiliser runoff, and potential increases of global carbon emissions from the plantations themselves as well as from deforestation. Oil palm expansion could also threaten the lifestyles and livelihoods of local farmers in ways such as erosion of local cultures due to forest clearance, exploitation of labour forces, abuses against local people, land tenure conflicts, and food security issues.

The basics of oil palm cultivation and the structure of the oil palm industry in Thailand were also presented in this chapter, in order to provide fundamental knowledge for understanding the change to oil palm cultivation in Nong Khai province which is dealt with in the empirical chapters which follow (Chapters 4 and 5). Southeast Asian countries including Thailand are known to be ideal places for oil palm plantations because of high annual rainfall, temperature, and sunlight hours, which could lead to higher yields and oil extraction rate. In Thailand, oil palm plantations have surged to 4.08 million rais in 2010, of which 24,848 rais are in Nong Khai province (the research's field site). However, literatures on the economics of oil palm plantations in the Northeast region of Thailand have identified concerns over the environment in this region being inappropriate for oil palm plantations.

The following methodology chapter contains the analytical framework of the research, which I specifically developed in order to understand the change to oil palm cultivation in the northeast of Thailand. This framework highlights the farmers' decision to start growing oil palms, the socio-economic impacts of the change and its policy processes specifically in the context of Thailand. Choices of methodologies, the research questions, and the design of the research will also be introduced and discussed in the next chapter.

Chapter 3:
Research Framework, Logic, and Methods

The preceding chapters established the rationale, the significance of the research topic and the significance of the expansion of oil palm farming for developing biodiesel, from both global and Thai perspectives. This chapter develops the analytical framework used to analyse oil palm issues specifically in the Thai context and also provides a critical account of the design of the study and the research methods used.

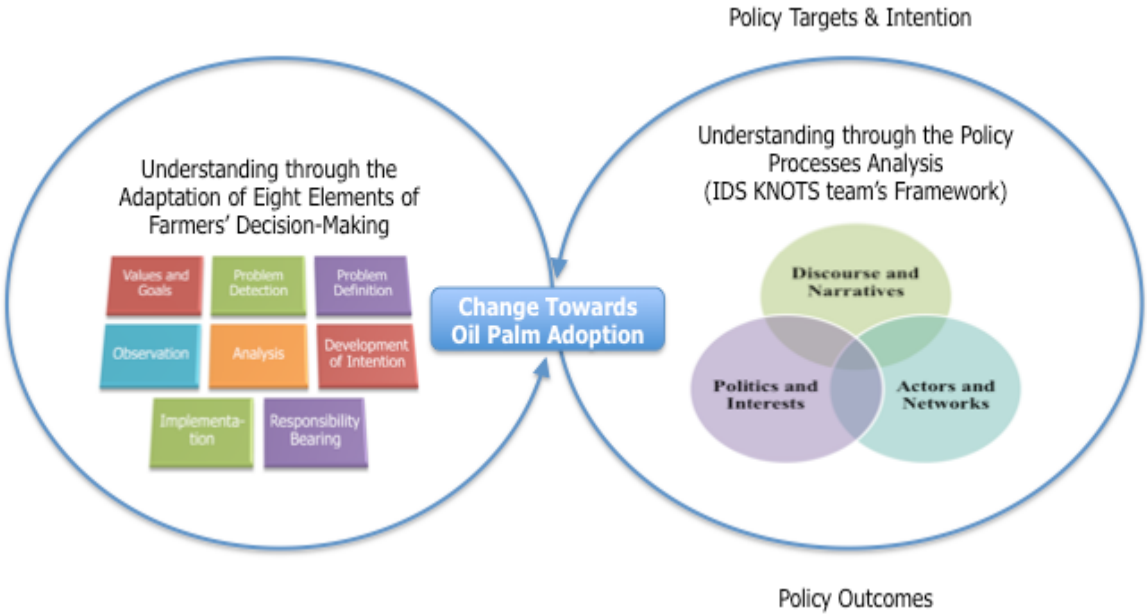
This chapter consists of six sections. The first section is the analytical framework of the study. The second section describes the choice of methodology, research question and sub-questions. The third section focuses specifically on research sites and sample selection. It includes some reflections on the author's research experiences and considers how some of the difficulties encountered were resolved. The fourth section covers data collection and data analysis, and the fifth discusses ethical issues in the fieldwork. The chapter ends with a summary of the key points.

3.1 Analytical Framework of the Research

The analytical framework of this research consists of two main theoretical approaches, namely the eight elements of farmers' decision-making, and IDS KNOTS team's framework on policy processes. The analytical framework is introduced at the beginning of this chapter (see Figure 3.1 below) in order to provide a holistic view of the research before exploring in detail the two theoretical approaches and how they were developed for analysing the change to oil palm cultivation, specifically in the Thai context. The two different analytical approaches mentioned earlier are drawn on in order to encompass the oil palm issues fully, as exploring only one particular perspective could not fully reflect the reality of the oil palm issues in the Northeast region of Thailand. Because of a substantial increase in oil palm plantations in Nong Khai province in particular, it was necessary to understand the rice farmers' rationale for engaging in oil palm cultivation. Comprehending the decision-making of oil palm farmers provided a fundamental insight for further analysis of oil palm policy processes, to investigate whether the change to oil palm cultivation was significantly influenced by the oil palm expansion policy and, if so, in what ways. Thus the first sub-section is devoted to discussing the adaptation of eight elements of farmers' decision-making theory, with the aim of understanding the change to oil palm cultivation from the bottom up, as well as identifying the factors which influenced the local farmers in choosing whether or not to move to oil palm cultivation.

The second sub-section then explores approaches to policy processes and employs IDS KNOTS team's framework for policy analysis of oil palm planting in Nong Khai province. The final sub-section presents the analytical framework of the research, which is shaped by the adaptation of these two main theoretical approaches, in order to comprehend the change towards farming oil palms, specifically in the Thai context.

Figure 3.1: Analytical Framework of the Research



Source: Diagram by the Author

3.1.1 Adaptation of Eight Elements of Farmers' Decision-Making Concept

Figure 3.2 below presents the concept of eight elements of decision-making, which are: values and goals, problem detection, problem definition, observation, analysis, development of intention, implementation, and responsibility bearing. The researcher has adapted this concept to suit the aims of the research, which was to understand the change to oil palm cultivation through the farmers' perspectives, a bottom-up approach per se. The adaptation of the eight elements concept will be discussed after a brief survey of the literature on farmers' decision-making.

Figure 3.2: Eight Elements of Farmers' Decision-Making

Source: Ohlmer et al.(1998)

Most research and teaching across the social sciences has explored the drivers of individual behaviour and suggested various models of decision-making from diverse perspectives ranging from, for instance, utility-based decision models and behavioural economics, technology adoption theory and attitude-based decision-making, social and environmental psychology, and social construction of decision-making (Wilson and Dowlatabadi, 2007). However, few studies have been made of how farmers make decisions (Ohlmer et al., 1998).

In the literature on how farmers make decisions, the decision-making process has traditionally been viewed as a linear series of stages, a list of five to eight decision-making steps (Bradford and Johnson, 1958; Johnson et al., 1961; Castle et al., 1972; Boehlje and Eidman, 1984, Castle et al., 1987; Kay and Edwards, 1994). Johnson et al. (1961), for example, identified six steps of decision-making, namely problem definition, observation, analysis, decision, action, and responsibility bearing. Steps not listed explicitly by Johnson et al. (1961) but listed by others include setting goals, monitoring, and evaluating outcomes. It was implied that these steps followed sequentially for every decision; however, researchers (Witte, 1972; Johnson 1976; Mintzberg et al., 1983; Johnson, 1986; Johnson, 1994) have found that farmers do not follow the decision-making process sequentially. Based on the insight that farmers should not be expected to follow a common set of steps in any simple, sequential process, Ohlmer et al. (1998) developed eight elements of decision-making at the farm level, which are: values and goals; problem detection; problem definition; observation; analysis; development of intention; implementation; and responsibility bearing (see Figure 3.2). These eight elements may or may not be sequential and should be viewed as separate actions. Each element may be part of an individual decision, but every element is not required to be part of every decision.

This research has therefore adapted the conceptual model of farmers' decision-making process developed by Ohlmer et al.(1998) as a tool for understanding the farmers' decisions to adopt oil palm cultivation, particularly in the Thai context. This decision-making model was chosen because it includes farmers' values and goals, which is essential to understanding farmers' behaviour in moving towards oil palm cultivation. A Theory of Human Need (THN) developed by Doyal and Gough (1991) was employed to elaborate farmers' needs in the values and goals element and to investigate whether oil palm adoption was in fact meeting their needs. Although Ohlmer et al. (1998) has proposed a revised model of decision-making, which is viewed as a matrix of four phases (problem detection, problem definition, analysis and choice, and implementation) and four sub-processes (searching and paying attention, planning, evaluating and choosing, and checking the choice), reflecting the non-linear process of making decisions. The farmers' values and goals are not listed in this revised model as they should be understood to have been developed before the start of any decision-making processes. Because values and goals are essential to comprehending the factors shaping farmers' decisions to plant oil palms, I chose to adapt the traditional eight elements of decision-making to comprehend the oil palm issues in Nong Khai province.

The values and goals element is the first of the eight elements of farmers' decision-making to be explored. Values and goals can significantly affect farmers' decision-making. Values signify the goodness and badness of results, situation, and things, and express the farmers' needs. Goals are things for which farmers have decided to strive and are a means for the farmers to follow their values. In this element, I have given priority to understanding the farmers' needs by analysing them through the lens of THN. According to Doyal and Gough (1991), "physical health and autonomy are the two basic needs for all human beings and if these two are not satisfied, individuals will suffer serious harm, which significantly impairs the achievement of their goals (page 73)".

According to THN, these basic needs are not satisfied directly, but are met through the satisfaction of eleven intermediate needs, which are met in different societies via locally determined specific needs satisfiers. The eleven intermediate needs are food and water; housing; a non-hazardous work environment; a non-hazardous physical environment; health care; security in childhood; significant primary relationships; economic security; physical security; education; and safe birth and child-bearing. When individuals' basic needs are met, according to THN, it enables them to participate more fully in social life. For example, when individuals are in good health, they can perform cultural activities such as "*tum boon*" (paying respect to the Buddha by giving donations to the temple) or "*fung ted*" (listening to monks preach).When people are autonomous they are in control of what they believe to be in their interest. Certainly, planting oil palm is one of the farmers' aims and strategies in the case study.

In this respect, this element aims to investigate the eleven intermediate needs or "needs satisfiers" of the farmers in relation to oil palm adoption in Nong Khai province, in order to understand their needs in choosing to cultivate oil palms. After understanding the farmers' needs, there are two key questions to be investigated: what other factors (for instance, what kind of personal histories and belief systems) shape the farmers' decision to adopt the oil palm? And what are the consequences after oil palm adoption? Are the farmers' needs met? The second to sixth elements will be adapted to answer the former question, whilst the seventh and eighth elements aim to address the latter.

Problem detection is the second element. According to Ohlmer et al. (1998), it involves examining both internal and external data to become aware of a problem or opportunity. The word "detection" is used instead of "recognition" as one must detect a problem before one can recognise it. Problem detection is essential for the farmers to be motivated to engage in the decision-making process. Thus, in this research this element focuses on the farmers' perception of rice cultivation, as every household interviewed was or had previously been involved in the paddy fields; rice cultivation was a crucial activity that significantly affected the farmers' decision about oil palm adoption.

Problem definition is the third element. Problem definition is typically the process of stating the problems, searching for options, and then identifying alternative actions in order to solve the problems. Having used the previous elements to understand the farmers' needs and their problems, I have adapted this element to understand the reasons why the farmers choose oil palm cultivation rather than other possible crops such as eucalyptus, cassava or rubber. The options are evaluated in terms of their compatibility with the farmers' morals, values, beliefs and goals.

The fourth element is observation, which involves collecting and processing information about the options favoured by the farmers, such as the information required to plan the actions, and information about the consequences of the actions. Because specific knowledge and a significant amount of capital are required to grow the crop successfully, the research uses this element to examine the farmers' sources of knowledge about oil palm cultivation and of funding for it. This element connects the oil palm farmers with key actors in the research, for example, the local government agencies for providing knowledge, or Nong Khai Oil Palm Research Centre (NKO) for providing financial support to the oil palm farmers. This element also discusses the differences in the knowledge acquired by and sources of funding available to the oil palm farmers in the three villages in the study.

The next element is analysis, which typically involves planning actions, estimating consequences, evaluating, and opting for actions. However, this element is adapted to highlight the key factors affecting the farmers' decision in choosing to adopt oil palm cultivation. In order to understand the oil palm issues in Nong Khai province from a different perspective, the final section of this element is devoted to the analysis of rice farmers who have not yet adopted oil palm cultivation, using another set of evidence from 18 households in the three villages.

Development of intention, the sixth element, is about deciding to implement the actions selected based on social norms, personal norms, habit and direct influence of the situation. The choice having been made, through the factors discussed in the previous five elements, to move to oil palm cultivation does not guarantee implementation. Thus, this element is adapted to understand the farmers' view of oil palm cultivation based on personal norms and habits. This element examines whether oil palm planting is suited to the farmers' lifestyle and in what ways.

Next is the implementation element, which typically involves acquiring resources, putting the selected plan into action, controlling the results and evaluating them. However, this thesis focuses on evaluating the socio-economic aspects of the farmers' situation after the implementation of oil palm cultivation in the study areas. In social terms, the changes to the farmers' ways of life as a result of oil palm adoption will be investigated, whilst in economic terms, the farmers' financial situation after adopting oil palm production will be examined and explanations given of both troubled and thriving households.

The last element is responsibility bearing, which is about accepting the evaluation after implementation, and realising who is responsible for the decision-making. This element is used to discuss the consequences of oil palm adoption in terms of the farmers' satisfaction with the oil palm crop in relation to their needs as discussed in the first element. This will be analysed at two different stages of growing: households who have started harvesting, and those waiting to harvest for the first time. Problems related to the growing of oil palm will also be highlighted.

3.1.2 Policy Processes Approaches

The adaptation of the concept of eight elements of farmers' decision-making provided us with an understanding of the transition to oil palm from the farmers' perspective. However, this study found that the oil palm expansion policy, which is currently under the direction of the 5-year Oil Palm Industry and Palm Oil Development Plan (2008-2012) (MOAC, 2008) and the 15-year Alternative Energy Development Plan (2008-2022) (DEDE, 2008), was a crucial factor affecting the farmers' change to the oil palm adoption. Hence it is necessary to develop a framework for policy analysis that allows us to understand the transition to oil palm farming specifically in the Thai context. This sub-section then presents the analytical framework of IDS KNOTS team that was used in analysing oil palm expansion policy and explains how they were developed and applied to the research. We will begin by briefly considering the literature on the approaches to policy processes.

In fact, there is a large amount of literature and a long-running debate on how to understand policy processes, which can be characterised into two main perspectives: rationalist and political. The rationalist believes that science is sufficiently well developed and should be applied to policy-making processes so that the most rational policy positions are adopted. Thus, the rationalist approach suggests that a linear policy-making process, in which rational decisions are taken by those with authority and responsibility for a particular policy area, should underpin policy making. In other words, the rationalist views policy-making as a technocratic, top-down, problem-solving process, which involves a number of stages that lead to a policy decision (Sabatier, 1986; Thomas and Grindle, 1990; Gasper and Apthorpe, 1996; Keeley and Scoones, 1999; Sutton, 1999; Blaikie and Soussan, 2001; Pasteur, 2001). Within the linear model, decisions are made rationally through each logical stage of the process, starting from understanding the policy issue or problem (agenda-setting), exploring possible options for resolving the problem, weighing up the costs and benefits of each option, making a rational choice about the best option (decision-making), implementing the policy, and ending, possibly, with evaluating the outcome (KNOTS, 2006).

In the linear approach, it is assumed that there is a clear separation between policymaking and policy implementation. As defined by Lampton (1987: 5), policy implementation is "the stage between the high politics of policy formulation and feedback once the effects of policies become apparent". The linear model treats implementation as separate activity that occurs after policy decisions have been made. In this model, the implementation is viewed as administrative activity meant to resolve the problem as understood in the policy. The dichotomy between policy-making and implementation is a major fault in the linear model because policies often change as they move through bureaucracies to the local level where they are implemented (Juma and Clark, 1995).

The main consequence of the separation between policy-making and implementation is the possibility that policy-makers will avoid taking responsibility. This is because it dangerously separates the decision from the implementation and hence opens up "escape hatches" through which policy-makers can shirk responsibility (Clay and Schaffer, 1984). Failure to achieve the intended results is often not blamed on the policy itself, but on, for instance, unsuccessful management of and commitment to implementation, weak institutional capacity, shortage of resources, or a lack of political will (Clay and Schaffer, 1984; Thomas and Grindle, 1990; Juma and Clark, 1995; Brinkerhoff, 1996).

This traditional model of policy-making assumes that policy-makers approach the issues rationally, going through each logical stage of the process and prudently considering all relevant information. Also, there is an apparent separation of facts (a rational policy approach, based on evidence, sciences, and objective knowledge) and value (seen as a separate issue, dealt with in the political processes). Policy-making is a bureaucratic or administrative exercise, in which implementation is an entirely technical or administrative procedure (realm of facts), whilst decision-making is indivisible from politics (realm of value). Scientific expertise is presumed to be independent and objective, and the role of technocrats is viewed as crucial to the process of making rational decisions (Wolmer and Scoones, 2005; KNOTS, 2006).

On the other side, the political view argues that science can rarely provide a definitive answer to any policy choices. The act of policy-making is fundamentally political, and the traditional model of policy processes cannot adequately and accurately reflect the complexity of the reality (Parson, 1995; Hill, 1997, Brock et al., 2001). To allow technical experts to take a key role in policy decision-making is to foster technocracy, which stands in opposition to democracy. Policy is, in fact, an astonishingly slippery word and difficult to define as Keeley and Scoones (1999: 3) have pointed out: "policy is rather like an elephant: you know it when you see it, but you cannot easily define it". In this political approach, policy-making must be understood as a complex and messy process, by which policy is formulated and implemented, and involving a range of actors. Policy-making processes are by no means the purely technical, rational activity that they are often held up to be, but are incremental, complex and messy as Lindblom (1959; 1979) has pointed out on his classic works: policy-making is the science of muddling through.

The political view also highlights the importance of policy implementation, which should not be divorced from policy processes as "implementation always makes or changes policy to some degree" (Lindblom, 1980; 65). Indeed, implementation itself can be intensely political (Grindle, 1980; Grindle and Thomas, 1991; Crosby, 1996; Sutton, 1999; Little, 2008), is greatly complex, and is shaped by both "the content of the policy (in terms of interests affected, the types of benefits expected, the extent of change envisioned, sites of decision-making, the number and type of programme implementers and resource committed) and the context of implementation (power, interests and strategies of actors involved, institution and regime characteristics, compliance and responsiveness)" (Little, 2008: 16). Implementation is an interactive, non-linear process that needs to be managed through, for instance, consensus building, stakeholder participation, and resource mobilization (Grindle and Thomas, 1991).

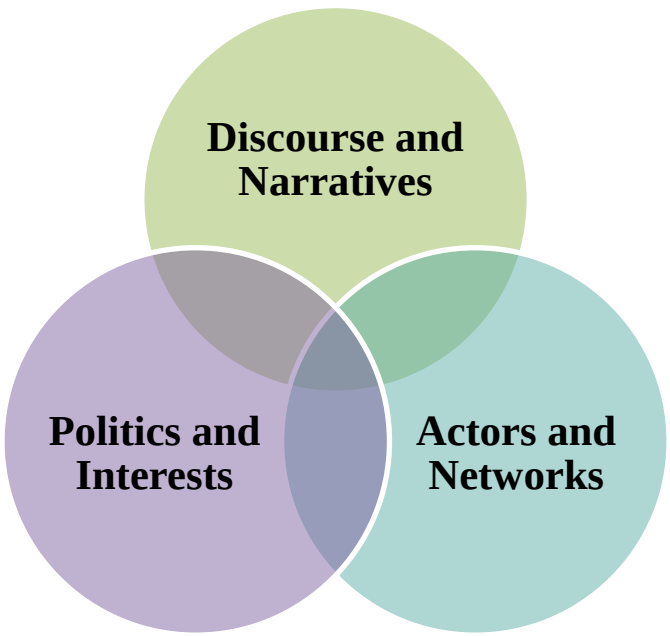
Another theme that is worth emphasising in this political approach is the importance of context and policy history. Policy processes are influenced to a large degree by local context (Grindle and Thomas, 1989). Indeed, the social, economic, political, and governance contexts can significantly affect policy-making and implementation (Fisher and Forester, 1993; Blaikie and Soussan, 2001). As Keeley and Scoones (2000: 90) underline, in order to understand the policy processes, "the interplay between context specific circumstances and the changing effectiveness of different networks of actors in the policy debate" is essential. Moreover, path dependency is critical to understand policy-making and change. As suggested by Blaikie and Soussan(2001), path dependency includes, for instance, "policy heritage" (past policies that have been important in defining the present policy processes), important conferences, key events that catalysed policy change, publication of rules, influential evaluations and public responses.

The political approach also tends towards a more bottom-up view of policy-making by highlighting the importance of the issues of empowerment and people's participation, with a wide range of actors being able to influence the policy processes (Ostrom, 1990; Long and Long, 1992; Shankland, 2000; Blaikie and Soussan, 2001). Nonetheless, there is no final conclusion nor unified understanding of the policy processes, which often vary depending on the sphere of the policy-making across the context-specific political system (Atkinson and Coleman, 1992).

In this study, I applied the framework of the Knowledge, Technology and Society (KNOTS) team of IDS, which builds on the work of Keeley and Scoones (1999, 2001; 2003) to understand the policy processes concerned with oil palm adoption in Nong Khai province as these works offered a novel perspective on policy processes and thus set out a distinctive framework for policy analysis. The IDS KNOTS team's framework was developed from extensive reviews of the literature on the policy processes which revealed three broad approaches to understanding policy-making, rooted in different schools and disciplines. The first highlights political economy and the interactions of state and civil society and different interest groups, whilst the second examines the role and agency of individual actors. The last considers the histories and practices linked to shifting discourses, and how these shape policy problems and courses of actions. The attempt to integrate these different, but overlapping, perspectives into a simple framework led to the IDS KNOTS team's framework (Keeley, 2001).

In essence, the IDS KNOTS team's framework suggests that policy processes can best be understood using three interconnected themes: *knowledge and discourse* (What is the policy narrative? And how is it framed?), *actors and networks* (Who is involved and how are they related?), and *politics and interests* (What are the power dynamics involved? (KNOTS, 2006). The diagram can be seen in the Figure 3.3 below.

Figure 3.3: IDS KNOTS Team's Framework to Understand Policy Processes



Source: KNOTS (2006)

Understanding these three influences on policy enables us to address questions such as how do policies get created and by whom? Whose voices and views are taken into account in the policy processes? How are boundaries drawn around problems and policy storyline elaborated as well as the networks associated with them? What is included and excluded (often the perspectives of the farmers and marginalised people) from consideration? And how, when, and due to what influences do policies change? Each theme comes from different intellectual traditions, yet each offers particular and valuable insights. Understanding the policy processes, therefore, comes as a result of looking at the intersection of the three overlapping themes. Using the IDS KNOTS team's perspective on the policy processes, each theme and the policy space can be summarised as follows:

Policy Narratives

Policy narratives, in other words "received wisdoms", are stories with a beginning, middle, and end that explain events, or define the world in certain ways, and so shape policy decisions. Indeed, policy narratives have a capacity for persistence which cannot be overturned by simply presenting them as fallacious in a particular instance, but only by providing a superior and more convincing story (Kaplan, 1990; Roe, 1991; Roe, 1994). These storylines define a problem, describe how it comes about, and show what needs to be done to prevent disaster or bring about a favourable conclusion. In other words, they aim to explain what is wrong and how it must be put right. Policy milestones and implementation are included in this theme in order to understand the oil palm policy in Thailand's context. As suggested by Keeley (2001), policy narratives involve sets of questions: what are the narratives and the basic problems being addressed? (How is it to be framed?) Whose interests and perspectives are included and excluded? And how could this be reframed? These questions are addressed and analysed in the policy processes analysis chapter (Chapter 5).

Actors and Networks

Networks, coalitions and alliances of actors (individuals or institutions) with a shared vision or similar beliefs are essential in spreading and maintaining narratives through chains of persuasion and influence, such as conferences, education or informal introductions. Through the actor-networks, "norms of good and bad practice are reinforced, research agendas are set, and orthodoxies or conventional wisdoms are reiterated and, very often, dissenting opinions or unconventional views are suppressed" (Keeley and Scoones, 2000: 20).

Importantly, the actor-networks are not exclusively restricted to state institutions. Instead, they link the government and civil service with the private sector, donors, and actors in civil society: for instance, local scholars and non-governmental organisations (NGOs). Hence, the existence of actor-networks can make for pluralist policy-making concerning a range of different stakeholder/actors. Processes of negotiating and bargaining between interest groups are at the centre of policy-making. Networks can significantly change narratives as well as reinforce them, as they bring together people who strategise and exchange ideas. On this theme, we address the questions of who is inside and outside a policy network? How do people or institutions become enrolled into a network? How do ideas circulate through a network? What are core beliefs? And where is the network weak, and where is it strong?

Politics and Interests

Certainly, policy is intrinsically political and contested, and more incremental and haphazard than is suggested by the conventional view of it, in which facts and values are separated. Politics shape policy processes in several vital ways. Firstly, differing political contexts can affect policy-making. Different interests of particular regimes and authorities seeking to remain in power can impose different constraints on what is achievable. Certain strategies that look promising within a democratic setting, and with an active civil society, are not possible elsewhere. Competition exists between groups in society, based on their differing interests with regard to, for instance, allocation of resources, or social concerns. Indeed, politics could influence policy processes to suit the interests of particular regime, especially when Thailand's politics have been sharply polarised ever since the military coup in September 2006. Thus, this section of analysis discusses the Thai politics, and how they shaped the oil palm policy processes.

Secondly, policy processes are influenced by a range of interest groups that exercise power and authority over policy-making at every stage. The vested interests of various actors in the network, such as influential private companies or independent experts, might be served by the perpetuation of certain narratives. Because policy-makers sometimes make important policy decisions before soliciting expert advice, and then seek to obtain spurious scientific support for those decisions, there are strong vested interests in playing down uncertainty and portraying risk as insignificant.

Thirdly, technical or scientific language, which emphasises rationality and objectivity, is always in some ways political. In other words, the political nature of policy is hidden by the use of these types of language. Lastly, bureaucrats are not just neutral executors of policy. On the contrary, they have their own personal and political agendas to negotiate. Bureaucratic politics are relevant - for instance, battles within ministries for control over policy arenas. Hence, the research, on this theme, deals with the questions: who is engaged in the policy processes? How many stakeholders are involved in the issue? Are there clear vested interests in the policy arena? Are the processes essentially inside or outside a bureaucracy? How much capacity exists within the bureaucracy to reflect on policy aims and implementation? What types of informal relationships occur within ministries or departments? And what "policy space" is there for pressing for different ways of doing things?

Policy Space

Identifying the policy space of an issue involves bringing together the three themes set out above. Influencing policy is entirely about identifying moments for change. According to KNOTS (2006: 13), the idea of policy space "relates to the extent to which a policy-maker is restricted in decision-making by forces such as the opinions of a dominant actor network or narrative". Often there appears to be very little flexibility in policy processes, where the governance setting may offer little room to manoeuvre in terms of either demands for inclusion or facilitation of voices from local grassroots. Decision makers may not have much room to consider wider sets of options if particular actor-networks associated with dominant perceptions and interests seem to be firmly entrenched.

Definitely, understanding policy processes by examining knowledge and narratives, actors and networks, and politics and interests can be of help in recognising policy spaces. These often include spaces within the networks, for example, capacity for new actors to join a network, or the opportunity for a key actor in one network to be enrolled into another network. This thesis aims to identify and make use of policy spaces in order to push for change in the oil palm issues, based on the six types of spaces proposed by Wolmer and Scoones (2005): invited spaces (discussion on policy led by government agencies, involving selective participation of stakeholders), popular spaces (demonstrations led by social movements, putting pressure on formal policy-making), practical spaces (pilot projects initiated by interest groups, giving policy-makers the opportunity to observe and monitor them), bureaucratic spaces (formal policy-making spaces within the government system, led by government officers with selected input from external experts), electoral spaces (formal participation in the electoral system, allowing voting on the policy positions of competing candidates), and conceptual spaces (spaces where new ideas are introduced into debates and circulated through a range of media).

However, the research also adopted a salient concept in the work of Majone (1989), who argues that policy processes should be understood in terms of three main elements: evidence, argument and persuasion. He suggests that policy is not made solely on the basis of evidence, but evidence is an important concept for the adoption of policy. Evidence in this context is not similar to data or information, "it is information selected from the available stock and introduced at a specific point in the argument in order to persuade a particular audience of a truth or falsity of a statement" (Majone 1989: 10). If its strengths and appropriateness are wrongly assessed, its inclusion might weaken the argument and damage attempts to reach a conclusion. He further argues that policy is made on the basis of constructing arguments, which often start from opinions, values, and contestable points of view, combined with factual statements, interpretations and subjective evaluations. Joining the evidence and argument together in order to convince the public, including the key actors in the society, to adopt a particular course of action is what he terms persuasion. It is worth noting that this thesis uses the salience of these three concepts (evidence, argument, and persuasion) in analysing oil palm policy processes in the policy narratives theme of the IDS KNOTS team's framework.

3.1.3 Summary of the Analytical Framework for this Research

As shown in Figure 3.1, in order to accommodate insights from the fieldwork and to guide the analysis and the research designs, this thesis proposes an analytical framework which incorporates two main theoretical approaches, namely the eight elements of farmers' decision-making, and the IDS KNOTS team's policy processes framework. At the centre of the diagram is the change towards oil palm adoption of the farmers in Nong Khai province. Although previously oil palm was not typically grown in the Northeast of Thailand, the number of oil palm plantations in the region has risen significantly from none in 2005 to 46,739 rais in 2009, in which 21,897 rais were concentrated in Nong Khai province (OAE, 2009). From my experience in the field sites, I believe that the actual figures for oil palm cultivation in Nong Khai province were higher than central government suggested, as there were numerous oil palm farmers interviewed who were never registered in the government's oil palm database.

The left circle of the diagram was developed to understand the farmers' decision in relation to changing over to oil palm cultivation in Nong Khai province through the adaptation of the eight elements of the farmers' decision-making model. Using the eight elements of farmers' decision-making and the THN as analytical tools to understand the oil palm issues, Chapter 4 will examine the values and needs of the oil palm farmers, problems regarding rice production, choices between optional crops, knowledge and funding of the oil palm crop, factors which influence oil palm adoption, personal norms and habits in relation to oil palm cultivation, the socio-economic outcomes of oil palm adoption with regard to the farmers' values, and the farmers' satisfaction with the oil palm crop.

Farmers in Nong Khai province have been harvesting oil palm crops since the government promoted oil palm planting in the region in 2005. Rice farmers, who can be found in all areas in the Northeast region, have become interested in potentially planting oil palm in various areas in the province. Although oil palm expansion policy is currently following the direction of the 5-year Oil Palm Industry and Palm Oil Development Plan (2008-2012) (MOAC, 2008) and the 15-year Alternative Energy Development Plan (2008-2022) (DEDE, 2008) set by MOAC and MOEN respectively, the oil palm issues in Nong Khai province date back to May 2005 when the cabinet approved the action plan for the development and support of biodiesel. The right circle of the diagram was developed to address oil palm policy issues.

As there were various factors affecting the farmers' decisions to adopt oil palm cultivation (discussed in the Chapter 4) and oil palm expansion policy was one of them, the right circle of the diagram, which will be discussed further in Chapter 5, analyses the oil palm policy processes in the Nong Khai province using the IDS KNOTS team's policy processes framework. The analysis is divided into three themes according to the IDS KNOTS team's framework, which are discourse/narratives, actors/networks, and politics/interests. Policy space is then identified through the examination of these three themes in order to make use of it for promoting different ways of doing things in oil palm production. Majone's concept of evidence, argument and persuasion is also utilised mainly in the discourse/narratives section.

3.2 Choice of Methodology and Research Question

The analytical framework for the research described in the previous section influenced my choice of methodology for the study and the design of the research (see also Section 3.3). Firstly I will explain why the qualitative research methodology was applied to this research. According to Kanbur (2001), there are various debates regarding the strengths and weaknesses of quantitative and qualitative research. Perhaps the most notable distinction between the two is that the quantitative method implies the use of numbers, which can be more easily aggregated, but it can hide the texture or in-depth detail that can be derived from qualitative research. It is useful to reflect briefly on the nature of these two approaches to better understand them before moving on to my choice of methodology.

From an epistemological point of view, quantitative research is linked with positivism and thus seeks to apply a natural scientific model to study social reality. Much emphasis is therefore placed on understanding reality as an objective and external phenomenon which is observable. From the observations, theories and hypotheses are generated or refuted. In contrast, qualitative approaches are usually linked with an interpretive position. Interpretivism rejects the link between natural and social sciences, and argues that the most appropriate way to understand the social world is through an examination of the interpretation of that world by its participants, using specific research techniques such as “participant observation”, “ethnography”, and “qualitative interviewing” (Bryman, 2008). According to Geertz (1973), the task of the social researcher is to get as close as possible to the reality where individuals interpret the world through their own experiences. In other words, the research methods used in social sciences can approximate reality, but this is not absolute reality. What is called “reality” in social sciences, according to Geertz (1973), has been constructed through the interrelations of human action.

Although qualitative research has been much criticized for being too impressionistic and subjective, difficult to replicate, restricted in the scope of its findings, and lacking transparency, I chose to adopt the qualitative approach because the focus of the research was on understanding the social and political context of oil palm farmers in the villages, rather than on generating a model as a means to test a theory. In order to gain data relating to the farmers’ lives and attitudes, such as their reasons for starting to grow oil palms, it was important to apply research methods that were geared towards tackling issues of a subjective nature. As such, this study did not approach the oil palm issues by proving or rejecting constructed hypotheses, but rather by allowing the data to dictate the method of the research.

Thus, the two types of social research methodology used in the study are purposive sampling (Coleman, 1958; Patton, 1990; Salganik and Heckathorn, 2004; Bryman, 2008) and qualitative interviewing (May, 2001; Bryman, 2008). This research did not seek to sample the cases on a random basis, but to sample the research sites and participants in a strategic way, so that those sampled were relevant to the research question and sub-questions. Because purposive sampling is a non-probability sampling approach that does not allow the researcher to generalise to a population, research sites and people within the sites were selected for their relevance to understanding a social phenomenon: oil palm adoption. The snowballing technique was also used to identify key actors in the thesis as it allowed me to make initial contact with a small group of people who were relevant to the research topic, and use their knowledge of the community to establish contacts with others. The selection of research sites and participants is discussed in detail in Section 3.3.

The type of qualitative interviewing that was used in the research is a semi-structured interview, which was applied to all the interviews carried out. This style of interview was chosen because it allowed me to direct the structure of the interview whilst at the same time maintaining a degree of flexibility to react to the interviewees' answers and pose further questions in response. In contrast to the structured interview used in quantitative research, the semi-structured interview takes greater account of the interviewees' point of view and thus provides insights into how research participants view the world, through their rich and detailed answers. These characteristics of the approach were well suited to the nature of this research into oil palm adoption. At the field site, I had an interview guide consisting of a list of questions, which can be seen in Appendix E, to direct the interviews towards the focus of the research as well as to help the questioning to flow reasonably well. However, when the interviews took place the questions did not follow on exactly as outlined in the interview guide. In fact, the order of questions changed in many of the actual interviews. I was able to ask unplanned questions when an interviewee made an interesting point that could be related to the research topic. By and large, all the questions in the interview guide were asked with similar wording from interviewee to interviewee.

At first, I planned to use a tool called Net-Map in the research to map the local and national actors involved in planting oil palm at the field sites in order to understand their relationships, the power/influence of the actors in the network, and the goals and interests of these different actors. Essentially, Net-Map is an empirical research tool that merges characteristics of the two existing methods, namely social network analysis (Wellman and Berkowitz, 1988; Scott, 1991; Hanneman, 2003) and the power mapping tool (Schiffer, 2005; Schiffer, 2007).

Social network analysis or network mapping is a set of relationships mapped between key actors. The actors are represented as nodes and their interactions are represented as links, with the aim of understanding the social and political situation by focusing on both formal and informal structures. The characteristics of actors such as their power/influence and goals are given less attention. That is to say the power/influence of actors is only explained by the positions of the actors in the network, for example, their closeness, betweenness, and centrality. Power mapping, on the other hand, is good for collecting data about the perceived power of various actors within a policy field. By bridging these two methods, Net-Map creates a three-dimensional structure in which interviewees and interviewers together draw a network map of the actors involved in the issue, including the different kinds of links between the actors. Then influence towers are added to the network in order to transfer abstract concepts of power/influence into the three-dimensional form. Finally, the interviewees are asked to assess the goals that these different actors pursue (Schiffer and Waale, 2008).

However, my experience in the field suggested that there were not many stakeholders involved in oil palm adoption issues in the three villages: a total of 15 key actors, which included government agencies, private seedlings suppliers, private merchants, large-scale oil palm producers, inspirational local leaders, and large-scale palm oil refinery in Chonburi province. Thus, their networks and influences could be mapped and understood individually through the semi-structured interview. Difficulty in gathering the oil palm farmers together was another constraint on the application of this research method. I had made several attempts to assemble the oil palm farmers in Baan Tarn village, but failed for various reasons, such as the workload in the rice paddy fields, the necessity for them to be at social events such as '*tum boon*' at the temple or attending an ordination ceremony, and unavailability in the morning due to harvesting rubber at night. When I asked if it would be possible to gather the oil palm farmers at a place in the village, the head of Baan Tarn village responded, "Can they be rice farmers instead? Rice farmers are a lot easier to find and make a group. We have plenty of them around here, every household. Oil palm farmers, we have like 10 to 15 households in each village around this area. Difficult. Very difficult."

Returning to the focus of this thesis, the research process started with finding a general research question and sub-questions, which came about from reading relevant literature reviews as described in Chapters 2, and discussing ideas with my supervisors. Based on the insights obtained from the fieldwork and a discussion with the supervisors on developing the research's analytical framework, the research question and sub-questions were specified more tightly. The resulting main research question for this thesis, and its three sub-questions, are outlined below.

The Main Research Question

- What are the critical factors shaping the change towards oil palm adoption of small-scale farmers in Nong Khai province (in the Northeast region of Thailand), and what are the implications for Thailand's oil palm policy development?

The Two Sub-questions

- What are the key factors affecting the farmers' decision to adopt or not to adopt the oil palm cultivation?

- What is the rationale of the oil palm policy and how is it implemented?

3.3 Research Sites and Sampling Selection

As discussed in Chapter 2, as well as the Southern and Eastern regions of Thailand, the number of oil palm plantations in the Northeast region has been growing. The majority of oil palm plantations are concentrated in the areas of Nong Khai, Loei, Amnat Charoen, Ubon Ratchathani, Mukdahan, and Sisaket provinces. Nong Khai province was chosen to be a research site because Nong Khai was considered to be one of the most suitable areas in terms of climatic and soil conditions for oil palm cultivation in the Northeast region and also the ideal place to build up understanding of food and energy trade-offs: Nong Khai was formerly one of the major rice producers in the Northeast, in which 64 percent of the total cultivated land in the province was devoted to rice paddy fields (OAE, 2010a).

According to data from the Northeastern Region Economic and Social Development Office (NESO) (2009), Phon Phisai district ranked third amongst the 17 districts in Nong Khai province in terms of the area devoted to oil palm plantations at 4,319 rais in 2008, whilst Bueng Kan and Seka districts were first and second, at 7,185 and 6,276 rais respectively. From an informal email discussion with the director of NESO, I learned that a significant number of small-scale oil palm farmers were concentrated in Phon Phisai district. In addition, Phon Phisai had been chosen by the local government to be a pilot site for oil palm cultivation and the policy of oil palm production had been actively promoted in the district. Taking these facts into consideration, I decided to investigate the oil palm issues and compare similarities and differences in the networks between the oil palm farmers and the key actors in the areas of Phon Phisai district. However, it is worth noting that it was extremely difficult to find comparable planted areas of oil palm and numbers of oil palm households/farmers at district, sub-district, and village levels, and the statistics could vary widely across different local government agencies. For example, the areas

growing oil palm in Phon Phisai district could range from 799 rais to 4,319 rais in the same year according to different sources of data.

In accordance with the research plan, the sampling selection started with accepting the three sub-districts in Phon Phisai district that had the largest area of oil palm cultivated land, using information obtained during the actual fieldwork from the government sector, for instance, Nong Khai Oil Palm Research Centre (NKO), Department of Agriculture (DOA), Office of Agricultural Economics (OAE), and (Phon Phaisai Agricultural Extension Office (PAE). Four categories of farmers were subsequently chosen for each sub-district. The first category concerned the small-scale oil palm farmers who were previously rice producers and then turned the lands over completely to oil palm growing. Data from the NESDB (2009a), which suggested that the small-scale oil palm farmers accounted for 80 percent of the total number of oil palm farmers in Thailand, with an average of 30 to 40 rais planted per household. Based on this, the small-scale oil palm farmer in this research was defined asa household that occupied less than 50 rais of oil palms. The next two categories were small-scale farmers growing both rice and oil palms. The second category included oil palm farmers who planted oil palm on more than 50 percent of their land. The third was oil palm farmers with less than 50 percent of their land devoted to oil palms. Small-scale rice producers were the final selection, because they allowed me to examine reasons for not adopting oil palm cultivation.

Each category consisted of a sample of five households. Each category included at least one household headed by a female, in order to explore whether there were any differences between male and female-headed households in shaping the farmers' decisions to adopt the oil palm cultivation. At this stage, there would be 60 interviewees from the three sub-districts to be included in the research. Other key actors relating to the change towards oil palm adoption in each sub-district would be identified through the snowball sampling technique. The before-fieldwork sampling selection and sample size are summarised in the Table 3.1 below.

