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Technology and Agrarian Development
Environmental Policy

A Political Ecology of Jatropha Promotion

Elucidating Actors, Narratives and Local Reality in the Lao PDR

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Abstract

Located in the center of Southeast Asia, the Lao People's Democratic Republic is both a bridge and a buffer between its neighboring countries. Its geographical situation within one of the world's most economically dynamic regions intensifies the influence of neighboring countries on the Lao economy and increases its dependency on trade and investment. In order to compete with these dynamics, agricultural transition towards a market-oriented production is encouraged by the provision of land concessions to foreign investors. Due to the dependency to import 100% of fossil fuels the promotion of jatropha as a potential biofuel feedstock is receiving increased attention. Jatropha promotion is an objective of political debate shaped by power struggles, environmental discourses and economic forces. On the national level a variety of actors are involved in the formulation of the Renewable Energy Development Strategy manifesting their interests in supporting and constraining discourses. Disinterest of governmental actors that are not directly benefiting and the role of international development aid are influencing this process and widen the gap between policies and practices. The neglect of district authorities within this policy process results in a weak position in rural areas, lacking regulation and monitoring systems to implement policies. Due to the absence of district legislation the dominant role of the private sector controlling jatropha activities in rural areas is encouraged. Rural development as an objective to reduce poverty is prioritized and assumed to be in line with the promotion of jatropha development. In reality the main beneficiary is the private sector and to some extent the national government through leasing land concessions. However, the local farmers investing labor and time in cultivating jatropha gain the least. Jatropha promotion implies a reorganization of land resources and the rural population depending on it to secure livelihoods.

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List of Acronyms

ADB	Asian Development Bank
AFDS	Agriculture and Forestry Development Strategy
ASEAN	Association of Southeast Asian Nations
DAFO	District Agriculture and Forestry Office
DLMA	District Land Management Authority
DoE	Department of Energy
FAO	Food and Agriculture Organization
FDI	Foreign Direct Investment
GNI	Gross National Income
GIZ	German International Cooperation
GoL	Government of Laos
GPS	Global Positioning System
ha	Hectare
hh	Household
IMF	International Monetary Fund
JBEDC	Japan Bio-Energy Development Corporation
JDI	Japan Development Institute
LAK	Lao Kip
Lao PDR	Lao Peoples' Democratic Republic
LDC	Least Developed Country
LIRE	Lao Institute for Renewable Energy
LPRP	Lao People's Revolutionary Party
LSFC	Lao State Fuel Company
LWU	Lao Women's Union
MAF	Ministry of Agriculture and Forestry
MEM	Ministry of Energy and Mines
MLO	Multilateral Organization
NAFRI	National Agriculture and Forestry Research Institute
NEM	New Economic Mechanism
NGO	Non-Governmental Organization
NGPES	National Growth and Poverty Eradication Strategy
NLMA	National Land Management Authority
NTFP	Non-Timber Forest Products
PAFO	Provincial Agriculture and Forestry Office
PL	Pathet Lao
PLMA	Provincial Land Management Authority
RE	Renewable Energy
RETI	Renewable Energy Technology Institute
REDS	Renewable Energy Development Strategy
RLG	Royal Lao Government
SNV	Netherlands Development Organization
SVO	Straight Vegetable Oil
VT	Vientiane Times
WB	World Bank
WTO	World Trade Organization

Exchange rate August 2011:
8,000 LAK are equal to 1US$ (Source: www.oanda.com)

Chapter 1: Introduction

1.1 Problem Statement

Global production and demand of biofuels have been growing rapidly as a response to the energy and climate crisis (White & Dasgupta, 2010). This is contested in a complexity of motivations and questioned by many scholars. These scholars influence the biofuels debate by manifesting a variety of supporting and constraining agro-economic and social discourses. *Jatropha curcas L.* (jatropha) is promoted internationally as a potential biofuel with regard to its presumed agronomic viability in marginal and degraded lands, economic returns for small-scale farmers and lack of competition with food crops. Jatropha, a hardy scrub claimed to be drought resistant, has the ability to reclaim land and prevent erosion. However, an increasing amount of literature is objecting these claims. A growing number of studies have been questioning the socio-economic and ecological sustainability of biofuels. For economic reasons a high yield of jatropha is essential and therefore correlates with soil fertility and hence increases cultivation preferences on arable land in direct competition with food production (Ariza-Montobbio et al., 2010; Hunsberger, 2010; White & Dasgupta, 2010).