During the actual fieldwork, it is normal for a researcher to discover that their research does not always proceed sequentially or as expected. The possibility of change and emergence of new ideas are a normal occurrence in research and this thesis is no exception. Although I tried to ensure that the research objective did not deviate from the original research plan, which focused on understanding the decision-making of small-scale farmers in adopting the oil palm cultivation and the impact of oil palm policy, during the first and second field visits in Nong Khai province some changes were made regarding the research sites, sampling selection, and sample size.

Evidence from several interviews with the oil palm farmers in Jumpon, Kud Bong, and Baan Pho sub-districts in Phon Phisai district has shown that there were no significant differences in the oil palm issues between these three areas. For example, the oil palm farmers in these sub-districts acquired the oil palm seedlings and knowledge from the same source, and named the same private buyer, inspirational local scholar, and large-scale oil palm producer. The history of oil palm farming in the sub districts and the attitude of the farmers were also similar.

After a discussion with the key persons at NKO and PAE using the local data, they reckoned that there were a significant number of small-scale oil palm growers in other districts in Nong Khai province apart from Phon Phisai, namely So Phisai, Seka, and Bueng Kan districts. I therefore decided that including these three districts in the research would better represent the holistic view of the change to oil palm cultivation in Nong Khai province. It also offered an opportunity to compare similarities and differences and to comprehend the different perspectives of the oil palm question in different geographical areas in Nong Khai province. However, an in-depth interview in qualitative research is a time-consuming process, taking me approximately 50 minutes to 1 hour per interview in the actual fieldwork. As a student, I had limited time and budget, which forced me to omit one district from the research. Bueng Kan district was excluded due to the difficulties in transport to the area and a possibility of flash floods from the Mekong River during the fieldwork period. Hence the research sites then changed from being concentrated merely in Phon Phisai district to being distributed across three districts, namely Phon Phisai, So Phisai, and Seka.

The fieldwork experience led me to think about focusing the interviewing on a village by village basis. In doing that the number of key actors and networks would be better organised and thus allow me to compare similarities and differences between the villages. One village was then chosen in each district, based on a discussion with and data obtained from NKO, PAE, So Phisai Agricultural Extension Office (SPAE), and Seka Agricultural Extension Office (SAE), and some suggestions from local people around the research sites. Factors that were used in selecting the villages included the estimated number of small-scale oil palm farmers, the co-operation of the village headman and villagers, and accessibility of transportation. The villages' real names have been altered, so that the respondents in the research remain anonymous (see Section 3.6 for a discussion on ethical issues). The following fictitious names have been given to the selected three villages, which were:

1) Baan Tarn for a village in Phon Phisai district,
2) Baan Sa Ard for a village in So Phisai district, and
3) Baan Hat for a village in Seka district.

Table 3.1: Summary of Sampling Selection and the Sample Size in the Research Plan

Case	Small-Scale Oil Palm Farmers (Completely Switched from Rice Cultivation)	Small-Scale Farmers Who Adopted Both Rice and Oil Palm Cultivation		Small-Scale Rice Farmers	Key Actors from the Snowballing Technique **	Sample Size in Each Sub-district
		More than 50 Percent of Lands Devoted to Oil Palm Plantations	Less than 50 Percent of Lands Devoted to Oil Palm Plantations			
I. *Sub-district A (Jumpon)*	5	5	5	5	X	20 + X
II. *Sub-district B (Kud Bong)*	5	5	5	5	Y	20 + Y
III. *Sub-district C (Baan Pho)*	5	5	5	5	Z	20 + Z

***** The figures shown in the Table 3.1 are sample size in each category. In each case the unit is a household.

** The key actors identified through the snowball sampling method may be businesses, universities, local scholars, NGOs, and local government organisations.

Returning to the sample selection in the research, my experience in the field sites demonstrated that it was extremely hard to unearth small-scale farmers in these areas who were growing only oil palm. This is to say it did not even exist in some villages. Likewise, it was difficult to find farmers who devoted more land to oil palm than rice cultivation. For most of the farmers, rice cultivation was their main agricultural activity. As a result, the categorisation of farmers in the original research plan proved impractical in view of the reality in the actual fieldwork. Therefore I made the decision to interview all the small-scale oil palm growers in the selected three villages, resulting in 14 households being interviewed in Baan Tarn, 23 households in Baan Sa Ard and 8 in Baan Hat.

In terms of the rice farmer category, I divided the small-scale rice farmers into two groups. The first group was the rice farmers who had more than 20 rais of rice paddy fields, whilst the second group was the farmers who devoted less than 20 rais of land to rice cultivation. This was because I intended to investigate whether the amount of rice paddy fields which could directly be converted to oil palm plantations was a significant factor for the rice farmers in choosing not to be involved in the oil palm cultivation. Three households were selected in each category, i.e. a total of six households in each village. The snowball sampling technique was still applied to identify key actors in relation to the oil palm farmers of the three villages and the interview guide prepared for the semi-structured interviewing remained similar to the one in the original research plan. A summary of sampling selection and sample size used in the research, and a summary of linkages between research questions, sampling selection and interviewing method can be seen in the Table 3.2 and Figure 3.4 respectively.

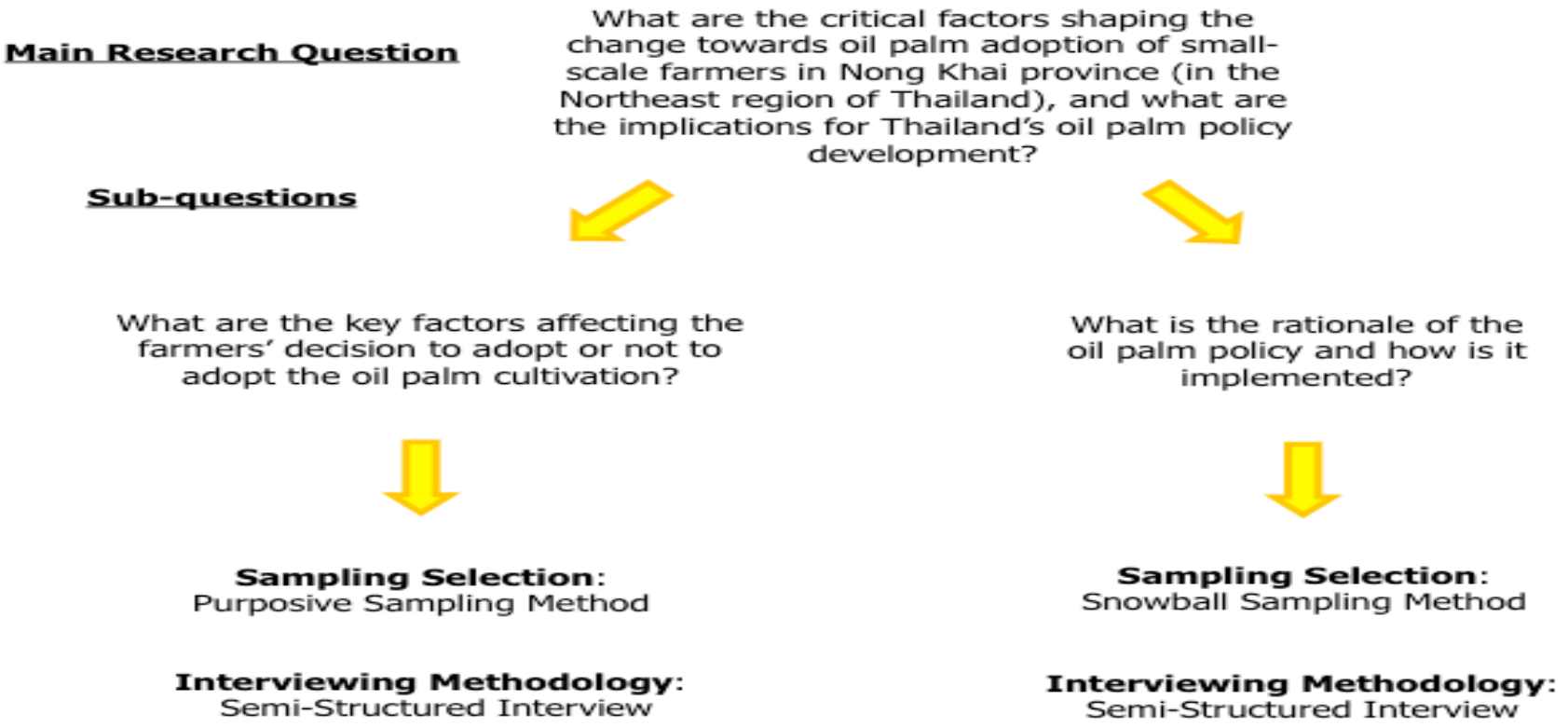
Table 3.2: Summary of Sampling Selection and the Sample Size Used in the Thesis

Case	Interviewed Small-Scale Oil Palm Farmers / Small-Scale Oil Palm Farmers in Total (As of November 2010)	Rice Farmers Who Have Not Yet Adopted Oil Palm Cultivation		Key Actors from the Snowballing Technique**	Sample Size of the Research
		Occupied More than 20 Rais of Paddy Fields	Occupied Less than 20 Rais of Paddy Fields		
I. *Baan Tarn* *(Phon Phisai District)*	14 / 14	3	3	15	63 + 15 = 78
II. *Baan Sa Ard* *(So Phisai District)*	23 / 23	3	3		
III. *Baan Hat* *(Seka District)*	8 / 11	3	3		

***** The numbers shown in the Table 3.2 are sample size in each category. In each case the unit is a household.

** The 15 key actors are from NKO, Nong Khai branch BAAC, DOA, PAE, SPAE, SAE, private seedlings supplier A, private seedlings supplier B, private merchant C, private merchant D, large-scale oil palm producer E, large-scale oil palm producer F, inspirational local leader G, inspirational local leader H, and a large-scale palm oil refinery in Chonburi province.

Figure 3.4: Summary of Linkages between the Main Research Question, Sub-questions, Sampling Selection, and Interviewing Method Used in the Thesis



Source: Diagram by the Author

3.4 Data Collection and Data Analysis

The actual fieldwork was undertaken over a period of approximately 9 months from 25th April 2010 to 15th January 2011. Preparation for the fieldwork started in March 2010 when I went to Nong Khai province to familiarise myself with the area, and also to Khon Kaen University in a quest for research assistants. From April to November 2010, I conducted the interviews in the research sites during 6 visits ranging from 8 to 12 days per visit. Then I arranged interviews with the key actors in Chonburi province and in Bangkok, which took place between December 2010 and January 2011.

Understanding the language and dialect are bound to be of importance for a qualitative researcher because it is through language that, in interviews, questions are asked and answered. Because I was from central Bangkok and my undergraduate degree in development economics was at Chulalongkorn University, also located in Bangkok, I had no experience of speaking and listening in Esaan and thus could not fully understand or communicate with local people. Esaan refers to the Northeastern part of Thailand, where the research sites were located, and most people used Esaan or Lao as the local languages. From my experience in the field, speakers of central Thai could not fully understand what Esaan people were saying because of some differences in pronunciation, lexicon, and/or grammar.

Although Esaan people express their feelings and communicate with each other in the Esaan language, most of the interviewees in the research were able to understand and speak central Thai. However, they were not comfortable doing so, for fear of ridicule from their friends. The key actor at PAE explained,

> "I can understand what you say. The villagers also understand, but speaking central language here makes us feel a bit *dut ja rid* (pretending to be someone else or being a different person according to time and/or environment). The response to questions will be slow because we have to think of words before saying." (Male, semi-structured interview, May/June 2010).

In order to cope with the language concerns and to make the conversations flow during the interviews, the need for research assistants with ability in Thai and Esaan languages was evident and this research therefore employed two research assistants.

One assistant was a student from the department of community development at Khon Kaen University. He was a native Esaan speaker, who was able to speak central Thai fluently, and had regularly participated in community development volunteer camps in various places across the Northeast region. He was also the president of the senior student of the community development department. His experiences in the field of rural development helped me greatly in terms of conducting the interviews in the Esaan language, being able to locate places and finding contact persons in the communities. Another research assistant was a postgraduate student and a member of the Research Group on Wellbeing and Sustainable Development (WeSD) at Khon Kaen University, who was able to communicate fluently in both Esaan and Thai. He assisted by taking down notes, following up interesting points made and clearing up inconsistencies in answers during the interviews. The collected data from the interviews was subsequently discussed, validated, and fully written up almost every night at our residence near the research sites.

I trained the two research assistants to ensure that they understood the objectives and themes of the research. They were given the interview guides to study and I clarified all the issues and questions to be addressed to the interviewees. I also taught them both how to use Net-Map, before discovering later in the research sites that the methodology did not suit well in this context. Although most of the interviews from the first visit to the field sites, particularly in Kud Bong and Baan Pho sub-districts were not included in the research, they worked well as interviewing exercises. These interviews helped us to become familiar with the questions in the interview guide. They also helped me to investigate whether the questions prepared were understandable to the interviewees and whether the settings for the interviews were appropriate to the local context.

Originally, I had planned to audio-record the interviews so that I would not be distracted by having to concentrate on getting down notes, and would be able to focus on not just what the interviewees said but also on the way that they said it. The process of recording and transcribing interviews also permits repeated examinations of the interviewees' answers and opened up the data to other researchers who could evaluate the analysis or reuse the data in other ways than the original research.

However, I had tried using an audio recorder in the actual interviews, but the method did not work well in this research. When I informed the interviewees that the conversations would be recorded using the audio equipment and they agreed to participate in the interviews, it was obvious that they talked very softly and quietly, answered the questions with reluctance, and said only all the good things about the issues. They also gave less opinion on everything, and expressed their feelings towards the issues in a more neutral way. It was apparent that using this method could lead to biased results, as there were discrepancies between what the interviewees told me and what they really thought.

The reason for this was that the interviewees allowed us to record the interviews out of politeness. It is part of the unique Thai value system not to hurt anyone's feelings and to avoid conflict (*Kreng Jai* in Thai). The first reaction of some interviewees when they knew the conversations would be recorded was to ask questions such as "Does it need to be this serious?" or "Easy is better? I am not familiar with this." However, they still agreed to participate in audio-recorded interviews. I found that a better way was to set up the interviews in a more relaxed atmosphere and let the farmers talk more naturally, so that they were able to express their thoughts explicitly. Thus it was decided not to use audio equipment in the research.

Nonetheless, without audio recording there arose a concern over the natural limitation of human memory in remembering what was said in the interviews. I recognised this concern and therefore instructed one of the two research assistants to be highly attentive to what was being said by the interviewees and focus just on taking down notes. Discussion with the research assistants almost every evening after the interviews, which occurred in the daytime, was very fruitful because I was able to examine more thoroughly what the interviewees had said. It also helped me to check the accuracy of the data and to correct any misunderstanding that had occurred during the interviews. The story of the word "*bia*" is a good example. The word "*bia*" in the central Thai language meant something close to money that can be used for trading things. When the interviewees explained that they did not have "*bia*" to grow oil palm, I assumed that the households did not have enough money or savings to grow oil palm. After a discussion with the team, we established that the word "*bia*" in Esaan language meant seedlings in this context, so in this case the interviewees meant that it was difficult to find the oil palm seedlings. Thus, the correction had to be made to prevent the analysis from being biased.

The preliminarily data analysis in the research took place in the field sites through the discussions mentioned earlier. The collected data was then typed into a Word document in central Thai language in order to preserve the true meaning from the interviews. I carried out this conversion while I was off the field sites in Bangkok, preparing for the next field visit. The next process of data analysis involved coding the data. Initially, I was considering the use of Computer-assisted Qualitative Data Analysis Software (CAQDAS) called NVivo to code the data. Although using the NVivo allows a researcher to group together all the fragmented data that correspond to a certain category or theme, it meant I would have to learn to use a new software package and to spend a substantial amount of time on naming and grouping the codes. Moreover, during the time of data coding, the latest version of the program (NVivo version 9) was not supported on the Macintosh (Mac) operating system, which I had been using for a long time. Because there was a relatively small set of data (78 interviews), spending a lot of time and trouble navigating my way around a new operating system would have been impractical. As a result, I decided to complete the data coding manually. However, the data was coded in Thai and only the answers that are quoted in this thesis were translated into English.

I coded all the interview data myself in order to sharpen my understanding of it. The data were coded with the aim of answering the research question and sub-questions. The relationships between the interviewees were highlighted and linked by the codes. Comparisons within and across the villages were carried out to identify the main similarities and differences. The findings were explored to investigate their relationships to the existing literatures in the Chapters 2, as well as to consider whether the results established new theories or concepts, or raised issues that had been unobserved in research into biofuels, particularly in biodiesel from oil palm and sustainable development in the Thai context.

4.5 Ethical Considerations

I was well aware of the ethical issues that might arise in the processes of collecting and analysing the data in and out of the field. My most important ethical principle was to ensure that the research did no harm to the participants. According to Bryman (2008), research that is likely to harm participants, whether the harm is in the form of physical harm, harm to participants' development, loss of self-esteem, or high levels of stress and anxiety, is regarded as unacceptable by most social researchers. Thus, I assured the interviewees that I would do my utmost to uphold confidentiality and anonymity. The participants were informed that their real names would not be used in the research and they were guaranteed anonymity. However, the real names of the government agencies have been used in this thesis, but other specific details such as gender or age that could be used to identify the respondents in these organisations have been kept confidential.

After being informed that his/her anonymity would be assured, one of the interviewees in a government organisation expressed his/her feelings as follows:

> "Talking about the failure of the policy is quite dangerous. No one wants to talk about it in detail. It is not the culture here. Actually, it is not the culture for anyone in the Thai government. Talking about success is a lot easier. But I talked to you, so it is a relief to know that you understand the situation." (Semi-structured interview, June 2010).

I have also altered the names of the three villages in the study to Baan Tarn (in Phon Phisai district), Baan Sa Ard (in So Phisai district), and Baan Hat (in Seka district) in order to make sure that the areas where the farmers lived would be kept confidential and they could remain anonymous. I ensured that the transcribed documents both in electronic and paper files did not contain the participants' real names. Pseudonyms were used in any transcribed documents, and the lists of participants and addresses, and their identifier codes, were stored separately in a safe cabinet. I also ensured that the details that were changed did not affect the analysis of the oil palm issues in any way.

Other principles that influenced my research were in the areas of informed consent and invasion of privacy. According to Diener and Crandall (1978)'s classification of ethical principles, these two areas overlap to some degree. The principle of informed consent means that social researchers should give as much information as possible about the research to prospective participants, so that they can make an informed decision about whether they wish to participate in a study. This principle was addressed very seriously in the research. Thus, before starting the data collection process, I emphasised to the research assistants the importance of providing a clear statement of the nature, intentions and purpose of the research to all the interviewees before proceeding to the interviews. We took approximately 5 to 10 minutes to explain the ideas and goals of the research (and also assure the participants of confidentiality and anonymity), speaking mostly in Esaan to ensure that the messages were well understood by the interviewees. The interviewees were also informed that there would be no repercussions if they decided not to participate.

Although the ethical principle of privacy is very much linked to the notion of informed consent, in the sense that research participants acknowledge that the right to privacy has been surrendered after informed consent is given, research participants can refuse to answer certain questions or to comply with any research methodology on whatever grounds they feel are justified. This was the case with the use of audio-recording equipment in the interviews. As mentioned in the discussion of the question of audio recording, as a result of the *Kreng Jai* culture many interviewees did not react directly by refusing to participate in the audio-recorded interviewing. However, I observed that the participants answered the interview questions with anxiety and gave opinions about the oil palm issues in a very generalised way. This was linked to the ethical issues of anonymity and confidentiality mentioned earlier, in that the participants might feel uncomfortable with the audio-recording procedure because they were anxious about whether harm could come to them from factors outside our control, such as theft of confidential documents. In order to respect the anonymity and privacy of those who participated in the research, I decided that it was not appropriate to record the interviews as it might lead to transgressions of the ethical principles of the research.

3.6 Conclusion

This chapter discussed the analytical framework, logic, and research methodology and the justification of their roles in attempting to develop a holistic approach to understanding the change to oil palm cultivation in Nong Khai province. The chapter started with a discussion of the analytical framework used in the thesis. In essence, the research's analytical framework was developed from two main theoretical approaches, namely the eight element of farmers' decision-making, and the IDS KNOTS team's policy processes framework. The first part of the research's analytical framework was devoted to the understanding of the oil palm change from the bottom-up perspective: the farmers' decisions to be precise. The concepts of eight elements of farmers' decision-making and THN were adapted to appropriately address the oil palm issues in the context of Thailand. The second part then adopted the IDS KNOTS team's policy framework to comprehend the oil palm issues, as oil palm expansion policy is one of the key factors shaping the change towards the oil palm adoption in Nong Khai province.

The chapter then explored the choice of methodology, logic, and research designs of the study. It began with the choice of methodology, which resulted in the use of qualitative research methods, semi-structured interviewing, and snowball sampling methods. The discussion then moved to site and sample selection, which deviated from the initial research plan to some extent. In essence, the research sites changed from three sub-districts in Phon Phisai district to three villages in three different districts in Nong Khai province. The 15 key actors were then identified through the snowballing technique. Semi-structured interviewing was applied to all the participants in the research.

The logic of the data collection, data analysis and ethical considerations were then investigated. The data in the research were collected through the eight visits to the field sites (including two preparatory visits) and two interviews with key actors that occurred outside the field sites, in Bangkok and Chonburi provinces. Two research assistants were employed in the research due to concerns over the Esaan language used by the local people. The process of data analysis began in the field sites, where I set up meetings with the team almost every night to check for errors and ensure the accuracy of the collected data. I then converted the collected data into a Word document and coded it manually during the periods between field site visits and after the fieldwork was completed.

As for the ethical issues, the real names of the research participants and the three villages have been kept confidential and anonymous, so that there will be no harm to the participants. The research participants were clearly informed in detail of what their involvement were likely to entail. No audio-recording equipment was used during the interviews, partly due to concerns over possible transgressions of the ethical principles. In accordance with analytical framework discussed in this chapter, the next chapter will analyse the key factors affecting the farmers' decisions in relation to oil palm adoption.

Chapter 4:
Understanding the Change to Oil Palm Cultivation: Farmers' Decisions and Consequences

As stated in the previous chapter, the thesis's analytical framework has been developed to understand the change to oil palm cultivation in the Northeast region of Thailand, where the area occupied by oil palm plantations in Nong Khai province has increased dramatically from none in 2005 to 24,848 rais in 2010 (OAE, 2010b). This chapter will provide insights for the Thai government and all other stakeholders into the oil palm issues from the bottom-up perspective. In order to understand the oil palm issues in Nong Khai province, this chapter discusses the critical factors shaping the decision-making of farmers to adopt or not to adopt oil palm cultivation as well as the consequences of the change. This chapter is divided into two sections, described below.

The fourth chapter begins with an overview of the analytical framework used in this chapter, and introduces the main findings. There follows a discussion of the key factors affecting the decisions of farmers in adopting oil palm cultivation in accordance with the adaptation of the eight elements of farmers' decision-making concept, which is divided into eight sections. The first six sections (elements) examine the key factors affecting the farmers' decisions about changing over to oil palm production. The seventh and eighth elements then analyse the socio-economic consequences of the change towards oil palm plantations as well as the farmers' satisfaction after oil palm adoption. The final section of this chapter concludes our examination of oil palm issues from the farmers' perspective.

4.1 Understanding the Farmers' Decisions in Adopting Oil Palm Cultivation and the Consequences of the Change: Key Areas

In order to analyse the change to oil palm cultivation specifically in the Thai context, I developed an analytical framework which draws from two main analytical approaches, namely an eight element model of farmers' decision-making, and the IDS KNOTS team's policy processes framework. This chapter addresses the analytical framework shown in the diagram (Figure 4.1), which is devoted to understanding the change to oil palm cultivation from the farmers' point of view. The concept of eight elements of farmer decision-making (Ohlmer et al., 1998) was adapted to appropriately address oil palm issues in the context of Thailand.

Figure 4.1: Analytical Framework Applied in Chapter 4

Source: Diagram by the Author

The findings in this research suggest that economic security is important to farmers when deciding whether to engage in oil palm cultivation. However, it has emerged that the real desires of the farmers are to live comfortably and close to their children, which implies an urban to rural migration on the part of the children who moved away. Other critical factors are intrinsic characteristics of oil palm cultivation such as long life-span and short harvesting period, the low productivity and high production costs of rice cultivation, the government's support for oil palm farming, the roles of inspirational local leaders and large-scale oil palm producers, the price of oil palm fruits, the links between farmers and local buyers, some farmers' experience of oil palm cultivation in the southern region of Thailand, and the success of rubber plantations.

All the findings will be justified in detail in the subsequent sections, according to the adaptation of the eight elements of farmers' decision-making model discussed in Chapter 3. The analysis starts with the values and goals element, which explores whether the farmers' values and goals can significantly affect their decision-making.

4.2 Values and Goals Element

As stated in Chapter 3, the Theory of Human Need (THN) was deployed in this element to elaborate the farmers' needs in choosing to start cultivating oil palms. The insight in this element will provide a foundation for a further investigation into whether these needs are met as a result of the farmers adopting oil palm production. The consequences will be discussed in the implementation and responsibility bearing elements which follow. According to the theory, the two basic needs, which are physical health and autonomy, are met through the satisfaction of a set of eleven intermediate needs, or needs satisfiers. These eleven needs satisfiers are: adequate nutritional food and water; adequate protective housing; a non-hazardous work environment; a non-hazardous physical environment; appropriate health care; security in childhood; significant primary relationships; economic security; physical security; appropriate basic and cross-cultural education; and safe birth and child-bearing. All eleven are critical to safeguard the two basic needs of people and thus enable them to participate in their preferred way of life according to their culture. However, identifying specific intermediate needs in particular contexts could vary from society to society. In other words, the THN underlines the importance of local contexts, by recognising that in different social and environmental contexts the eleven intermediate needs can be met in different ways.

In this research, evidence from the oil palm farmers shows that success in moving to oil palm cultivation could have several effects on the farmers' autonomy, which is one of the two basic needs according to the THN. As suggested by Doyal and Gough (1991), autonomy must be distinguished from independence or separateness; it refers to the capacity of individuals to formulate consistent aims and strategies, which they value or are interested in, and their ability to put them into practice in the activities in which they engage. Obviously, most of the oil palm interviewees (41 of 45households) identified that an increase in economic security, which was one of the eleven intermediate needs, was what they perceived as their need before making the decision to invest in oil palms. All of these farmers broadly accepted that this intermediate need would be satisfied through success in cultivating oil palm and rubber rather than the traditional rice.

In fact, a rise in someone's standard of living would allow that persons' autonomy to increase, and thus improve their capacity to participate in their way of life. One of the farmers said,

> "If we get more money from oil palms in the future, it will help reduce our household expenses. So we can do other things … I want to buy my son equipment for fixing motorcycles. He loves it and it can be his future job." (Male, Baan Hat, semi-structured interview, June 2010).

Some households planned to pursue their agricultural strategy by investing the money in ploughing machines to increase their productivity in rice cultivation and/or for hire purposes, or investing in the irrigation systems on their farms. However, the priorities of some interviewees were to obtain luxury goods such as the famous Toyota Hilux Vigo and Isuzu MU-7 pick-up cars or new motorcycles, or to refurbish their houses. These farmers' values could lead them into debt, as there would be no opportunities to sustain their incomes in the future. I found this group of farmers quite different from the previous one, who had likewise identified economic security as their need, but planned to use the forthcoming income from oil palms to invest in activities or equipment that could generate more income in the future. In one case where the interviewee was already in debt from buying luxury goods, the situation was getting worse. This interviewee explained,

> "I've got the Vigo now just to be cool driving to town. It looks great. But now I have to find more money just to pay for it every month. Not good I know, but I don't know what to do. It has already happened. I hope that the oil palm crop can help." (Male, Baan Sa Ard, semi-structured interview, June 2010).

Nonetheless, probing deeply into the issue revealed that the farmers have another set of values. Although they are very interested in earning more, their motive for wanting an increased income is to live comfortably with their children in the areas of their hometowns. This highlights the significance of primary relationships in the eleven intermediate needs. Certainly social relationships are important satisfiers for maintaining and extending autonomy, which could be satisfied through interactions with close friends and relatives, or other relationships that matter, in particular community and societal contexts. In the past, many households, particularly in the Northeast region, had to force their children to work in urban or industrial areas in order to acquire sufficient income. Krongkaew et al. (1992) found that farmers normally migrated to find work during the slack seasons, whilst long-term migration was also apparent across country. Since the economic boom in the mid-1980s, the demand for manufacturing labour increased drastically. As manufacturing offered a higher and more stable income than agriculture, rural workers migrated to urban centres, including a significant number of the children of the farmers in this research, who were long-term migrants.

It is a well-known fact that migration has been perceived in Thailand as a means to alleviate poverty and achieve a better standard of living (Krongkaew et al., 1992; Sussangkarn and Chalamwong, 1994; Tsay, 2002; Osaki, 2003; Guest, 2003). Seasonal migrants bring back income to their households, whilst long-term migrants send remittances home. In fact, there is evidence that these remittances contribute significantly to reducing poverty and income inequality among households in Thailand (Guest, 2003; Osaki, 2003; NESDB and World Bank, 2005). In the Northeast region, approximately 45 percent of all households received remittances, the highest proportion in the country (NESDB and World Bank, 2005, p.108). Osaki (2003) also found that the poorer the households they came from, the more likely the migrants were to send remittances. However, the findings in this research suggest a reversal of the trend of migration because of oil palm plantations. Many interviewees (26 of 45 households) believe that oil palm plantations could create more employment and thus attract their children who had migrated to come back to agricultural work in their home areas.

This is illustrated by the following excerpts from interviews:

> "I want them (oil palms) to be successful, then my daughter can come home when she has a kid. Doesn't have to job around in Bangkok." (Female, Baan Hat, semi-structured interview, June 2010),

> "You see, in that village (the next village), his sons came back helping their dad doing rubber tapping. I want more money, more jobs, I want my son to come back too. It has been a long time since he went. Seeing your son only once a year (during Songkran Festival) is not enough. It is never going to be enough." (Male, Baan Tarn, semi-structured interview, May 2010),

> "If they (oil palms) work in the future, my kids don't have to go anywhere. This is for my family. I want to live as a family. Everyone does." (Male, Baan Sa Ard, semi-structured interview, July 2010).

In many oil palm households, an increase in income also means the family can save additional money for the future education of their children, which is one of the farmers' needs contributing to the strengthening of their autonomy, according to the THN. The position of *Pen Jao Khon Nai Khon*, which could be translated into English as 'being master and having subordinates', was the farmers' plan for their children. It was believed that the position could be achieved through education. The higher the level of education the children could achieve, the better their future life would be. There would be no need to sell valuable assets such as land, cows, or their stores of rice for their children's education if the households had adequate incomes. According to the THN, this desire to invest in the education of their children means that their children's autonomy will be strengthened, according to the element of education in the eleven needs satisfiers.

> "If the oil palm can bring us a good income in the future, I will keep the money for my children to go to school. So they can choose what they want to do and be in the future. Maybe not in agriculture, it is up to them, but deep down I want them to be around here." (Male, semi-structured interview, Baan Tarn, May 2010).

The values of these interviewees were definitely bound up with the prospects for their children. Oil palm cultivation itself has been viewed as a potential source of inheritance for their children. This was because of the perception of the oil palm crop being *Num Seum Bor Srai*("Water Pouring in Sand"). *Num Seum Bor Srai* is the traditional Thai idiom describing the way one generates an income out of something for an infinite length of time. Unlike rice cultivation, oil palm plantations have a long lifespan; the trees can attain an age of 25 to 30 years under 'good' conditions. The farmers also stressed the importance of having reliable sources of income throughout the year and the opportunity to work equally at every stage of the year, as is the case for those engaged in agriculture.

The findings also highlighted that some households valued a crop that involved relatively less labour than the rice cultivation. This surfaced in the households without children or whose children had settled for work reasons in areas outside the villages. These farmers did not show much interest in having huge increases in income, but they were concerned about leisure time and not having to work as hard as they once used to in labour-intensive rice farming.

It was noticeable in the research that every farmer in the interviews had adopted an integrated farming method. There are five crops that appear in the research sites, namely rice, rubber, oil palm, eucalyptus, and watermelon, and each household cultivated two, three or four of these crops (see Table 4.1). The combinations varied from household to household. However, there was one householder interviewed who at the time of the fieldwork was not growing rice as he had switched the whole farm over to oil palms. That householder, who was in Baan Sa Ard, insisted that the reason he abandoned rice cultivation was because of his age.

> "I am too old to grow rice. So, I have no choice but to grow the crop that I can do," (Male, semi-structured interview, August 2010).

Table 4.1: Number of Households and Occupation of Crops by Village

Village	Oil Palm	Rice	Rubber	Eucalyptus	Watermelon
1. Baan Tarn	14/14	14/14 (100%)	10/14 (71%)	6/14 (43%)	3/14 (21%)
2. Baan Sa Ard	23/23	22/23 (96%)	23/23 (100%)	3/23 (13%)	0/23 (0%)
3. Baan Hat	8/8	8/8 (100%)	3/8 (38%)	2/8 (25%)	0/8 (0%)
Total	45/45 (100%)	44/45 (98%)	36/45 (80%)	11/45 (24%)	3/45 (7%)

Source: Data from Field Interviews (2010)

At first, I was found that 44 of the 45 households were self-reliant in terms of producing sufficient rice for their annual household consumption. However, rice and oil palms are planted in similar land areas, and it might be possible for farmers to plant oil palms in some parts of their rice paddy fields for experimental purposes. Hence, I put further questions to the farmers regarding their future oil palm expansion plans, and whether they wanted to continue with rice cultivation. The results differed from the previous findings, as the number of households planning to abandon rice cultivation had surged to nine. All of them were the farmers in Baan Sa Ard (see Table 4.2).

Table 4.2: Number of Households that Planned to Abandon Rice Cultivation by Village

Village	Planned to Switch Completely from Rice to Oil Palm Cultivation
1. Baan Tarn	0/14 (0%)
2. Baan Sa Ard	9/23 (39%)
3. Baan Hat	0/8 (0%)
Total	9/45 (20%)

Source: Data from Field Interviews (2010)

The explanation for farmers abandoning rice cultivation in Baan Sa Ard lies in the character of local leaders. The inspirational local leader H, who influenced farmers in Baan Sa Ard to adopt oil palm cultivation, has replaced 50 rais of rice farming with oil palm trees since 2006. H was a leader in the community in growing oil palms and rubber (see also Chapter 5 for details). H's reason for switching completely from rice paddy fields was the lack of farm labour in his household, and several oil palm farmers in Baan Sa Ard followed their leader's direction. As one household summarised,

> "He (the inspirational local leader H) buys rice also and I did not see him having any problems at all. My household and his household are quite the same, no labour for rice farming. As long as we have enough money to buy rice, it is fine." (Male, semi-structured interview, August 2010).

Although these nine households would be growing at least two crops (oil palms and rubber) on their land after the switch, they would be less able to be self-reliant in terms of producing rice for household consumption. This group of farmers showed no hesitation in buying rice for their household consumption. One of the farmers in the group explained,

> "Rice farming makes a loss. Actually, no one in my household wants to do any labour. All of my children want to do something else. Buying rice is not that bad: it is actually quite convenient." (Female, Baan Sa Ard, semi-structured interview, August 2010).

Nonetheless, the majority of the oil palm farmers (80 percent: 36 of 45 households) insisted that growing rice was important to them, regardless of how much it costs to produce it. One of the farmers in Baan Tarn said,

> "Profit or loss, we will grow rice. Esaan people will not leave their rice paddy fields. Oil palm is good, but I cannot accept the feeling of buying rice from others. It is not our culture and it hurts. We need to produce rice, at least for ourselves." (Male, Baan Hat, semi-structured interview, June 2010).

The most common answer from the farmers, when they were asked whether to continue the rice farming, was "We have to grow rice for our own eating. If not, what will we eat?"

The evidence from the farmer in Baan Tarn who had migrated from the Southern region to settle in the Northeast suggested that farmers in the Northeast were different from the South in terms of how they valued self-reliance and rice farming. Farmers in the South were more likely to abandon rice farming and adopt other agricultural crops that offer higher profitability, such as oil palm, rubber or prawn farming. The Southern farmers switched promptly according to the market prices of agricultural crops.

> "Unlike Esaan people, Southern people do not value their rice paddy fields very highly. It is normal for them to buy rice. Esaan people will choose to sell prime pieces of lands instead of selling their rice paddy fields, if they are in trouble. That would not happen with Southern farmers," elaborated the farmer in Baan Tarn (Male, semi-structured interview, May 2010).

The farmer in Baan Sa Ard who reserved 5 rais of land for rice cultivation instead of changing all his land to oil palm plantations was another good example. His reason for growing rice was simply because rice had a tremendous value for him.

> "I am a farmer and I love being a farmer. It is a shame not to produce rice for ourselves. If we fail to do that, we should not call ourselves farmers," he declared (Male, semi-structured interview, August 2010).

Likewise, the interviews with the rice farmers who were interested in oil palm cultivation revealed similar values in terms of their attitudes towards producing rice. Many households insisted that they needed to buy new land for oil palm cultivation, as they would not convert their rice paddy fields to oil palm cultivation due to concerns over food security. One interviewee said,

> "I do not have much rice land, so I am afraid of having nothing to eat. Turning all the rice land into oil palms? No. No way. That is not good logic." (Male, Baan Hat, semi-structured interview, June 2010).

According to the biofuel literature discussed in Chapter 2, there is general evidence that the increase in land devoted to biofuel production has contributed to a reduction of land for food and feed crops, thus raising concerns over food security, especially in countries that rely heavily on food imports because of the volatility of food prices. The findings in this study suggest that the oil palm farmers in the Northeast region of Thailand are unlikely to convert all of their rice paddy fields to oil palm plantations. This is to say that the change to oil palm cultivation would not turn the country into a net importer of rice because the Esaan farmers felt strongly about producing rice, at least for their own consumption.

To sum up, the findings in relation to this element suggest that an increase in economic security is the farmers' main intermediate need in deciding to start growing oil palms and could result in greater autonomy for the farmers, which is one of the two basic needs according to the THN. The farmers believed that this intermediate need would be satisfied through success in oil palm and rubber rather than in the traditional rice cultivation. Probing deeply in the issues revealed that the farmers valued their family relationship as well as the prospects of their children very highly. This is to say that not only an increase in economic security, but also living comfortably with their children in the areas of their hometowns and the future of their children have been highly prioritised by the farmers. Thus, success in the oil palm cultivation will provide sufficient amount of money to support their children's future education and attract them to come back and live with the parents in their hometowns. These values of farmers stress towards the significance of primary relationships and education elements in the eleven intermediate needs, which can strengthen the farmers' autonomy.

In the next element, I will analyse the farmers' decisions about oil palm versus rice cultivation. The farmers' perceptions of rice cultivation will be revealed, as every household interviewed was or had previously been involved in the paddy fields. Certainly rice cultivation is a crucial activity that significantly affects their decisions about changing to oil palm farming.

4.3 Problem Detection Element

Unquestionably, the driving force for oil palm cultivation in the three villages was related to problems in the rice paddy fields. Thailand has a long tradition of rice production and consumption. Rice is grown throughout the country and has always been a vital part of the agricultural sector. Rice cultivation has shaped a way of life, faith, belief, economics, and cultures in the country (Vanichanont, 2004). Of the four regions of the country, the Northeast is the largest and covers about one-third of Thailand's total land area. In 2008, rice cultivation occupied 57.4 percent of the Northeast region's agricultural land and it comes as no surprise that the majority of Thailand's rice production, 34.3 percent, was from the Northeast region (OAE, 2009).

Nonetheless, rice farming in the Northeast region is mostly, at 95 percent, in rain-fed areas, where there is only one growing season per year, between May and October. In this region, infertile sandy soils and erratic rainfall are the two major causes of low rice production. The rice yield in the North East was the lowest of all the regional rice yields at 331 kilogrammes per rai in 2008, compared to the country's average of 427 kilogrammes per rai in the same period (NESDB, 2009a). The soil across most of the region is sandy, with low organic matter content. Sandy soils do not retail water well and the soil quality could not readily be mitigated by simply applying chemical fertilisers in order to achieve higher productivity.

As well as soil constraints, the Northeast has an erratic rainfall pattern. Annual rainfall land, more critically, rainfall distribution varies considerably in the region. There is a distinct rainy season from May to October with peaks in June and September. Although the amount of rainfall received could vary from 1,100 millimetres to 2,200 millimetres per year throughout the Northeast region (Moroizumi et al, 2009), the critical factor affecting agricultural production is the huge variability both within and between years. A late start to the rainy season in May and June, dry spells when the rice is getting established in late June and July, short periods of flooding in September, and the late-season droughts in October and November could all be detrimental to the rice harvest.

The evidence from the interviews confirmed those limitations, as most households in the three villages faced problems regarding rice productivity. In the villages, low productivity of rice farming was reflected in the households' low incomes from rice. The interviews indicated that the incomes obtained from rice production were low and did not cover the costs of production, such as the soaring price of fertilisers and agricultural wages. The elderly and the land abundant farmers in the villages did not harvest rice themselves, but hired agricultural labourers within the village, in three different ways. Some farmers hired agricultural labourers on a daily basis, at a rate varying from 180 to 250 Baht per day. Other farmers shared the rice harvest with their labourers at a ratio of 1:1, but the farmers had to provide all the agricultural materials and equipment. A third group of labourers brought all the materials and equipment used in rice cultivation and received two thirds of the rice harvest.

In this research, there were nine elderly households (20 percent) in the three villages. All of them hired labourers for rice farming. According to the United Nations (2012b), 65 years of age is a normal benchmark for defining an elderly person, in order to make a comparison internationally. However, the Constitution of Thailand (1997) defines the role of the state in providing financial assistance and welfare to satisfy the basic needs of elderly Thai people, regardless of gender and social class, as follows: "Persons who are 60 years and over and have insufficient income to maintain their living are entitled to receive assistance from the state (Article 54)". Thus, this research uses the age of 60 to define the elderly in Thailand. "Elderly household" in this research refers to a household where the person who is respected by other household members as head of household is aged 60 or over.

It is important to note that most of the elderly people in this research lived with their adult children, which could be explained by the traditional norm that the elderly should be taken care of by kin. Most people in the Northeast region are still strict about the tradition of filial piety (Philips, 2000), known as *Boon Koon* in Thai. Adult children are morally obliged to take good care of their parents in their old age in return for care received when they were being brought up. Grandparents, in return, would look after their grandchildren. As a result, people in the Northeast region mainly live in large households. The Socio-Economic Survey (SES) in Thailand revealed that, on average, more than four people were found in Northeastern households in 1998, whilst the average household size in other regions was lower than four at 3.30, 3.60, 3.47, and 3.96 persons in Bangkok, the Central, North, and South regions respectively. Although there is an increasing trend for elderly Thais to live in smaller households (alone or with a spouse), more than 40 percent of older people live in families comprising three generations (Keeratipongpaiboon, 2012). However, it is clear from this research that the elderly people prefer to live with their children or at least nearby, so that they can see their children daily. This is the reason why big families in Thailand, particularly in the Northeast region, have not dramatically decreased as in the developed world.

Returning to rice, the costs of rice production, as mentioned earlier, are seen by most of the interviewees as very high and unreasonable, which reduces the profitability of the crops and thus makes rice growing less attractive. The areas are also prone to flooding in the rainy season, which affects the amount of rice produced. Consequently, the farmers had to find new sources of income, whether selling agricultural labour, planting alternative crops, or receiving remittances from relatives working in urban areas, in order to balance the households' expenditures. One of the interviewees explained,

> "Doing only rice will not fill your stomach. You must find other things to support it." (Male, Baan Sa Ard, semi-structured interview, July 2010).

His statement also disclosed his inclination towards abandoning rice farming,

> "You invest 35,000 Baht and get 15,000 Baht back in selling. If you were me, would you still want to do it?" (Male, Baan Sa Ard, semi-structured interview, July 2010).

The main purpose of growing rice is that the households used to consume rice as a major source of energy at every meal of the day. Some households were less concerned about the issues of cost and profit of rice cultivation. The respondents felt that they have no choice but to grow rice as their main food. Rice is used for the domestic consumption rather than for selling to be a major source of income of the households. An interviewee in Baan Hat reflected this perception:

> "I know it is not worth doing (rice farming), but I do it anyway. I consume it in my family. If there is any left, I then think of selling." (Male, semi-structured interview, June 2010).

Apart from the problems related to rice farming, some households perceive growing oil palms as an opportunity to try something different. Four households bought additional land especially for planting oil palms. There were also several households that had acquired a lot of unproductive land, including abandoned arable land and bamboo-rich land areas, who wanted to transform these pieces of lands into valuable family assets. Oil palm cultivation was certainly considered as one of the potential choices by the interviewees.

To summarise, this element found that the uncompetitiveness of rice production in the areas due to its low productivity and high production costs, particularly in agricultural labour, had significantly tempted the farmers interviewed towards alternative crops including oil palms. The next element, then, investigates the reasons why the farmers choose oil palms rather than other possible crops such as eucalyptus, cassava or rubber. The options are evaluated in terms of whether they are compatible with the farmers' morals, values, beliefs and goals.

4.4 Problem Definition Element

As mentioned in Chapter 3, I have adapted this element to focus on the farmers' justification for rating oil palm cultivation above other optional crops in the area, such as eucalyptus, cassava and rubber. In fact, rubber is relatively safe from being overtaken by oil palm cultivation in the Northeast region. Despite the growing number of rubber plantations in the Northeast region, oil palm and rubber trees are planted in different land areas: flatland for the former and slightly higher ground for the latter. Besides, the farmers believe that rubber generates slightly more income per unit space and time than oil palm, which creates an economic disincentive for switching to oil palms. However, even if the price of oil palm fruits rose drastically in the future, farmers in the region would not be able to switch from rubber to oil palm plantations because the land is not appropriate. The real competition for utilising the land is between these four crops: eucalyptus, cassava, rice, and oil palms. Rice paddy fields are the most likely to be replaced by oil palm cultivation as the farmers showed signs of dissatisfaction with the crop. I have described the difficulties regarding rice cultivation in the previous element. This element therefore explains the farmers' crop options, starting with eucalyptus.

Eucalyptus was introduced into Thailand from Australia in the 19th century. Government officials encouraged farmers to grow it due to its characteristics of rapid growth, hard wood, and ability to grow in tropical areas. After three to five years' growth, eucalyptus trees grew can be turned into pulpwood either for using in the domestic pulp and paper industry or for export, mainly to Taiwan and Japan. However, as an increasing area has been planted, serious criticisms of the ecological problems of eucalyptus planting have emerged from rural NGOs and academics. Critics argue that, among other problems, eucalyptus destroys local biodiversity and species, uses more water than other crops thus depleting underground water sources, lowers soil fertility, and inhibits the growth of other crops (Patanapongsa, 1987; Usher, 1990; Doughty, 2000; Tunya, 2000; Jawjit et al., 2006; Bennett, 2010).

The interviewees supported the critics. One expressed the following views on planting eucalyptus:

> "The environment goes bad if you plant eucalyptus. You can't grow eucalyptus in or near the rice paddy fields. The rice won't grow. If you want to change to other crops, it will be difficult. The soil is spoilt and you have to spend a lot of money to get the roots out and also getting a lot of fertiliser for the next crop." (Male, Baan Tarn, semi-structured interview, May 2010).

The flow of income from eucalyptus trees is also a concern for several respondents. One interviewee lamented:

> "You have to wait for three to four years before you can get any money from the trees. Then you have to wait for another three to four years and you can only do this three times. Don't ask about oil palms, even compared to rice, I will choose rice. Growing eucalyptus doesn't put anything in our stomachs. Growing rice, you can sell it and get money or you can keep it for you and your family to eat." (Male, Baan Hat, semi-structured interview, June 2010).

The second alternative crop in the area is cassava. Cassava is an easy growing and drought tolerant crop, which grows well on sandy soils of low fertility. It can be grown on either flatland or hillsides and is utilised chiefly for the production of starch and animal feed, as well as for direct individual consumption. In 2009, Northeast farmers had planted cassava on an area of 4.24 million rais, which accounted for 54.73 percent of Thailand's cassava planted areas. Only 30.56 percent of the cassava production was used domestically (OAE, 2010a). However, there were concerns over the long-term detrimental effects on soil productivity of cassava planting (Howeler, 1991; Putthacharoen et al., 1998).

Although several interviewees believed that cassava causes soil degradation and that few other crops grow well where cassava has been grown, the interviewees stressed that cassava's price fluctuation was a larger problem. The farm price varied from 1.18 Baht per kilogramme in 2007 to 1.93 Baht per kilogramme in 2008 and dropped back to 1.19 Baht per kilogramme in 2009 (see Table 4.3). The initial aim of farmers in planting cassava was to obtain a more stable income, but farmers' experiences with cassava in the past suggest the contrary. One interviewee explained,

> "I was once growing cassava. The price was up and down. If the price is good this year, many people will grow it and next year the price will fall. We didn't sell it at a good price and in the end we made a loss." (Male, Baan Sa Ard, semi-structured interview, July 2010).

Table 4.3: Planted Areas, Production, Yield, and Price of Cassava (2001-2010)

Year	Planted Areas (1,000 rais)	Production (1,000 tonnes)	Yield Per Rai (kilogrammes)	Farm Price (Baht / kilogramme)
2001	6,918	18,396	2,805	0.69
2002	6,224	16,868	2,731	1.05
2003	6,435	19,718	3,087	0.93
2004	6,757	21,440	3,244	0.80
2005	6,524	16,938	2,749	1.33
2006	6,933	22,584	3,375	1.29
2007	7,623	26,916	3,668	1.18
2008	7,750	25,156	3,401	1.93
2009	8,584	30,088	3,628	1.19
2010	7,560	21,941	3,005	1.77

Source: OAE, MOAC

The findings show that oil palms have advantages over other crops in three noteworthy ways. Firstly, oil palms bear harvestable fruits every fifteen days once they are four years old, which promises to generate a relatively stable income for the peasants. A more stable income than is available from cassava, eucalyptus or rice is very attractive for the farmers. As mentioned earlier, with eucalyptus, farmers have to wait three to four years before obtaining any income, whilst with cassava the waiting time is about ten to twelve months for each crop. Rice farming has a shorter period of growing and therefore generates income sooner but can only be planted once a year in the area studied.

Another advantage of oil palm cultivation is related to the farmers' perception of using palm oil as a substitute for diesel. The interviewees spoke positively about expecting a higher demand for biodiesel in the future, which would be converted into a rise in demand for oil palm fruits as a major feedstock for Thailand's biodiesel production.

> "The demand for oil will be higher than the demand for cassava or eucalyptus in the future. Oil is used in everything. Paper and cassava are not." (Female, Baan Sa Ard, semi-structured interview, July 2010).

Although cassava is also used in the production of ethanol, the first preference feedstock for the current proven technologies in Thailand is cane molasses because it produces ethanol at a relatively lower cost per unit (NESDB, 2009a). Another advantage is that obtaining bioethanol from cassava, cane molasses, or sugarcane would entail less impact from land competition. This results partly from the government's policy of increasing crop yields instead of turning more land over to cassava. Thus, the total area planted with cassava is expected to be at the same level as in 2008, when the 15-year Alternative Energy Development Plan is approved (see Table 4.3) (Sriroth et al., 2010; Bell et al., 2011). The fact that cassava has less policy support from the government than oil palms also makes it less attractive than oil palms. One interviewee pointed out another perception in favour of oil palms, which was that cassava could and should be grown in less arable, marginal lands where other crops could not thrive:

> "We normally grow cassava on very infertile soils. Our land's quality is better than to just grow cassava. We then look for other options." (Male, Baan Tarn, semi-structured interview, May 2010).

The farmers' third positive perception of planting oil palms is their long life-span. The average life of oil palm trees is 20 to 25 years depending on the climatic conditions and maintenance. The respondents felt strongly that this was a huge advantage over the other competing crops. In addition, most interviewees suggested that oil palm cultivation involves less labour in maintenance and harvesting. The crop also involves just a one-off planting, which differs from rice and cassava which entail the labour of planting annually[3].

To summarise, this element suggests that in the Northeast region, rubber trees are grown on different types of land from oil palms. Thus, oil palm and rubber cultivation are not competing with each other. Moreover, the environmental impacts of growing eucalyptus and the price fluctuations of cassava have shaped the decisions of the farmers in favour of moving to oil palm. In the next element, I will examine the farmers' sources of knowledge about oil palm cultivation and of funding for it. This element also discusses the differences between the oil palm farmers in the three villages in the study in terms of the knowledge they have acquired and the sources of funding available to them.

[3]Several respondents also demonstrated a clear *Sue Norn Gin* attitude. The phrase literally translates as 'Tiger Sleep Eat', and is a reference to Thai classical literature. It implies getting "something for nothing", gaining benefits without hardship, or putting in less effort but still acquiring something. To the farmers, oil palm plantations seem to offer a perfect fit with that position.

4.5 Observation Element

To understand oil palm issues from the bottom up, this element has been adapted to focus on the farmers' compilation of knowledge about oil palms and their choices as regards funding oil palm farming. I have split this element into two sub-sections: the farmers' sources of oil palm knowledge and their sources of oil palm funding. The discussion starts with farmers' acquisition of oil palm knowledge.

5.5.1 The Farmers' Sources of Oil Palm Knowledge

The findings suggest that householders in the three villages acquire oil palm knowledge in three different ways. The first way is through the government sector, namely: Nong Khai Oil Palm Research Centre (NKO); Department of Agriculture (DOA); and the local Agricultural Extension Offices. The majority of the households obtained their oil palm seedlings from NKO and learned about oil palms from them.

I divided these households into two categories based on how the oil palm seedlings were obtained from NKO. In the first category are the households who borrowed oil palm seedlings from NKO under the Oil Palm Plantations Supporting Project (OPPSP). This project enabled the farmers to receive oil palm seedlings without laying out initial capital, but with a requirement to pay back in the form of either oil palm production or money from the beginning of the 4th year (see details in Chapter 5). I refer to this type of household as a 'contracted household' in this thesis. In the second category are the households who bought oil palm seedlings directly from NKO, at the price of 50 to 60 Baht per seedling. This type of household is called a 'buying household' in this thesis.

The contracted and buying households were concentrated in two of the three villages in the study, namely Baan Tarn and Baan Sa Ard, whilst Baan Hat householders acquired oil palm seedlings differently. In Baan Hat, none of the oil palm growers obtained seedlings through the involvement of NKO (see Table 4.4). All of the households in this village ordered oil palm seedlings from private suppliers, either locally or in the Southern region. Thus the farmers in Baan Hat had obtained their oil palm knowledge from different sources from the contracted farmers in Baan Tarn and Baan Sa Ard.

Table 4.4: Number of Households and Sources of Acquiring Oil Palm Seedlings by Village

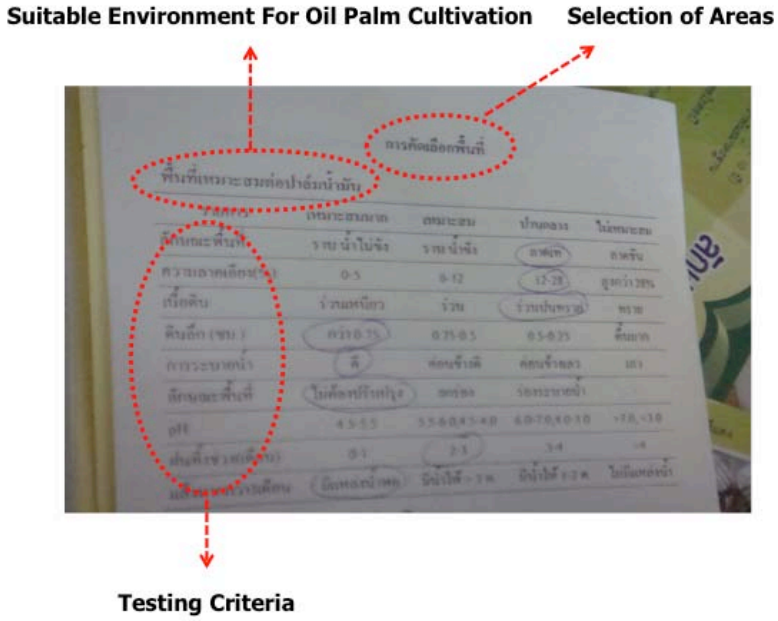
Village	NKO *		Private Suppliers *
	Contracted Households	Buying Households	
1. Baan Tarn	9/14 (64%)	6/14 (43%)	2/14 (14%)
2. Baan Sa Ard	9/23 (39%)	11/23 (48%)	5/23 (22%)
3. Baan Hat	0/8 (0%)	0/8 (0%)	8/8 (100%)
Total	18/45 (40%)	17/45 (38%)	15/45 (33%)

* The total number in each category might exceed the total number of interviews as several households acquired their oil palm seedlings from more than one source.

Source: Data from Field Interviews (2010)

Nonetheless, there were several differences between the contracted and buying farmers in acquiring oil palm expertise. Most of the contracted households received before-planting advice from NKO, such as land preparation, lining and planting holes, planting techniques, and practice lessons in the oil palm testing field. Additionally, the contacted farmers were offered initial soil testing by DOA officials to ensure that the areas were suitable for oil palm cultivation. Underground water levels were checked to ensure the areas had sufficient underground water to support the growing of oil palms (see Picture 4.1).

Picture 4.1: DOA's Soil Testing Document from Baan Tarn



Source: Photograph by the Author (2010)

According to the Oil Palm Plantations Supporting Project (OPPSP), Department of Agriculture (DOA) had to provide the contracted farmers with oil palm knowledge and maintenance techniques both before and after the seedlings were planted. Nong Khai Oil Palm Research Centre (NKO)is the local government agency under DOA that works in support of DOA's measures. However, from the interviews, there was confusion in many households that the officials in the soil testing and monitoring of oil palms were from NKO, which signified that few farmers were participating in the OPPSP.

The fact that the government had made oil palm knowledge accessible played an important role in convincing the contracted farmers to make the change to oil palm cultivation.

> "I was interested in oil palms but I had no idea how to plant them here. The project was good for me. They (NKO officials) gave us everything we need to plant oil palms. They provided us with the seedlings, advised us in the testing fields, and gave us the handbooks. The only problem is: will it work here?" explained one interviewee at Baan Tarn (Male, semi-structured interview, May 2010).

Talking to the DOA officials while the soil was being tested also assisted the contracted farmers in gaining oil palm knowledge, the same interviewee further explained:

> "I also asked them (DOA officials) during the soil testing, but it was all about techniques and tips for oil palm plantations. Water is a key. I was excited. Luckily, my land was okay for planting."

As well as this initial help, DOA officials came to the villages to monitor the oil palms' growth for the contracted farmers. However, the frequency of the visits differed between the two villages: they visited Baan Tarn approximately once every 4 months, and Baan Sa Ard once every 6 months. The contracted farmers could also take advantage of these visits to gain further oil palm knowledge by asking the officials.

> "If we have problems, we can ask them (DOA officials) when they come. They gave us some advice, but we don't actually know exactly when they will come to see us. The latest was early this year (in 2010)," said an interviewee from Baan Tarn (Male, semi-structure interview, May 2010).

In contrast to the certified oil palm seedlings received from NKO, the buying farmers had to plant oil palms at their own risk and expense. There were no soil testing and monitoring processes involved in the oil palm planting for this group of farmers. Although the buying farmers were able to ask NKO officials for advice on any oil palm related issues, in reality the buying farmers did not ask for oil palm knowledge from NKO, and the NKO officials only provided handbooks for the buying farmers (see Picture 4.2). Moreover, some buying farmers obtained NKO's seedlings through their friends in the village. The farmers did not contact NKO directly, so they had no opportunity to gain proper oil palm knowledge from NKO.

> "I wanted the oil palm seedlings from NKO because it is cheaper and I trusted NKO. But I didn't go to NKO myself because it was quite far from here. My friend got them (oil palm seedlings) for me, along with the handbooks," explained one interviewee (Male, Baan Sa Ard, semi-structured interview, July 2010).

Picture 4.2: The Oil Palm Handbooks Provided by NKO

Source: Photographs by the Author (2010)

The oil palm seminars run by the local Agricultural Extension Offices in co-operation with NKO were meant to be an important source of oil palm knowledge for farmers who were interested in oil palm cultivation. The seminars included the markets for oil palm, management of oil palm farming, suggestions of appropriate fertilisers, and oil palm harvesting techniques with oil palm experts from the Southern region as guest speakers. However, the fact that the seminars could not be held on a regular basis made it difficult for the farmers to obtain oil palm knowledge from the local government. They had to go directly to the local Agricultural Extension Offices or NKO for advice, as an interviewee described:

> "I went to a seminar at Seka Agricultural Extension Office (SAE) a long time ago. It was useful, but it was, like, once in two or three years. Contacting NKO or SAE is not practical for us. NKO is too far away. We can ask the officials at SAE about oil palms at the rubber meeting, but we prefer asking people who have planted them around our village." (Male, Baan Hat, semi-structured interview, June 2010).

The evidence also showed that some farmers were reluctant to attend the oil palm seminars provided by the government sector. They felt that they did not have the right to attend the seminars because they had not borrowed oil palm seedlings from NKO.

> "I bought seedlings from NKO. But my name wasn't on the list for the seminar. I was too shy to attend so I decided to ask (about the seminar) my friend who was in the project." (Female, Baan Tarn, semi-structured interview, May 2010).

The second way of acquiring oil palm knowledge was from the experience some of the farmers had gained previously. These farmers were confident about starting oil palm plantations because they had previously worked in oil palm farming in the Southern region and had learned how to grow and harvest oil palms there. Some farmers had worked in the south mainly as rubber tappers or construction workers and had just spent their spare time as hired labour in the oil palm fields nearby, cutting palm fruit bunches. Some were originally from the south and had migrated to live in the Northeast region. The interviewee explained,

> "I worked in the south, in the oil palm fields, for 3 years. I learned the oil palm skills from there and also brought three oil palm seedlings with me when I came back. I just wanted to try. They grew well here so I was quite confident in deciding to plant more." (Male, Baan Sa Ard, semi-structured interview, August, 2010).

The final way the farmers in this study had acquired oil palm knowledge was by learning from people who had experience of planting oil palms, including private suppliers. Many interviewees (31 of 45 households) said that they were not concerned about acquiring oil palm knowledge before planting oil palms because they could easily consult with other oil palm farmers in their village. Some contacted friends who had oil palm plantations either around the village or in the Southern region for additional advice. Nonetheless, they were concerned about the techniques they would need after planting. As several interviewees stated, there was no single conclusion about the best way to maintain oil palms and they were worried about their yields.

In the case of Baan Hat, consulting with experienced farmers was the primary source of oil palm knowledge. The interviewees did not pay attention to the government supports, although they went to the seminars which were organised - albeit rarely - by the local government. The private seedlings supplier B, who lived in the village, was essential in providing oil palm knowledge for the oil palm farmers in Baan Hat.

> "I got the knowledge from him (private seedlings supplier B). He came from the south so he knew how to plant it. I bought the oil palm seedlings from him then he taught me. He will come to see if you have any problems. The planting of oil palms wasn't that difficult," said the respondent in Baan Hat (Male, semi-structured interview, June 2010).

To summarise, this sub-section has shown that the farmers have various sources of oil palm knowledge. The knowledge provided by the government plays a significant role as most of the oil palm farmers are involved with the government agencies. Oil palm seminars organised by NKO and district-level Agricultural Extension Offices, and the loans of oil palm seedlings provided by NKO, also help boost the farmers' confidence in growing oil palms. Learning from other farmers with experience of oil palm and some of the farmers' own experience in the South are also useful and help encourage the farmers' confidence to begin oil palm cultivation (see Table 4.5). In the next sub-section, I will move on to investigating the farmers' sources of funding for oil palm cultivation.

Table 4.5: Number of Households and the Farmers' Sources of Acquiring Oil Palm Knowledge by Village

Village	From Government	From Southern Experiences	From Oil Palm Experienced Farmers
1. Baan Tarn	12/14 (86%)	2/14 (14%)	5/14 (36%)
2. Baan Sa Ard	19/23 (83%)	3/23 (13%)	15/23 (65%)
3. Baan Hat	6*/8 (75%)	2/8 (25%)	6/8 (75%)
Total	37/45 (82%)	7/45 (16%)	24/45 (53%)

* From attending seminars provided by SAE and NKO only.

Source: Data from Field Interviews (2010)

4.5.2 The Farmers' Sources of Oil Palm Funding

In terms of the farmers' sources of funding for oil palm cultivation, the Bank for Agriculture and Agricultural Co-operatives (BAAC) could not provide financial support to attract the farmers in the three villages. Although the central government granted financial support for oil palm investment through BAAC's soft loans with a total value of 7 billion Baht in 2007 (Siriwardhana et al., 2009), none of the farmers in this research participated in the Oil Palm Plantations for Alternative Energy Project (OPPAEP) because the interest rate was higher than the normal rate that the farmers could get.

> "I didn't want to go for the BAAC's oil palm project. It was expensive. Getting money from the village fund or the local co-operative was cheaper and a lot easier," explained a respondent in Baan Tarn (Male, semi-structured interview, May 2010).

Thus, the farmers had to find their own sources of funding to cultivate the oil palms. The evidence shows that oil palm cultivation has favoured the rich farmers in all three villages. Most of the oil palm farmers (44 of 45 households) had higher annual income than the average incomes of people in Phon Phisai, So Phisai, and Seka districts, which were at 38,777 Baht, 38,012 Baht, and 37,502 Baht in 2009 respectively (see Appendix A). The farmers that are able to invest in oil palms are those whose financial position is better than that of the average rice farmer in the villages, as one interviewee explained:

> "The government only lately came in to play seriously (in the OPPSP), but they only help partly. They did not grant us money or fertilisers to grow oil palms, unlike rubber. So, the growers have to have their own capital, maybe from rubber cultivation, savings, or even remittances from family or children working in the cities, and so on. Doing only rice farming would make it extremely difficult to accommodate oil palms." (Male, Baan Sa Ard, semi-structured interview, August 2010).

Clearly, the picture of oil palm funding was different in each village. In Baan Sa Ard, rubber tapping was the major source of household income which provided financial support for oil palm cultivation. Every household in the interviews at Baan Sa Ard planted rubber trees and only one household of the total 23 households was waiting for their first rubber harvest. The evidence indicated that most of the farmers' loans in this village were for the expansion of rubber fields through the BAAC's rubber supporting project, yet the farmers spent part of that money to invest in their oil palm cultivation, for instance, in the processes of ploughing, preparing water resources, and applying fertilisers.

There were four households in the interviews at Baan Sa Ard which had not yet generated income from rubber cultivation when they started growing oil palms. These households used other sources of income to help fund their oil palm plantations, including working as labourers in rubber tapping, running a small retail shop, and being the shuttle driver between the village and the school. These four households were also found to have loans from BAAC, the village fund and the local co-operative under the name of the rubber supporting scheme, of which part of the money was utilised in the growing of oil palms.

On the other hand, rubber is not the primary source of household income in Baan Tarn and Baan Hat. Hence, the farmers in these two villages had to rely on various sources of income to support oil palm investment. Some households utilised their savings from when they had gone to work in the south or abroad to facilitate oil palm investment. Some households spent the money which they received monthly from their children who worked outside the area. Some households were selling their labour and assets such as cows and buffalos to invest in the crop. Savings from running small businesses in the village and government pensions were other sources of income which were invested in oil palms.

Money from agricultural loans was another way to support oil palm cultivation especially in the maintenance period as many farmers spend this money on fertilisers for their oil palms. The loans in these two villages were from three channels, namely BAAC, the village funds, and the co-operatives. The loan from BAAC was intended for non-oil palm crops: for instance, rice and rubber. However, in reality the farmers spent the money to invest in all agricultural activities including oil palm cultivation.

> "I borrowed 40,000 Baht from BAAC this year (in 2010) through the rubber project. But I spent the money to buy fertilisers for rice, eucalyptus, and also oil palms. So, I don't really know exactly how much money I have spent on oil palms. It was a kind of mixture of everything," said an interviewee in Baan Tarn (Male, semi-structured interview, May 2010).

Interestingly, the findings suggest that some farmers decided to borrow from village funds and co-operatives as they are easy to access and their processes are simple. However, the amount of borrowing varied between households depending on the size of their oil palm plantations, household incomes, and the amount of oil palm investment – which in turn depended on whether the farmers had decided to participate in the OPPSP. The summary of sources of financial support for oil palm investment is depicted in Table 4.6 below.

Table 4.6: Number of Households and the Farmers' Financial Sources for Oil Palm Cultivation by Village

Village	Savings From Rubber Cultivation	From Other Sources of Income*	From Loans**
1. Baan Tarn	3/14 (21%)	10/14 (71%)	7/14 (50%)
2. Baan Sa Ard	19/23 (83%)	4/23 (17%)	15/23 (65%)
3. Baan Hat	1/8 (13%)	6/8 (75%)	4/8 (50%)
Total	23/45 (51%)	20/45 (44%)	26/45 (58%)

* Other sources of income included working as labourers, selling assets, savings from businesses, pensions, and remittances from relatives.

** Loans were from the Bank for Agriculture and Agricultural Co-operatives (BAAC), village funds, and the co-operatives.

Source: Data from Field Interviews (2010)

This sub-section has explored the farmers' sources of oil palm funding. I found that there is no oil palm funding from BAAC in any of the three villages and the farmers need to find their own sources of funding to support oil palm cultivation. This funding comes from savings from rubber cultivation, other sources of income including selling their labour and remittances from their relatives, and loans. In the next element, I will highlight the key factors affecting the farmers' decisions in choosing to begin oil palm cultivation. The next element will also analyse the rice farmers who have not yet begun oil palm cultivation, using another set of evidence from 18 households in the three villages.

4.6 Analysis Element

As indicated in the previous chapter, I adapted this element to understand the factors affecting the decisions of the farmers in the three villages to grow or not to grow oil palm. To understand these factors, I have divided this element into two sub-sections: the factors affecting the farmers' decisions to begin oil palm cultivation, and the factors which influenced rice farmers' decisions not to convert to oil palm cultivation. This element begins with the analysis of the farmers who have converted to oil palm cultivation.

4.6.1 The Factors Affecting Farmers' Decisions to Adopt Oil Palm Cultivation

In the case of the farmers who have begun to grow oil palms, the belief that demand for oil palm fruits will rise in future is one of the key factors in switching to the oil palm crop. The oil palm farmers in all three villages stress the importance of the oil palm fruits, which are used in many industries to manufacture a wide range of products, for instance, palm oil in food industries, soap, detergent, cosmetics, plastics, and car tyres. The farmers acknowledged the oil palm's ability to produce an astonishing array of upstream products as one interviewee explained,

> "They (oil palm fruits) can be used to produce many things. The empty bunches can be sold for animal feeding, fertilisers, or for mushroom growing. Go to the kitchen, you will see a bottle of palm oil. It is essential. I once tried to squeeze the oil palm fruits myself for cooking, but it didn't work well. I don't know how they turn them into the diesel oil that is used in engines, but I am quite sure it will be good for us. We will have a market for our crop." (Male, Baan Tarn, semi-structured interview, May 2010).

Many interviewees also perceived that planting oil palms makes them feel really good as if they could produce crude oil above the ground.

> "It is like having oil wells on the surface. It is great, isn't it? Oil is expensive these days and we can plant it now. So, oil palms have a bright future in my opinion." (Male, Baan Sa Ard, semi-structured interview, August 2010).

The price of oil palm fruits and the marketing channels from growers to buyers were other factors determining whether farmers adopted the crop. The price of Fresh Fruit Bunches (FFB) was at its peak in 2008 at 4.23 Baht per kilogramme, which provided a good incentive for farmers to start growing oil palms in that period (see Table 4.7). Most of the contracted farmers began to cultivate oil palms during 2007 and 2008, when the price of oil palm fruits was good.

> "When the government approached us with the project, the price was really good and I thought about it. Now (in 2010) the price has dropped, but I don't think it will go down further. I believe that the price will go up again and I don't really care about the price now. I focus on the maintenance. 3 Baht per kilogramme is what I want and I think it is quite possible." (Male, Baan Tarn, semi-structured interview, May 2010).

Table 4.7: Average Price of Oil Palm Fresh Fruit Bunches (FFB), 2000-2009

Year	FFB Price (Baht per Kilogramme)
2000	1.66
2001	1.19
2002	2.30
2003	2.34
2004	3.11
2005	2.76
2006	2.39
2007	4.07
2008	4.23
2009	3.64

Source: OAE, MOAC

The link between the farmers and the buyers of oil palm fruits is also essential in building the confidence of the farmers enough for them to adopt oil palm cultivation. In Baan Sa Ard, the farmers have a clear marketing channel in mind and plan to sell oil palm fruits as a group to a private merchant once a fortnight in the next village, which we will call Baan Ngam. It was local leader H, who lived in Baan Ngam, who contacted a middleman who then shipped the oil palm fruits to feed the oil palm refinery in Chonburi province. In the case of Baan Tarn, the same structure of planning was applied. The farmers planned to sell the oil palm fruits together with the inspirational local leader G in another village that we will call Baan Tarn Mai, who had already harvested oil palms. The only difference between Baan Sa Ard and Baan Tarn was the fact that the trade system was up and running at the time I interviewed the farmers in Baan Sa Ard, whilst in Baan Tarn the system was still at the planning stage and the farmers in the village who had already harvested sold their oil palm fruits to private merchant A individually.

The farmers in Baan Hat had to transport the oil palm fruits and sell them to the middleman at Kum Tha Kla district, Sakhon Nakorn province, which is 35 kilometres away from the village. However, they plan to sell as a group in the future. The respondent in the village explained,

> "If we have more production than we have now, they (the middleman) will come and buy them (oil palm fruits) at the village. Now we have to sell them at their place. I think we have to wait for the people around the area to harvest oil palms, then the buyer will definitely come to our village. Selling as a group might get a better price, but it is for the future. One step at a time. At least it is good to know that there are oil palm buyers around in the area." (Male, semi-structured interview, June 2010).

According to the OPPSP, many farmers were interested in the project and accepted that the project was crucial in persuading them towards oil palm adoption, particularly in Baan Tarn and Baan Sa Ard. The OPPSP, which I described in the previous observation element, provided contracted farmers with both oil palm knowledge and financial support. The knowledge included planting and maintenance techniques. This group of farmers was also offered financial aid via the loan of oil palm seedlings. To general farmers, NKO, DOA, and district-level Agricultural Extension Offices were the government agencies that collaborated to offer oil palm seminars and certified oil palm seedlings at the below-market price of 50 to 60 Baht per seedling, compared to 70 to 180 Baht per seedling from the private suppliers in the areas.

However, the project had already finished at the time I was in the field site. Farmers were not able to register for the project and hardly any oil palm seedlings have been provided by the NKO in the area since 2009. Thus, some of the farmers in the interviews who were interested in participating in the project were forced to buy oil palm seedlings from either NKO (as buying farmers) or from private suppliers. The farmers who had started growing oil palms admitted that the government's support was influential in their deciding to plant oil palms. An interviewee in Baan Tarn explained,

> "Now there is no borrowing project from the government. I hope the project is back soon, so I can plant more without spending my own money first. I think there are many people who are interested in planting oil palms and want to join the project. To know that the government is all around supporting us makes the decision a lot easier." (Male, semi-structured interview, May 2010).

In fact, there were three households in Baan Tarn that had firm intentions of joining the oil palm project, but these households did not have land that was suitable for oil palm cultivation because their rice land was slightly hilly. The NKO therefore did not accept these farmers into the project, so they decided to buy oil palm seedlings from NKO and grow them at their own risk. This, in other words, meant that NKO supplied oil palm seedlings to farmers who did not have suitable land for oil palm cultivation. This could surely affect the overall quality of oil palm cultivation in the Northeast region in the future.

Examples of oil palm farmers' attitudes towards rice cultivation include:

> "Planting rice cannot feed your stomach. You have to find extra money to support rice."

> "No one is rich from rice. Only orchardist does."

> "You should plant rice just for your own eating and do something else with the land."

> "You won't get rich by growing rice. If you plant rubber trees or oil palms on 10 to 20 rais, you will get a car and also have savings in your account."

According to the problem detection element, the oil palm farmers also felt that rice cultivation in the villages was low in productivity, using huge labour, and with high costs of production. Thus, most of the oil palm farmers mentioned dissatisfaction with rice cultivation as part of their reason for planting oil palms. When I started to discuss oil palm adoption issues, the first reaction of many interviewees was, 'Rice is not worth growing'.

The role of inspirational local leaders and large-scale oil palm growers had been prominent in convincing the oil palm farmers to make the switch. These leaders had previously been oil palm producers outside the villages. They brought oil palm cultivation into the area and had already harvested oil palms. Most of the households in Baan Tarn and Baan Sa Ard who had already started growing oil palms referred to the inspirational local leaders as examples of success with the crop. The picture was positive in Baan Sa Ard as the local leader was willing to offer oil palm support to other farmers and also had a firm intention of forming a group of oil palm farmers in the area. As a result, the oil palm farmers in this village had been confident in starting a new crop.

> "Esaan people have to see others do it (oil palm cultivation) successfully first, they will then follow. He (inspirational local leader H) did it well and is a leader around our village." (Male, Baan Sa Ard, semi-structured interview, July, 2010).

The situation in Baan Hat, however, differed from the other two villages. There were no inspirational local people around the areas. Indeed, there were three households in the village that were able to harvest the oil palms at the time I interviewed the oil palm producers. However, they were all considered unsuccessful as oil palm producers in this research due to low yields and a lack of profit.

On the other hand, some households in the interviews described large-scale oil palm producers as their motivation. The oil palm growers stressed that the very fact of the capitalists' investment in oil palm plantations signified that the crop had great potential to grow well in the area. This reduced some farmers' worries regarding oil palm cultivation.

> "Large-scale oil palm producer E came in to grow oil palms on more than 1,000 rais around the area of Phon Phisai district. They have to know what they are doing to spend a lot of money in planting oil palms. The crop should be good and when big investors come in to play, a lot of things will follow such as factories, a market, jobs, and knowledge." (Male, Baan Tarn, semi-structured interview, May 2010).

According to the problem definition element, the characteristics of oil palm itself are the factors shaping the farmers' decisions to establish oil palm plantations. Four significant advantages commonly mentioned by the farmers were: the oil palm's ability to produce a harvestable crop every 15 days; its long life-span; one-off planting; and using less labour in growing and harvesting. The farmers also thought that skilled labour is not necessary to harvest the crop. Thus labour for the plantations could be found without difficulty. The crop owner could hire casual agricultural labour to harvest the crop at a wage of 180 to 250 Baht per person per day depending on the agricultural season. An alternative option open to owners is piece work - paying labourers according to the weight of oil palm fruit harvested. One tonne of oil palm fruits is equivalent to 150 to 200 Baht of labour cost. This labour cost is attractive to oil palm farmers especially in comparison to rice farming.

Some farmers pointed out that they were interested in oil palms because they could easily replace oil palms with rice if the oil palm crop was not commercially viable.

> "I gave it a try because if it doesn't work, I can go back to growing rice as usual. Not like the eucalyptus. It's as simple as that," said a respondent in Baan Hat (Male, semi-structured interview, June 2010).

The experience of oil palm cultivation in the Southern region helped encourage the farmers to experiment with growing oil palm in the Northeast region by providing oil palm knowledge. In many interviews, the farmers stressed the desire to try something new on the land they owned.

> "I just want to try whether oil palms will work here or not. I had two pieces of land growing rice. I chose to plant oil palms on the smaller one. It is too risky to plant oil palms on all my rice paddy fields. Actually, there are some parts of my rice paddy fields where I can't grow oil palms. It is on a slope and gets flooded at times," (Male, Baan Sa Ard, semi-structured interview, July 2010).

This perception was widespread amongst the farmers and was reflected in the amount of land each household devoted to rice and oil palm cultivation. Only one household had replaced all their rice paddy fields with oil palms. The number of households which devoted more land to oil palms than rice was still low, at 6 households out of the total 45 oil palm farmers in the study (see Table 4.8). The evidence also showed that the rice paddy fields were the primary source of land converted to oil palm plantations. Although some farmers used less profitable land such as pasturage and bamboo-rich lands to cultivate oil palms, 38 households switched rice paddy fields to oil palm cultivation (see Table 4.9). An interviewee added his view,

> "I bought new land for planting oil palms. It has to be rice paddy fields with water resources nearby. I think that is the most suitable land for oil palm plantations." (Male, Baan Hat, semi-structured interview, August 2010).

Table 4.8: Number of Households and Structure of Oil Palm and Rice Cultivation in One Household by Village

Village	Completely Switched to Oil Palms	More Lands Devoted to Oil Palms	More Lands Devoted to Rice
1. Baan Tarn	0/14 (0%)	2/14 (14%)	12/14 (86%)
2. Baan Sa Ard	1/23 (4%)	3/23 (13%)	19/23 (83%)
3. Baan Hat	0/8 (0%)	1*/8 (13%)	6*/8 (75%)
Total	1/45 (2%)	6/45 (13%)	37/45 (82%)

* One household in Baan Hat had the equal amount of lands devoted to rice and oil palm cultivation.

Source: Data from Field Interviews (2010)

Table 4.9: Number of Households and Previous Crops Occupying the Oil Palm Land by Village

Village	Rice	Unbeneficial Land	Cassava	Eucalyptus	Rubber
1. Baan Tarn	12/14 (86%)	2/14 (14%)	1/14 (7%)	2/14 (14%)	0/14 (0%)
2. Baan Sa Ard	21/23 (91%)	3/23 (13%)	1/23 (4%)	1/23 (4%)	0/23 (0%)
3. Baan Hat	5/8 (63%)	2/8 (25%)	1/8 (13%)	0/8 (0%)	1/8 (13%)
Total	38/45 (84%)	7/45 (16%)	3/45 (7%)	3/45 (7%)	1/45 (2%)

Source: Data from Field Interviews (2010)

Remarkably, rubber planting had boosted the confidence of the farmers who had made the change in starting to cultivate oil palms. According to the observation element, many households spent their rubber savings and incomes to support the investment of oil palms (see Table 4.6). However, planting rubber trees had reassured the farmers with expectations of good incomes in the future, even during the period that they were waiting for their first harvest. Thus, the farmers who had made the change, and who were waiting for rubber incomes, had transferred their confidence in rubber plantations to oil palm cultivation. A respondent in Baan Tarn explained,

> "The first and second year of growing oil palms was a bit difficult for us. But when we start rubber tapping next year, the situation will be a lot better. We decided to grow oil palms because of the government support and the fact that we were on the fourth year of growing rubber trees." (Male, Baan Tarn, semi-structured interview, May 2010).

The number of households planting rubber trees in the three villages is presented in Table 4.10 below.

Table 4.10: Number of Households in Rubber Cultivation by Village

Village	Rubber Cultivation	
	Already Harvested	**Awaiting for Harvesting**
1. Baan Tarn	3/14 (21%)	7/14 (50%)
2. Baan Sa Ard	22/23 (96%)	1/23 (4%)
3. Baan Hat	1/8 (13%)	2/8 (25%)
Total	26/45 (58%)	10/45 (22%)

Source: Data from Field Interviews (2010)

As we have seen, this sub-section has identified the key factors affecting the farmers' decision to adopt oil palm cultivation in the three villages. The results show that the farmers' expectation of high incomes from rubber in the future was the key factor that gave them additional confidence to invest in oil palms. The farmers' oil palm experience in the Southern region was also essential in terms of providing the skills and knowledge to grow and harvest oil palm. Moreover, the roles of inspirational local leaders and the large-scale oil palm producers were crucial, as it is part of the culture of the Northeast farmers that they need role models in order to start doing anything different in the region. The fact that oil palms can be used to produce a wide array of products convinced the farmers that the demand for palm oil would increase significantly in the future. The robust marketing channels from growers to buyers in the area were the key influencing factor for the farmers, especially in the case of Baan Sa Ard. Moreover, the characteristics of oil palm cultivation, for instance, a 15 day harvesting interval, long life-span, single-time planting, and low labour requirement for growing and harvesting, have attracted the farmers to switch to it. Having identified the key factors in some farmers choosing to adopt oil palm cultivation, I will move on in the next sub-section to discuss the reasons for others choosing not to adopt oil palm cultivation but to continue as rice farmers.