Industrial countries have an increasing demand for biofuels based on new regulations and policies. However, this policy induced production to meet the demand is not realizable which acknowledges the requirement of enormous land allocation. The demand creates a global biofuels market, which supported by foreign investment, develops in countries with weak and preferable regulations. This leads to a shift of the land allocation problem, also referred to as 'land grabbing', from industrialized to developing countries (Eide, 2008). Correlating with the boom of food prices and the financial crisis provokes a rediscovery of the agricultural sector by a variety of investors and a wave of interest in land acquisition in developing countries (WB, 2010b).

The Lao People's Democratic Republic (Laos) has emerged as a 'hotspot' for transnational agribusiness investment and gained increasing international attention as the global land grab took off in the end of 2007 (Dwyer, 2011). Located in the center of Southeast Asia, Laos is both a bridge and a buffer between its neighboring countries. The emerging economic powers of China, Vietnam and Thailand are bordering as well as Cambodia and Myanmar the landlocked country Laos. Its geographical situation within one of the world's most economically dynamic regions intensifies the influence of the newly industrialized countries China, Thailand and Vietnam on the Lao economy and increases its dependency on trade and investment (G. Evans, 2002). The strong economies of the neighbors and the development agenda grounded on 'turning land into capital' encourages the agricultural transition towards more export-oriented production and foreign direct investment (FDI) (Dwyer, 2007). The Government of Laos (GoL) illustrates the image of a resource-rich country which is also reflected in publications of international development actors (WB, 2010a; ADB, 2009a). Land is granted to foreign and domestic investors by a patronage network of powerful governmental authorities and thus Laos appears as a country with weak legislations (Dwyer, 2011). It has one of the

lowest concession rates among Southeast Asian countries, estimating that 10 to 15% of the whole Lao territory is already under concession (GTZ, 2009). In other words, Laos is presented as a *new frontier* for natural resources and business opportunities (Barney, 2009) which leads to a wave of FDI into the country (Rigg, 2005).

Besides the global demand for biofuels, the GoL is creating a national demand for biofuels within the country. Laos is required to import 100% of fossil fuels from neighboring countries and due to this dependency renewable energy technologies receive special attention. This is constituted in the development of the Renewable Energy Development Strategy (REDS), which is currently formulated for Laos to become more independent from the import of fossil fuels. So far, the biofuel production in Laos is only undertaken at an experimental level with a primary focus on jatropha (ADB, 2009a, 2009b; Yang et al., 2009). However, more updated literature already acknowledges an emerged biofuel sector focusing on the production of jatropha feedstock for export (PEI, 2010). There is a wide range of numbers regarding the total amount of jatropha plantations. However, these numbers are controversy and point out that there is a lack of clear and reliable information about the biofuel sector and in general the availability and utilization of land resources. In 2007 the Ministry of Planning and Investment stated that 16,579 hectares (ha), around 10% of the total arable land, is used for this energy-crop (Voladet, 2009). Shepley (2009) assumed an area of 1,500 ha of commercial jatropha plantations in 2009. For the same year a higher estimate was provided by the Lao Institute for Renewable Energy (LIRE) of 30,000 ha (PEI, 2010).

A variety of international companies are investing in jatropha plantations throughout the country facing different agro-economic challenges due to improper business models, misunderstanding of the local context, lack of practical experience and overestimated expectations (Rietzler et al., 2009). The most important actor of the private sector is Kolao Farm & Bio-Energy Co. Ltd (Kolao), a South Korean-Lao cooperation, which is acknowledged as the dominating business force in regard to jatropha promotion throughout the country however no more details about business structure are presented (ADB, 2009a, 2009b; Markandya & Setboonsarng, 2008; MEM, 2007a). By presenting the private sector as the leading force constitutes a weak position of the GoL in actually promoting and extending a jatropha-based biofuel sector. Furthermore an effective management and administration system on land concessions is lacking in the working structure of the GoL. The provision of land concessions is an un-transparent process and does not consider environmental and social assessments as well as local participation (WWF, 2007).

The main consequence of the un-transparent land concession process causes social, economic and ecological threats to local livelihoods. According to a survey conducted by CIDSE (2009) the main problems faced are due to uncompensated loss of natural resources, out- migration, decreased food security and loss of biodiversity. Hall (2003) points out that large-scale agricultural plantations are mainly established in areas which do not have clearly defined property rights. This land is claimed to be state owned

however the local communities have traditionally inhabited the land. Furthermore, the gap between policy and practices is growing and therefore reduces the possibility of these communities to make use of their agency and decide about their land (Lang, 2008).

Bases on the presented information, the problem statement reveals jatropha promotion as an un-transparent process on the national as well as on the local level. This thesis aims to elucidate (1) the variety of actors and interests involved in policy formulation, (2) the unclear position of the private sector presented as a dominant force and (3) the material and social outcome of the promotion in rural areas. The disconnection of policy narratives on national level and the actual implementation of jatropha on local level will be presented by providing knowledge to fill this gap focusing in particular on the role of the private sector as the linking actor between national and local level.

1.2 Research Objective and Research Questions

This thesis aims to analyze the promotion of jatropha-based biofuel production in Laos in regard to policy narratives, the institutionalization of the private sector as well as the social and material outcome in rural areas. Since a few years Jatropha is promoted in Laos however the outcome of policy formulation to regulate the implementation and the resulting effects on local level are still unknown processes.

Currently in Laos the Renewable Energy Development Strategy supported by external funding is formulated, involving a variety of actors bringing together different expertise from various sectors. In line with governmental policies and objectives the promotion of jatropha, as an additional income for the rural population and as potential reduction of energy dependency, receives attention by the GoL, national as well as international actors. The REDS formulation process provides interesting insights what actors are involved and how their interests are presented. So far, no research has been conducted on the issue of constructing policies and discourses related to jatropha promotion. Because there is hardly any written information elucidating actor-profiles and interests manifested in discourses, the first research question is as follows:

(1) What actors are involved in jatropha promotion and how are discourses constructed on national level?

In order to provide a complete overview of involved actors and their interests within the promotion the first sub-question explores: *(1.1) what are interests of involved actors and why do they promote or not promote jatropha.* After establishing an actor-profile the second sub-question outlines dominant discourses acknowledging supporting or constraining narratives of jatropha promotion by asking: *(1.2) what are dominant discourses and how are these constructed by actors*. These questions will provide insights in policy processes related to jatropha promotion on the national level.

The private sector is the main promoter of jatropha activities as identified in the literature in rural areas but there is a lack of studies and knowledge to demonstrate the influential

position of the private sector. Furthermore the process of jatropha promotion is an unclear and continuously changing field and no research has been conducted to illustrate this business. Therefore, the second research question elucidates how the private sector is institutionalized and how policy narratives are reflected on local level:

(2) What jatropha promotion strategies are exercised by the private sector and how are discourses translated into local context?

This question will be explored by focusing on actors located and active on local level by elaborating the first sub-question: *(2.1) what jatropha promotion practices are applied by the private sector.* After the provision of insights in reality of jatropha and the unpacking of cultivation practices the second sub-question assesses: *(2.2) what are interactions of the private sector with the government and farmers*. This question is answered on the one hand by evaluating the provision of social and economic incentives by the GoL to the private sector. On the other hand the particular interaction between company and farmers is elucidated. In addition, these practices and interactions will be analyzed in the light of obtained discourses on national level and how these are translated into the local context.

This thesis incorporates a cross-scale analysis, spanning across national policy to local implementation framed by the approach of political ecology. Further key concepts are applied to highlight aspects within the promotion of jatropha. On the national level, the concept environmental discourse combined with the actor-oriented approach as a structural tool presents an actor-profile and elucidates related policy narratives. The private sector, considered as a key category of actor that connects national and local level, is analyzed in light of the concept embedded autonomy in order to assess the involvement and interaction with the government supporting or constraining the private sector in form of subsidies to develop and compete on the market. On the local level, the concept territorialization explores the material and social outcome in regard to the reorganization of land resources and the rural population. These concepts will be presented in detail in Chapter 2 incorporated in the theoretical framework of this thesis. The following sections provide background information about Laos focusing on the socio-economic and political development and the biofuel boom in order to contextualize the empirical data presented in the following chapters.