4.6.2 The Factors Affecting Rice Farmers' Decisions Not to Adopt Oil Palm Cultivation

On the other side of the story, it is essential to understand oil palm issues from the perspective of the farmers who have not yet adopted oil palm cultivation. From the evidence of the 18 interviews, I can group the rice farmers into three categories: rice farmers who plan to cultivate oil palms in the near future; rice farmers who are interested in oil palm cultivation but with conditions; and rice farmers who are not interested in oil palm cultivation at all. The details are presented in Table 4.11 below.

Table 4.11: Number of Rice-growing Households by Village and their Interest in Oil Palm

Village	Already Plan to Cultivate		Interested with Conditions		Not Interested	
	> 20 rais	< 20 rais	> 20 rais	< 20 Rais	> 20 Rais	< 20 rais
1. Baan Tarn	1/3	0/3	2/3	2/3	0/3	1/3
2. Baan Sa Ard	0/3	0/3	0/3	2/3	3/3	1/3
3. Baan Hat	1/3	0/3	1/3	2/3	1/3	1/3
Total	2/18 (11%)		9/18 (50%)		7/18 (40%)	

Source: Data from Field Interviews (2010)

The "interested" rice farmers stressed the importance of government support in funding oil palm cultivation. As stated in Chapter 3, the criteria for interviewing the rice farmers were based on how much rice they grew: more than 20 rais of rice paddy fields, and less. The findings showed that the latter were more likely to rely on government support because most of the rice farmers in this category refused to convert all their rice paddy fields to oil palm cultivation. In addition, the "interested" farmers who had less than 20 rais of rice emphasised their reluctance to start growing oil palms on the grounds of their land being unsuitable. Some of the rice farmers who are interested in oil palms underlined that parts of their rice paddy fields are not suitable for oil palm cultivation because the land is slightly hilly. Besides, their rice paddy fields lack the water resources to meet the requirement of oil palm cultivation. Thus, they need to install systems for watering oil palm trees, which would require capital that they thought the government should provide.

These farmers also accentuated the need to obtain more capital to invest in buying additional land to grow oil palms.

> "I want to try oil palms and keep it for my kids, but I don't have money to buy extra land for oil palms. Land is expensive these days. If I use my current rice paddy fields to grow oil palms, what will I eat then? That's why I want the government to come in and help seriously," explained the interviewee in Baan Hat (Male, semi-structured interview, June 2010).

Many interested rice farmers stressed that the quality of oil palm seedlings was their main concern in making a decision as to whether oil palms were commercially viable in the area. Indeed, there are several private suppliers of oil palm seedlings nearby, but the "interested" rice farmers would prefer the oil palm seedlings to be provided by the government for two reasons. First, they trust the quality of NKO's seedlings and could ask for replacements if the seedlings did not thrive as a result of diseases, insects, or unusual infections. However, NKO's seedlings were difficult to find in the market, especially in 2010, due to a supply shortage.

Although most of the private seedling suppliers offer several varieties of DOA-certified oil palm seedlings, some farmers still hesitate to buy them due to concerns over low quality varieties, which would affect the yield and oil content. The second reason is that private suppliers were charging a significantly higher price for their seedlings than NKO. The price of private seedlings varied from 70 Baht to 180 Baht per seedling depending on varieties, whilst NKO's seedlings were sold at 50 to 60 Baht per seedling.

Another important factor for the "interested" rice farmers in delaying oil palm cultivation was the fact that not many oil palm producers in the villages had yet harvested oil palms (see Table 4.12). The "interested" rice farmers emphasised that they were worried about the market and the fluctuating price of oil palm fruits.

> "Now very few people around the village are selling oil palm fruits. They still have to wait for the palms to become productive. If the outcome shows that they have profits and the government shows a will to support, I will definitely go in," said a respondent in Baan Tarn (Male, semi-structured interview, May 2010).

The want of local farmers who had successfully harvested an oil palm crop affected the decision-making of the rice farmers, especially in Baan Hat, where there was no local trailblazer to take a lead. In Baan Hat, 4 of the 6 interviewees strongly rejected oil palm cultivation, and all of them mentioned the lack of successful examples of growing oil palm around the area.

Table 4.12: Number of Households Harvesting Oil Palm by Village

Village	Already Harvesting Oil Palm
1. Baan Tarn	1/14 (7%)
2. Baan Sa Ard	2/23 (9%)
3. Baan Hat	3/8 (38%)
Total	6/45 (13%)

Source: Data from Field Interviews (2010)

As for the farmers who were totally uninterested in oil palm cultivation, there were two main explanations. Firstly, these farmers were quite content with their lives and jobs at the moment. They stated that they had no incentive to start a new crop and also did not want to get themselves into more debt.

> "I have heard people talking about oil palms in the village, but I am not interested. I only grow rice and I think some parts of my land are suitable for oil palm plantations. My children are settled in other places and send money back to me every month. I am happy with the way it is now. No need to risk anything more," clarified one interviewee (Male, Baan Hat, semi-structured interview, June 2010).

Secondly, these households consisted of elderly people or had insufficient labour to cultivate a new crop. Some of these households spent their labour in rubber tapping either on their own lands or as agricultural labourers.

> "Doing rubber tapping with my children on our own land is quite hard. We don't have enough labour to do anything more. Plus, I am used to selling rice. If I have to buy rice, it will feel weird to me. I am a son of a rice farmer and so proud to be a rice farmer," explained one interviewee in Baan Sa Ard (Male, semi-structured interview, August 2010).

The rice farmers who planned to cultivate oil palm in future presented a different picture. These rice farmers were confident in the long-term market for oil palms, even though they had concerns over the short-term price of oil palm fruits and the suitability of their land. Additionally, a major reason why these farmers were planning to cultivate oil palms in future rather than immediately was that they were waiting to harvest their first rubber and they planned to invest in oil palm cultivation once the rubber income was established.

> "I will use part of my rice paddy fields to grow oil palms. Just to give it a try. My rubber trees will start to yield next year. So after everything is okay, I will plant oil palms. The price should be good in the future. It is surely better than rice," said a rice farmer (Male, Baan Sa Ard, semi-structured interview, August 2010).

Interestingly, 4 households of the total 9 households that cultivated more than 20 rais of rice were not interested in oil palm cultivation. This implied that how much rice they grow has only minimally affected the decision of the rice farmers in this research to adopt oil palm cultivation. In contrast, the rice-growing households with less than 20 rais of rice were likely to adopt oil palm cultivation in the future, as 6 of the 9 households were interested in oil palm cultivation. It is worth noting that acquiring oil palm knowledge was not a concern for the rice farmers; they underlined their confidence that they could ask oil palm experienced farmers in and around the villages.

To sum up, this sub-section suggested that most of the rice farmers who had not yet adopted oil palm cultivation were interested in planting oil palms in the future, subject to concerns over future support from the government, the quality of oil palm seedlings, and the shortage of successful oil palm producers around the areas. The rice farmers who were not interested in oil palm cultivation insisted that they had no incentive to plant oil palms because they were happy with their life and jobs at that moment, and also because they were short of help on the farm. This research also suggests that the amount of rice grown has only minimally affected the rice farmers attitudes towards oil palm adoption. In the next element, I will examine the farmers' views of oil palm cultivation based on personal norms and habits, including whether - and in what ways - oil palm planting is suited to the farmers' lifestyle.

4.7 Development of Intention Element

I adjusted this element to understand the farmers' views of oil palm cultivation based on personal norms and habits. Even if all the factors discussed in the previous five elements were in favour of a farmer choosing to go into oil palm cultivation, this did not guarantee implementation. This element therefore examines whether oil palm growing is suited to the farmers' behaviour and, if so, in what ways.

Only one negative perception about oil palm cultivation emerged from both the oil palm farmers' and the rice farmers' interviews, and it was something that went against the farmers' personal norms and habits. A farmer suggested that one of the reasons not to adopt oil palm cultivation was that oil palm trees have a lot of thorns, which the farmer was not comfortable with.

> "I don't have enough help on the farm to do oil palms. I am old now. But more important, I hate the thorns of oil palms. They hurt my skin when I was trying to cut the oil palm bunches and I didn't want to get close to them," lamented a rice farmer in Baan Hat (Male, semi-structured interview, June 2010).

Nonetheless, most of the farmers reckoned that oil palm cultivation suited their ways of life well, especially compared with rubber cultivation. Rubber trees are not a traditional crop in the Northeast region. Thus, oil palm and rubber trees have one similarity in terms of being a new crop in the Northeast, and the farmers used to compare the suitability of these two crops to their life. In essence, oil palm plantations offer the farmers more free time as growing and harvesting is less labour intensive. The farmers, thus, have more time which they could either use to concentrate on seeking additional jobs to boost their household incomes or spend as leisure time. Moreover, some of the farmers suggested that not only is oil palm cultivation easy in terms of maintenance, but also oil palm harvesting occurs during daylight hours, which suits their habits and personal norms.

In contrast, rubber cultivation requires farmers to change their personal norms and habits. Rubber tapping must be done at night during a dry period. The farmers in the three villages need to work at night, 5 or 6 days a week, when the weather permits. Cultivating rubber trees is hard work, in the farmers' view. When it is time for tapping, the farmers have no choice but to work all night or else lose money. One interviewee further pointed out,

> "When you get older, rubber is less suitable for your life. It is really hard to always work in the night. Life is not a life." (Male, Baan Tarn, semi-structured interview, May 2010).

To reiterate, the findings in this element suggest that oil palm cultivation in the three villages had shown no characteristics that were contrary to the farmers' personal norms and habits, especially when compared to growing rubber. Oil palm cultivation does not disrupt the farmers' personal norms and habits:

> "Oil palms don't require much of our attention. We can live our normal life. It is better than rubber in this respect. In the future, maybe I will hire someone else to do the rubber tapping for me and I will do only oil palm harvesting myself. I will have more time to chill." (Male, Baan Sa Ard, semi-structured interview, August 2010).

The next element addresses the consequences of oil palm adoption by evaluating the socio-economic aspects of the farmers' situation after the implementation of oil palm cultivation in the study areas.

4.8 Implementation Element

This element was adapted to understand the farmers' socio-economic situation after implementing oil palm cultivation. In the first sub-section of this element, I will investigate the changes, in social terms, to the farmers' ways of life as a result of oil palm adoption. The second sub-section then examines the farmers' financial situations after adopting oil palm production, looking at both troubled and thriving households. The final sub-section of this element is devoted to a discussion of the environmental issues of oil palm plantations in the three villages.

4.8.1 Social Situation after the Implementation of Oil Palm Cultivation

In social terms, the majority of the farmers insisted that cultivating the oil palm did not make them feel that their way of life had changed significantly because once it was established the crop required simply watering, fertilising, and grass cutting during the maintenance period. The farmers might need to tend their oil palms anything from twice a week to once in 6 months. The farmers also suggested that oil palms and rice are different in terms of the time that has to be devoted to the crop. Rice cultivation requires intense work only in a certain part of the year, whilst oil palms involve less intense work but require regular monitoring throughout the year. Which of rice and oil palm cultivation requires more effort is a subjective question based on an individual's own view. Some of the farmers consider that they have less work after switching some parts of their rice paddy fields to oil palms and thus have more time for other activities, including spending time with their families, which is something some farmers valued.

Some farmers felt as if nothing had changed after oil palm adoption, as one interviewee described,

> "I feel the same. Okay, it (oil palm cultivation) is less heavy than doing rice, but you have to do it in most of the year. So, taking everything into account, I didn't feel much of a change." (Male, Baan Tarn, semi-structured interview, May 2010).

Interestingly, some farmers did not notice the changes because they normally hire agricultural labour to do the rice cultivation. In other words, the farmers no longer cultivate the rice themselves and oil palm cultivation has only added a small burden to their efforts. Some farmers also emphasised that oil palm cultivation has given them hope for a better life, which in turn has strengthened their family relationships.

> "The crop brings hope to us. I am feeling excited and enthusiastic. With hope, I have good feeling about myself. Everyone in my family is also excited and we help each other in taking care of the crop and everything. The relationships in the family are getting better," expressed a respondent in Baan Sa Ard (Male, semi-structured interview, July 2010).

Nonetheless, there were some farmers who stated that they put considerably more energy into growing, maintaining and harvesting oil palms than they did before. These were rubber-based farmers, who had spent most of their time doing rubber tapping without hiring agricultural labour and felt that cultivating oil palms had brought them additional work. In fact, the farmers admitted that oil palm cultivation was considered as light work compared to rice cultivation, but doing all the agricultural work themselves for rice, rubber and oil palms was exhausting. This type of household was mostly found in Baan Sa Ard as Table 4.13 explains.

Table 4.13: Number of Households and Their Feeling After Oil Palm Adoption

Village	Feeling as Normal	Working Harder than Prior	Better Off
1. Baan Tarn	9/14 (64%)	3/14 (21%)	2/14 (14%)
2. Baan Sa Ard	8/23 (35%)	9/23 (39%)	6/23 (26%)
3. Baan Hat	7/8 (88%)	1/8 (13%)	0/8 (0%)
Total	24/45 (53%)	13/45 (29%)	8/45 (18%)

Source: Data from Field Interviews (2010)

In short, after adopting oil palms, the majority of the farmers insisted that it did not make them feel that their way of life had changed significantly, because in the maintenance period the crop simply required watering, fertilising, and grass cutting. The next sub-section investigates the economic aspect after the farmers adopted oil palm cultivation.

4.8.2 Economic Aspect after the Implementation of Oil Palm Cultivation

In economic terms, although most of the households (30 out of 45 households), were only slightly affected by oil palm investment in terms of their financial situation, some households felt that investing in oil palm cultivation had significantly increased their household expenditure and thus negatively affected their standard of living and/or their ability to maintain the quality of oil palm crop. According to the observation element, the farmers' funding for investing in oil palms comes from three channels: savings from rubber cultivation, other sources of income, and loans (see Table 4.6). Each household had their own issues depending on household structure and whether they had decided to be in the government's Oil Palm Plantations Supporting Project (OPPSP). The source and amount of income, size of oil palm plantation, household expenditure, household habits, and individual circumstances also varied amongst the households.

In most of the households that were only slightly affected, savings from rubber cultivation played an important role in supporting oil palm investment. Many households were found to have loans, mostly under the name of a rubber supporting scheme, but the farmers had spent the loan money on all of their agricultural activities including oil palm growing. The contracted households were likely to be in the 'untroubled' category in terms of their financial situation. This was because the farmers are allowed to defer payment for their oil palm seedlings until the crop starts to yield. However, there were several households that faced various financial difficulties resulting from investing in oil palm plantations. I will explore the issues using the examples of troubled farmers from each village, starting with one in Baan Tarn.

In Baan Tarn, the troubled household had cultivated 9 rais of oil palm and 45 rais of rice, without any land devoted to rubber plantations. The household income was mainly from selling rice and watermelons. The household acquired oil palm seedlings from NKO in 2008 but did not participate in the oil palm project due to their land being found unsuitable for oil palms. The farmer therefore bought the oil palm seedlings directly from NKO at the price of 50 Baht per seedling, which was one of the key factors affecting the financial situation of the household. The household also borrowed 30,000 Baht in 2010 and spent part of the money on agricultural crops. Most of the money spent on the oil palm crop was for the fertilisers they applied every 6 months.

However, the difficulties in the household started with a reduction in rice incomes, as the farmer explained:

> "We had flooding early this year (in 2010) and the rice production wasn't good. So, we had less income. The price of fertilisers is very high lately and money was rather tight because our crops need fertilisers. Oil palms need fertilisers. Then I needed to borrow from BAAC to buy fertilisers for all the crops and to spendon my family. Actually, I reduced the amount of fertilisers given to the oil palms." (Male, Baan Tarn, semi-structured interview, May 2010).

The case of Baan Sa Ard provided a different picture of the troubled households in the study. All the oil palm producers in Baan Sa Ard were growing rubber, including the troubled household. The household had just planted 7 rais of oil palm in March 2010, when the farmer bought oil palm seedlings from NKO at 55 Baht per seedling. Rubber cultivation accounted for 20 rais of cultivated land and all 20 rais had been productive since mid-2009.

Because the rubber had only produced a yield for the first time in 2009, the household did not have much in savings to support oil palm cultivation. As a result, the farmer relied on rubber income to facilitate the buying of oil palm seedlings and fertilisers as well as to cover the cost of land preparation. When there were additional expenditures, the household was forced to borrow more to cover the expenses.

> "I have three children. All of them are now in school. It was quite difficult when I had to pay tuition fees for my children, invest in rice cultivation, and buy fertilisers for both crops. That's where the loan from BAAC came in. Sometimes during the rainy season there is no income from rubber. Then at some parts of the year you can face shortages if the expenses rise." (Male, Baan Sa Ard, semi-structured interview, August 2010).

The last case we will consider was in Baan Hat and presents a different view of the issues. Although the troubled household had cultivated rubber trees for more than 10 years, they encountered financial difficulties with their 15 rais of oil palms. This was because the household had spent their savings on additional land for oil palm plantations. The farmer insisted that maintenance cost of oil palm had little effect on them, but the costs of oil palm seedlings and additional land had drastically increased their household expenditure.

> "I have already spent 100,000 Baht on oil palms. Most of it was for getting the land. I just planted them in June this year (in 2010), but now I am a bit worried because my child will soon be going to school in Bangkok. I spent a lot of my savings. I didn't borrow. I need to be economical now. Let's pray for the price of rubber," (Male, Baan Hat, semi-structured interview, August 2010).

As we have seen, most of the households were not financially affected by the oil palm investment as the oil palm project and their savings from rubber cultivation had played an important role in supporting their oil palm investment. However, it is also clear that there were various factors forcing some households into financial difficulties after taking up oil palm growing. From the examples, the savings and income from rubber plantations, unpredictable natural disasters, expenses related to their children's education, and the amount of oil palm investment, such as the costs of oil palm seedlings, land, land preparation, water system, and fertilisers, had played a significant role in terms of influencing the households' financial situations. The justification depends on case-by-case analysis.

In the next sub-section I will analyse the environmental aspect of oil palm adoption in the three villages.

4.8.3 Environmental Aspect after the Implementation of Oil Palm Cultivation

In terms of the environmental consequences of oil palm adoption, 41 of the 45 oil palm households in the study have not yet found any negative environmental impact from oil palm adoption. Only four households stated that dead fish had been found in the areas of oil palm plantations. The reasons for the dead fish were far from concrete and there were several assumptions amongst the farmers. One farmer assumed that the dead fish resulted from the water logging after flooding in the rainy season, which was not directly due to oil palm cultivation. Another farmer suggested alternatively that it was because of chemical herbicides for weed control and rodenticide for the control of rodents at the base of oil palm trees. These two were the main suspects especially when the flooding occurred around the area.

The oil palm literature in Chapter 3 suggests that oil palm plantations require a large amount of fertilisers in order to maintain and increase yields. Despite Thailand's national policy of discouraging the application of chemical fertilisers and pesticides since the 7th NESDP (1992-1996), the amount of imported chemical inputs has been increasing gradually (OAE, 2010c). Rice farming is responsible for some of this increase, as it is one of the country's major agricultural activities. The findings in this research suggest that although oil palm cultivation has consumed more fertiliser than many farmers initially thought, less fertiliser is applied to oil palm than to rice. One of the farmers who affirmed this fact to me explained,

> "How much fertiliser did I use on the rice crop..? I can say that it is a lot. Imagine: I have to have two rice paddy fields. One, which uses chemical fertilisers, is for selling and one, which grows naturally, is for my family. Oil palm crop uses less chemical inputs than the rice crop for sure, I can guarantee. But to tell the exact amount, I don't know. One third less than rice, maybe." (Male, Baan Sa Ard, semi-structured interview, July 2010)

In addition, some farmers reckoned that they did not buy new fertilisers especially for their oil palm plantations, but diverted the fertilisers that were provided for rice cultivation to the oil palm crop. As a result, this evidence suggests that the total amount of fertiliser applied by many oil palm farmers in the study has not significantly changed from the usual levels before the oil palm adoption.

It is worth noting that there were two households in the study that had already adopted organic farming practices on their oil palm plantations. One of the two explained,

> "I saw the oil palm trees were growing well without a lot of fertiliser use, so I tried organic fertilisers from cow and buffalo manure. It is working well so far. It also reduced the cost of planting because chemical fertilisers now are very expensive." (Male, Baan Tarn, semi-structured interview, May 2010).

Also, I further asked the farmers in the interviews whether they used fire to clear the land before planting oil palms, as oil palm smallholders almost always use fire in preparing land for cultivation because they cannot afford land-clearing machinery and are accustomed to this method (CIFOR, 2009). The findings suggest that there was only one household in the interviews that burned the land in preparation for oil palm planting, because it was easy. The rest of households believed that using fire to clear the land negatively affected the future growth of any crops in that land. One of the interviewees pointed out,

> "Soils will be destroyed. You have to use a lot of fertilisers and they may not work. Oil palm is a long-term gain that requires land preparation just once in 20 years; you should then do it with care in my opinion. It is not worth the risk." (Male, Baan Sa Ard, semi-structured interview, August 2010).

The literatures reviewed in Chapter 2 suggested that oil palm plantations are believed to be the major cause of biodiversity loss through the destruction of forests particularly in Malaysia and Indonesia. In other words, there is a direct relationship between the expansion of oil palm farming and the loss of natural forests and biodiversity in Malaysia and Indonesia, as Clay (2004) has presented. Contrary to those research findings, the evidence in this research showed that most of the lands used for oil palm plantations were previously agricultural lands (see Table 4.9). Thus it was unlikely that direct land use change has occurred, according to the farmers interviewed in this research.

As a result of changes in government policy at different times, there exist a host of government offices dealing with land issues in Thailand, which result in there being 10 different types of land certificates ranging from land use permits to land titles (Routray and Sahoo, 1995). The land tenure of the oil palm households in the study was in three types of land documents, namely title deed of agricultural land reform (SPK), local maintenance tax form (PBT 5), and certificate utilisation (NS 3). SPK is an allotment of land from Agricultural Land Reform Office, in which the land can only be used for agricultural purposes. The certificate entitles the owner to use the land and can be transferred only by inheritance. PBT 5 is evidence that the occupier of the land has been issued a tax number and has paid tax annually for using the benefit of the land. This confers no right to the land, but was formerly used to establish that the holder was occupying a piece of land and could apply for another type of certificate.

NS 3 is a document which signifies the land occupier's right to possess the land, but without conferring actual possession. There are no restrictions regarding the use of the land and the land can be transferred and leased, subject to a 30-day public notice period. In this research, most of the households held SPK and PBT 5 land certificates, whilst NS 3 accounted for just a small number of households

Nonetheless, there was one case in Baan Tarn where the farmer had not obtained the land documents before cultivating oil palms. The farmer insisted that the land for oil palm cultivation was formerly abandoned arable land, which was used for raising cows and buffaloes, but in the interview he refused to discuss further the story of the land tenure. Thus, there was still a possibility that the farmer had converted forest to oil palm plantations, which would imply negative environmental consequences such as deforestation and loss of biodiversity around the study areas.

To summarise, the evidence in the research suggested that there was no concrete sign of destruction of natural habitats in any of the three villages. Although the oil palm plantations in the three villages were based on the application of chemical inputs, which could harm the environment, the amount of chemical inputs used in the oil palm plantations were relatively lower than the crops which had previously occupied the ground, which could imply the unlikeliness of overusing chemical substances to increase the crop production. In the next element, I will discuss the consequences of oil palm adoption in terms of the farmers' satisfaction with the oil palm crop in relation to their needs as discussed in the first element.

4.9 Responsibility Bearing Element

I have adapted this element to discuss the consequences of oil palm adoption in terms of the farmers' satisfaction with the crop in relation to their needs as discussed in the first element, as well as their problems with it. To understand the issues, the oil palm farmers in the study must be categorised into two groups: the farmers who were awaiting their first harvest and the farmers whose crops were already productive.

The former group, which consisted of 39 households (see Table 4.14), was mostly satisfied with the outcome of their change to oil palm cultivation. Although the farmers had not yet reached the oil palm harvesting period, the flourishing of oil palm trees on their lands and their belief that the price of oil palm fruits would be good in the future had made them confident about their income increasing in future, which was an objective of many farmers in the research, as discussed in the first element. Whether the oil palm trees were deemed to be flourishing was based on the farmers' judgments as to whether the oil palm trees had big trunks, reasonable height, and straight fronds. The male flower issue was a concern for some farmers since male flowers do not produce any fruit bunches as pointed out in Chapter 2. In other words, the number of oil palm fruit bunches depends on the number of female flowers. A lower ratio of female to male flowers indicates lower potential yields.

Table 4.14: Number of Households and the Farmers' Satisfaction after Engaging in Oil Palm Cultivation by Village

Village	Households who have Harvested		Households Awaiting Harvest	
	Satisfied	**Dissatisfied**	**Satisfied**	**Dissatisfied**
1. Baan Tarn	0/1 (0%)	1/1 (100%)	10/13 (77%)	3/13 (23%)
2. Baan Sa Ard	2/2 (100%)	0/2 (0%)	18/21 (86%)	3/21 (14%)
3. Baan Hat	0/3 (0%)	3/3 (100%)	4/5 (80%)	1/5 (20%)
Total	2/6 (33%)	4/6 (67%)	32/39 (82%)	7/39 (18%)

Source: Data from Field Interviews (2010)

One of the satisfied farmers reflected,

> "They (oil palm trees) are beautiful. They are the same height as my neighbour's oil palm trees. It is what I expected and it offers me a good chance of getting good results. I can see some bunches now and it is a relief. Next is the price of them, but I am not afraid of it. The price is already good now." (Male, Baan Sa Ard, semi-structured interview, August 2010).

In addition, 10 households in this category reported that their children, who worked outside the areas, were planning to come back and live with their parents in the coming years when the oil palm plantations would be another source of income for the families. One of the interviewees explained,

> "Now we have rubber that creates a good income for our family. The price has been really good recently. Next year, the oil palm trees will be ready for harvesting. They (their children) said that this is good and they will come back to help. So, I don't have to hire labour. If we have enough jobs (in the area), we will have enough money." (Male, Baan Sa Ard, semi-structured interview, July 2010).

From these farmers' perspective, oil palm plantations had the potential to help them to achieve the 'living comfortably with their children in their hometown area' goal stated in the values and goals element.

However, there were 7 households of the 39 households who felt that their oil palm trees had not grown well. Four of these farmers were hugely affected by flooding and water logging in the rainy season, which then caused spear rot at the base of the oil palms. One of the four farmers was really disappointed as he lost 110 out of 200 oil palm trees as a result of the flooding. The farmer described,

> "I am so down. Less than half is left. I don't have the heart to take care of them (oil palm trees) anymore. So, I leave them as they are. No maintenance. It really destroyed my hope." (Male, Baan Tarn, semi-structured interview, May 2010).

Significantly, two of the four households that were affected by the flooding had been told that their land was unsuitable for oil palm cultivation. These two households wanted to participate in the government project, but were not able to as their land was deemed unsuitable.

The second problem reported by the dissatisfied farmers was related to various kind of rodents. In two of the unsuccessful cases, the rodents had damaged many of the oil palm trees. The rodents ate almost every part of the oil palm trees including fronds and oil palm fruits both ripe and unripe. One of the two farmers had lost 23 of his 30 oil palm trees because of the rodents. However, both households had already replanted the damaged oil palm trees with the new ones, as one of the explained:

> "I think it is my fault for not taking very good care of the oil palms from the start. So, I will give it another chance and I think it is going to be good." (Male, Baan Sa Ard, semi-structured interview, July 2010).

The seventh case was insignificant, as the farmer gave no clear reasons for the below-par development of his oil palm trees. He only talked in comparison to the neighbour's oil palms.

Even in the case of satisfied farmers, they had faced problems related to pests and diseases. Apart from rodents, insect pests such as rose beetle had also damaged the leaf tissues of the oil palm trees. Crown disease had occurred occasionally in the waterlogged and flooded areas. Another type of Crown disease, which is the most common disorder of oil palm trees during the first three years after field transplanting, was found in a few cases. The main symptom of crown disease is the bending of spear leaves, which was assumed to result from imbalance nutrients between nitrogen and magnesium. However, the satisfied farmers had not been affected on a large scale by damage from pests and diseases to the oil palm trees. As one interviewee summarised,

> "It depends on the piece of land used in growing the oil palms. The same farm might have different landscapes. All problems can happen. Insects were eating the leaves of the oil palms and some were dead because of water logging. But, this happened to only 2 to 3 percent of the oil palm trees. The rest are still good." (Male, Baan Tarn, semi-structured interview, May 2010).

Returning to the second group of farmers, amongst the 6 households who had already harvested oil palm fruits, only two households considered themselves successful in oil palm cultivation. These two households insisted that the oil palm crop has fulfilled their objectives, which were to reduce the hardship of cultivating rice and to be able to work and generate reasonable incomes throughout the year. The rest of the households were having difficulties in terms of how well their oil palm trees were growing as well as the market for oil palm fruits. Two of the four households had problems related to the yields of their trees, whilst all four households were dissatisfied with the price of oil palm fruits. The interviewees in Baan Hat stressed that the price of oil palm fruits at 2.50 Baht per kilogramme was not worth the investment. The cost of transporting the crop to the private merchant was also high. In addition, the fact that private merchant D did not have much capital meant the farmers had to wait 3 to 4 weeks for the money from selling the oil palm fruits.

However, when I went into the villages, the price of oil palm fruits differed significantly between Baan Sa Ard and the other two villages. At the time that I interviewed the farmers who had already harvested in Baan Tarn and Baan Hat, the price of oil palm fruits was at 2.25 to 2.50 Baht per kilogramme. In contrast, the price of oil palm fruits was at 3.60 Baht per kilogramme when I did the interviews in Baan Sa Ard (see Table 4.15). This meant the farmers in Baan Sa Ard had more reason to be satisfied with oil palm cultivation than those in the other two villages. This was also the reason why the two satisfied households in this group were both in Baan Sa Ard (see Table 4.14). Overall, the oil palm cultivation was a success from the perspective of these farmers, who accounted for 76 percent of the 45 households in the interviews. This is to say the crop showed positive signs of achieving the farmers' objectives.

Table 4.15: Average Monthly Price of Oil Palm's FFB in 2010

2010	FFB Price * (Baht per Kilogramme)
January	3.88
February	3.57
March	3.48
April	3.42
May	3.38
June	3.86
July	4.08
August	4.53
September	4.83
October	5.17
November	5.64
December	5.32

* The farmers in the three villages received approximately 1 Baht per kilogramme less than the market price from the local merchants due to the long distance in delivering the products to the large-scale oil palm refinery in Chonburi province.

Source: OAE, MOAC

4.10 Conclusion

This chapter analysed the key factors affecting the farmers' decisions about oil palm adoption, and the consequences of the change. Using the analytical framework developed in Chapter 3, this change to oil palm cultivation in the three villages in this study was understood through the adaptation of eight elements of farmers' decision-making (Ohlmer et al., 1998). It has emerged that there were several key factors influencing the farmers to engage in oil palm cultivation.

An increase in economic security was the main intermediate need of the farmers in deciding to adopt the oil palm plantations. However, probing deeply into the issues revealed that the farmers had another set of values. Although they were very interested in increasing their incomes, this was so that they might live comfortably with their children in their home areas, which could lead to a reversal of the trend of migration in the future.

The uncompetitiveness of rice production in the areas had likewise tempted the farmers towards alternative crops including oil palm cultivation. Moreover, the government having offered both oil palm knowledge and funding to the farmers in the OPPSP had played an important role in convincing the farmers to adopt oil palm cultivation. The high expected of incomes from rubber plantations in the future was also a key factor that gave the farmers additional confidence to invest in the oil palm crop.

The experience some farmers had of oil palm in the Southern region was essential in terms of providing skills and knowledge to grow and harvest oil palms. Moreover, the role of inspirational local leaders and the large-scale oil palm producers was crucial, as it was part of their culture for the Northeast farmers to have role models in order to start doing something different in the region. The fact that oil palm can be used to a wide array of products had convinced the farmers that the demand for oil palm would increase significantly in the future. The well-established marketing channels from growers to buyers in the area were a key influence on the farmers especially in the case of Baan Sa Ard. Characteristics of oil palm cultivation such as 15 days' harvesting interval, long life-span, single-time planting, and requiring only a small amount of labour in growing and harvesting, also attracted the farmers.

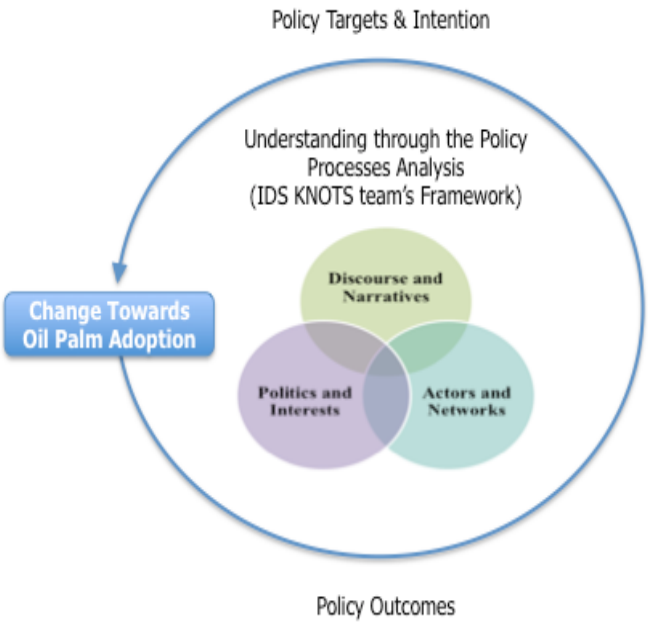
There is no doubt that understanding farmers' decisions in adopting oil palm cultivation is important for comprehending the change to oil palm cultivation from the bottom-up perspective. Perhaps a more important issue is the extent to which oil palm expansion policy affects farmers. Certainly, the policy affects farmers, but the magnitude of its effect differs between cases. For this reason, the next chapter will analyse oil palm policy processes specifically in Nong Khai province using the IDS KNOTS team's policy processes framework.

Chapter 5:
Understanding the Change to Oil Palm Cultivation: Policy Processes of the Oil Palm Plantations in Nong Khai Province

In the preceding chapter I have identified the key factors which influenced the local farmers in choosing whether or not to move to oil palm cultivation. Certainly, government support through the oil palm expansion policy in Nong Khai province has played an important role in shaping the farmers' decisions towards oil palms. It is undeniable that the OPPSP has significantly influenced the farmers in this research in numerous ways, including by making available oil palm knowledge, the funding for oil palm cultivation, and oil palm seedlings. In order to encompass the oil palm issues fully, this chapter focuses on how the change to oil palm cultivation was significantly influenced by the oil palm policy processes. It uses the IDS KNOTS team's policy processes framework for policy analysis of oil palm planting in Nong Khai province.

As stated in Chapter 3, I developed an analytical framework which draws from the two main analytical approaches, namely an eight element model of farmers' decision-making, and the IDS KNOTS team's policy processes framework. In this chapter, I apply the analytical framework shown in the following diagram (Figure 5.1) to analyse the change to oil palm cultivation in this research. The IDS KNOTS team's policy processes framework was chosen as the main analytical tool to analyse oil palm policy processes because it offers a novel perspective on policy processes and thus set out a distinctive framework for policy analysis. Understanding the influences on policy of the three interconnected themes of the IDS KNOTS team's policy framework enables me to address questions such as: How does policy get created and by whom? How are boundaries drawn around problems? How are the policy storyline and its associated networks elaborated? What is included and excluded? And how, when, and due to what influences do policies change?

Figure 5.1: Analytical Framework Applied in Chapter 5



Source: Diagram by the Author

There are five sections in this chapter. It starts by discussing the first theme of the IDS KNOTS team's policy processes framework, namely the policy narratives theme, which includes the path dependency of the oil palm expansion policy in Thailand and Nong Khai province. The second section explores the actors and networks involved in oil palm plantations in the three villages in this research. It is presented in two sub-sections: the networks of key actors along the path of oil palm production, and the networks of key actors that influence the oil palm farmers. The next section then discusses the politics/interests theme, which is the third theme in the IDS KNOTS team's policy framework. The fourth section involves policy space, which will be identified through examining these three themes in order to make use of the policy space for advocating different ways of doing things in the oil palm arena. The chapter ends with relevant concluding points.

5.1 Discourse/Narratives Theme

Only recently has the Thai government begun to establish policy to push for increased production of biodiesel from oil palms. On 17th May, 2005 the cabinet approved the action plan for biodiesel development and support in order to increase the energy security of the country, to create rural economic development and to mitigate climate change. Since then a major oil palm expansion policy has been promoted in the Northeast region, particularly in Nong Khai province, which is a relatively remote, predominantly agricultural area.

Energy security appears to be the main driving force for Thailand's involvement in oil palm-based biodiesel development. The country's high dependence on imported oils is a serious threat to its energy security, in that it implies a high risk of fossil fuel supply disruptions from international markets, especially those in unstable regions such as the Middle East and Africa. According to a DOA official interviewed, the Thai government has seen biodiesel from oil palms as a very attractive option because it can easily be blended with traditional fossil fuels and thus offers an immediate impact by reducing the quantity of fossil fuel imported (Semi-structured interview, December 2010).

The DOA official also mentioned that protecting the country's trade balance and foreign exchange were one of the government's priorities in pursuing a policy of oil palm expansion.

> "Reducing imports helps the trade balance. We will have more foreign exchange reserve and this will benefit the country as a whole. With a more stable economy we will have money to fight the crisis, to control the exchange rate. The 1997 financial crisis might not have happened. The last government saw this (oil palm expansion policy) as a great opportunity," explained the DOA official (Semi-structured interview, December 2010).

However, Matsuda and Kubota (1982) and Zhou and Thomson (2009) argue that in financial terms the amount saved by reducing imports of fossil fuels could possibly be less than the amount gained by exporting the crop as food, and thus it may not improve the country's trade balance. In contrast, the evidence in this research suggests that the protection of the trade balance and foreign exchange is a valid driver for biodiesel development in Thailand because almost all of the oil palm produced in Thailand is used domestically (see Table 5.1). The DOA official pointed out that,

> "Unlike cassava, oil palms can reduce oil imports and increase trade surplus of the country. A lot of cassava is exported, so if we use it to produce ethanol, the trade balance might not change much from its previous level. But oil palms can offer this kind of benefit (improving trade balance)." (Semi-structured interview, December 2010).

Table 5.1: Thailand's Palm Oil Balance Account (2007-2009)

Year	Opening Stock	Production	Import	Total *	Export	Domestic Uses		Closing Stock	Total **
						Consumption	Biodiesel		
2007	164,521	1,051,089	-	1,215,610	219,700	844,812	62,182	88,916	1,215,610
2008	88,916	1,543,761	28,385	1,661,062	288,054	989,061	276,000	107,946	1,661,062
2009	107,947	1,387,604	-	1,495,551	67,292	910,700	380,000	137,559	1,495,551

* Including opening stock, production, and imports
** Including exports, domestic uses, and closing stock

Source: OAE, MOAC

Another key driver for the oil palm expansion policy in Thailand is rural economic development. Because growing and harvesting the oil palm crop requires extensive labour and manual work, it could increase employment in the agricultural sector and thus provide income-generating opportunities for farmers. The local NKO official stressed that creating employment in local areas and reducing migration to urban areas were core benefits of the oil palm expansion policy,

> "Planting oil palms can surely create jobs for people around here. Having more jobs mean having more income. The government sector project (oil palms) helps in developing the economy of the villages, so there is no need for farmers to work elsewhere." (Semi-structured interview, June 2010).

From the central government's perspective, a DOA official suggested that creating a new biodiesel market could prevent oil palm products being oversupplied, which could lead to a fall in price. This is to say the farmers could receive a better price for their crops due to increased demand.

> "The government wanted to develop oil palms and biodiesel because they can help sustain the price of oil palms in the long run. This means the government does not have to intervene in the market and that then saves the government's budget in dealing with the price problem," explained the DOA official (Semi-structured interview, December 2010).

In fact, by increasing the percentage of biodiesel required to be blended with conventional diesel oil, the government could create a huge biodiesel market for oil palm products. The government mandates were in accordance with the Ministry of Energy (MOEN)'s 15-year Alternative Energy Development Plan (2008-2022), in which the government set a target of mandating a single grade of biodiesel B5 (a blend of 5 percent biodiesel and 95 percent conventional diesel) nationwide in 2011. However, the plan to mandate a single grade of biodiesel B5 nationwide had to be postponed to another time because of supply problems: the unavailability of palm oil, to be precise.

> "The problem is that we do not have enough oil palm to produce biodiesel. The government can control the demand. It is not difficult: just increase the blend to B5 or B10. That is why the oil palm expansion policy is crucial," reckoned the official from DOA (Semi-structured interview, December 2010).

From the evidence in the research, fighting climate change is not considered a main driver for the Thai government as Thailand is not listed in the Kyoto Protocol as an Annex 1 country[4] and is thus not required to reduce its greenhouse gas emissions. Although mitigating climate change is mentioned in the Oil Palm Industry and Palm Oil Development Plan (2008-2012) (MOAC, 2008), a DOA official suggested that the policy's main objectives are increasing energy security, improving trade balance, creating jobs and incomes for farmers, and at the same time protecting the environment, rather than significantly reducing the country's greenhouse gas emissions.

> "Okay, global warming is important, but it is clearly not the priority of the government or the country now. If the oil palm plantations help reduce the global warming, it is more than fine. The point is, we need to make sure that oil palm expansion does not harm our environment - no forest clearance, for example. Helping local farmers and the energy security of the country are more important at this stage," explained the DOA official (Semi-structured interview, December 2010).

[4] There are 41 industrialised countries and economies in transition listed in Annex 1 of the United Nations Convention on Climate Change (UNFCCC). Their responsibilities are various, and include a non-binding commitment to reducing their greenhouse gas emissions to 1990 levels.

Nonetheless, both DOA and NKO officials admitted that the greatest concern of the oil palm expansion policy was the issue of food security. According to the interviews, some officials in the government sector viewed the oil palm expansion policy as a threat to national food security, which could reduce the self-reliance of the country in terms of producing sufficient food for domestic consumption.