1.3 Background Information of the Lao PDR

Laos, located in the middle of Southeast Asia, is both a bridge and a buffer between its neighboring countries. Currently the landlocked country is still counted as a Least Developed Country (LDC)[1] and together with Cambodia and Myanmar the poorest country in that region. Contrary to its neighboring countries Laos is characterized with a low population density of 6.5 million in total, distributed unevenly across the country. The area of 236,800 km² is dominated by a rugged terrain with mountains that cover

[1] The United Nations established the categorization of countries, whereas the Least Developed Country (LDC) status represents the poorest and weakest segment of the international community, including Laos within the list of 48 LDCs.

about 75% of the land's surface, providing only a small amount of arable land for agricultural activities. This is essential in regard to the engagement of over 75% of the population in agricultural activities with most people being dependent on subsistence farming (CIA, 2011). To implement the process of agrarian transformation the GoL is supporting the development from subsistence to a market-oriented agricultural production with a particular focus on the rural countryside. In the latest UNDP's Human Development Report Laos is ranked as 122nd in the human development index out of 169 countries (UNDP, 2010a).

Figure 1 - Country map of the Lao PDR (WB, 2003)

The geographic situation within one of the world's most economically dynamic regions makes Laos an interesting country to study. China, Thailand, and Vietnam are heavily influencing the Lao economy and increasing its dependency on trade and investment. Furthermore the geographic situation of the landlocked country is placing Laos in a special position characterized by a lack of infrastructure. In particular in rural areas physical infrastructure, such as roads and bridges, is poorly developed. Dominated by the interest of its neighboring countries road investment to expand infrastructure is increasing in order to connect China, Thailand and Vietnam. Besides this regional influence, the dependency on international development aid is consistently dominating economic development in the country with an official development assistance accounting for 10% of the gross national income (GNI). Laos has been dependent on foreign assistance for more than half a century by donors with a variety of humanitarian, political and economic

motivations. This dependency of Laos, a weak multi-ethnic nation with geopolitical, physical and natural constraints, is manifested in both positive and negative impacts of aid. On the one hand, Laos is benefiting of loans with low interest rates, the development of physical infrastructure and human capacity building. On the other hand, the negative impacts are social problems but also political constraints reflected in a lack of transparency in government and of good governance (Phraxayavong, 2009).

To provide background information to answer the research questions the sections below outline the historical events relevant for the socio-economic and political development of the country. Particular attention will be given to the liberalization of the market by the implication of foreign direct investment (FDI). The process of agricultural transition will be elaborated with regard to implications on poverty reduction and rural development. Hence, the historical, political, economic and social development of Laos will be broached in order to present main dynamics, shaping and influencing the broader context of the country.

1.3.1 History and Political Situation

Tracing the history of Laos is important in order to understand the correlation between the political system and the economic development in the country. Laos' history is dominated by several external and internal conflicts shaping terrain and people manifested in an economic dependency.

In the 14th century the kingdom *Lan Xang Hom Khao*, 'a million elephants under a white parasol', was established by the connection of several independent and autonomous units and geographically shapes Laos as it is now by the warrior king Fa Ngum. Next to the high privilege to the Buddhist religion, which is still dominating Lao culture nowadays, a strong feudalistic system was established. Around 1695, Lan Xang dissolved into three separate kingdoms, in the North Luang Prabang, in the Centre Vientiane and in the South Champasak. Rival factions between these three kingdoms caused a political systems seeking powerful outside support, dominated by the Siamese (Thai) kingdom which claimed major power in the region (G. Evans, 2002).

In the 19th century with the French colonization of Indochina the territory of today's Laos was incorporated. The traditional feudal system still existed and the administrative system was modernized supported by the Vietnamese elite. However, the modernization by economic development failed in the form of an intrusive administration and capitalist exploitation. Under the French no industry was implemented and the integration in the rest of the economy of Indochina was not successfully based on poor infrastructure. With the exception of the Japanese rule during the Second World War, the French remained in control until 1954 when defeated by the communist Viet Minh (Stuart-Fox, 2005).

The rapid polarization into communist and non-communist parties following the ending of the Second World War and the beginning of the Cold War between the United States

and Soviet Union entangled Laos into a struggle over power in Indochina. The Royal Lao Government (RLG) was supported by the US to defend against communism by the provision of US aid. This had been politically motivated from the beginning and became a central issue in Lao politics. Development aid was strongly contested by the communist Pathet Lao (PL) which was supported by the Viet Minh. Due to series of military coups and counter-coups between the RLG and the PL it was not possible to create a stable government in Laos. The cooperation with the Viet Minh and the Ho Chi Minh trail connecting North and South Vietnam, running through Lao terrain, swept the country into the Vietnam War and left it devastated, full of unexploded ordnances and created enemies in particular between and within ethnic groups living in Laos. Eventually, the communist PL achieved victory and declared the Lao People's Democratic Republic in 1975 (G. Evans, 2002).