> "It depends on the perception. Some think that growing oil palm will affect the food supply of the country - rice, you can say. So, they feel that it (the oil palm policy) does not go well with the sufficiency economy, which I disagree with, and then they do not want to support it or aren't brave enough to push the policy forward," elaborated the DOA official (Semi-structured interview, December 2010).

In fact, the findings in Chapter 4 suggested that majority of the oil palm farmers in the research felt strongly about producing rice for their own consumption and refused to convert all of their land to oil palm plantations. Thailand is a food surplus country. Production of food, particularly rice, has immensely increased far more than domestic demand due to agricultural development policy in the past, such as improvements in irrigation systems, road networks, and the rapid adoption of green revolution technology in the early 1970s. The surplus is exported, to the value of 612.87 billion Baht in 2007. Rice is a major staple food of the country, and occupied almost 60 percent of total cultivated land in 2007. It is grown throughout the country in flatland areas, which could directly convert to oil palm plantations. The Northeast region, which was the focus of the research, has the largest share of both rice area and production, standing at 50.21 percent and 34.68 percent respectively in 2007 (NESDB, 2009a).

The domestic consumption of rice is enormously less than the country's production. Thus, nearly 42 percent of the total rice production in Thailand was exported in 2007 (see Table 5.2). The country's high ratio of rice exporting and the fact that the farmers in this research were unlikely to discontinue their rice paddy fields suggest that the change to oil palm farming is unlikely to affect the food security of the country. The DOA official pointed out that,

> "Rice lands can be used to grow oil palm, definitely. But, we exported rice a lot in the past, too much I think - half of the production, roughly - and the price has not been good. So, food security is not a problem. If we can use the land to do other things that can generate more income, it should be fine. Organic rice farming for domestic consumption might be the answer. Moving to more quality of rice." (Semi-structured interview, December 2010).

Table 5.2: Rice Production, Domestic Consumption, and Export (1971-2007)

Period	Population (Million)	Total Rice Production (Million Tonnes)	Domestic Consumption (Million Tonnes)	Export (Million Tonnes)	Percent of Export
1971-75	39.27	9.24	7.93	1.31	16.45
1976-80	44.35	10.45	8.04	2.41	23.06
1981-85	48.97	12.27	8.49	3.78	30.81
1986-90	52.91	12.42	7.52	4.90	39.45
1991-95	56.48	13.25	8.12	5.13	38.72
1996-00	59.70	15.46	9.38	6.08	39.33
2001-05	63.22	17.39	9.31	8.07	46.46
2006-07	65.71	19.40	11.26	8.14	41.96

Source: NESDB (2009a)

The official from NKO also shared a similar viewpoint with the DOA official,

> "To say that we are going to reduce rice production is very sensitive. Many people believe that farmers will completely switch to oil palms because of the policy support and then start asking what we are going to eat in the future. Do we have to buy rice from Vietnam in the future? I think this is exaggerated." (Semi-structured interview, June 2010).

However, according to the literatures in Chapter 2, the competition between biofuels and food production for land and labour might place further strain on already short supplies of arable lands, and thereby pushing up food prices. This is to say converting lands to oil palm cultivation could affect the food security of the rural poor through the volatility of food prices.

Although food prices in Thailand and elsewhere depend on various factors and change rapidly due to a range of powerful forces, including income growth, climate change, government policy, trend of staple foods, production costs linked to energy prices, urbanisation, and market speculation, it is clear that oil palms are one factor.

> "Surely, there will be an impact (on food prices). But how much, we do not know. Maybe it is good because the price of rice will be better. But it will affect the poor to some degree. The question is by how much and how we can help them," explained the DOA official (Semi-structured interview, December 2010).

Thus, more research response is needed to examine the impact of increased interest in oil palms on issues of food prices and food security: whether the threat is real and significant and if so, how this can be remedied effectively. It is worth noting that this research did not aim to focus on these issues.

Returning to the path dependency of the policy, in accordance with the cabinet resolution on the 17th of May 2005, MOAC was assigned to determine suitable oil palm areas within the time frame of 6 months, to provide oil palm seedlings, to support oil palm planting, and to study and assess the impact of oil palm cultivation on farmers. In addition, the cabinet agreed to develop pilot projects in some provinces in the North and Northeast regions that had potential for oil palm cultivation. In the cabinet resolution, a financial budget of 1,300 million Baht was also approved, of which 800 million Baht would be available as working capital for planting oil palm, whilst 500 million Baht would be used for R&D as well as administration costs (The Secretariat of the Cabinet, 2005).

In order to comply with the cabinet resolution, MOAC ordered DOA to prepare 1 million oil palm seedlings for use in future oil palm projects in the Northeast region. Subsequently, the cabinet further approved the guideline of the Oil Palm Plantations for Alternative Energy Project (OPPAEP) on the 2nd of August 2005. The details included the assignment of MOAC to create a pilot project for expanding oil palm farming in Nong Khai province. MOAC was also assigned to produce the budget details of the OPPAEP and submitted for the cabinet's approval (The Secretariat of the Cabinet, 2005a). The MOAC notifications were then issued to address identification of the potential oil palm areas, the regulations and conditions for oil palm seedling providers, and the regulations for farmers' participation in the OPPAEP (MOAC, 2005a; MOAC, 2005b; MOAC, 2005c). 60,000 rais of land in Nong Khai province were listed as targeted oil palm cultivation areas in 2006 in the MOAC's notifications.

On the 2nd of February 2006, DOA formally announced the details of the OPPAEP (DOA, 2006). The aims of the project were to increase the oil palm areas in order to produce sufficient palm oil for domestic consumption and to use oil palm products as feedstock for biodiesel production. The OPPAEP targeted an increase in oil palm cultivation by 5 million rais in the new areas between 2006 and 2009, of which 540,000 rais were in the Northeast region (see Table 5.3).

Table 5.3: Annual Targets of Oil Palm Expansion in the OPPAEP (2006-2009)

Unit: Rais

Oil Palm Areas	2006	2007	2008	2009	Total
1. New Areas	535,000	1,260,000	1,590,000	1,615,000	5,000,000
- Southern Region	300,000	500,000	510,000	855,000	2,165,000
- Eastern Region	85,000	240,000	400,000	480,000	1,205,000
- Northeast Region	60,000	120,000	180,000	180,000	540,000
- Military Areas	90,000	-	-	-	90,000
- Neighbouring Countries	-	400,000	500,000	100,000	1,000,000
2. Replacing Areas	185,000	250,000	300,000	265,000	1,000,000
Total	720,000	1,510,000	1,890,000	1,880,000	6,000,000

Source: DOA (2006)

According to the OPPAEP and the MOAC notifications mentioned earlier, interested farmers needed to register with local officials from Department of Agricultural Extension (DOAE), and then DOAE, DOA, and BAAC would consider whether the farmers' lands were suitable for the oil palm cultivation. The farmers who participated in the project would be provided with low interest rate loans from their local BAAC, but must buy the oil palm seedlings from DOA-certified seedling providers due to concerns over low quality oil palm seedlings being offered to the farmers. In January 2006, there were 387 oil palm seedling providers registered with DOA with an estimated production capacity of 16.98 million oil palm seedlings. This figure excludes the 1 million DOA-provided oil palm seedlings specifically for use in the Northeast region. The selling price of 8-month-old oil palm seedlings in the project was capped at 65 and 75 Baht per seedling depending on variety (DOA, 2006).

Under the OPPAEP, between 2006 and 2011BAAC provided a total of 6,102 million Baht in loans to participating farmers in the Northeast with the total (see Table 5.4). The project was initially designed to establish a special organisation to purchase oil palm products from farmers with a price guarantee of 2.50 Baht per kilogramme of fresh fruit bunches. However, the interested farmers had to undertake the oil palm knowledge transfer programme organised by DOA before participating in the project in order to ensure that they had sufficient skills in planting, maintenance, watering, fertilising, and harvesting the oil palm trees.

Table 5.4: Estimation of Loans in the OPPAEP (2006-2011)

Unit: Million Baht

Oil Palm Areas	2006	2007	2008	2009	2010	2011	Total
1. New Areas	4,993.3	8,752.3	11,985.9	16,959.4	3,735.3	2,454.3	48,880.5
- Southern Region (13,000 Baht per Rai)*	3,024	5,430	6,276.8	10,091.4	1,937.7	1,385.1	28,145.0
- Eastern Region (11,300 Baht per Rai)**	712.3	2,121.7	3,801.7	4,931.2	1,272.0	777.6	13,616.5
- Northeast Region (11,300 Baht per Rai)**	502.8	1,083.6	1,761.6	1,936.8	525.6	291.6	6,102.0
- Military Areas (11,300 Baht per Rai)**	754.2	117.0	145.8	-	-	-	1,017.0
2. Replacing Areas	1,864.8	2,760.5	3,648.7	3,466.2	830.5	429.3	13,000.0
Total	6,858.1	11,512.8	15,634.6	20,425.6	4,565.8	2,883.6	61,880.5

* 13,000 Baht per rai includes oil palm seedling and maintenance costs at 7,300 Baht per rai and land preparation at 5,700 Baht per rai. The loans are made to farmers for a period of three years.

** 11,300 Baht per rai includes oil palm seedling and maintenance costs at 7,300 Baht per rai and a water system installation at 4,000 Baht per rai. The loans are made to farmers for a period of three years.

Source: DOA (2006)

In March 2006, MOAC issued further notifications regarding oil palm issues (MOAC, 2006a; MOAC, 2006b; MOAC, 2006c). The core was to simplify the regulations and conditions for oil palm seedling providers and interested farmers participating in the project. The examples were to extend the timetable for applying to be an oil palm seedling provider within the project and to reduce the interested farmers' minimum requirement of land for oil palm cultivation from 15 rais to 2 rais per household.

The DOA, led by the team of the DOA official interviewed in the research, thus announced the oil palm pilot project to pursue the target of 60,000 rais in Nong Khai province. Primarily, DOA targeted the Hauy Mong irrigated areas of 58,363 rais in Tha Bo district, Nong Khai province, for planting oil palms. With the expansion in irrigation systems around the area in the future, the suitable areas for oil palm cultivation could increase to be at least 170,455 rais in Tha Bo and Si Chiang Mai districts, according to the DOA's study. The yield was expected to exceed 2.5 tonnes per rai per year in these suitable areas (DOA, 2006a).

However, at the meeting chaired by the Director General of DOA on the 19th of March 2006, the participants divided the suitable oil palm areas in Nong Khai province into two groups based on the future locations of palm oil refineries. The first group was in the irrigated area called Hauy Mong and its surrounding areas, which covered the districts of Tha Bo, Si Chiang Mai, Pho Tak, Mueang, and Phon Phisai. The second group was the area on the Eastern part of Nong Khai province which included Seka, So Phisai, and Bueng Kan districts. The DOA would provide a total of 800,000 oil palm seedlings for the project in Nong Khai province, of which the first allocation of 300,000 seedlings would be ready from May 2006 (DOA, 2006b).

In accordance with the cabinet resolution on the 25th of April 2006, the cabinet approved the OPPAEP submitted by MOAC. The cabinet, thus, assigned government stakeholders to structure the action plan and submit to Bureau of the Budget (BB) for budget consideration during the fiscal years 2007 to 2009 (The Secretariat of the Cabinet, 2006). On the 13th of September 2006, BAAC announced their loan policy for oil palm cultivation to the branch managers. The details of the loans followed the framework of the OPPAEP which had been approved by the cabinet. The interest rate for loans in the project was the Minimum Retail Rate (MRR) which was 7.5 percent per annum at that time (BAAC, 2006).

According to the MOAC's regulations for participating farmers, farmers who were interested needed to achieve oil palm knowledge and skills through the seminars and training organised by DOA prior to cultivating the oil palms. The farmers were then allowed to start the loan processes with BAAC. The number of farmers who completed the oil palm training programme in Nong Khai province was 732 and at the end of August 2006 they had an estimated 3,760 rais assigned to oil palm. Only 183 of the trained farmers, with a total of 3,005 rais allocated to oil palm had intended to start growing oil palm in 2006, (see Table 5.5).

Table 5.5: Details of Participants in the OPPAEP (As of 31st of August 2006)

Districts	Interested Farmers		Completed the Training Programme		Intention to Plant in 2006	
	Farmers	**Rais**	**Farmers**	**Rais**	**Farmers**	**Rais**
Group 1: Hauy Mong Irrigated Areas and the Surrounding Areas						
1. Mueang	70	1,024	24	196	6	79
2. Sa Khrai	8	146	3	35	-	-
3. Tha Bo	153	3,514	68	975	3	107
4. Pho Tak	135	3,063	53	637	9	126
5. Si Chiang Mai	133	6,126	44	2,165	11	102
6. Sang Khom	228	3,501	62	742	7	85
7. Phon Phisai	186	6,252	76	857	19	208
Group 2: The Eastern Part of Nong Khai Province						
8. Fao Rai	45	623	9	130	-	-
9. Rattanawapi	209	2,948	29	584	5	37
10. Pak Khat	233	3,376	24	253	3	34
11. So Phisai	369	6,109	12	290	-	-
12. Phon Charoen	88	1,390	7	88	2	23
13. Si Wilai	104	1,538	18	391	6	102
14. Bueng Kan	698	15,477	107	4,234	47	1,546
15. Bung Khla	74	1,017	11	195	3	18
16. Bueng Klong Long	126	1,563	34	369	6	57
17. Seka	274	4,739	151	1,619	56	481
Total	3,133	62,406	732	13,760	183	3,005

Source: BAAC (2006)

Despite policy narratives claiming that oil palm development was a top priority for both the national and provincial government during this planning period, I found that the oil palm expansion policy in Nong Khai province failed to achieve the initial target of 60,000 rais set in the OPPAEP during 2005 and 2006. The official data from the Nong Khai branch of BAAC indicated that only 77 farmers participated in the project, covering an area of only 1,384 rais. These 77 farmers were concentrated in only 6 of the 17 districts of Nong Khai province (see Table 5.6).

Table 5.6: Number of Farmers Participating in the OPPAEP and Their Oil Palm Plantation Areas in Nong Khai Province (2006-2007)

Districts	Farmers Participating in the OPPAEP (2006-2007)	
	Farmers	**Rais**
1. Tha Bo	5	112
2. Sang Khom	14	214
3. Phon Phisai	7	110
4. Pak Khat	4	85
5. So Phisai	2	245
6. Bueng Kan	45	618
Total	77	1,384

Source: BAAC

One of the main downsides of the project was the loan process itself. Obtaining the loan from BAAC involved a long and time-consuming procedure. In essence, an applicant farmer needed to be a member in the project, acquire an oil palm training certificate and be individually approved by MOAC before starting the loan process with BAAC. The Nong Khai branch of BAAC followed BAAC's loan process which consisted of explaining, investigating, producing documents, checking documents, obtaining project approval, preparing loan disbursement, loan disbursement, and filing the documents.

My interviews with farmers revealed that these processes created significant barriers to participation in the oil palm project, while, by contrast, they were much more at ease applying for loans under rice and rubber cultivation projects. In August 2006, there were 3,133 farmers in Nong Khai province who intended to join the OPPAEP, representing a total oil palm area of 62,406 rais. However, the figures dropped drastically to 732 farmers and 13,760 rais when oil palm training certificates were taken into account. This suggested clearly that the farmers were reluctant to continue with the oil palm project due to the complicated loan process. The farmer in Baan Tarn reckoned that,

> "Other ways of borrowing (village fund, co-operative fund, and rice and rubber projects) are a lot easier. We have to do many things to get an oil palm loan from BAAC. Wait and wait, and the opportunity goes away from you. It is a waste of time." (Male, semi-structured interview, May 2010).

However, MOAC had not achieved the expected outcomes of the oil palm policy. In May 2007 therefore, MOAC established the Oil Palm Industry and Palm Oil Development Plan (2008-2012) in order to solve the problems encountered in the OPPAEP. The core of the plan involved the target to increase by 2012the total area of oil palm plantations by 2.5 million rais in those areas that had been identified as potential oil palm areas in the OPPAEP. It was planned that the targets would be achieved in 5 years, during which the oil palm areas would increase by 500,000 rais annually. The plan also expected to replace 500,000 rais of low productivity and old oil palm trees over the entire 5 years of the plan. A rise in oil palm productivity to 3.0 to 3.5 tonnes per rai per year and an increase in oil content of oil palm products to 18.5 percent were also targeted (MOAC, 2008).

With this oil palm expansion plan, which is still current, MOAC aims to address the failure of the OPPAEP by making it easier for farmers to participate in the project and simplifying the loan approval processes from BAAC. Interested farmers are not required to attend the oil palm training programme from DOA, but can request an oil palm certificate after attending an oil palm orientation seminar if they already have sufficient oil palm knowledge and skills. In order to speed up BAAC's loan process, the approval process has altered so that authorisation no longer has to be given by MOAC but can be obtained from provincial-level Agricultural Extension Offices. In addition, the plan has given farmers flexibility to choose DOA-certified oil palm seedling suppliers who might not participate in the project. Regrettably, the number of farmers participating in the project in Nong Khai province has hardly increased since the deregulation of the current MOAC plan (see Table 5.7). In total, there were only 112 farmers involved in the OPPAEP, representing a total oil palm area of 1,943 rais.

Table 5.7: Number of Farmers Participating in the OPPAEP and Their Oil Palm Plantation Areas in Nong Khai Province (2007-2008)

Districts	Farmers Participating in the Project (2007-2008)	
	Farmer(s)	Rais
1. Sang Khom	1	50
2. Phon Phisai	6	102
3. Pak Khat	6	63
4. So Phisai	1	10
5. Bueng Kan	17	301
6. Seka	4	33
Total	35	559

Source: BAAC

There are several explanations for these unsuccessful outcomes. A lack of financial incentive from the government was a chief reason to hinder the progress of the project. Although the government has accepted the financial responsibility of 61,881 million Baht in funding farmers in the project, the interest rate in the project was considered too high (at 7.5 percent per year) by many farmers. As noted in Chapter 4, the oil palm farmers in the three villages decided to borrow from village funds, co-operatives, and BAAC's rice and rubber projects to support oil palm cultivation. The farmers insisted that the BAAC's loan offering under the OPPAEP was unrealistic and would attract no one to switch to growing oil palms.

> "Actually, the project in 2006 and 2007 was interesting. The only problem was the interest rate. It was far too high," reckoned the oil palm farmer in Baan Tarn (Male, semi-structured interview, May 2010).

One official from the Nong Khai branch of BAAC insisted that the unattractiveness of financial support in the project had contributed to the low take-up rate among Nong Khai farmers. The official explained that,

> "The interest rate was high. Too high to attract farmers, I knew. If I were the farmers, I wouldn't take it either. But it is normal for the bank to set a high interest rate for a project that has high risks like this (oil palms). The government did not come in and help at all financially." (Semi-structured interview, September 2010).

The distribution of rainfall in Nong Khai province is also a concern for oil palm cultivation in the view of the BAAC official. There is a 2-month period of heavy rainfall each year, which results in flooding in many districts in Nong Khai province. These two months of heavy rainfall lead to a high average figure in terms of annual rainfall in Nong Khai province, and it is the average figure that fits well with the requirement of 1,800 millimetres of annual rainfall for cultivating the oil palm (see Table 5.8). This concern prevented BAAC to confidently provide oil palm loan to farmers.

> "Nothing can guarantee the success of oil palm cultivation here in Nong Khai. The debates are still ongoing in academic circles. We have to protect ourselves by not lending BAAC's money for an infeasible project. We do not want to tie ourselves into a risky project and that is why the financial conditions could not be attractive," explained the interviewee (Semi-structured interview, September 2010).

Table 5.8: Average Annual Rainfall in Nong Khai Province (2000-2009)

Unit: Millimetres

Year / Month	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Jan	0	0	1	9	1	0	0	0	33	1
Feb	22	15	41	81	236	0	5	19	31	13
Mar	16	19	34	159	57	12	81	13	98	31
Apr	92	19	26	46	80	63	299	57	101	63
May	140	268	252	166	248	146	239	210	212	212
Jun	304	281	500	346	235	471	213	392	602	358
Jul	311	275	352	215	519	331	438	218	500	333
Aug	130	372	471	293	274	373	371	532	374	345
Sept	221	263	338	414	299	426	139	378	332	318
Oct	26	47	70	30	0	27	146	288	137	84
Nov	0	5	14	0	16	57	0	4	55	15
Dec	0	0	24	0	0	0	0	0	0	2
Total	1,261	1,564	2,122	1,759	1,965	1,907	1,932	2,110	2,475	1,776

Source: OAE, MOAC

The attractiveness of rubber cultivation at that time was also the key reason for the failure of the OPPAEP in terms of the participation of farmers in the project. An increase in rubber prices in 2006 and continuing support for rubber production in the Northeast region from the government, which provided free or subsidised inputs and low-interest loans, attracted many farmers to engage in rubber planting. The rubber price had risen from 44.13 Baht per kilogramme in 2004 to 66.24 baht per kilogramme in 2006 and farmers in Nong Khai province were very attracted by the surging price (OAE, 2008).

> "I heard about the oil palm project in 2006, but I was not interested at that time. I was busy rubber tapping and I think most of the farmers around here were also. When the chance came, you needed to take it because you do not know the price next year. Luckily, the rubber price is increasing each year," (Female, Baan Sa Ard, semi-structured interview, August 2010).

The government's project in supporting rubber plantations in the Northeast region through Offices of Rubber Replanting Aid Fund (ORRAF), which provided free or subsidised inputs and low interest rate loan to farmers, lured farmers in Nong Khai province towards rubber at that time. ORRAF's support included technical advice, free seedlings and fertilisers, low interest loans from BAAC, and subsidised material inputs, especially herbicides. The rubber project also supported other income-generating activities such as fishponds, livestock, and handicrafts in order to assist farmers to maintain their standard of living in the first 7 years before the rubber trees could be tapped (Fox and Castella, 2010). The interviewee in Baan Sa Ard summarised,

> "Rubber was a real hot topic here; there are almost 1 million rais in Esaan now. Everyone was talking about it. If the government can do the same as they did for rubber, oil palm will definitely be popular." (Male, Baan Sa Ard, semi-structured interview, August 2010).

Analysing with Majone's policy framework, which stresses the understanding of the policy processes through the three elements, namely evidence, argument and persuasion, the below-expected outcomes of the OPPAEP can be shown to result from the fact that the evidence and argument in favour of the policy failed to persuade the farmers and some key actors at the local level to adopt the oil palm plantation strategy. As argued in Chapter 3, there is no clear conclusion in the academic literature as to whether oil palm plantations can be economically viable in the Northeast region. An NKO official pointed out that,

> "At that time, no one believed that oil palms could grow well in Esaan soils. Many academics raised their concerns about planting the oil palm here. The government officials were also reluctant, especially at local level. The farmers then had no direction and had to delay their decisions." (Semi-structured interview, June 2010).

One of the farmers in Baan Sa Ard who planted the oil palms in 2008 also said,

> "I heard about the government support, but I was uncertain. Who would think that oil palms would grow well here in Esaan, the most drought-prone region in Thailand. But, when the large-scale producers and some farmers started to grow, I made up my mind." (Male, semi-structured interview, August 2010).

Despite the OPPAEP having been approved by the central government, the officials from PAE and the Nong Khai branch of BAAC hardly believed that oil palm cultivation could be economically viable in Nong Khai province. It was only in the irrigated Hauy Mong areas, which covers 60,000 rais of land suitable for oil palms that local officials believed oil palms could profitably be cultivated.

> "Water is a key. Other areas in Nong Khai can also grow oil palms, but installation of water systems is a must. Installing water systems is extremely costly and for that reason it is not worthwhile to invest here," explained the official from the Nong Khai branch of BAAC (Semi-structured interview, September 2010).

The PAE official has added that,

> "At first, I have to say I did not think oil palms were a good choice of crop here. So, I did not talk much about them or encourage farmers to grow them. But now, I believe in them. You can go and see for yourself. Like rubber, it takes time to know whether it works here or not." (Semi-structured interview, June 2010).

The failure of the OPPAEP led to the emergence of the OPPSP, which was created by DOA in order to distribute the 800,000 prepared oil palm seedlings to farmers in Nong Khai province. The project started in June 2007, and DOA appointed NKO to allocate the oil palm seedlings to interested farmers. The OPPSP offered farmers the oil palm seedlings as a loan, to be repaid in the form of money or oil palm production in the beginning of the 4^{th} year of cultivation, when the farmers would begin to harvest (NKO, 2007). This project was a success in terms of the oil palm expansion. Nong Khai became the province that had the highest oil palm area (17,156 rais) in the Northeast region at the end of 2007. The second was Ubon Rachathani province, which accounted for 1,742 rais in 2007 (OAE, 2008).

As of May 2008, there were 16,104 rais of oil palm cultivation in Nong Khai province that had come from NKO's oil palm seedlings, of which the participants in the OPPSP own 12,001 rais. The rest of the oil palm seedlings were distributed to the farmers who bought the oil palm seedlings directly from NKO at the price of 50 Baht per seedling, and to farmers who were in the OPPAEP and chose to obtain the oil palm seedlings through NKO (see Table 5.9). Although the OPPSP had ended in 2008, NKO still offered the remaining oil palm seedlings to interested farmers at a price ranging from 55 to 60 Baht per seedling between 2009 and 2010.

Instead of providing a full financial support package, including oil palm seedlings, maintenance costs, land preparation and water system installation, the OPPSP merely offered farmers the oil palm seedlings on loan, to be returned as money or oil palm production in the beginning of the 4th year of cultivation, when the farmers began to harvest. This, in other words, meant an interest rate of zero percent over a 4-year period was given to the farmers who paid 50 Baht per oil palm seedling. Although there were various factors shaping the decision of farmers towards oil palm cultivation, the evidence from the oil palm farmers in the interviews suggested that providing financial incentive in the project through lending oil palm seedlings would lure a large amount of farmers towards oil palm cultivation.

> "A lot of farmers around the area want the project back. I want it back too because I want to expand my oil palm crop. Okay, the more the government support there is, the more benefits for us. But it is more than enough, especially when the government gives the oil palm seedlings to you free of charge at the start, many will grow oil palms," explained one interviewee (Male, Baan Sa Ard, semi-structured interview, August 2010).

Table 5.9: Oil Palm Area and Number of Oil Palm Seedlings Distributed by NKO in Nong Khai Province (As of May 2008) *

Districts	OPPSP		Acquired Directly from NKO		OPPAEP		Total Area (rais)
	Area	Seedlings	Area	Seedlings	Area	Seedlings	
1. Mueang	42	1,050	139	3,475	-	-	181
2. Sa Khrai	-	-	-	-	-	-	-
3. Tha Bo	575	14,375	65	1,625	47	1,175	687
4. Pho Tak	73	1,825	31	775	-	-	104
5. Si Chiang Mai	104	2,600	29	725	99	2,475	232
6. Sang Khom	-	-	64	1,600	121	3,025	185
7. Phon Phisai	657	16,425	406	10,150	53	1,325	1,116
8. Fao Rai	114	2,850	267	6,675	32	800	413
9. Rattanawapi	132	3,300	330	8,250	-	-	462
10. Pak Khat	98	2,450	112	2,800	20	500	230
11. So Phisai	2,910	72,750	324	8,100	96	2,400	3,330
12. Phon Charoen	76	1,900	71	1,775	-	-	147
13. Si Wilai	295	7,375	241	6,025	-	-	536
14. Bueng Kan	2,257	56,425	715	17,875	461	11,525	3,433
15. Bung Khla	168	4,200	2	50	-	-	170
16. Bueng Klong Long	99	2,475	105	2,625	-	-	204
17. Seka	4,401	110,025	273	6,825	-	-	4,674
Total (Rais / Seedlings)	12,001	300,025	3,174	79,350	929	23,225	16,104

* 1 rai of oil palm cultivation requires a maximum of 25 oil palm seedlings. The data obtained from NKO and BAAC differed slightly in the amount of oil palm areas in the OPPAEP.

Source: Adapted from NKO

In fact, many farmers insisted that if NKO either provides oil palm seedlings via the OPPSP or sells them directly at below market price it would significantly stimulate oil palm expansion in Nong Khai province. This is because the price of oil palm seedlings from private suppliers around the area is high: 70 to 180 Baht per seedling, compared to 50 to 60 Baht from NKO. In addition, as discussed in Chapter 4, the farmers were less concerned over sources of funding for land preparation and maintenance costs as they could obtain the funding from village funds, co-operatives, and BAAC's rubber and rice projects and utilise that money to support their oil palm cultivation. Income from rubber cultivation could assist some farmers to purchase NKO's oil palm seedlings directly without participating in the OPPSP.

> "I want oil palm seedlings that I can trust and at a good price. No need to be part of the borrowing project (OPPSP). If they just provide good quality seedlings, a lot of farmers will be interested. Now, it is hard to find the seedlings around here. The government should provide knowledge and teach us how to do the maintenance," said an interviewee in Baan Tarn (Male, semi-structured interview, May 2010).

Interestingly, from the interview with an NKO official, providing oil palm seedlings in the OPPSP would, in turn, offer reasonable profits to the government, which could compensate for the 4-year zero percent interest rate provided to farmers. The actual cost of the double-stage nursery method (Hartley, 1988; Azman, 2002) used in the preparation of NKO's oil palm seedlings in 2007 was 41.51 Baht per seedling (NKO, 2009). The 8.49 Baht per seedling gap between the borrowing price of 50 Baht per seedling and the cost of production represented a healthy profit for the government, which would reduce the financial budget spent in funding the OPPSP.

The official from NKO insisted that,

> "Ask me personally, I think the government should further support the oil palm project. The government will gain and gain, either from the profits in producing oil palm seedlings to sell directly to farmers or in the borrowing project. Farmers want the seedlings and it is a win-win situation." (Semi-structured interview, June 2010).

However, the OPPSP may face difficulties over payback in the future, as no one started to return either money or oil palm production to the government in 2010.

> "The structure of the payback is still unclear. I still do not know who will be the one to collect the money from the farmers, DOA, BAAC, or us. Certainly, DOA is responsible for everything," pondered one interviewee (NKO, semi-structured interview, June 2010).

In terms of the annual yield of 3.0 to 3.5 tonnes per rai and 18.5 percent of oil content targeted in the current oil palm expansion plan, the outcomes in Nong Khai province are far from achieving those targets. The majority of oil palm farmers in Nong Khai province started to harvest in 2009, producing 9,762 tonnes throughout the province. Because the oil palms were in the early stages of harvesting, the yield per rai in Nong Khai province was 0.569 tonne per rai per year, which was enormously lower than the national average of 2.560 tonnes per rai per year in 2009 (OAE, 2010a).

> "Oil palms have just started here, so the crop cannot compete with oil palms from the Southern region of Thailand. But it depends on the knowledge also. If the government seriously provides sufficient oil palm knowledge to farmers, the crop has a chance to match the yield and oil content of the oil palms from the South in the future. But I do not think the oil palms here are going to achieve better yields than the South's. The climate is different and it affects the oil palms," explained NKO Official (Semi-structured interview, June 2010).

In terms of oil palm knowledge, the evidence suggests that there is a lack of knowledge within the local government offices themselves, as well as a lack of distribution of oil palm knowledge to farmers. NKO is the leading local government agency in supporting oil palm knowledge throughout the Northeast region. However, NKO has a small number of members, just 24, of which 16 are accountants and administrators, whilst the other 8 are researchers and policymakers.

> "We do not have enough manpower. We have just what you see here, a very small group of people. We really need more people and money to push the policy forward, and so we can do more things than we are currently doing. I have to say we cannot do much more than this in this condition," admitted an NKO official (Semi-structured interview, June 2010).

The main responsibilities of NKO were to research and develop the oil palm crop, produce high quality oil palm seedlings, and disseminate oil palm knowledge in the Northeast. NKO officials obtained oil palm knowledge from Surat Thani Oil Palm Research Centre (STO) based in the Southern region and applied the knowledge to the Northeast's climate and soil conditions.NKO had oil palm testing fields, in which they did the research in 2005 in order to determine the most suitable oil palm variety for the Northeast region by focusing on the varieties developed by STO, which were Surat Thani 1 to 6. The results are presented in Table 5.10 below. The Surat Thani 2 variety was selected for use in the OPPSP because of its drought resistance.

Table 5.10: Average Yield and Oil Content of Surat Thani 1 to 6 Varieties, Compared Between NKO and STO Testing Fields

Category	Variety	STO	NKO *
Average Yield (Kilogrammes/Rai/Year)	Surat Thani 1	3,450	1,546
	Surat Thani 2	3,617	1,522
	Surat Thani 3	2,939	1,458
	Surat Thani 4	3,349	272
	Surat Thani 5	3,054	20
	Surat Thani 6	3,258	1,140
Oil Content (Percent)	Surat Thani 1	26	19.8
	Surat Thani 2	23	17.6
	Surat Thani 3	27	15.8
	Surat Thani 4	25	11.1
	Surat Thani 5	26	n/a
	Surat Thani 6	27	16.2

* 36 months after planting.

Source: NKO

Nonetheless, NKO undertook very little research and development and produced few seedlings after the OPPSP was discontinued in the late 2008, due to a lack of budget from the central government. Hence NKO's only responsibility since late 2008 has been the dissemination of oil palm knowledge in Nong Khai and other potentially relevant provinces in the Northeast region, for instance, Ubon Ratchathani and Si Sa Ket. The evidence showed that NKO, in co-operation with district-level Agricultural Extension Offices in Nong Khai province and STO, arranged three to five seminars a year to disseminate oil palm knowledge to farmers in various districts in Nong Khai province. The farmers considered these attempts insufficient to enhance their ability to achieve the targets of increasing productivity and oil content of the crop, as stated in the oil palm expansion plan. The daily work of NKO, thus, involved providing services to farmers who came directly to NKO for advice on diverse agricultural crops including oil palms.

The evidence also underlined that due to budget constraints PAE, SPAE, and SAE have organised hardly any oil palm seminars for farmers, an average of just one per year. The headline of the seminars focused on the growing and maintenance of oil palm trees, particularly their watering and fertilising requirements at different ages. These seminars averaged 100 participants, who were mostly oil palm growers.

Although the district-level Agricultural Extension Offices were the most practical way for the farmers to contact the local government, particularly when they had problems regarding oil palm cultivation, these district-level Agricultural Extension Offices had no in-house oil palm research. Their oil palm knowledge was provided by NKO. Thus, the advice given to farmers was based on NKO's oil palm knowledge and the previous experience of the officials in these three offices themselves. Because of their experience in the oil palm cultivation in the Southern region, two of the three interviewees had been appointed to responsible for the oil palm promotion in each district.

> "I gave advice to farmers from my own experience. I did not ask NKO because I grew oil palms when I lived in the South. Now I have also planted the oil palms here, so I am able to understand the problems and the differences in Esaan context," explained an SPAE official (Semi-structured interview, August 2010).

Certainly, the extent to which the local government had disseminated oil palm knowledge and developed oil palm knowledge specifically for the Northeast region was not in line with the targets set in the plan.

The climate conditions in the Northeast region are another obstacle to achieving the oil palm targets in this region. The yield and oil content of oil palm in Nong Khai province cannot compete with the Southern region's or the superior Malaysian oil palms due to the climate being less suitable. The fact that oil palm plantations in Nong Khai province were in their infancy added another constraint to the crop yield there. Typically, oil palm trees will reach their peak in terms of productivity at the age of 6 to 10 years (DOA, 2010). Thus it is not logical to conclude from the official statistics at this early stage that oil palm productivity in Nong Khai province was low at 0.569 tonnes per rai per year and was not worth the investment.

Although oil palm farmers in Nong Khai province have adopted the drought-resistant Surat Thani 2 variety developed by STO, a DOA official insisted that a 5-month period of drought annually in Nong Khai province (see Table 5.8) would still negatively affect the crop yield, which could not be compared to the yield of plantations subject to a maximum of 3 months drought in the Southern region or less than 1month in Malaysia.

> "We did not aim to beat the oil palms in the Southern region's or anywhere, when we started the oil palm project in Nong Khai. We just wanted to help local rice farmers to have a better life," concluded the interviewee (DOA, semi-structured interview, December 2010).

To recap, the findings in this section suggested that in the action plan for biodiesel development and support approved by the Thai cabinet, the climate change mitigation was not considered a main driver of the oil palm expansion policy. However, the utmost concern of the oil palm policy was the issue of food security; the findings in the previous chapter suggest that the majority of the oil palm farmers in this research have a strong interest in continuing to produce rice for their own consumption and are unwilling to convert all of their lands to oil palm plantations.

Despite policy narratives claiming that oil palm development was a top priority for both the national and provincial government during this planning period, the oil palm expansion policy in Nong Khai province failed to achieve the initial targets of 60,000 rais set in the OPPAEP during 2005 and 2006. A lack of financial incentive from the government was a major hindrance to the progress of the project. Apart from the high interest rate offered by BAAC, another downside of the project was the loan process itself. Obtaining the loan from BAAC was a long and time-consuming procedure. My interviews with farmers revealed that these processes created significant barriers to participation in the oil palm project, whilst, by contrast, farmers were much more at ease applying for loans under rice and rubber cultivation projects. The attractiveness of rubber cultivation at that time was also a key reason for the failure of the OPPAEP in terms of uptake. The distribution of rainfall in Nong Khai province was another concern which affected the confidence of BAAC in providing oil palm loans for farmers, leading in turn to higher interest rates.

The failure of the OPPAEP led to the emergence of OPPSP created by DOA in order to distribute the 800,000 prepared oil palm seedlings to farmers in Nong Khai province. The OPPSP offered farmers the oil palm seedlings on loan, to be returned in the form of money or oil palm production in the beginning of the 4th year of cultivation, when they would start cropping (NKO, 2007).

The OPPSP was a success in terms of area expansion, as it resulted in a staggering increase in oil palm areas from none in 2006 to 17,156 rais at the end of 2007. This was due to the attractiveness to the farmers of the borrowing scheme. Because oil palms were in the early stages of harvesting in 2009, the yield per rai of oil palm cultivation in Nong Khai province was hugely lower than the country's average of 2.560 tonnes per rai per year. A lack of oil palm knowledge on the part of local government and a failure to disseminate oil palm knowledge to farmers were the primary explanations for not achieving the yield and oil content targets. The evidence also shows that NKO in collaboration with district-level Agricultural Extension Offices and STO arranged only 3 to 5 seminars per year to disseminate oil palm knowledge to farmers in various districts in Nong Khai province. These attempts were considered insufficient to enhance farmers' oil palm ability to achieve the targets.

In the next section, I will explore how networks, coalitions and alliances of actors with a shared vision or similar beliefs spread and maintain narratives through chains of persuasion and influence. The actors/networks are not exclusively restricted to state institutions. Instead, they link up the civil service and the government with the private sector, including local leaders and large-scale producers. On this theme, I will address the questions of, for instance, who is inside and outside a policy network? How do people and institutions become enrolled into a network? How do ideas circulate through a network? And what are core beliefs?

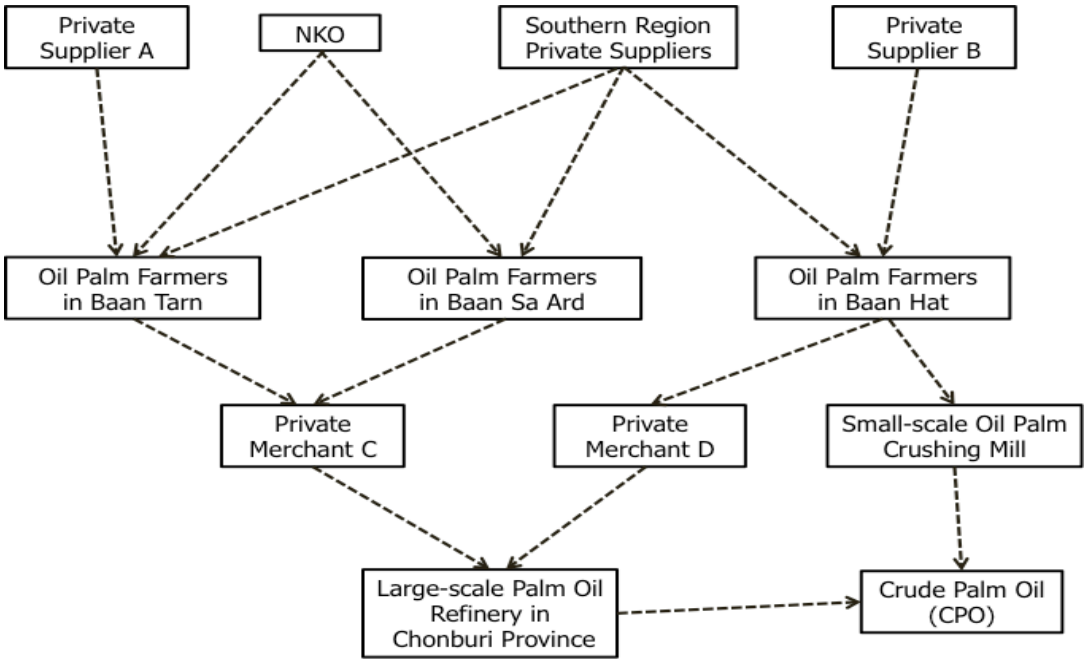
5.2 Actors/Networks Theme

In order to understand the networks and key actors related to the oil palm issues, I have divided this section into two parts. The first part explores the path to oil palm production in the three villages and the key actors involved, starting from the oil palm seedling providers and ending with the large-scale palm oil refinery in Chonburi province. The second part, then, discusses how the farmers in the three villages were influenced in adopting oil palm cultivation, which involved local leaders, large-scale oil palm producers, and government agencies.

5.2.1 Networks and Key Actors in the Path to Oil Palm Production

The evidence suggested that the farmers in the three villages set out on the path to oil palm production by acquiring oil palm seedlings. NKO and the private suppliers, including suppliers from the Southern region, were the key actors in providing the seedlings to the farmers. The farmers then grew the oil palms and sold the oil palm fruits to middlemen and the small-scale oil palm crushing mill in the area. The middlemen transported the oil palm products to the large-scale palm oil refinery in Chonburi province, which was 700 kilometres from Nong Khai. However, there were differences in the path to oil palm production amongst the three villages as depicted in Figure 5.2 below.

Figure 5.2: Networks of Key Actors in the Path to Oil Palm



Source: Diagram by the Author; Data from Experience at the Field Site (2010)

As noted in the preceding chapter, NKO was the main government organisation which provided oil palm seedlings to most of the oil palm farmers (see Table 5.11) in two of the villages, namely Baan Tarn and Baan Sa Ard, whilst the oil palm farmers in Baan Hat relied on oil palm seedlings from private suppliers, including some in the Southern region. As described in the previous chapter, NKO provided the oil palm seedlings to the farmers in two different ways: either via the OPPSP and/or by selling them directly to the farmers at the price of 50 to 60 Baht per seedling, excluding the transaction cost. Some of the non-NKO seedlings in the three villages came straight from the Southern region suppliers since the oil palm farmers trusted the quality of oil palm varieties from the South and the oil palm seedlings from NKO were in short supply. An example can be seen in the case of Baan Sa Ard, in which none of the farmers' oil palm seedlings came from local private suppliers.

Table 5.11: Number of Households and the Oil Palm Seedlings from NKO and Private Suppliers by Village

Village	NKO *		Private Suppliers *	
	Contracted Households	Buying Households	Southern Suppliers	Local Suppliers
1. Baan Tarn	9/14 (64%)	6/14 (43%)	1/14 (7%)	1/14 (7%)
2. Baan Sa Ard	9/23 (39%)	11/23 (48%)	5/23 (22%)	0/23 (0%)
3. Baan Hat	0/8 (0%)	0/8 (0%)	1/8 (13%)	7**/8 (88%)
Total	18/45 (40%)	17/45 (38%)	7/45 (16%)	8/45 (18%)

* The cumulative number in each category might exceed the total number of interviews as several households acquired oil palm seedlings from more than one source.

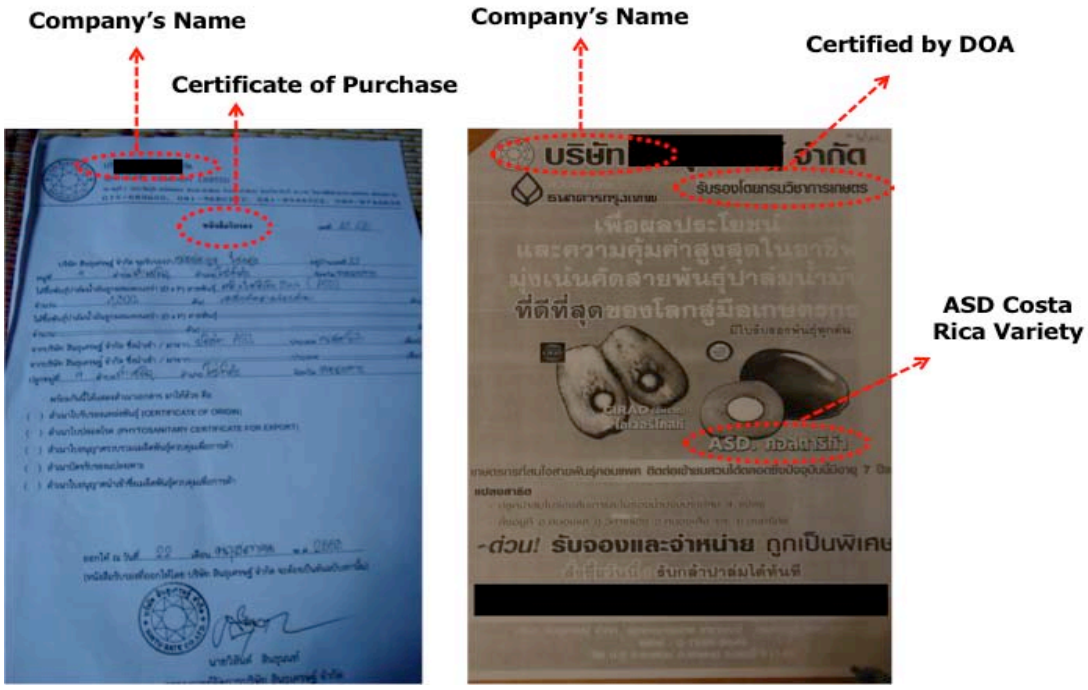
** One of the oil palm famers in this village was a local private supplier.

Source: Data from field Interviews (2010)

The oil palm farmers in Baan Sa Ard acquired their oil palm seedlings from different suppliers in the Southern region. This was in the period from 2009 to 2010 when there were shortages of oil palm seedlings from NKO. These suppliers delivered the oil palm seedlings to the farmers in Baan Sa Ard at a price ranging from 90 to 130 Baht per seedling including the transaction cost. One interviewee in this village explained,

> "The demand for oil palm seedlings is high lately. The oil palms from the South are also good in quality or even better. The oil content and yields are high. They have long experience in growing oil palms. My friends there also recommended this company to me (see Picture 5.1)." (Male, semi-structured interview, August 2010).

Picture 5.1: A Farmer's Documents from One of the Private Seedling Suppliers in the Southern Region



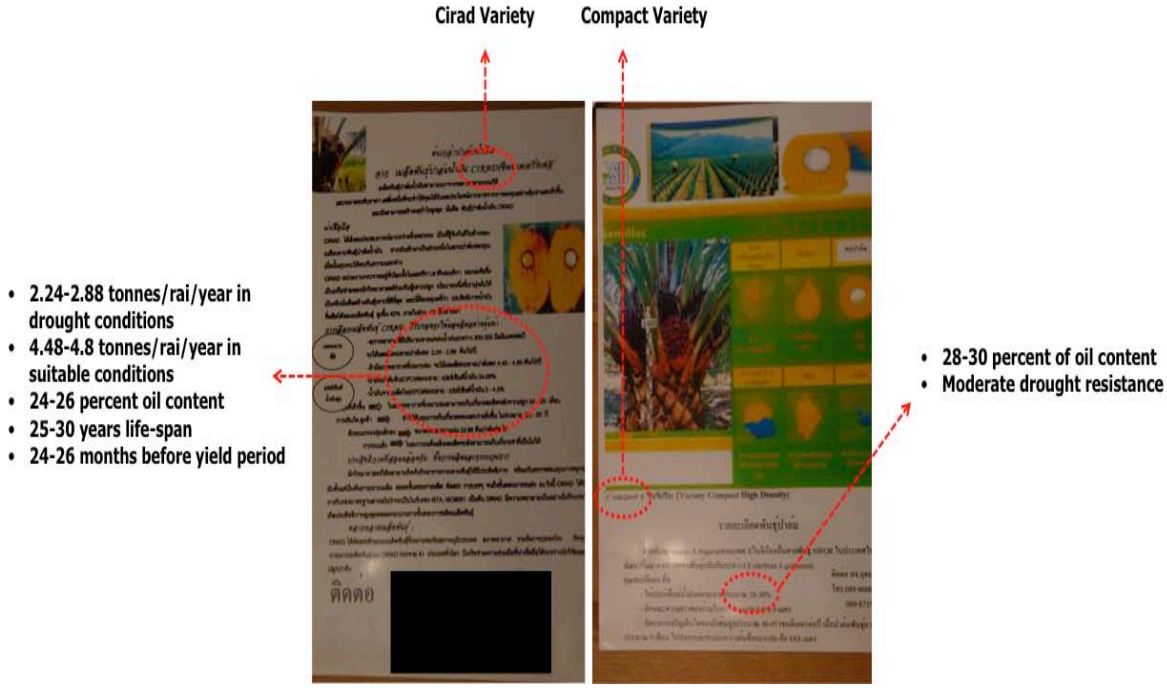
Source: Photograph by the Author (2010)

The reason for choosing private suppliers from the Southern region varied in each household depending on the farmers' experiences in the South, suggestions from their friends, the companies' reputations, and the price and quality of the oil palm varieties offered. One interviewee in Baan Hat bought oil palm seedlings from the company that had supplied the oil palm farmer he once worked with in the South.

> "I brought the oil palm seedlings with me when I came back to the village. It is the same variety because I had got used to growing this variety." (Male, Baan Hat, semi-structured interview, May 2010).

In the interview with private seedlings supplier A, who provided the oil palm seedlings to the oil palm farmer in Baan Tarn, he emphasised that oil palm seedlings from private suppliers were of better quality than the ones from NKO. The seedlings from NKO were of the variety Surat Thani 2 Tenera, which gives 23 percent oil content with an average production of 3.6 tonnes per rai per year, whereas the DOA-certified CP Golden Tenera variety from private supplier A offered higher figures at 4 tonnes per rai per year, at least 25 percent oil content, and 4 to 5 months' drought resistance. This private supplier A also suggested that there were other two uncertified oil palm varieties in the market that offered great yields, namely Cirad and Compact varieties (see Picture 5.2).

Picture 5.2: Advertising Brochures for Oil Palm Varieties in the Study Area



Source: Photograph by the Author (2010)

The CP Golden Tenera variety was selling at 120 to 150 Baht per seedling depending on the transaction cost. The private seedlings supplier A's customers were small-scale farmers, who were mainly from the provinces of Nong Khai, Sakhon Nakorn, Nakorn Phanom and Loei, in the Northern region. The interviewee emphasised the importance of oil palm quality in cultivating the oil palms and gave the example of a private seedling supplier in Si Chomphu sub-district, So Phisai district. This seedlings supplier sold low quality oil palm seedlings to farmers around the Si Chomphu sub-district areas at the tempting price of 40 Baht per seedling. Many farmers bought oil palm seedlings from this supplier, but years after planting the oil palms did not yield and the farmers lost their money. Later, this supplier stopped selling oil palm seedlings and moved out of the areas.

Private seedlings supplier A also described a surge in the demand for oil palm seedlings in the past couple of years (2009-2010). Oil palm seedling suppliers in Nong Khai province had had a larger role in selling seedlings in 2010 since the OPPSP by NKO had ended and there were no longer any oil palm seedlings coming from NKO. Private seedlings supplier A said,

> "I think this year is truly a year of private suppliers in this area. A lot of farmers wanted to grow oil palms and I think it is a good opportunity to supply them with good quality oil palm seedlings. NKO had some sorts of problems I don't know, but the farmers' willingness to plant the oil palms is still there." (Male, semi-structured interview, October 2010).

In the case of Baan Hat, private seedling supplier B provided seedlings to most of the oil palm farmers in the village. The DOA certified seedlings came from Chumphun province in the South at the price of 60 Baht per seedling and this supplier added his mark-up to sell them at 70 to 100 Baht per seedlings including delivery service. One interviewee, who also lived in the neighbouring village next, had worked in Chumphun province and was attracted by the oil palm cultivation in the South. His oil palm knowledge was gained from attaining seminars in the Southern region as well as attaining the oil palm pilot projects organised by the large-scale palm oil refinery in Chonburi province.

The customers of private seedlings supplier B were mostly small-scale farmers from Seka district and some districts in Sakhon Nakorn province. The interviewee admitted that the volume of oil palm seedlings sold increased considerably in 2010, which generated a staggering monthly profit of 10,000 to 20,000 Baht for supplier B. Supplier B's plan was oil palm breeding, and he was, at that time, experimenting with suitable oil palm varieties.

Both private seedlings suppliers A and B predicted a sizeable increase in purchases oil palm seedlings from private suppliers in the study areas due to the dearth of oil palm seedlings from NKO. However, the quality of oil palm seedlings was a major concern in cultivating the oil palms. There were a few private suppliers who were trying to persuade the farmers towards the postulated higher yield of the uncertified oil palm varieties. The price of these varieties was as high as 180 Baht per oil palm seedling, excluding the delivery service. In fact, the small-scale farmers responded unenthusiastically to these new oil palm varieties, since the price was extremely high and as yet they had little trust in either the suppliers or the new varieties.

> "Quality of oil palm seedlings is everything. Success or failure, it is all about the quality. I know about the new varieties here. They look good on paper, but no one knows in reality. No one guarantees the outcomes except the sellers. The wild claims of yields of 5 to 8 tonnes per rai per year seem impossible to me here (in the Northeast region), but who knows?" said private seedlings supplier A (Male, semi-structured interview, October 2010).

Three to four years after the oil palm farmers have planted the seedlings, the issues are about the market for oil palm fresh fruit bunches (FFBs). The farmers in the three villages sold their oil palm production in two different ways. All the farmers in Baan Tarn and Baan Sa Ard who had harvested sold some or all of the oil palm fruits to the middlemen in the area. The rest of the oil palm production was transported by the farmers directly to the small-scale oil palm crushing mill in Tha Kok Daeng sub-district, Seka district.

Private merchant C is the oil palm buyer in the area of Baan Tarn and Baan Sa Ard. In the case of Baan Tarn, the farmers had to deliver their oil palm fruits to private merchant C's place in Rattanawapi district because the farmer had only a small amount to sell. Alternatively, the farmer could contact the private merchant A directly to ask whether he was around the village to collect the oil palm fruits. However, the picture was different in Baan Sa Ard: private merchant C came to the neighbouring village, Baan Ngam, to buy oil palm fruits once a fortnight. This had been organized by local leader H in Baan Sa Ard (see more details in section 5.2.2).

In fact, the evidence from the interview with private merchant C showed that he bought more oil palm fruits from Nong Khai province (approximately 500 tonnes per year) than anywhere else. Oil palm fruits came from almost every district in Nong Khai province, and also from a few districts in Loei, Sakhon Nakorn and Nakhon Phanom provinces, which produced of 300 tonnes, 100 tonnes, and 100 tonnes respectively per annum. Private merchant C purchased the oil palm fruits from the farmers at 1 Baht per kilogramme below the market FFB price across the board, without grading the farmers' oil palm production by quality. Private merchant C also claimed that the quality of oil palm production from the Northeast region was better than the Southern region's in terms of the oil percentage, but the yield per rai per year was still lagging behind that of the South.

Returning to the marketing channel, the Baan Hat farmers had two choices for selling their oil palm production. One way was to sell the oil palm outputs to the local oil palm crushing mill in Tha Kok Daeng sub-district, Seka district. This small-scale plant had been set up by a group of people who had gained experience in oil palm farming and palm oil extraction in the Southern region. This family business was run by a small number of workers using second-hand machines with the capacity to process approximately 10 tonnes of oil palm fresh fruit bunches per day. This small-scale oil palm crushing mill was permanently closed in April 2010. I went to the plant site, but was not able to interview the stakeholder as the family had already moved to invest in other businesses elsewhere. The information obtained about this crushing mill was based on discussions with the villagers around the plant site and an interview with government official from SAE.

Normally, this crushing mill did not operate every day, as there were insufficient oil palm fruits in the area. However, there were rumours amongst the oil palm growers that the mill's second-hand equipment was in extremely poor condition and was no longer run well enough to produce high quality crude palm oil (CPO). Moreover, this family business did not have enough capital and cash flow, which affected their ability to purchase oil palm fruits from farmers. The oil palm farmer in Baan Hat recognised these problems since it took several weeks to receive money from selling the oil palm products (see also Chapter 4). Therefore, many oil palm farmers, including the oil palm farmers in Baan Hat, switched to dealing with private merchant D, even though the price he pays is 1 Baht below the market price offered by the oil palm crusher.

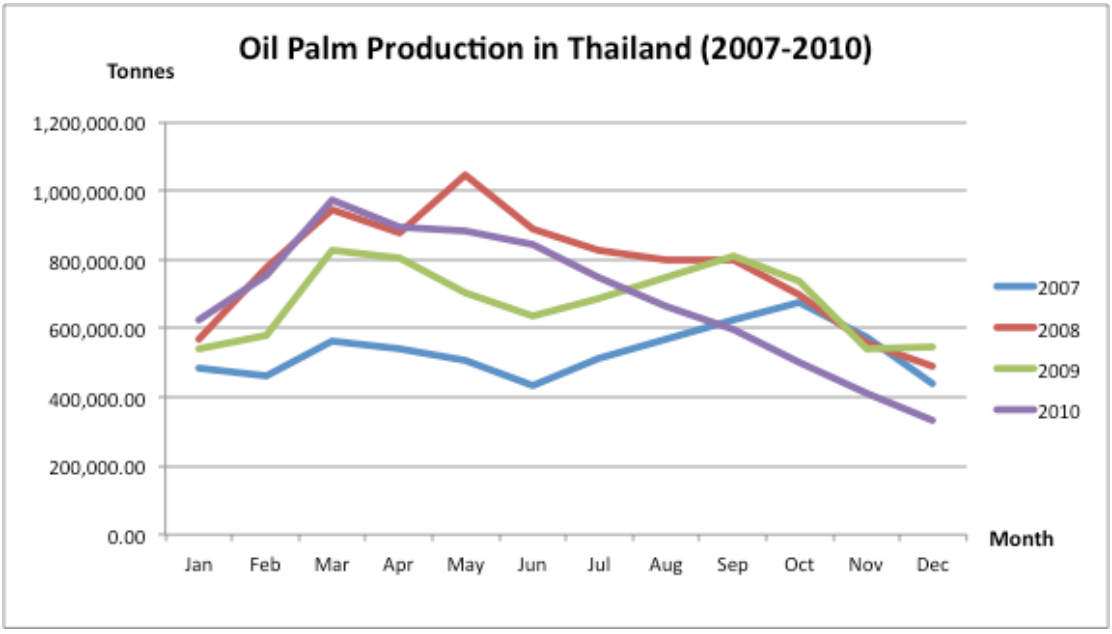
Private merchant D, who is located in Kum Tha Kla sub-district, Sakhon Nakorn province, is an alternative purchaser of oil palm products for the farmers in Baan Hat. Merchant D started buying agricultural products including oil palm fruits in January 2010 after moving with his wife from Vanorn Nivas sub-district to live in Kum Tha Kla sub-district, Sakhon Nakorn province. The customers of private merchant D were from Seka and Phon Charoen districts in Nong Khai province, and a few districts in Sakhon Nakorn province. However, private merchant D and private merchant C were not competing to obtain oil palm products in the same areas, as private merchant D explained,

> "He (private merchant C) has been in this business for a long time and is a big name in the area. I won't compete with him. I don't want to make an enemy. So, I am going into the areas he cannot reach." (Male, semi-structured interview, November 2010).

Although the oil palm fruits should reach the palm oil refinery within 24 hours because of a loss in the percentage of oil, private merchant D only manages to deliver oil palm products to the palm oil refinery 4 to 10 times a month, with a consignment of from 8 to 13 tonnes of oil palm fruits each time. This depends hugely on the season of oil palm production. Typically, oil palm products in Thailand are at their peaks in two periods every year: from March to May and from September to October (see Figure 5.3). However, there are concerns over the grade of the farmers' oil palm fruits.

> "Some cut unripe bunches to sell us: they cannot notice the ripe ones. But I had to buy them and told them to make it right next time. I need to build up customer relationships, which will help my business in the future," explained merchant D (Male, semi-structured interview, November 2010).

Figure 5.3: Oil Palm Production in Thailand by Month (2007-2010)



Source: OAE, MOAC

Both private merchants C and D had to transport the oil palm products 700 kilometres to the large-scale palm oil refinery in Chonburi province, in the Eastern region of Thailand, for which they took 1 Baht per kilogramme off the FFB market price they paid to the oil palm farmers. Nonetheless, both merchants had suggested that a small-scale oil palm crusher would soon arrive in the area. Private merchant B admitted that he was interested in investing in a 10-tonne per day oil palm crusher to produce CPO in the future. The interviewee planned to operate as a co-operative, community-based oil palm crusher; the oil palm farmers would be invited to be shareholders in the co-operative and private merchant D would concentrate primarily on management and marketing issues.

In contrast, private merchant C refused had no interest in setting up a small-scale oil palm crusher himself, but suggested that within 3 years when the oil palm production in the area flourished, there would be plenty of small-scale oil palm crushers.

> "In the next 3 years, the oil palm production in the Northeast will be enough for oil palm crushers to come to the area. I think less than 20 percent of oil palm farmers have harvested so far. There is a lot of talk about crushers here. They will be here soon, I believe," explained private merchant C (Male, semi-structured interview, October 2010).

Private merchant C showed no sign of anxiety about the future appearance of oil palm crushers in the area because he had another oil palm related business, which involved the selling of agricultural chemicals including oil palm fertilisers. Besides, he cultivated 30 rais of oil palms and planned to expand in the near future.

Private supplier A also believed that CP Group, which is a large-scale food company listed in the Stock Exchange of Thailand, was closely monitoring the oil palm situation in the Northeast region. Because the demand for oil palm crushers from oil palm farmers in this region would become stronger in a couple of years, CP Group might be interested in seeking new market opportunity in the Northeast region.

> "I cannot tell you where and when the oil palm crushers will come, but it is certain that the CP Group are thinking about it. I don't think they will start with a large one, it should be a small one in the area of Phon Phisai and Rattanawapi districts. Wait and see, they will surely come," forecasted the private supplier A (Male, semi-structured interview, October 2010).

When the oil palm products from private merchants C and D arrived at the Chonburi palm oil refinery, the refinery did not grade the quality of oil palm fresh fruit bunches. Typically, the Southern refineries classify the oil palm fruits based on the size and varieties, and the purchase price varies according to the oil content. However, the Chonburi refinery could not offer this service to their customers because it would increase the cost, and in any case there were no significant differences amongst the oil palm varieties that arrived at the refinery.

The interviewee suggested that the oil palm fruits from the Northeast region are medium sized because the trees were still immature at 4 to 5 years of age and thus the percentage of oil could not compare to the oil palm fruits from trees over 10 years old.

> "The quality of oil palms should be judged when the oil palms are at least 10 years old. Small-size oil palm fruits definitely give less oil than the large ones," he explained (Male, semi-structured interview, January 2011).

The informant believed that the Southern region's oil palm fruits had slightly more oil content (which implied better quality) than the Northeast's due to the more suitable climatic conditions, such as rainfall distribution and humidity.

In fact, all of the oil palm fruits at the Chonburi refinery came from the Northeast and Eastern regions. Most of them, approximately 98 percent, were from the Eastern region. Although the production capacity of the refinery was 90 tonnes of oil palm fruits per hour, the monthly production varied from 400 tonnes per day in low season to 1,000 tonnes per day in peak season. The average oil palm production of the Northeast region was 500 tonnes per month, the majority from Ubon Ratchathani and Nong Khai provinces. This low figure could not tempt the refinery to establish either a full-scale palm oil refinery or even a small-scale crusher in the Northeast region.

Expansion of production capacity to 135 tonnes per hour was a priority for the Chonburi palm oil refinery owners.

> "300 to 400 tonnes per month (in the low season) is not enough to build a refinery. If we decide to do so, we are looking for 700 to 800 tonnes per day. So, I would say no chance at the moment or in the near future," expressed an interviewee (Male, semi-structured interview, January 2011).

A small-scale crusher was not possible either as CPO from a small-scale crusher is below the standard set by the refinery.

> "The quality of CPO is also different if you produce CPO from a small-scale crusher. The market price of oil palm fruits needs to be lower for the small-scale one. It would affect our company's reputation in the future," emphasised the interviewee (Male, semi-structured interview, January 2011).

The interviewee further suggested that the company will not consider producing biodiesel until the price of diesel oil reaches 40 Baht per litre. Producing cooking oil and products such as margarine, soap and shortening offers higher profits to the company. Thus the CPO from oil palm fruits is used mainly to produce palm oil for cooking purposes through the subsidiary company located in the same area. Although the company started to produce biodiesel in 2005, production was discontinued in 2008 as a result of surging production costs which reduced the company's profit margin.

> "Actually, we also want to make biodiesel. A lot of opportunity there, but the government came in too much in controlling the price of it. So, we didn't make enough profit, or even made losses when the price of oil palm fruits was high. We had to do it and then stop and then do it and stop again. It has been like this for the past couple of years." (Male, semi-structured interview, January 2011).

As we have seen, the production path of palm oil in this research, which involved a range of actors from the oil palm seedling suppliers (both local and Southern) to the oil palm farmers in the three villages, to the local private buyers of oil palm fruits, and to the local crushing mill and large-scale palm oil refinery in Chonburi province, differed across the three villages. This sub-section has provided an understanding of the shared and differing values and beliefs of these different actors in the oil palm network. In the next sub-section, I will explore the networks of key actors that influence the oil palm farmers in the three villages.

5.2.2 Networks of Key Actors that Influence the Oil Palm Farmers in the Three Villages

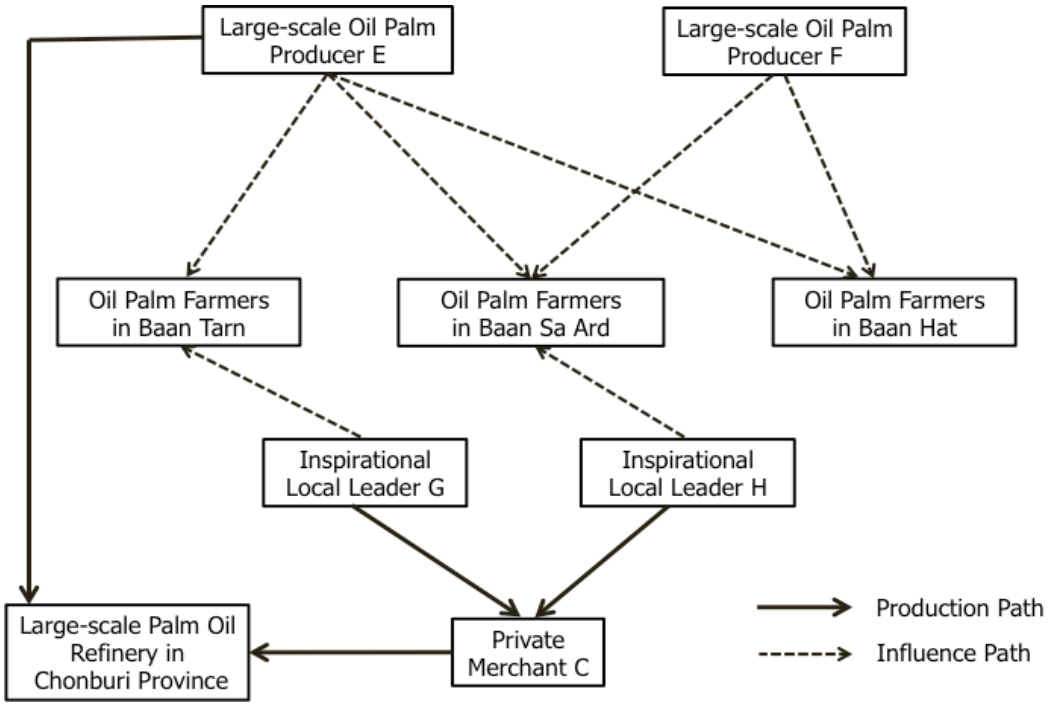
In order to understand this network, I divided this sub-section into two parts. The first deals with the inspirational local leaders and large-scale oil palm producers in the three villages, and the second is devoted to the government agencies.

5.2.2.1 Inspirational Local Leaders and Large-scale Oil Palm Producers

As illustrated in Chapter 4, the roles of the inspirational local leaders and large-scale oil palm producers and the success of their oil palm plantations were influential factors in persuading the farmers to engage in oil palm cultivation. The relationships of the inspirational local leaders and the large-scale oil palm producers to the oil palm farmers in the three villages are presented in Figure 5.4 below.

In the case of Baan Tarn, local leader G's successes in oil palm cultivation have inspired the farmers in the village to follow her path (see also Chapter 4). Local leader G, who lived in Baan Tarn Mai (a neighbouring village), has 40 rais of oil palm plantations, as well as rice paddy fields and rubber plantations, which account for 30 rais and 31 rais respectively. At that time half of the planted oil palms were productive. Since early 2009, local leader G had been harvesting 2 to 3 tonnes of oil palm production per month, which generated an average monthly income of 10,000 Baht for the household. However, the remaining 20 rais of oil palm plantation was expected to be ready for harvesting in late 2012.

Figure 5.4: Networks of Inspirational Local Leaders and Large-scale Oil Palm Producers



Source: Diagram by the Author; Data from Experience at the Field Site (2010)

According to the interviewee, the first batch of oil palm seedlings, 25 percent of the total, came from the seedling supplier in Si Chomphu sub-district, Nong Khai province, at the cost of 40 Baht per seedling. As private supplier A suggested, there is a high possibility of receiving low quality oil palm seedlings from private seedling suppliers in the Si Chomphu area. Local leader G managed to achieve a healthy condition in 80 percent of his trees. Subsequently, she changed to oil palm seedlings from NKO, which accounted for 75 percent of the local leader G's oil palm area.

> "The oil palm seedlings from NKO are a lot better. Less than 5 percent of the oil palm seedlings were unable to grow into oil palm bunches," informed the inspirational local leader G (Female, semi-structured interview, August 2010).

Local leader G was in one of the first groups of farmers to consider oil palm cultivation in the Northeast area. This assisted the household to become famous amongst farmers interested in oil palms as well as amongst government officials in order to learn from their achievement. The household was granted an annual 100,000 Baht loan from BAAC under the OPPAEP and OPPSP. They also acquired enough oil palm seedlings from NKO for 30 rais, of which 10 were given to them free of charge. In the implementation of the OPPSP, DOA officials had also taken special care of this local leader G, which involved frequent visits, close monitoring, and a full package of oil palm knowledge transfers. According to the results in this study, this was the right strategy, as the inspirational local leaders have played an important role in encouraging oil palm cultivation in locally by giving advice, forming groups of oil palm farmers, and taking the lead in oil palm issues. This positively affected the decision of Baan Tarn farmers to participating in the OPPSP.

Indeed, local leader G attempted to collect the oil palm harvests of the small-scale oil palm farmers around Baan Tarn Mai and sell them on behalf of the group to private merchant C for a negotiated price. However, the oil palm production in the area had not reached the level where the oil palm farmers could bargain to achieve a better price from private merchant C. One of the chief reasons was from the oil palm farmers themselves. A lack of co-operation and understanding amongst the oil palm farmers meant that they harvested at different times, which resulted in an insufficiency of oil palm products at any given time to negotiate with the merchants.

> "People here drink (alcohol) together, but they work separately. I think they might get envious of another persons' success. I have been trying to form a group, but I have to accept that it is not in a good shape," expressed the inspirational local leader G (Female, semi-structured interview, August 2010).

Apart from the attempts to form an oil palm group, local leader G was also giving advice to farmers around the village who were interested in oil palms.

> "When people ask me about oil palms, I give them advice. Some think that my advice and experience are useful and then decide to plant the oil palms. They see my success, they understand that the oil palms can be real here," explained the interviewee (Female, semi-structured interview, August 2010).

Looking again at the production path, when the oil palm fruits are ready, local leader G has two options: either contact private merchant C to collect the products, or to deliver the products to him. If the oil palm production is plenty, say, more than 1 tonne of oil palm fruits at a time, private merchant C will come to collect the fruits or give a concession for bringing them to him. Nonetheless, local leader G believes that the middlemen in Nong Khai province will be forced out of the palm oil supply chain, when the crushers arrive in the area in the near future.

Likewise, the success story of the inspirational local leader H in Baan Ngam has strongly influenced the farmers in Baan Sa Ard towards adopting oil palm cultivation. Local leader H had taken oil palm seedlings from NKO before the emergence of OPPSP. Leader H had replaced all 50 rais of rice paddy fields with oil palms, which meant the household had to buy rice for their household consumption. Although leader H started to harvest oil palm fruits in October 2009, the major source of household income was from 150 rais of rubber cultivation. The household was a leader in rubber cultivation in Tham Charoen sub-district, So Phisai district, with 20 years of experience.

The example of group selling in the case of rubber products had encouraged the oil palm farmers to follow the same path, with the guidance of the well-known local leader H. The local leader H was very clear in his mind about supporting the oil palm cultivation as he planned to expand his oil palm plantations from 50 rais to 130 rais at the end of 2011. Leader H was trying to convince interested farmers in the area to adopt oil palm cultivation using the knowledge he had gained by trial and error and then form a group of oil palm growers.

This oil palm group could offer economies of scale in buying agricultural materials and selling their produce to the middlemen. At that time, the local leader H organized an oil palm market with private merchant C in the open space in front of local leader H's house. The market takes place every 15 days, and the buying and selling activity is on a one-to-one basis: each individual farmer negotiates separately to sell to private merchant C.

> "It is difficult to sell the products as a group. I mean to sell the oil palm products together in one big lot to merchant C in order to get a better price. Maybe it is a new thing here and it is not our culture to work as a group. Actually, I think it is a great move to set up the market place successfully. I don't think it is a bad starting point, not at all," explained inspirational local leader H (Male, semi-structured interview, July 2010).

As explained in the previous chapter, a huge amount of investment in cultivation by oil palm investors positively affected how confident the farmers in the three villages were about adopting oil palm cultivation. The large-scale oil palm producer E had influenced many oil palm farmers across the three villages to invest in oil palm plantations, particularly in the case of Baan Tarn, where the oil palms of the large-scale oil palm producer E are planted very nearby. The large-scale oil palm producer E obtained 3,000 rais of oil palm area in Phon Phisai district, of which all have been productive since the end of 2008. The average oil palm production of 300 tonnes per month is a primary source of household income, as well as the 200 rais of rubber plantations.

The large-scale oil palm producer E moved from the South to trade auto spare parts in the Phon Phisai area before switching to agriculture in 2003. She started with rubber plantations and then added 2,000 rais of oil palm in 2005. A dripping water system was installed for the oil palms, using water from bogs and groundwater wells. During her interview, this large-scale producer E stressed the importance of being a large-scale agricultural producer. The attitude of large-scale producer E differed from that of the small-scale oil palm producers in the three villages in several aspects.

Because of a belief that large-scale agriculture is necessary, the large-scale producer E planned to invest in a medium-sized oil palm crusher with a production capacity of 40 tonnes per day, in the near future. Hence, the market for oil palm products did not concern producer E in the long run. In producer E's opinion, without co-operation between farmers, small-scale agriculture may not be economically viable due a lack of economies of scale in buying agricultural materials and selling the products.

> "Esaan people are very lazy. They always talk about 'some say' and then do nothing. That is why it is difficult to form a group for anything. If they compete between themselves, put their hearts into agriculture, and work hard, they will definitely be successful in doing agriculture," believed the large-scale producer E (Female, semi-structured interview, November 2010).

Oil palm producer E also informed us that being a large-scale investor, she was given 10 percent of total sales in return for selling oil palm products to the large-scale palm oil refinery in Chonburi province.

Her attitude about the government sector was also different from that of the small-scale farmers. Most of the small-scale farmers trusted the government support including oil palm seedlings and advice. The large-scale investors had a different perspective about the government sector from the small-scale farmers, demonstrated by producer E insisting that local government, especially NKO, lacked knowledge of growing oil palms. Moreover, the large-scale producer E did not trust the quality of oil palm seedlings obtainable from the government sector, and in particular whether Surat Thani 2 variety was suitable for the conditions in the Northeast. As a result, producer E brought the oil palm seedlings from the Southern region, of a variety which was a hybrid between Malaysia and Tenera varieties. This hybrid variety was expected to offer higher productivity and percentage of oil than the Surat Thani 2.

> "I asked my friend in Chumphon province and also learnt from my experiences. NKO does not know anything about oil palms. They sometimes buy the oil palm seedlings directly from the South and resell them. So, why not do it yourself?," said large-scale oil palm producer E (Female, semi-structured interview, November 2010).

The conditions attached to the loan from BAAC could not tempt this large-scale producer E to be in either the OPPAEP or OPPSP. Producer E decided to take her custom to a private commercial bank.

> "The government provided nothing, or they provided something that did not work. I do not think we need it anyway," explained large-scale oil palm producer E.

The evidence shows that producer E did not increase the area planted with rubber because the rubber tapping process requires a huge amount of labour and, thus, is prone to cheating by the hired rubber tappers. In contrast, oil palm cultivation, after 5 to 6 years of growing, uses less labour than rubber cultivation especially since the shade of the oil palm trees naturally limits the growth of grass. In the view of the large-scale oil palm producer E, oil palm cultivation is relatively easy compared to rubber cultivation in terms of monitoring and harvesting. Oil palm harvesting is carried out in daylight, which makes it easy to scrutinise the oil palm products over larger areas. Producer E chose to hire a 60-person oil palm harvesting team to collect the oil palm fresh fruit bunches at the rate of 500 Baht per tonne. The grass cutting was also serviced at 5 Baht per tonne by the same team.

It is important to note that the large-scale oil palm producer E is a head of household who is female. Although the percentage of female-headed households in Thailand was at 31.67 percent in 2007, a significant increase from 21.13 percent in 1980 according to NSO (2009), there were only three female-headed households amongst all the farmers interviewed in this research: the other two were a rice farmer who had not yet adopted oil palm cultivation in Baan Tarn and an oil palm grower in Baan Hat. This can be explained by the fact that agriculture, including oil palms, involves harsh physical conditions and hardship, which puts females are at a disadvantage compared with males. In this research, in which most of the interviewees were farmers producing either rice or oil palms, the number of female-headed households was at the time lower than the national average. Moreover, in Thai culture, it is generally preferred to have a male in the role of head of a household rather than a female. There is a firm belief that a male should lead the household and the female should play a supporting role: raising children, cooking, helping her husband with agricultural work, or doing part-time work to generate additional income for the household, which differs sharply from the western culture. Large-scale oil palm producer E explained during her interview,

> "I am a rare case because I have to be. I moved from the South, so I do not have relatives here. When my husband died, I had no choice but to fight for my children. I did what I love to do, which is agriculture. Step by step. But in fact, I am a woman, so having a man to lead your household is a good thing to me. It supposed to be equal, men and women. But deep down, no women want to lead. Men do not want us to lead either. They will feel ashamed." (Female, semi-structured interview, November 2010).

On the other hand, large-scale oil palm producer F has influenced the farmers in the two villages, Baan Sa Ard and Baan Hat. None of the oil palm farmers in Baan Tarn mentioned the oil palm activities of producer F. The large amount of oil palm planted areas (2,800 rais in 2008) attracted the farmers to emulate the efforts of large-scale producer F. In fact, producer F expanded his business in the Southern region to start a new business in the Northeast region in the form of a family company. His businesses included boutique hotels in various places in the South, real estate in Khon Kaen province (Northeast region), a pool construction business, and oil palm cultivation.

Focusing on the oil palm cultivation only, producer F grew oil palms in various places on different scales. The figures were 30,000 rais in Songkhla province (Southern region), 2,800 rais in Nong Khai province, and 1,000 rais in each of Udon Thani (Northeast region), Nongbua Lamphu (Northeast region), and Kanchanaburi (Central region) provinces. The evidence suggested that large-scale oil palm producer F was interested in expanding his oil palm cultivation in the Northeast region due to the inexpensiveness of agricultural land.

> "We sold our land in Songkhla province to buy new land here. The land was very cheap and we got plenty of it for the same amount of money. It was worthwhile to invest here, better than in the South," expressed the large-scale oil palm producer F (Male, semi-structured interview, August 2010).

Similar to producer E, producer F did not demand any support from the government sector. Producer F employed two Thai oil palm academics from the universities and one oil palm expert from Malaysia to simplify the oil palm knowledge for practical purposes. Their work included investigating soil types in the planted areas in order to apply the most suitable fertilisers to the trees according to the variety. Funds came from other businesses as well as loans from private commercial banks, but not from the BAAC's oil palm projects. Large-scale producer F also planned to purchase a 13 million Baht oil palm crusher with a production capacity of 50 tonnes per day when their oil palm fruits started to ripen. The crusher would be located in Udon Thani province.

Both the large-scale producer E and the large-scale producer F suggested that the sub-district Administration Organisations were the only two local government organisations that came to discuss the land tenure of the oil palm cultivation with them. Most of the land acquired by the large-scale producers was abandoned arable land, formerly used for rice cultivation. Only a small amount of the land was bamboo land. Both large-scale oil palm producers insisted that they acquired the land legally with the correct NS 3 and PBT 5 documents from the farmers.

> "I was not afraid when the officials came to me because I did everything right. They will ask for money if you do something wrong. But I have had these kinds of experiences, so everything was on the paper and the documents were kept well," underlined large-scale oil palm producer F (Male, semi-structured interview, August 2010).

It is worth noting that producer F raised the seedlings in the oil palm nursery in Songkhla province before conveying them to plant in the northeast region. The reputation of the modified Malaysian oil palm variety had influenced many farmers in So Phisai district and the surrounding areas who worked daily in investor B's oil palm plantations, to start growing oil palms. Producer F sold the oil palm seedlings to interested farmers with no oil palm seedling certification from DOA.

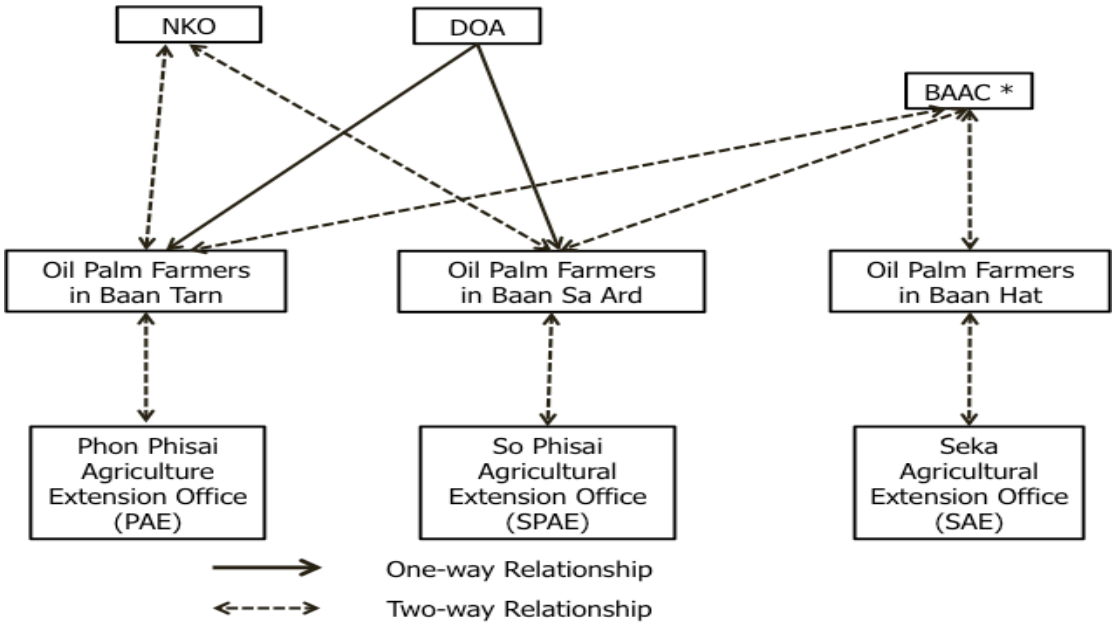
> "A lot of farmers were interested and asked for the oil palm seedlings. I sold the oil palm seedlings to them without guarantee, replacement, or anything. But, I did not sell many of them, only the leftovers," explained producer F (Male, semi-structured interview, August 2010).

To summarise, the findings in this part suggest that inspirational local leaders have strongly influenced the farmers in both Baan Tarn and Baan Sa Ard in terms of the techniques of oil palm agriculture as well as engaging in oil palm cultivation. The large-scale oil palm producers have likewise influenced the farmers in all three villages. However, the attitude of the large-scale producers towards the government sector differed from that of the small-scale farmers. Indeed, the large-scale producers did not trust the government agencies and asked for no support from them. In the next part, I will explore the network of the government agencies influencing the oil palm farmers.

5.2.2.2 Government Agencies

There are six government agencies involved in the oil palm cultivation of the three villages, namely Nong Khai Oil Palm Research Centre (NKO), Department of Agriculture (DOA), Bank of Agriculture and Agricultural Co-operatives (BAAC), Phon Phisai Agricultural Extension Office (PAE), So Phisai Agricultural Extension Office (SPAE), and Seka Agricultural Extension Office (SAE). In Figure 5.5, the relationships between these six government agencies and the three villages have been depicted. These government agencies are introduced below.

Figure 5.5: Networks of Government Agencies



* BAAC was not involved directly in funding oil palm loans to the farmers. The farmers borrowed under the rubber and rice cultivation projects in order to support the oil palm cultivation.

Source: Diagram by the Author; Data from Experience at the Field Site (2010)

The Department of Agriculture (DOA) is one of the 15 government departments and offices under the Ministry of Agriculture and Co-operatives (MOAC). The department is the government's agricultural development think tank, whose main responsibility is research and development of crop varieties and agricultural machinery in order to increase crop productivity and value. Other responsibilities include certifying agricultural products to international standards, and supplying crop knowledge and skills to farmers for the benefit of Thailand's agricultural development in the longer term.

Nong Khai Oil Palm Research Centre (NKO) is the local government agency under DOA, MOAC. Initially, NKO was named Nong Khai Horticultural Research Centre and was reformed to NKO in 2005 because of the government policy on alternative energy. NKO is a supporting unit to the field study of DOA officials, in which NKO is responsible for providing oil palm support to farmers in the Northeast region in co-operation with the 15 Provincial-level Agricultural Research and Development Centres in the Northeast. Although the institute had 24 officials, who could be divided into 8 policymakers and 16 administrative officials, the main responsibilities of NKO were to research and develop crops, produce seeds and seedlings, and provide crop knowledge and academic research to farmers. All of these focused on the subject of oil palms.

The Phon Phisai Agricultural Extension Office (PAE), So Phisai Agricultural Extension Office (SPAE), and Seka Agricultural Extension Office (SAE) are district-level Agricultural Extension Offices under the Department of Agricultural Extension (DOAE), MOAC. They were created in order to stimulate the competitiveness of farmers in producing and managing agricultural products in response to the market. They are also intended to strengthen agricultural community, to advise and solve agricultural problems for farmers, and to disseminate agricultural knowledge acquired from various government agencies to local farmers. Indeed, district-level Agricultural Extension Offices were the local government agencies that worked closely with the farmers and have influenced the farmers' crop selections in the local areas.

The Bank of Agriculture and Agricultural Co-operatives (BAAC) is a state-owned bank, in which the Minister of Finance was an ex officio chairman of the board and had full authority in guiding the bank's direction. The bank's ultimate goal was to raise the quality of life of small-scale farmers in rural areas by providing loans to support an increase in both quantity and quality of agricultural products. Providing support to farmers in terms of agricultural knowledge and career development were also priority objectives of the bank. The strength of BAAC is its relationships with rural farmers throughout the country, as the bank has branches in almost every district in Thailand.

As illustrated by Chapter 4 and the previous policy narratives section, NKO had strongly influenced the oil palm farmers in the two villages of Baan Tarn and Baan Sa Ard, either through the OPPSP or by the direct selling of oil palm seedlings. However, in the case of Baan Hat, the oil palm farmers had no relationship with NKO or DOA due to geographical difficulties. One of the farmers explained,

> "NKO is in Rattanawapi district, not far from Mueang district, which is like the capital of the province. We are more than 150 kilometres away from NKO, so it is difficult to go and visit them. Actually, I think NKO could not reach us either. They (NKO) feel the same way." (Male, semi-structured interview, August 2010).

The official from NKO admitted,

> "Long distances have an impact on our work, I have to say. Villages around this area, such as in Phon Phisai and So Phisai districts, are a lot easier for NKO to visit, to monitor, and to give advice. That is why I think NKO having the responsibility to look after oil palm farmers in Nong Khai province and the whole Northeast region is far too much, especially considering our manpower." (Semi-structured interview, June 2010).

The evidence showed that DOA was responsible for checking the appropriateness of the farmers' oil palm lands.

> "The teams went in to test the soil every farmer had prepared for the oil palm plantations (who participated in the OPPSP). NKO was a facilitator because they knew the area quite well," explained the official from DOA (Semi-structured interview, December 2010).

This informant reckoned that the DOA teams gave priority to local leaders in oil palm cultivation in order to monitor the results of their oil palm plantations.

> "We understand the importance of local leaders in the Esaan context, so we want to nurture them to be successful growers in the future. We try to keep in contact with them as much as possible. We also learnt from them because they were the ones who planted the oil palms. They knew the problems, and we can help them solving those problems." (Semi-structured interview, December 2010).

Because DOA is a central government agency, the relationship between the DOA teams and the oil palm farmers was a one-way relationship. The oil palm farmers would contact NKO or district-level Agricultural Extension Offices in preference to DOA if they needed advice regarding the oil palms.

> "They (DOA officials) came from the Bangkok. They told us we could contact them anytime. But I feel better about contacting the local government around here, like PAE or NKO. It is more convenient and we already know them (PAE officials). They have been around for some time," explained an oil palm farmer in Baan Tarn (Male, semi-structured interview, May 2010).

The DOA official added,

> "Very few people contacted us (DOA) directly, even though we left them our numbers. We are looking more at the big picture of the issues, so the farmers contacted NKO first for overall suggestions. I think this is good. NKO is closer to them. I mean both in relationships and in distance." (Semi-structured interview, December 2010).

Although PAE, SPAE, and SAE officials had a good relationship with the oil palm farmers in each district, most of the farmers preferred to discuss oil palm issues with their local leaders and the oil palm growers in their villages.

> "The oil palm growers around here talk to each other very often. They share their experiences and sometimes go to ask local leaders about the harvesting. I also talked to a PAE official, but only when he came in to suggest the new rice scheme from the government." Said a farmer in Baan Tarn (Male, semi-structured interview, May 2010).

The evidence from a SAE official suggested in a similar vein,

> "A lot of farmers have been asking me about oil palms in the past 2 years especially when I went to villages to talk about government policy and the crop selection. I answered them from my oil palm experience when I lived in the South. If there is something I do not know, I will contact NKO." (Semi-structured interview, November 2010).

As discussed in Chapter 4, BAAC has influenced the oil palm farmers in the three villages in terms of providing funds for the oil palm plantations. However, the funding came from the rice and rubber plantation projects: some of the farmers utilised that money to support their oil palm plantations. A BAAC official summarised that,

> "We were involved directly in the OPPAEP, but it was not successful, as you know. A lot of farmers then used the loan from the rubber project to back the oil palms. I have no problems with that, if they can still pay the money back to us, which they did." (Semi-structured interview, September 2010).

The evidence in this part has shown that NKO and DOA had significantly influenced the farmers in the two villages, namely Baan Tarn and Baan Sa Ard, whilst in Baan Hat, the oil palm farmers had no relationship with them due to geographical difficulties. All of the government agencies had a two-way relationship with the farmers except DOA, where there was only a one-way relationship. However, most of the farmers preferred to discuss oil palm issues with their local leaders and oil palm growers in the area.

It is undeniable that politics affect policy processes in several vital ways. Thus, in the next section, I will discuss politics and how they shape oil palm policy processes. On this theme, I will address the questions of, for instance, who is engaged in the policy processes? How much capacity exists within the local government to carry out policy aims and implementation? And what types of relationships occur within ministries and departments?

5.3 Politics/Interests Theme

Many of the informants interviewed for this study indicated a lack of direction, seriousness and continuity on the part of the government in achieving its oil palm policy objectives. Certainly, political instability due to conflicting notions of political legitimacy has affected the oil palm policy processes since the political upheaval of 2006. Thaksin Shinawatra, the Prime Minister of Thailand, was ousted from power by a peaceful military coup d'état on the 19th September 2006. Back in January 2001, Thaksin had been elected to government with unprecedented popular support through his *Thai Rak Thai* (TRT or "Thais Love Thais") party. He immediately enacted "populist policies" designed to appeal to the relatively poor and rural voters, who were left behind by the long economic boom prior to the 1997 Asian financial crisis.

These "populist policies" introduced by the TRT offered social welfare, income support, and ideas about how the poor might be given priority, which included the famous 30 Baht universal healthcare scheme, the one million Baht microcredit scheme (SML), and the One *Tambon* (subdistrict) One Product (OTOP) project. The immense popularity of these populist policies captured the hearts and minds of Thailand's rural majority, particularly in the North and Northeast regions, and thus handed a landslide victory to the TRT in the re-election in February 2005. Thaksin was the first Prime Minister in Thailand's history both to complete a full 4-year term in office and to be re-elected at the head of a political party that controlled parliament.

Although Thaksin had put Thailand on the map of the world's emerging markets with a massive rate of GDP growth, strong leadership, clear policy direction, and apparent democratic consolidation, his administration was accused of a lengthening trail of corruption, conflict of interest, and alleged abuses of power (Montesano, 2007; Dressel, 2010; Hewison, 2010; Chachavalpongpun, 2011; Jha, 2011). Mass demonstrations against Thaksin's administration (which were later formed into the People's Alliance for Democracy or the Yellow Shirts) began in September 2005 and expanded enormously in January 2006 after the tax-exempt sale of Thaksin's Shinawatra Corporation (Shin Corp), worth 1.9 billion USD, to the sovereign wealth fund of the government of Singapore, Temasek Holdings.

After months of turbulence, Thaksin decided to dissolve parliament in February 2006 and called for a snap election in April 2006, which the opposition parties boycotted. Predictably, Thaksin won the April 2006 election with 57 percent of the votes cast (Ockey, 2009), but this result was fraught with controversies due to the fact that Thailand's 1997 constitution required unopposed candidates to receive the support of at least 20 percent of eligible voters. Later, the constitutional court annulled the April 2006 election and directed the government to conduct a fresh election. Charges were also filed by the courts against the TRT for engaging dummy parties to compete in that election, and against the Democrat Party (DP) for boycotting it.

Thaksin, as caretaker Prime Minister, responded by calling for a new general election in October 2006. Nonetheless, the yellow-shirted People's Alliance for Democracy (PAD) persisted in its protest against the Thaksin regime, eroding his legitimacy and occupying the streets with protesters in the weeks leading up to the military intervention on the 19th September 2006, while Thaksin was out of the country at the annual session of the United Nations General Assembly in New York. Up to this point, street demonstrations had distracted the focus of the government away from constructing and pursuing new policies, including the oil palm expansion policy in Nong Khai province. The fact that the cabinet approved the OPPAEP on 25th April 2006 meant it was extremely difficult to make further progress on the oil palm policy.

The interviewee at DOA explained,

> "The timing of the oil palm policy was really bad. It (the oil palm policy) started in mid-2005 and the project (OPPAEP) was then further refined in mid-2006. Look at this period, there were a lot of protesters on the streets, very long rallies and demonstrations, and then the coup. No government on earth could work in those circumstances. So, no one cared about the oil palm expansion. Politicians only cared about their survival in the government. It was a really bad situation." (Semi-structured interview, December 2010).

An NKO official also felt this difficulty,

> "Everything had been at a standstill since we started to have conflicts. It seemed like everyone was so obsessed about them (conflicts) and the oil palms were just a really small issue to them (policy makers). I hoped the conflicts would end soon at that time, but in reality they did was not. It was getting worse." (Semi-structured interview, June 2010).

After the September 2006 coup, Thailand was hurled back into a familiar whirl of elections, constitution amendments, and arguments about political legitimacy that caused instability to the country. Five Prime Ministers, who were Thaksin Shinawatra, Surayud Chulanond, Samak Sundaravej, Somchai Wongsawat and Abhisit Vejjajiva, came into power in a time span of just 4 years (2006-2009). General Surayud Chulanond was named as the interim Prime Minister by the Council of National Security (CNS) on the 1st of October 2006. The military leaders abrogated the 1997 constitution and then appointed a committee to draft a new constitution, which was designed to elevate bureaucrats and judges at the expense of elected politicians, political parties, and the Prime Minister (Jha 2011). After the proceedings of public hearing and submissions of the 2007 constitution, the general election was scheduled for the 23rd of December 2007.

During the Surayud government, Thaksin's TRT was also dissolved by the military-appointed court and 111 of its executives were barred from political participation for 5 years. The TRT's successor was called People's Power Party (PPP) and was led by Samak Sundaravej. It was victorious in the December 2007 election with a solid margin over the Democrat Party (DP), 233 to 165 seats in the revised 480-member assembly. However, the PAD began to wear Royal Yellow Shirts and mobilise support against the PPP, actively opposing Samak's reconciliation efforts, rectification and amendment of the 2007 constitution, and the relations with neighbouring Cambodia over the Phreah Vihear dispute. The street demonstrations continued unabated. The Yellow Shirts demanded Samak's resignation and, in August 2008, intensified their protests by laying siege to several state agencies and occupying the Government Houses in order to prevent the elected parliament from opening. Meanwhile, Thailand witnessed the emergence of United Front for Democracy against Dictatorship (UDD), commonly known as the Red Shirts, in response to the activities of the Yellow Shirts. The clash between these two colours in September 2008 resulted in dozens of injuries and a state of emergency declaration.

In September 2008, the constitutional court gave a verdict that Samak was guilty of violating the constitutional ban against outside employment, because he was being hired and paid by two cookery programmes on television. This forced him to resign immediately, and he was then succeeded by Somchai Wongsawat, who was Thaksin's brother-in-law. This change was rejected by the Yellow Shirts, who continued to fight against constitutional amendments, to implement the "new politics" of mostly appointed rather than elected representatives, and to eliminate Thaksin influence on the government. The protests accelerated, and the Yellow Shirts again seized the Suvarnabhumi airport for a week in late November 2008, shutting down all flights and stranding thousands of tourists in Thailand.

In what may represent another major twist in the tale, the constitutional court again dissolved the PPP and two other allied parties for alleged vote-buying in the December 2007 election. Thus, the PPP's executives including Prime Minister Somchai were banned from politics for 5 years starting from December 2008. The new coalition under Abhisit Vejjajiva of the DP emerged, as some of the pro-Thaksin political leaders changed sides and defected to the government under the DP. The political legitimacy of the DP was questioned by the Red Shirts, and they took to the streets in protest. In April 2009, the Red Shirts disrupted the fourth East Asia summit in Pattaya by storming into the hotel, which resulted in a cancellation of the summit. From March to May 2010, the Red Shirts staged demonstrations in Bangkok in large numbers, which provoked widespread violence in the entire country. Town halls in several provinces in the North and Northeast regions and 17 buildings in Bangkok burnt down, including the office of the Stock Exchange of Thailand and Central World, which was the biggest department store in Thailand. Prime Minister Abhisit called for reconciliation in order to cure Thailand's deep political polarisation, which in this two-month period had led to confrontations between the Red Shirts and the military and 91 deaths.

The past few years (2006-2010) have been a difficult period for Thailand. Throughout those years, the oil palm policy was deeply affected by the political turmoil. A DOA official summarised, "If the head does not move, the tail can hardly move either. Everyone was at a standstill. There was no one to make a decision and that was a big problem. The projects were set up at the wrong time. We have had a lot of meetings about the oil palm issues in Esaan, but 4 years have already passed and we are still at the same place. The politics are unstable." (Semi-structured interview, December 2010).

A PAE official also added the local perspective that,

> "Here we knew that the central government had a policy of supporting oil palm expansion, but that is all. The issues were forgotten until the DOA and NKO pushed the issues forward. But it was only a year period between 2007 and 2008 and then the central government was silent again. I could see the possibility (oil palms), so I suggested the oil palms to farmers myself. Do what I can do. They (policy makers at the central government) are maybe very busy with political matters lately." (Semi-structured interview, June 2010).

The evidence from the interview with the DOA official suggested that several persons at the very top of the DOA did not support the idea of oil palm expansion in the Northeast region, as there was no concrete conclusion that oil palm plantations can be economically viable in the Northeast region.

> "It is still uncertain whether the oil palms can do well in Esaan. Several academics came out to warn the farmers about cultivating oil palm in Esaan. So, it is understandable that no one in the government sector would want to get themselves involved in the issues. It is not worth risking their careers when they can wait for results and support the crop later on. They still have time."(DOA, semi-structured interview, December 2010).

According to the interview, the name of NKO would be changed at some point in 2011 from 'Nong Khai Oil Palm Research Centre' to 'Nong Khai Agricultural Research and Development Centre', in order to de-emphasise their role in supporting the oil palm crop in the Northeast region.

Interestingly, there were also politics within government offices in the MOAC in supporting the oil palm projects. These offices were the DOA, the Department of Agriculture Extension (DOAE), the Office of Agricultural Economics (OAE), and the Land Development Department (LDD). Ideally, these four offices needed to work in harmony to promote oil palm expansion in the Northeast region: LDD would identify suitable oil palm areas in the Northeast region and DOA would then provide the oil palm knowledge to farmers, whilst OAE was responsible for the planning of oil palm expansion for the entire country. However, in reality, there was no integration amongst these three government agencies as a DOA official explained,

> "The communication between government agencies in MOAC is poor. Each one did its work without looking at the big picture of a plan or strategy. So, it ends up with them all working at the same tasks. LDD did not understand the whole story. They did their work based on their understanding only. So, we (DOA) have our own database, which differs from theirs. Actually, we also do the planning and supply it to OAE. You could say that we were the ones who do everything." (Semi-structured interview, December 2010).

The SPAE official also confirmed the principal role of DOA by pointing out that,

> "I did not see any other government agencies involved in oil palm issues, only DOA, NKO (which is under DOA) and us (under DOAE). But all we did was go out and encourage farmers to grow, and tried to help them all the best we could. The rest is DOA's responsibility. It is such a hard, big, and very difficult task to accomplish. I understand them." (Semi-structured interview, August 2010).

It is clear from the evidence in this research that political uncertainty in Thailand and the politics within the government agencies were the two influential factors contributing to the failure of the OPPAEP discussed in the policy narratives section. In the next section, I will identify how much policy space there is for pushing for different ways of doing things and for changes in the oil palm arena.

5.4 Policy Space

Understanding policy processes through an examination of discourse/narratives, actors/networks, and politics/interests helps in recognising the policy space of the oil palm issues in the research. According to the six types of policy spaces proposed by Wolmer and Scoones (2005), the oil palm issues in this research involve 'invited spaces', in which discussion on oil palm policy was led by government agencies with the selective participation of stakeholders.

> "The meetings were held many times during the 2006 and 2007 period, about 6-7 times. But, only local government agencies were involved, such as NKO, Nong Khai province and all district-level Agricultural Extension Offices in Nong Khai, and BAAC. There were no farmers or seedling providers or buyers participating in the discussions about the future of oil palms here in Nong Khai," informed an NKO interviewee (Semi-structured interview, June 2010).

According to Pretty (1995)'s seven typologies of participation, the evidence in this research suggests that for local oil palm farmers, participation is most likely to mean simply being told what has been decided or has already happened, a 'passive participation' typology, which should be seen as a type of non-participation. The PAE official further explained,

> "The farmers did not know anything. They just decided whether they wanted to grow them (oil palms) or not. That was the farmers' only role. It was like providing them with a very fixed package: they did not have any options. Accept the terms and the government will help you with growing. That was how things worked here." (Semi-structured interview, June 2010).

The evidence shown in the three themes of IDS KNOTS team's policy processes framework and the previous empirical chapter suggests that the government agencies, particularly DOA, work largely in ways remote from the farmers, are insensitive to diversity of context, and are concerned about themselves generating and transferring technologies. Clearly, the oil palm policy processes did not have room for farmers to participate in the networks, or in designing oil palm policy which directly affected them. The oil palm policy was made according to the traditional top-down, transfer-of-technology (TOT) paradigm, in which the government transferred the oil palm knowledge to the farmers via seminars and training. In this model, development professionals and scientists, who usually had a background in just a single discipline, determined agricultural research priorities and then experimented on research stations in order to generate new technology. This new technology would then be handed over to a larger group for transfer to farmers (Chambers et al., 1989; Chambers, 1993; Scoones and Thompson 1994).

The DOA official explained his/her mindset:

> "Because we (DOA) know that farmers and academics want to know how to grow oil palms in Esaan, we are trying to develop the oil palm seedlings that suit the conditions in Esaan and supply them to farmers. It is the main responsibility of DOA. We are *krom vi cha karn kaset* (DOA in Thai) and *vi cha karn kaset* means we have to seek new agricultural knowledge and then provide it to farmers." (Semi-structured interview, December 2010).

Indeed, many oil palm farmers asserted in the interviews that oil palm knowledge and the availability of high quality oil palm seedlings were their priorities in terms of support from the government. However, they further insisted on the necessity for the participation of the local government agencies in facilitating their success with their oil palm plantations.

> "I want knowledge, but it is not just about oil palm knowledge. I need to know where to buy and sell the oil palms. They (the DOA team) came to see our land, but I want more. Not just having the land checked. Help with water resources is important," declared a farmer in Baan Sa Ard (Male, semi-structured interview, August 2010).

The traditional TOT mode of the oil palm expansion policy in this research accentuated the farmers' unequal ability to participate in the oil palm projects, particularly in the case of the OPPSP. Allowing the farmers to borrow oil palm seedlings from NKO under the OPPSP meant only the farmers who were better off and had resource-rich farms and land benefited from the policy. In the interview, a PAE official pointed out that,

> "The farmers who grow oil palms around here are quite rich. If they do not have money, they will not be able to plant in the oil palms. They have to invest in a lot of things such as land preparation, fertilisers, and water systems, even though they receive oil palm seedlings for free through the project. They have to have rubber, or run a community trading shop, or have a good source of income." (Semi-structured interview, June 2010).

The evidence was clear in the case of Baan Sa Ard, where most of the oil palm farmers were also involved in growing rubber. The SAE official explained,

> "I think a lot of oil palm farmers here grow rubber so they have enough money to maintain the oil palms. Definitely, they are not poor. They are the farmers who are seeking new opportunities here, and the oil palms are a good crop with a good future." (Semi-structured interview, August 2010).

The oil palm expansion policy was based on experiments in the research stations, in which the physical and economic conditions on-station were often similar to those of resource-rich farms (Chambers, 1993; Chambers 2005). Thus, there was a strong possibility of having contrasting results in comparison with those of the resource-poor farms, which would benefit much less - or actually lose -by participating in the OPPSP. The NKO official was aware of this issue in the interview and pointed out that,

> "We tested the oil palm seedlings in the experimental stations here in Nong Khai. They worked well, but in reality if farmers cannot prepare good conditions for farming such as sufficient water resource on their land, they might have problems with the results. Surely, some can do that, but some cannot do that, especially the poor, who do not have much capital to turn things around." (Semi-structured interview, June 2010).

In order to serve the resource-poor farmers well, the oil palm policy needs to be bottom-up rather than the transfer of technology (TOT) model, which is deeply embedded in normal professional thinking and prescription. The mindsets of most professionals change very slowly. As the NKO official expressed his/her view on the role of DOA,

> "If we want to succeed, we need to change here, but it is going to be really difficult. The central government (DOA) did not share the same view with us. They said they cared about local farmers, but in practice they did not. It has been like this for a long time. They like to think on their own and then come up with something for farmers. It is not going to work for every farmer, I am sure. The project will be a success, if you are lucky." (Semi-structured interview, June 2010).

To make progress with oil palm expansion, it was essential to instill new 'farmer-first' behaviours and attitudes into the average professionals and particularly the role of DOA. The objective of this bottom-up approach was to empower farmers to learn, adapt, and do better by analysing, choosing, experimenting, and evaluating on their own, with the outsiders - including government agencies - providing support and consultancy (Chambers, 2005). Research and development occur primarily not on the research stations, but on the farmers' fields and in their actual conditions. This is necessary to generate diversity, and to provide farmers with wider ranges of options to choose from. It is believed that the best results occur when farmers are involved in decision-making during all stages of the project, from design and formulation to maintenance of the crop.

During interview, an NKO official summarised the future development of the oil palm policy as follows:

> "Farmers have to come in and help design the oil palm plan, telling us what they want and what they are lacking because each area has different conditions: soils, water resources, land gradient, and many more. Marketing channels in each area have to be planned wisely. I mean, we have to identify and to provide buyers and sellers of oil palms around the areas for farmers. Case by case, starting from the district level. Not like what we did in the OPPSP." (Semi-structured interview, June 2010).

This will not be easy: the professionals will need to be able to pick and choose appropriate methods for particular tasks based on case-by-case analysis.

5.5 Conclusion

This chapter analysed the oil palm policy processes in Nong Khai province using the IDS KNOTS team's framework as the main policy processes framework for analysis. After understanding the farmers' rationale for adopting oil palm cultivation in the previous chapter, the analysis in this chapter has provided a complete picture in reflecting the reality of the oil palm issues in Nong Khai province as well as in the Northeast region of Thailand.

The findings in this chapter suggest that the oil palm policy processes in Nong Khai province do not have room for farmers to participate in the networks, or to design the oil palm policy that directly affects them; this is passive participation according to Pretty (1995)'s seven typologies of participation. The policy was made in top-down, TOT mode, in which the government only transferred oil palm knowledge through seminars and trainings. There were also issues concerning the inequality of farmers in participating in the oil palm projects. Indeed, the OPPSP favours the rich farmers, as farmers need a significant amount of capital to prepare for and maintain oil palm crops. Implementation of the farmer-first approach is necessary in order to push the policy forward to serve the resource-poor farmers properly. New behaviours and attitudes must be encouraged in most of the professionals encountered in this research.

The oil palm expansion policy in Nong Khai province started in 2005, when the Thai Cabinet approved the action plan for biodiesel development and support in order to reduce dependence on imported fuels and stimulate rural economic development. Despite policy narratives claiming that oil palm development was a top priority for both the national and provincial government during this planning period, the oil palm expansion policy in Nong Khai province failed to achieve the initial targets of 60,000 rais set in the OPPAEP during 2005 and 2006 due to a lack of financial incentives from the government. Apart from high interest rate loans offered by BAAC, another downside of the project was the loan process itself. The attractiveness of rubber cultivation at that time was also a key reason for the failure of the OPPAEP in terms of the participation of farmers in the project.

Many of the informants interviewed for this study pointed to a lack of direction, seriousness and continuity on the part of the government in achieving its oil palm policy objectives. There were also politics within certain key government organisations, particularly in the MOAC, involved in supporting the oil palm projects. The failure of the OPPAEP led to the emergence of the OPPSP, which was created by DOA in order to distribute the 800,000 oil palm seedlings to farmers in Nong Khai province.

In fact, the OPPSP was a success in terms of expanding the area devoted to oil palms due to the attractiveness of the borrowing scheme provided for farmers, which resulted in a staggering increase in oil palm area, from none in 2006 to 17,156 rais by the end of 2007. However, the borrowing project may face difficulties over payback in the future, as no farmers had started to return either money or oil palm production to the government in 2010. The local government's lack of oil palm knowledge and its shortcomings in disseminating oil palm knowledge to farmers were the primary explanations for not achieving the yield and oil content targets in this region.

In order to come up with the proper policy suggestions, all the findings in this thesis need to be summarised first. The next chapter, then, presents a summary of the empirical results of the thesis in alignment with the main research question and the three sub-questions. The policy implications and future research recommendations of this thesis will then follow.

Chapter 6:
Conclusions, Policy Implications and Future Research

The literature reviews at the beginning of this thesis (Chapter 2) revealed a substantial gap in understanding small-scale farmers' engagement in oil palm cultivation, especially in the Thai context. In order to fill in some of these gaps, this qualitative research asked: what are the critical factors shaping the change towards oil palm adoption of small-scale farmers in the Nong Khai province (the Northeast region of Thailand), and what are the implications for Thailand's oil palm policy development? This question was motivated by a rapid expansion of oil palm plantations in Thailand, with the associated debates surrounding oil palm production issues and the inevitable arguments for and against them. In particular, production of oil palms could offer a route to sustainable development that could alleviate poverty and lead to a higher standard of living for farmers, or it could be, in contrast, a fast track to environmental ruin.

This research, therefore, investigated these phenomena by analysing farmers' oil palm adoption and the oil palm policy processes. Two sub-questions were then identified which would help answer the main research question. These three sub-questions are: 1) What are the key factors affecting farmers' decisions to adopt or not to adopt oil palm cultivation? and 2) What is the rationale of the oil palm policy and how is it implemented?

In order to find answers to these questions, I developed an analytical framework based on the three main analytical approaches, namely the eight elements of farmers' decision-making (Ohlmer et al., 1998), and the IDS KNOTS team's framework on policy processes (Keeley and Scoones, 1999; 2001; 2003; KNOTS, 2006). The two main criteria examined were the farmers' decisions, and the oil palm policy processes. First of all, the empirical analysis looked at the farmers' decisions in relation to changing over to oil palms in Nong Khai province, by adapting the eight elements of the farmers' decision-making model. Secondly, oil palm policy processes were analysed according to the IDS KNOTS team's and Majone's policy processes frameworks, in accordance with which the policy processes were examined in relation to three themes: discourse/narratives, actors/networks, and politics/interests.

This qualitative study relied on fieldwork carried out in a period of approximately 9 months between 25th April 2010 and 15th January 2011. The fieldwork relied on 78 semi-structured interviews categorised as follows: 63 oil palm and rice farmers in three selected villages in Nong Khai province, namely Baan Tarn (Phon Phisai district), Baan Sa Ard (So Phisai district), and Baan Hat (Seka district), and 15 key actors including various local and central government agencies, private seedling suppliers, private merchants, inspirational local leaders, large-scale oil palm producers, and the manager of a large-scale palm oil refinery in Chonburi province. These informants and research sites were chosen strategically, using purposive and snowball sampling techniques.

This concluding chapter will bring together the research findings and analysis from Chapters 4 and 5 on policy processes and farmers' decisions related to the question of oil palms. Accordingly, the first section of this chapter begins with some further analysis of the key findings. The second section offers some policy implications to policy makers regarding the understanding of the oil palm issues in Nong Khai province. The chapter concludes by highlighting the limitations of this research and putting forward some suggestions for future research.

6.1 Key Findings and Further Discussion

6.1.1 The Farmers' Decisions and the Consequences of Oil Palm Cultivation

As argued in Chapter 3, the analytical framework developed in this research provides a convincing basis for the analysis of the oil palm change in the Thai context. Understanding the change to oil palm production through the lens of farmers' decisions, and frameworks of policy processes, has encompassed the oil palm issues completely, as exploring only one particular perspective could not fully reflect the reality of the whole subject of oil palm cultivation in Nong Khai province. The following evidence gave rise to the key findings of this research.

Although Thailand is a middle-income country that has made overall progress in development, this progress has been unevenly distributed (Parnwell, 1996; Dixon, 1999; UNDP, 2007). Thailand's government has invested more in industry than in agriculture, with the result that urban areas have grown faster than rural areas, and poverty is concentrated in rural districts, particularly in the Northeast of Thailand. In order to reduce the gap between urban and rural economic development, the Thai government has acknowledged the need to promote oil palm expansion, particularly in the Northeast region. Because development there lagged behind all the other regions in Thailand in terms of initial incomes and growth rate, it is no surprise that an increase in economic security was the farmers' main reason for deciding to adopt oil palm cultivation in Nong Khai province.

However, it has emerged from this research that the real needs of the farmers were expressed as wanting to live comfortably and near to their children. These goals could be achieved through oil palm plantations, which could create employment and thus attract their migrated children to come back to work in agriculture in their home areas. If oil palm cultivation becomes a success in the Northeast region in the future, this would imply a reversal of the migration trend, from urban to rural areas, rather than the typical rural to urban trend (see Rigg et al., 2012) that Thailand has experienced so far. Rural lives in Thailand are changing. The government's subordination of agriculture to the industrial sector has resulted in a decline in agriculture, which has fueled the migration of rural farmers to urban centres, dividing households, scattering families, and depleting settlements (UNDP, 2007). Off-farm employment may sometimes be the best alternative to insure against agricultural risks. Farming in Thailand has deteriorated into a position where financial returns from farming relative to non-farming have significantly declined (Rigg, 1994; Rigg, 2001, Rigg et al., 2012). Without adequate opportunities in agriculture, many farmers decide to migrate to urban areas to find work. This migration brings remittances to villages, which increases rural incomes, enhances savings and assets, and reduces the slide into poverty.

An increase in savings and assets provides an opportunity for farmers to invest in new crops, including oil palms. The evidence of this research pointed to the fact that there were a significant number of farmers who had to rely on other sources of income to support oil palm cultivation, including remittances from migrated family members. However, as mentioned earlier, there are grounds for believing that oil palm cultivation can raise the farmers' incomes from farming itself, and thus encourage their children to migrate back from the urban areas. This precisely meets the farmers' needs towards fulfilling their goal of 'living comfortably and near to their children'.

This research also found that in most of the oil palm households, other major factors attracting them to adopt oil palm cultivation were its key characteristics, particularly there being only 15 days between harvests; long life-span; single-time planting; requiring only a small amount of unskilled labour to grow and maintain the crop; and daylight working hours. Oil palm cultivation has been viewed by many farmers as having the potential to provide an inheritance for their children, which was also reported as one of their needs. Many farmers suggested that these positive attributes of oil palm cultivation had a strong possibility of offering them a more reliable source of income throughout the year, as well as the chance to spread their workload evenly throughout the year in future. In essence, oil palm farming offers more free time to farmers than rice and rubber crops due to its lower labour demands during cultivation and harvesting. Thus, the oil palm farmers now have more time either to concentrate on seeking additional jobs to boost their household income or to spend in leisure.

The low productivity and high production costs of rice production in the Northeast region had tempted the farmers to try alternative crops, including oil palm. Other optional crops in the area are rubber, eucalyptus and cassava. However, rubber and oil palms require different types of land, slightly hilly for the former and flat for the latter. Thus, the real competition for land was between these four crops: eucalyptus; cassava; rice; and oil palms. Rice was very likely to be displaced by oil palms because the farmers expressed their dissatisfaction with rice cultivation. The evidence in this research shows that 38 of the 45 oil palm households interviewed had turned some of their rice paddy fields over to oil palms. The ecological problems of eucalyptus planting, such as inhibiting the growth of other crops, and the fluctuations in the price of cassava, have made oil palm cultivation more attractive to the farmers interviewed.

By incorporating the policy processes frameworks to understand the change to oil palm production within the analytical framework, this research offers a better understanding of oil palm policy processes and how they relate to farmers' decisions. The 2005 Oil Palm Plantations for Alternative Energy Project (OPPAEP) proved to be a failure due to lack of financial incentives, complicated loan processes, the attractiveness of rubber as a crop to farmers at that time, and the political uncertainty since the military coup in 2006. However, the Oil Palm Plantations Supporting Project (OPPSP), which was developed later (in June 2007) to lend farmers oil palm seedlings, to be repaid in the form of money or oil palm production when the oil palm plantations could be harvested, had played a key role in convincing the farmers to convert to oil palm production. It was also found that oil palm seminars organised by local government agencies and the high quality oil palm seedlings provided by the NKO boosted the confidence of many farmers in deciding to grow the oil palms.

This project (OPPSP) was considered a success in terms of oil palm area expansion, but a lack of oil palm knowledge within local government agencies and a failure to disseminate oil palm knowledge adequately to farmers were the chief reasons for not achieving the yield and oil content targeted in the oil palm expansion plan. The findings also suggest that the oil palm policy processes had no room for farmers to participate in the oil palm networks, or in designing the oil palm policy that directly affected them.

After analysing the networks of key actors in the policy processes frameworks, the role and attitude of local leaders and large-scale oil palm are better understood. It was found that the role of inspirational local leaders and large-scale oil palm growers was prominent in convincing the farmers to make the switch. The local leaders were oil palm producers outside the three villages, who had brought oil palm cultivation into the area and had already harvested oil palm fruits. Most of the oil palm growing households in Baan Tarn and Baan Sa Ard mentioned the inspirational local leaders, as it is part of the culture of the Northeast farmers to rely on role models if they are to start doing something different. Some households in the interviews also described the large-scale oil palm producers as their motivation.

Understanding the oil palm networks of the three villages, this research also found that the oil palms' ability to produce an astonishing array of products, the price of oil palm fruits, and the link between farmers and buyers were essential factors in convincing the farmers to believe that the demand for oil palms would increase significantly in the future and thus boosting the confidence of the farmers to adopt oil palm cultivation. In the case of Baan Sa Ard, the farmers had a clear marketing channel in mind and sold their oil palm fruits as a group to their local private merchant in a nearby village every 15days. It is worth noting that the success of rubber plantations had also increased the confidence of the oil palm farmers in starting to cultivate oil palms: seeing their rubber trees flourish had assured many farmers of secure future incomes. Thus, these farmers converted their confidence in rubber plantations into confidence in oil palm cultivation.

On the other hand, it is clear that not all farmers may have had the chance to be successful in oil palm cultivation. In terms of the rice farmers in this research who had not yet adopted oil palm cultivation, the findings showed that the majority (9 out of 18) expressed interest in planting oil palms in the future, but were holding off because of concerns over future support from the government and the poor quality of the oil palm seedlings that were available in the area. The findings also showed that farmers in the 'less than 20 rais of rice' category were more likely to rely on government support in terms of funding because they refused to convert their rice paddy fields to oil palm cultivation. The unsuitability of land for oil palm cultivation was also a concern for some farmers who had upland rice paddy fields. Lack of access to a water supply and an irrigation system also prevented some farmers from adopting oil palm cultivation. Another important factor for the rice farmers in delaying oil palm cultivation was the fact that there were not yet many oil palm producers who had already harvested oil palm fruits in the three villages. This was a cultural issue, as Esaan people generally need to have role models before starting to do something which is new in their region.

In terms of the consequences of oil palm adoption, there are serious concerns that oil palm expansion could trigger an outcry from the environmental sector for numerous reasons. According to the literatures discussed in Chapter 2, oil palm plantations are believed to be a major cause of deforestation both in Indonesia and Malaysia. However, the accusation of forest destruction due to oil palm expansion is far from reaching a conclusion and there are still debates over this issue. The findings of this research suggest, on the contrary, that most of the land used for oil palm plantations was previously agricultural land: 38 out of 45 oil palm farmers had converted rice paddy fields to oil palm plantations. This leads to the belief that forests had not been converted into oil palm plantations in the area covered by this research, and that a loss of biodiversity arising when forests are cleared is similarly unlikely to have happened.

It is generally believed that oil palm cultivation consumes a large quantity of chemical fertilisers in order to increase and maintain yields, which could increase eutrophication in water bodies and wetlands affected by runoff. This research found that there was no concrete evidence of runoff from the application of chemicals. According to the literatures explored in Chapter 2, oil palm smallholders almost always use fire in preparing land for cultivation because they cannot afford land-clearing machinery and are accustomed to this method. The findings suggested that there was only one household amongst those interviewed that burnt the land in preparation for oil palm plantations due to it being easy. The rest of households believed that using fire to clear the land negatively affects the future growth of any crops on that land. In terms of the environmental impacts of oil palm cultivation in Nong Khai province, this research found that there was no concrete evidence of destruction of natural habitats as a direct result of, for instance, the change of land use or the runoff from the application of chemicals.

Oil palm cultivation can also contribute to a range of social issues. Significant erosion of local culture has been reported in several studies referred to in Chapter 2. However, the findings showed that oil palm cultivation was consistent with the farmers' personal norms and habits, especially when compared to rubber cultivation, which requires, for instance, working at night time, 5 or 6 days a week. Moreover, there are literatures in Chapter 3 suggesting that oil palm expansion has called critical attention to potential conflicts over land tenure, especially in the case of large-scale oil palm projects. Because land is a productive asset, those who have more land have more economic opportunity. The research findings suggest that only one household of the total 45 households in the three villages had not obtained land title for oil palm cultivation. Some of the 'less than 20 rais' rice farmers also suggested that they had insufficient land to cultivate oil palms, and thus had to wait for government support before they could decide to do so. Land is essential to the livelihoods of poor communities in rural areas since it is a means of providing for subsistence needs and for generating incomes. An equitable distribution of land is important because it may increase farmers' employment and incomes. Land reform in Thailand is needed in order to address disparities in land ownership as well as to prevent rural to urban migration, thereby spreading the benefits of development more evenly.

As the literatures explored in Chapter 2 established, oil palm expansion in the Northeast region has long been discussed by Thai academics, with particular focus on whether oil palm plantations could become economically viable in the region. Some suggest that planting oil palms in the Northeast region is extremely risky because the environment is inappropriate for them. The findings of this research suggest that most of the oil palm farmers (34 of 45 households) were satisfied with their oil palm crop due to positive growth of oil palm trees and the high price of oil palm fruits at that time. The farmers were confident that the oil palm crop would help them to achieve their objective, which is to 'live comfortably with their children in their hometown areas'.

6.1.2 Oil Palm Change in Nong Khai Province: A Broader Discussion

Thai economic performance has been dramatic since the 1960s, which saw the beginning of three decades of uninterrupted rapid economic growth which ended with the financial crisis in 1997. Thailand then found itself trying to recover from the crisis and reconstruct its economy. It is clear that Thai economic performance since then has not been as impressive as it was to prior to 1997. Before the crisis in 1997, Thailand had moved from being one of the poorest countries in the world to a middle-income country. As a result of strong economic growth, income per capita increased from 2,250 Baht to 76,847 Baht during the period from 1960 to 1996. Moreover, the incidence of poverty declined remarkably from 88.3 percent of total population in 1962 to 14.8 percent in 1996 (Warr, 2004).

Despite a decline in overall poverty as a result of economic development, the distribution of the benefits of growth was rather uneven (Parnwell, 1996). In other words, a significant part of the economic benefit went to a small population group, leaving less for the remaining larger population. However, this came as no surprise. There have long been major income inequalities in Thailand. Thailand's Gini coefficient steadily increased from 0.41 in 1962 to 0.513 in 1996, and 0.522 in 2000, which is considered high even when compared with neighbouring East Asian Countries such as Indonesia, Malaysia, Singapore, and South Korea. Whilst it is apparent that overall poverty reduction in Thailand correlates with economic growth, the distribution of income has been unaffected by economic circumstances. Inequality in Thai society has remained high throughout the economic boom, the crisis and the recovery. Perhaps the inequality in Thailand persists partly because the Thai government has not made a significant commitment to egalitarian redistribution.

Looking at the change to oil palm farming in Nong Khai province, there are grounds to believe that it has favoured the richer farmers. The oil palm farmers in the three villages were mostly the better-off farmers, who used their rubber income to support their oil palm cultivation. It is clear that those who can be successful in oil palm cultivation have certain opportunities that not all farmers may have. First, farmers need to own land that is suitable for oil palm cultivation. Second, it is easier for farmers to switch to oil palm cultivation if they have minimal financial burdens or debts. Farmers also need to have enough initial capital through either agricultural loans or financial support from the government. Whilst access to local markets to sell oil palm products would help farmers to increase incomes, access to water supplies and irrigation systems is crucial. Furthermore, farmers cannot switch to oil palm cultivation without knowledge about how to grow it in the Northeastern context. The opportunity to gain oil palm knowledge via participation in training courses provided by local government is essential. These factors could lead to an increase in inequality of opportunity amongst farmers.

To ensure the benefits of economic growth are distributed more evenly, the government needs to come up with a development policy, including an oil palm expansion policy as defined in this research, which seriously addresses this problem. This can be done by allowing grassroots farmers to participate in designing the policy, both in agenda-setting and in decision-making, in order to design an appropriate policy that understands poor farmers, and thus reduces inequality. Understanding the change to oil palm cultivation in Nong Khai province showed that the farmers did not have the opportunity to participate in the oil palm networks, or to influence the design of the oil palm policy that directly affects them. Instead, the farmers were just told what had been decided or had already happened, in keeping with the traditional top-down, transfer of technology (TOT) paradigm, in which the government transfers knowledge to the farmers via seminars and training based on the results of experiments carried out on the research stations. This restricted type of participation means that the voices of the poor farmers are not being heard, which could result in even more income inequality in the country.

Looking into energy issues, global energy consumption is predicted to increase by 50 percent over 2007 levels by 2030, and approximately 95 percent of global energy comes from fossil fuels (EIA, 2007). Thailand, which has experienced great economic and industrial development in the past three decades, has followed the trend very closely. Thailand is the second largest energy consumer in Southeast Asia (Siriwardhana et al., 2009). Being a net oil importer, the Thai government thus pursued the development of oil palms for biodiesel due to two main drivers: sovereignty and control over national energy supply, as well as enhancing rural development.

Expanding oil palm cultivation in the Northeast region, including Nong Khai province, has certainly helped improve the national energy security of Thailand. Limited availability of oil palms, on the supply side, is the main obstacle to accelerating biodiesel development in Thailand. In order to cope with the rising demand for biodiesel, the Thai government needs to substantially increase the areas of oil palms in the Northeast region, which has most of the agricultural land in the country. Converting to oil palm cultivation in Nong Khai province can also help improve rural economic development, create rural employment, and reduce the urban-rural divide. As mentioned earlier, this could lead to an urban-rural migration trend amongst farmers because the higher farm incomes from oil palm cultivation could lure farmers to move back to their hometown areas, avoiding the high cost of living in the urban areas. However, how farmers would make this change to oil palm cultivation must be understood very clearly and the oil palm expansion policy must be designed by hearing the voice of the poor in order to narrow the inequality gap between rich and poor farmers in the rural areas.

6.2 Policy Implications

Although this research has highlighted the critical factors influencing small-scale farmers to adopt oil palm plantations in Nong Khai province and the implications for Thailand's oil palm development policy, there are many other aspects that need to be considered. The implications of the findings from this thesis which are relevant to policy are summarised here in order to provide options for policy makers to improve the oil palm policy processes.

Policy makers should seriously consider more participation by small-scale farmers at all levels of the oil palm policy processes in order to ensure that the oil palm policy will serve the farmers' needs well. The study found that the oil palm policy was developed very much in a top-down, transfer of technology (TOT) mode. This means that the policy process did not offer many opportunities for farmers to participate in the network, or to design the oil palm policy that directly affected them. Farmers should be encouraged to share their views of their needs, experiences and problems, and make suggestions with regard to improving oil palm policy. Moreover, the evidence of this research suggests that the government's oil palm projects favour the better off, resource-rich farmers, as oil palm farmers need a significant amount of capital for preparing and maintaining the crop. Therefore, policy makers, in order to push the oil palm policy forward, must ensure that the farmers are served and treated with equal respect by the government.

Attempts should be made to provide farmers with sufficient oil palm knowledge. This thesis has demonstrated that the seminars arranged by local government agencies in Nong Khai province were not on a regular basis and were considered insufficient in terms of enhancing the farmers' ability to achieve the oil palm policy targets. Moreover, the findings showed that there was a lack of oil palm knowledge development within the local government agencies in Nong Khai province, which therefore had to rely on the oil palm knowledge from the Southern region based government agency (STO). Thus, policy makers should be aware that, in order to improve the oil palm policy processes, some modifications are needed to existing policies and regulations related to the development and transfer of the oil palm knowledge within the government agencies as well as the adaptation of that knowledge to suit the unique Northeast region's climate and soil conditions. Moreover, oil palm knowledge should be made available to every farmer, rather than being restricted to the farmers who had participated in the government oil palm projects.

Policy makers should note the importance of inspirational local leaders and large-scale oil palm producers. The first point to be addressed is to understand that the Northeast region's culture of following role models and successful persons in deciding to do anything still exists. This research, as mentioned earlier, found that the roles and success in oil palm production of the inspirational local leaders and large-scale oil palm producers were influential factors in persuading the farmers in Nong Khai province to adopt oil palm cultivation, and thus affected the outcomes of the oil palm policy.

Another point that should be made is about ways of making use of these people to help achieve the oil palm policy targets. The findings in this research show that inspirational local leaders could steer the farmers towards either cooperative activities or giving up rice farming altogether, which would imply a reduction of households' self-reliance. Therefore, policy makers should consider paying great attention to these groups of people and leading them in a strategic manner. It should be noted that because oil palm is a new crop to the farmers of the Northeast region, for government agencies to change farmers' attitudes and behaviours alone is a challenging task that would require a lengthy period of time to succeed. However, co-operating with inspirational local leaders and large-scale oil palm producers in the area would be a far easier way to maximise the effectiveness of the oil palm supporting policy.

Policy makers should consider providing sufficient local buyers of oil palm produce by, for instance, facilitating the establishment of co-operatively run, small-scale oil palm crushers in the local areas. In this study, the oil palm farmers did not sell their oil palm fruits directly to palm oil refineries or small-scale oil palm crushers, but to local middlemen, who had to transport the oil palm product approximately 700 kilometres to the nearest palm oil refinery, located in the Eastern region of Thailand. This was due to the lack of local or community oil palm crushers in Nong Khai province. Without the local market for oil palm fruits, oil palm farmers had to accept the price of 1 Baht below market-price offered by the middlemen. However, the local middlemen and large-scale oil palm producers have plans to set up oil palm crushers in the research areas in the future, when the harvestable areas of oil palm cultivation have increased. In order to address the problems related to the oil palm market, policy makers should also consider managing the demand for oil palm fruits in order to stabilise the price of oil palm products, for instance, increasing the ratio of biodiesel from oil palms required to be blended with conventional diesel.

The availability of high quality oil palm seedlings is a fundamental area where government intervention could do much to promote the expansion policy, at no overall cost to the government. This research found that there was a lack of high quality oil palm seedlings available to farmers at a competitive price. It also found that the farmers trusted the quality of oil palm seedlings from the government more than those from their local, private seedling suppliers. In addition, the research suggested that the sale of oil palm seedlings to the farmers through the OPPSP actually generated reasonable profits for the local government agency (NKO). The government should therefore consider providing the farmers with a ready supply of good quality seedlings at an affordable price. This might be done by the local government agencies themselves or through co-operating with local private suppliers.

The long-term continuity of the oil palm policy should be prioritised. This is to say policy makers should consider supporting the oil palm expansion policy as part of the national agenda, which would help stabilise the impact of national politics in Thailand as well as the politics within the government agencies. It has been known since the peaceful military coup on the 19th September 2006 that Thailand has been sharply polarised into two radically different groups of people: the Red Shirts and the Yellow Shirts. This research found that the political instability resulting from conflicting notions of political legitimacy has strongly affected the oil palm policy processes, especially in Nong Khai province, in a way that has led to a lack of direction, seriousness, and continuity on the part of the government in seeking to achieve the oil palm policy objectives.

In addition, collaboration between the government agencies must be encouraged, particularly within MOAC. The findings in this research suggested that there was no integration amongst the government agencies in MOAC in order to promote oil palm cultivation in the Northeast region including Nong Khai province. In this study, the evidence also showed that there was a shortage of manpower to support the oil palm expansion policy in Nong Khai province, particularly in the local government agencies (NKO and the three district-level Agricultural Extension Offices). Therefore, policy makers should consider strengthening the workforce at local level in order to provide a better service and get more access to farmers in the rural areas.

Policy makers should consider using oil palm expansion to promote regional development in Thailand. The Thai government has been aware of the primacy of Bangkok since the third NESDP (1972). Consequently, policies to disperse growth centres to other regions, such as the BOI investment promotion packages, and the developments of both regional cities and ESB, have been emphasised in the following NESDPs. However, most of them did not meet with much success in drawing industries away from Bangkok, except for ESB. The North and Northeast regions are still the most backward regions in the country. As the findings of this research have shown that oil palm plantations in Nong Khai province could lead to an increase in income for farmers as well as encouraging urban to rural circulation, it would therefore help the Northeast region to catch up with the fast-growing Central and Eastern regions. Definitely, the Northeast region catching up through oil palm expansion would cause regional disparities to narrow. Oil palm expansion would stimulate growth in provinces away from Bangkok and hence reduce the predominance of Bangkok as the agglomeration core.

Poverty reduction and rural development policies including oil palm expansion policy should be prioritised to tackle inequality. Inequality and income redistribution received little priority in Thailand's development policy. They have been addressed through indirect policies such as expansion of basic infrastructure and government services to remote areas, measures to raise the income of the poor, tax incentives, and administrative decentralisation. However, these policies did not receive much attention in practice. Income across five income groups in the Gini coefficient remained just as unequal, and the differences in income between urban and rural areas did not narrow over time. The evidence in this research gives grounds to believe that the voices of the poor farmers have not been heard and that the oil palm policy in Nong Khai province appears to favour the rich farmers, who had better opportunities to cultivating oil palms. In order to ensure that oil palm cultivation can lead to a reduction in inequality, policy makers should consider redistributing suitable lands for oil palm cultivation, providing financial incentives and access to water supply and irrigation systems, and disseminating oil palm knowledge to farmers more equally.

Last but not least, policy makers should consider promoting environmental awareness amongst farmers. Although this research suggests that there is no evidence of oil palm expansion in Nong Khai province contributing to environmental degradation in the research areas, environmental issues should not be ignored. Environmental standards and regulations should be strictly enforced in order to promote sustainable palm oil production particularly for oil palm companies to adopt more responsible practices. Moreover, land-use regulations must also be strictly monitored as converting forested land to oil palm plantations, for instance, can lead to a range of severe environmental consequences.

6.3 Further Research

Because it is still unclear whether the rapid expansion of biofuels, particularly oil palms, could lead to, for instance, environmental degradation, increased global carbon emissions and a range of social issues, there have been urgent calls for a rapid research response to achieve a clearer picture of oil palm issues across countries. This thesis provides a rich insight into the reality of the change to oil palm cultivation in Nong Khai province. It does so by developing an analytical framework to understand the change from the perspectives of the farmers, the government agencies, and the other key actors in the oil palm networks. However, there are several possible directions for future research to extend the work presented here, which will be identified below.

Further research is needed in order to see if the findings in this research hold true for other regions of Thailand, especially the Southern region, where the oil palm cultivation is mostly concentrated. People in different regions have different values and goals, and how they respond to oil palm policy will differ. Comparison between regions would provide different pictures of the oil palm issues in Thailand and these would be interesting to compare. Further study should also be applied to investigate whether or not the impacts of oil palm expansion on food security are real and significant in those regions, and if so, how this can be remedied effectively.

This thesis did not encompass the life-cycle analysis of GHG emissions, in relation to which there have been considerable debates to determine calculations to present the carbon benefits or losses. Thus, an interesting further research project would be an exploration into this area to clarify whether or not oil palm cultivation in Nong Khai province has any positive effects on mitigating climate change, in terms of reducing GHG emissions. There is also a need to investigate how the carbon benefits and energy benefits of oil palm plantations can be maximised. Examination and comparison of the carbon implications of clearing different vegetation types such as primary forest, secondary forest, degraded forest, or different types of agricultural lands (rice paddy fields for example) and replacing them with oil palms would also be very interesting.

It is clear that oil palms can benefit smallholders, but the benefits are not shared equally with everyone impacted by or involved in palm oil production. This thesis deals with the small-scale farmers' decisions to adopt or not to adopt oil palm cultivation in a specific location, Nong Khai province to be precise. The research looks into the determination of the options for small-scale farmers to use oil palms as a part of a farm diversification approach and their choices on the management spectrum. The needs of these farmers and how their needs can be met are also investigated. However, there is a range of social issues regarding small-scale farmers that are currently neglected and require further investigation. These critical areas are: to research into the development of mechanisms that would give small-scale farmers access to better prices rather than selling their products to monophony buyers at low prices; to research into how to ensure access to high quality of oil palm seedlings; and to research into oil palm-based integrated farming for smallholders in order to identify the best options and the ways to promote them.

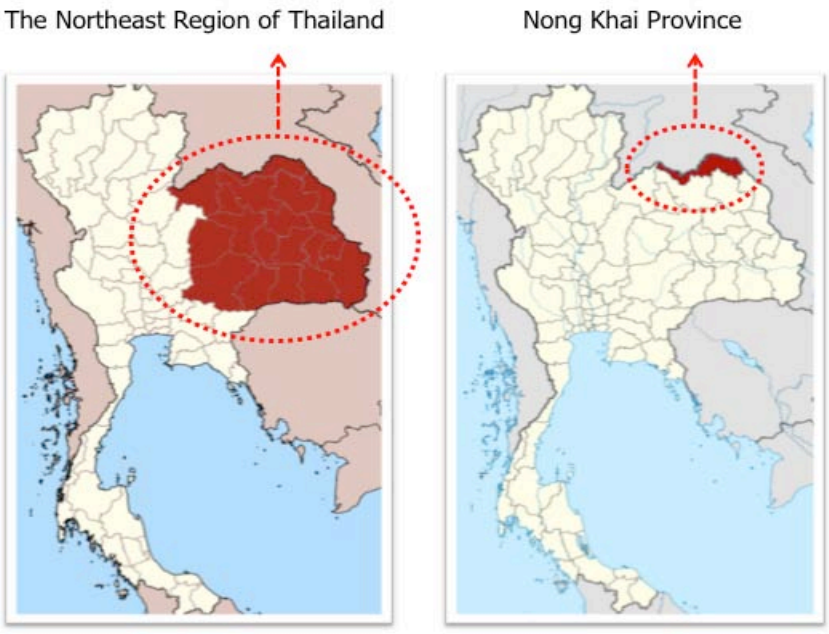
Oil palm cultivation in the Northeast region also requires distinctive knowledge, which differs from the oil palm knowledge of other regions of Thailand, particularly the South, due to geographical differences. There needs to be further research into the optimal planning and management of oil palm plantations, for example, where to plant, how to prepare land and manage plantations. This includes research into incentives and assistance that would encourage and allow small-scale farmers to adopt best management practice, such as zero burning.

It is indisputable that there is a dearth of academic research looking into the subject of oil palm plantations in Thailand. This thesis has, therefore, tackled the oil palm change in Thailand from the bottom-up perspective, emphasising the voices of farmers, by developing an analytical framework that can be applied to oil palm farming across the country as well as to other agricultural products in the Thai context. By using this approach, the issues in economic, social, and political dimensions are clarified and illuminated. Hopefully, the findings in this thesis will be a useful supplement to policy makers to move forward with the oil palm issues in this country particularly in the Northeast region. This thesis also hopes to instigate the beginning of the farmers' participation in government policy processes as well as to stress the importance of the policy in benefiting the farmers and the vulnerable, and in reducing inequality and alleviating poverty, particularly in the Northeast region, thus moving the country steadily towards a sustainable development pathway.

Appendix A:
Nong Khai Province: Facts and Maps

Nong Khai province is located in the upper part of the Northeast region of Thailand. The province sits on the western bank of the Mekong River, one of the major rivers in the world flowing through 6 countries namely: China; Myanmar; Laos; Thailand; Cambodia; and Vietnam. The province consists of 17 districts (*amphoe*), 113 sub-districts (*tambon*), and 1,305 villages (*muban*)[5]. The Northern part of the province is adjacent to the Mekong River (10 of 17 districts), whilst the Southern part is connected to Sakon Nakhon and Udon Thani provinces. The East and the West are share borderswith Nakhon Phanom and Loei provinces respectively. Geographically, the Western part of the province is forests and mountains, whilst the Central and the Eastern parts are flat and upland areas respectively.

Figure A.1: The Northeast Region of Thailand and Nong Khai Province



Source: Department of Provincial Administration, Ministry of Interior

[5]Nong Khai province was officially divided into two provinces namely Nong Khai and Bueng Kan on the 23rd of March 2011 after a cabinet resolution accepted the request of Beung Kan district on the 3rd of August 2010. Two of the three chosen villages in my study are located in the Bueng Kan areas (So Phisai and Seka districts).

Figure A.2: Location of Districts in Nong Khai Province

Source: Department of Provincial Administration, Ministry of Interior

The annual rainfall in Nong Khai province differs significantly from that of the Northeast region as a whole. The 10-year average rainfall measured by the Nong Khai Meteorological Station is 1,887.1 millimetres per year, significantly higher than the amount of 1,504 millimetres of the Northeast region in 2009. However, the amount of rainfall in Nong Khai is not evenly distributed throughout the year. Thus, the province usually faces a long period of drought from November to March every year, where the amount of rainfall is lower than 100 millimetres per month. (Table A.1).

Table A.1: The Annual Rainfall in Nong Khai Province (2000-2009): Millimetres

Year/ Month	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Jan	0	0	1	9	1	0	0	0	33	1
Feb	22	15	41	81	236	0	5	19	31	13
Mar	16	19	34	159	57	12	81	13	98	31
Apr	92	19	26	46	80	63	299	57	101	63
May	140	268	252	166	248	146	239	210	212	212
Jun	304	281	500	346	235	471	213	392	602	358
Jul	311	275	352	215	519	331	438	218	500	333
Aug	130	372	471	293	274	373	371	532	374	345
Sept	221	263	338	414	299	426	139	378	332	318
Oct	26	47	70	30	0	27	146	288	137	84
Nov	0	5	14	0	16	57	0	4	55	15
Dec	0	0	24	0	0	0	0	0	0	2
Total	1,261	1,564	2,122	1,759	1,965	1,907	1,932	2,110	2,475	1,776

Source: OAE, MOAC

The actual population of the province in 2009 was 537,744, of which 271,264 were male and 266,480 were female. Also, there were 132,919 households in the province, in which 6 of the 17 districts had more than 10,000 households. The average annual income per person was not substantially different between the 17 districts: in 2009the highest figure was 47,020 Baht in Bueng Kan district and the lowest was 37,013 Baht in Si Chiang Mai district. However, the average for Nong Khai province was 41,662 Baht per person per year from 2000 to 2009 (Table A.2).

Similar to most of the country, agriculture is the main economic activity in Nong Khai province. In 2009, the total cultivated land area was 2,751,159 rais, accounting for 60 percent of the total land area in the province. Rice and rubber tree were the two predominant crops, occupying 77.7 percent of the agricultural land. The other crops growing in the province included cassava, eucalyptus, and oil palms (Table A.3).

Table A.2: Number of Households, Average Income, and Population of Nong Khai Province in 2009, Categorised by District

Districts	Number of Households	Average Income (Baht/Person/Year)	Population		Total (Population)
			Male	Female	
1. Mueang	15,592	44,016	30,154	30,651	60,805
2. Tha Bo	11,207	46,700	20,737	21,485	42,222
3. Bueng Kan	14,130	47,020	29,083	27,581	56,664
4. Phon Charoen	4,066	41,029	8,044	7,822	15,866
5. Phon Phisai	15,948	38,744	33,088	32,816	65,904
6. So Phisai	11,327	38,012	22,500	22,088	44,588
7. Si Chiang Mai	5,563	37,013	10,075	10,438	20,513
8. Sang Khom	3,349	40,298	7,069	6,808	13,877
9. Seka	13,946	37,502	30,421	29,234	59,655
10. Pak Khat	4,487	40,739	10,161	9,913	20,074
11. Bueng Khong Long	5,913	40,820	11,927	11,516	23,443
12. Si Wilai	4,852	45,696	11,037	10,529	21,566
13. Bung Khla	2,326	40,402	4,480	4,346	8,826
14. Sa Khrai	4,114	37,495	8,453	8,292	16,745
15. Fao Rai	7,894	42,683	17,377	16,413	33,790
16. Rattanawapi	5,733	41,028	12,441	12,150	24,591
17. Pho Tak	2,472	41,828	4,217	4,398	8,615
Total (Nong Khai)	132,919	41,662	271,264	266,480	537,744

Source: Community Development Department, Ministry of Interior

Table A.3: Agricultural Areas in Nong Khai Province in 2009, Categorised by District

Districts	Number of		Land Areas (rais)		Rice (rais)		Rubber Tree (rais)	Others (rais)
	Sub-districts	Villages	Total	Agriculture	Glutinous	Others		
1. Mueang	14	147	379,660	223,407	104,075	36,751	2,085	80,496
2. Tha Bo	10	100	222,070	155,307	86,535	38,712	2,689	27,371
3. Bueng Kan	12	131	420,865	296,530	92,455	24,027	162,683	17,365
4. Phon Charoen	7	58	226,511	122,244	54,241	10,344	48,697	8,692
5. Phon Phisai	11	159	401,711	328,880	168,595	42,794	38,776	78,715
6. So Phisai	7	95	615,789	234,071	77,808	33,346	85,890	37,027
7. Si Chiang Mai	4	43	110,593	59,061	18,617	7,654	6,178	26,612
8. Sang Khom	5	36	281,077	112,777	16,843	611	44,424	50,899
9. Seka	9	135	611,518	420,316	122,956	46,452	103,660	147,248
10. Pak Khat	6	64	136,312	124,817	35,896	6,990	57,914	24,017
11. Bueng Khong Long	4	56	248,845	124,791	45,961	8,928	46,192	23,710
12. Si Wilai	5	51	281,250	152,536	43,211	14,557	66,961	27,807
13. Bung Khla	3	25	150,000	61,346	19,885	1,552	32,732	7,177
14. Sa Khrai	3	44	131,813	55,587	23,082	23,051	1,239	8,215
15. Fao Rai	5	72	159,937	123,826	35,900	24,569	38,163	25,194
16. Rattanawapi	5	62	127,505	116,453	48,278	8,820	49,801	9,554
17. Pho Tak	3	27	83,465	39,210	12,984	801	13,829	11,596
Total (Nong Khai)	113	1,305	4,588,920	2,751,159	1,006,422	329,959	801,913	612,865

Source: Nong Khai Provincial Agricultural Extension Office

Appendix B:
Phon Phisai District: Facts and Maps

Phon Phisai district is located in the Central area of Nong Khai province, 50 kilometres from the Mueang district. Basically, the district is separated into 11 sub-districts and 158 villages. The areas that surround Phon Phisai district are summarised below:

The North is adjacent to the Mekong River and Rattanawapi district, Nong Khai province;
The South is adjacent to Baan Dung, Srang Kom, and Pen districts, Udon Thani Province;
The East is adjacent to Fao Rai district, Nong Khai province; and
The West is adjacent to Mueang district, Nong Khai province.

Figure B.1: Map of Phon Phisai District and Its 11 Sub-districts

Source: Department of Provincial Administration, Ministry of Interior

Phon Phisai district had a total population of 65,904 in 2009, with little difference between the numbers of male and female in the district: 33,088 and 32,816 respectively. In 2009, Phon Phisai district had 15,948 households, of which 2,909 were in Jumpon sub-district, which is one of the three areas studied in the thesis. The details of the number of villages and households, and the population in the district can be seen in Table B.1 below:

Table B.1: Number of Villages and Households, and Population in Phon Phisai District, 2009

Sub-districts	Number of		Population		Total (Population)
	Villages	Households	Male	Female	
1. Kud Bong	14	1,353	2,560	2,584	5,144
2. Jumpon	26	2,909	6,164	5,948	12,112
3. Tung Laung	12	861	1,863	1,797	3,660
4. Na Nung	17	1,572	3,067	3,042	6,109
5. Serm	10	1,022	2,170	2,390	4,560
6. Lao Tang Kum	15	1,341	2,861	2,743	5,604
7. Chum Chang	19	1,905	4,158	4,132	8,290
8. Wat Laung	16	1,748	3,396	3,386	6,782
9. Srang Na Khao	8	732	1,439	1,488	2,927
10. Baan Pue	8	927	1,698	1,700	3,398
11. Baan Pho	13	1,578	3,712	3,606	7,318
Total (Phon Phisai)	158	15,948	33,088	32,816	65,904

Source: Village Basic Information (Nrd 2C), Community Development Department, Ministry of Interior (2009)

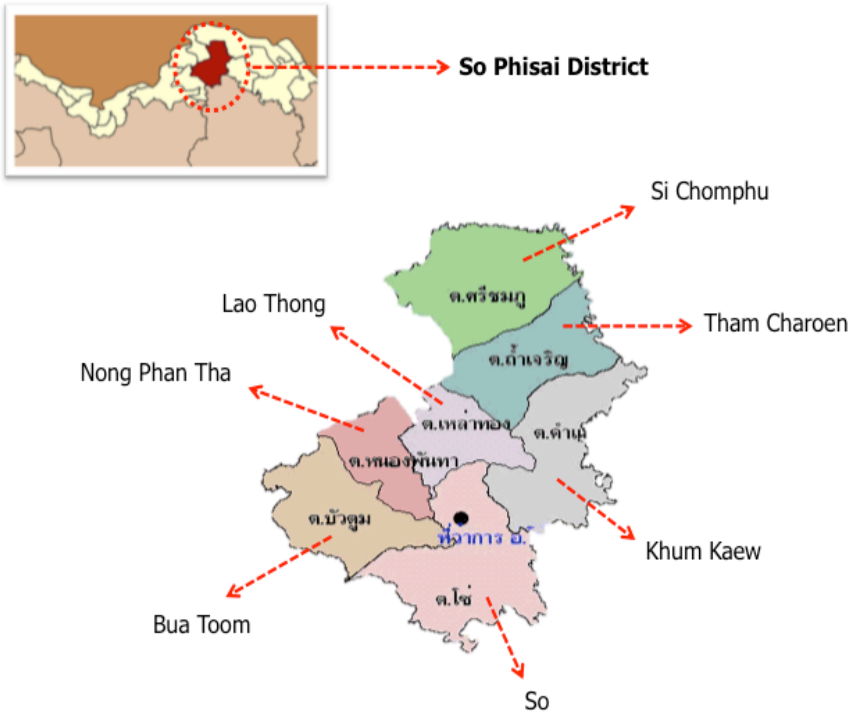
Most of the areas in the district are flatland with moderate to good soil conditions. The predominant type of soil here is sandy loam. Using natural water resources from Mekong River and local swamps, agriculture can continue in the dry season in some parts of the district. In terms of the climate characteristics, the rainwater in Phon Phisai district is well distributed throughout the year. The annual average rainfall in the district was 1,550 millimetres in 2008 with average sunshine of more than 1,500 hours per year. The district covers a total land area of 401,711 rais, accounting for 8.75 percent of the total area of Nong Khai province.288,017rais are agricultural land including rice and oil palms (PAE, 2010).

Appendix C:
So Phisai District: Facts and Maps

So Phisai district is situated at the Southeast of Nong Khai province, 92 kilometres from the central Mueang district. The district is separated into 7 sub-districts involving 95 villages. The areas surrounding the district are as follows:

The Northborders Pak Khat and Bueng Kan districts, Nong Khai province;
The Southborders Ban Muang district, Sakon Nakhon province;
The Eastborders Phon Charoen district, Nong Khai province; and
The Westborders Phon Phisai district, Nong Khai province.

Figure C.1: Map of So Phisai District and Its 7 Sub-districts



Source: Department of Provincial Administration, Ministry of Interior

In 2009, So Phisai district had a population of 44,588, of which 22,500 were male and 22,088 were female. The district also had 11,327 households in total. Tham Charoen sub-district (location of the selected village) ranked the second lowest in terms of population and number of households, at 4,517 people and 1,179 households. The details are shown in the Table C.1 below.

Table C.1: Number of Villages and Households, and Population in So Phisai District, 2009

Sub-districts	Number of		Population		Total (Population)
	Villages	Households	Male	Female	
1. Kham Kaew	13	2,108	3,382	3,621	7,003
2. Tham Charoen	N/A	1,179	2,262	2,255	4,517
3. So	N/A	2,080	3,289	3,129	6,418
4. Lao Thong	10	1,072	2,005	1,885	3,890
5. Nong Phan Tha	12	1,405	3,041	2,877	5,918
6. Si Chomphu	N/A	1,931	4,601	4,469	9,070
7. Bua Toom	14	1,552	3,920	3,852	7,772
Total (So Phisai)	95	11,327	22,500	22,088	44,588

Source: Village Basic Information (Nrd 2C), Community Development Department, Ministry of Interior (2009)

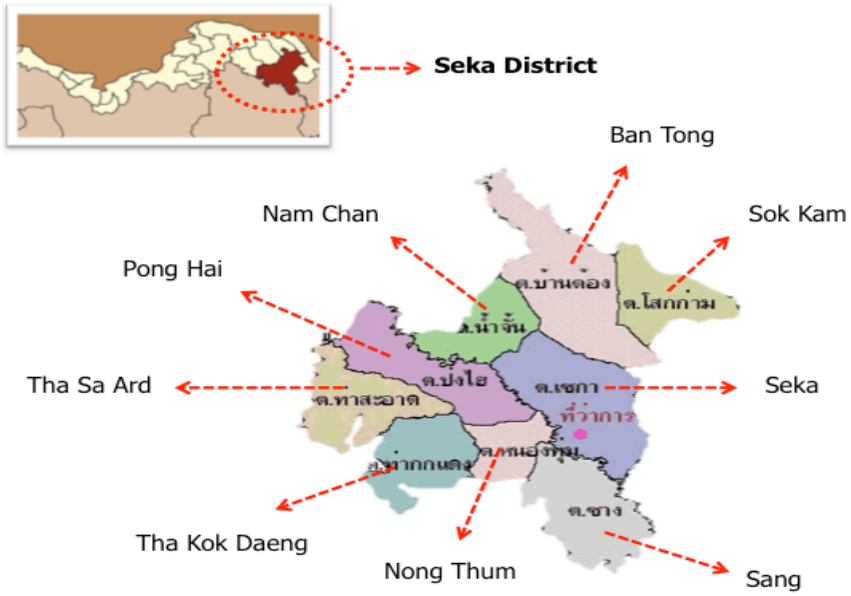
Most of the areas in the district are lowland with infertile soil conditions. The average level of sunshine in this district exceeds 1,500 hours per year. The district covers a total land area of 615,789 rais, accounting for 13.42 percent of Nong Khai province. Rice, rubber and eucalyptus were the top three crops in terms of planted area in this district in 2009 (SPAE, 2010).

Appendix D:
Seka District: Facts and Maps

Seka district is located in the Southeast of Nong Khai province. The district is 220 kilometres from the Mueang district, which is considered to be the centre of Nong Khai province. Seka district is divided into 9 sub-districts and 135 villages. The neighbouring districts can be seen below:

The North is adjacent to Bueng Kan and Phon Charoen districts, Nong Khai province;
The South is adjacentto Ar Kard Umnuai district, Sakon Nakhon province and Baan Phaeng district, Nakhon Phanom province;
The East is adjacentto Bueng Khong Long district, Nong Khai province and Baan Phaeng district, Nakhon Phanom; and
The West is adjacentto Kham Ta Kla district, Sakon Nakhon province and Phon Charoen district, Nong Khai province.

Figure D.1: Map of Seka District and Its 9 Sub-districts



Source: Department of Provincial Administration, Ministry of Interior

The population in Seka district was 59,655 in 2009, of which 30,421 were male and 29,234 were female. In 2009, the total number of households in the district was 13,946.The Tha Sa Ard sub-district, which features in this research, had 1,642 households. Details of the population and number of villages and households in the district are shown in the Table C.1 below.

Table D.1: Number of Villages and Households, and Population in Seka District, 2009

Sub-districts	Number of		Population		Total (Population)
	Villages	Households	Male	Female	
1. Seka	23	2,796	6,287	6,127	12,414
2. Sang	13	1,656	3,931	3,680	7,611
3. Nong Thum	13	1,240	2,839	2,643	5,482
4. Tha Kok Daeng	16	1,231	2,372	2,239	4,611
5. Tha Sa Ard	13	1,642	3,565	3,533	7,098
6. Pong Hai	18	1,735	3,466	3,362	6,828
7. Nam Chan	12	1,087	2,529	2,251	4,780
8. Ban Tong	15	1,637	3,527	3,475	7,002
9. Sok Kam	12	922	1,905	1,924	3,829
Total (Seka)	135	13,946	30,421	29,234	59,655

Source: Village Basic Information (Nrd 2C), Community Development Department, Ministry of Interior (2009)

Most areas in the district are upland with the fertile soil. The upland areas occupy 75 percent of the total land area in the district, whilst 23 percent is lowland and the remaining 2 percent is mountainous. The key natural water resources in the district are: 1) Song Kharm River, which benefits the people in Tha Kok Daeng, Tha Sa Ard, and Nong Thum sub-districts; 2) Hee River, which supplies water to Seka and Sang sub-districts; 3) Seka Swamp, the main water resource for agricultural uses in Seka sub-district; 4) Hau Hat Swamp, which is used for agriculture in Tha Sa Ard and Pong Hai sub-districts; 5) Kud Sam Kha, which provides water to Sang sub-district in both rainy and dry seasons; 6) Kud Sang, which is used only in rainy season for agriculture in Sang sub-district; and 7) Pluey Swamp, which benefits farmers in Seka sub-district.

Seka district has a tropical monsoon climate, which can be divided into 3 seasons: 1) the hot season, from February to May with an average temperature of 35 degree Celsius; 2) the rainy season, from May to October; and 3) the cold season, which is from November to January with the average temperature of 12 degree Celsius. Generally, there is rain from February to November, September having the highest number of rainy days in the year. The average annual precipitation from 1999 to 2008 was 2,396 millimetres (SAE, 2010).

The district covers a total land area of 611,518 rais, equivalent to 18.78 percent of the total land area of Nong Khai province. Agriculture is the primary economic activity in the district as there is no industrial plant situated in the area. The average income of the people in the district was 37,502 Baht per person per year in 2008. In 2008, the total farm holding lands in the district was 223,506 rais. Rice was by far the major crop in the district, occupying 131,486 rais, 58.4 percent of the total 223,506 rais. Rice is normally grown once a year in the rainy season from May to October, and the paddy fields being left fallow during the dry season. Glutinous rice dominated the overall paddy fields of the district and accounted for 100,135 rais in 2008. The second largest crop in the district was rubber, which covered 22,979 rais in 2008. The other important crops in the district are cassava, eucalyptus, and oil palms (SAE, 2010).

Appendix E:
Interview Guide Used in the Research

1. Interview guide for the oil palm farmers in the three villages, the large-scale oil palm producers, and the inspirational local leaders

Issues to be addressed: farmers' decisions to adopt oil palms and its consequences

1. What are the reasons for you to change to oil palms? What are your needs? How do you manage your farmland?
2. Why are you still in rice cultivation instead of switching all your land to other crops such as oil palms and rubber?
3. What were the problems when you were a rice farmer?
4. Why didn't rice cultivation satisfy your needs and motives?
5. Why did you decide to grow oil palms instead of other crops?
6. Why do you choose to grow oil palm on this proportion of your land?
7. What consequences did you initially expect after changing to oil palms?
8. How do you feel about the switch to oil palms now?
9. Has the switch to oil palms caused any changes to your life in socio-economic and environmental terms? And if so, in what ways?
10. Are the changes what you initially expected?
11. What is your plan for the oil palm plantation in the years to come?

Issues to be addressed: farmers' attitudes and their relationships to key actors

12. How do you know or acquire the knowledge for oil palm cultivation? How do you buy oil palm seedlings and sell your oil palm products? Do you have any problems with obtaining seedlings or selling your products?
13. Does anyone (or any organisation) provide you with knowledge and funding for the growing of oil palms? And if so, how?
14. Do you have any problems concerning the current situation of oil palm plantations around the village? Who do you contact when you have problems related to oil palm plantations?

Issues to be addressed: the facilitating roles of the government

15. Did you receive any supports or advice from local government?
16. Which organisations do you frequently make contact with?
17. How do they help you? Are their advice and support useful?
18. Have you had a chance to get involved in the planning of the oil palm policy? If yes, how?

2. Interview guide for the rice farmers (who have not yet adopted oil palms) in the three villages

1. Have you ever heard of oil palms? How do you know about oil palms here? Have you had information about support for oil palms from the government?
2. What is your view of the oil palm crop? How do you feel about the crop?
3. How is your life at the moment? Are you satisfied with your life now? What are your needs? How do you plan to achieve them?
4. Why have you decided still to grow rice? How do you feel about other optional crops such as rubber, cassava and oil palms?
5. Do you have any problems in cultivating rice? And if so, what are they?
6. Do you have plans to cultivate oil palm in the future? And if so, why?
7. If you are interested in growing oil palms, what support do you need from the government? How are you going to acquire knowledge and funding?
8. Do you have confidence in the local oil palm market? Does the crop have a future in Nong Khai province and in Esaan region? And why?

3. Interview guide for the government agencies in this research

1. How do oil palm plantations get started in the Esaan region, including Nong Khai province? What are the stories and rationale behind the oil palm policy?
2. Who is involved in the oil palm supporting projects?
3. What are the roles of your organisation in supporting oil palm expansion in Nong Khai province? Can you explain in detail?
4. Does the government's oil palm project face any difficulties? How are these problems being solved? What are the factors affecting the success of the project?
5. What is your perception of oil palm plantations in Esaan region? Does the crop have a future in your view, compared to other crops? Will it lead to better development for Thailand and in what ways?
6. How are the voices of farmers being heard both before and after adopting oil palms? How was the oil palm policy formulated? Does the policy offer the chance for farmers to participate in the policy processes?
7. What are the future policies and plans of your organisation regarding oil palm expansion in this region?

4. Interview guide for private suppliers (oil palm seedlings providers)

1. How long have you been in this business? What are your reasons for choosing to engage in this business?
2. Who are your major customers? Are they large-scale or small-scale farmers?
3. What is the sales volume? How do the volumes change over time?
4. How many oil palm seedlings suppliers are there in the area? Who are they? In what way are they different from you?
5. Where do you get oil palm seedlings? Are they certified? Why do you choose this type of oil palm seedlings?
6. How many types of seedlings are there in the market? What are the differentiating characteristics of each type? Which type of seedling is the most popular? And why?
7. How do you acquire oil palm knowledge? Does the knowledge differ from the oil palm plantations in the South? If yes, how?
8. How do you feel about planting oil palms in Esaan region? What are the advantages and disadvantages of Esaan oil palms comparing to rubber and rice as well as oil palms from the Southern region?
9. What are your future plans?

5. Interview guide for the private merchants (buyers of oil palm fruits)

1. How long have you been in this business? What are your reasons for choosing to engage in this business?
2. How do you offer the service? What areas do you cover? Who are your major customers?
3. How do you grade the oil palm fruits that you buy?
4. How many do you buy per year? What is the trend in the last 5 years?
5. What do you do after buying? And why?
6. How many buyers are there in the area? Who are they? How are they different from yours?
7. How is the situation with oil palms here in your view? Do you need any support from the government? Do oil palms have a future in Nong Khai province? How is it compared to other crops, including rice and rubber?
8. What is your future plan? How will you survive if the palm oil refinery comes to Nong Khai province in the near future? Have you considered producing palm oil yourself? Why, or why not?

6. Interview guide for the large-scale palm oil refinery (in Chonburi province)

1. How long have you been in this business? Can you explain in detail how the business works at the moment? How is it developing over time?
2. How many palm oil refineries are there in this area? How do you compete with them?
3. How do you grade the oil palm fruits that you buy? Where do they come from?
4. Can you explain in detail your business along the supply chain: from buying of oil palm fruits to the end products? Who are your customers? Why do you decide to do these activities?
5. What is your perception of oil palm cultivation in Esaan region? Is it possible in your view? Have you considered expanding your business there? And why/why not?
6. What is your view of Thailand's oil palm industry? Does the industry need anything to move forward especially in Esaan region? How does it compare to the Southern region's oil palms?
7. What is the future plan of the company?
8. What is your view of the role of the government?

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