Since 1975, the one-party state led by the Lao People's Revolutionary Party (LPRP) had arrived in Laos. Political insecurity persisted after 1975 until the mid-1980s as the new socialist government encouraged resettlement of upland 'minorities' to the lowlands to directly suppress political insurgency and to 'modernize' agricultural production (Fox et al., 2009). This hard regime in general caused many Lao to flee the country due to a tightly controlled communist society dominated by wealthy families and political advancement through kinship and connections by family members who had remained in the country. However, attempts to radically economic change, such as agricultural collectivization, were a failure and thus in the 1980s market reforms were implemented (G. Evans, 2002).

1.3.2 Economic Liberalization and Foreign Direct Investment

The process of market reforms by economic liberalization was designed to modify the existing economy through a transitional phase that would progressively facilitate the play of market forces internally and encourage FDI.

In 1986, the Government of Laos (GoL) officially abandoned the central planning system and introduced the New Economic Mechanism (NEM). The main political instrument of the transition, referred to as *Chin Tanakan Mai*, consisted in important regulatory reforms oriented towards a progressive liberalization of the domestic economy, including the promotion of FDI, privatization measures and the creation of property rights. Nevertheless, the political system has remained strictly communist manifested in firm control of all political activities. Concurrently, in order to facilitate this policy shift, various international donors and development agencies became involved in the making of a new legal framework (G. Evans, 2002). This point illustrates again the ongoing involvement of international development intensifying the economic dependency of the country.

Laos connected to the wider region economically by becoming a member of the Association of Southeast Asian Nations (ASEAN) in 1997, followed by entering the

World Trade Organization (WTO). These developments have led to progressive involvement in a domestic open market economy and a global economy (Stuart-Fox, 2005). A main development of an open market economy, supported by government policy of secure economic growth, is the rapidly increase of FDI in recent years. Major FDI to Laos comes from Thailand, China, Vietnam, Australia, India, Japan and South Korea (GTZ, 2009). Between 2000 and 2005 net average FDI inflows as percentage of GDP was 1.3%, between 2006 and 2008 not less than 5.8% with an increasing tendency (ADB, 2010). The Business Law was implemented in 1994 and the Law on the Promotion of Foreign Investment in 2004 in order to structure and facilitate FDI but these policies are quite general. The biggest share of the FDI still flows into the land resource sector, particularly hydro power and mining (about 80% of total FDI). In regard to the provision of economic incentives to develop plantations the seeking for land by actors for concessions has been developing and shaping the Lao countryside (Barney, 2008). Agricultural and forest land has become an important resource for industrial use and commercial crop production resulting in the dramatically growing demand for land resources. Thus, control over land became a new magnet for private investors and in regard to food and financial crises around the world, agricultural land was turned even more into a new strategic asset (GTZ, 2009; Dwyer, 2007). This development is combined with governance problems as state actors compete or are manipulated to allocate lucrative concessions to external investors (Barney, 2008).

Concurrently, business activities have experienced a boost in the last two decades. The share of agricultural productivity in the GDP has declined from 61% in 1990 to 33% in 2009 (ADB, 2010) reflecting an economic transition of the increasing establishment of new firms. The rapid growth of Lao and foreign business companies, both separately and jointly investing in a variety of projects, quickly overloaded the unprepared and narrowed bureaucratic system. For many situations there were no clear directives and guidelines and hence the new business policies supported a shadow economy (G. Evans, 2002). In regard to land concessions Barney (2008) adds to the point of a shadow economy as an ineffective coordination and regulation, lacking social and environmental assessments and participatory frameworks manifested in an environment of rushing investors and political patronage networks.

The lack of democratization has led to a vulnerable situation in particular for employees (mainly referring to farmers). Employees are not allowed to go on strike and have extremely limited possibilities for associations and trade unions. Moreover wages in Laos are very low, placing the majority of workers in a difficult position. Besides the lack of protection of human rights, the exploitation of environmental resources is increasing, which is a major issue in regard to environmental sustainability. Local populations, in particular in rural areas, generally experience the negative externalities (Andriesse, 2011). These aspects of poverty in rural areas in general and actually caused by agricultural transition will be presented in the next section.

1.3.3 Poverty, Control and Rural Development

Despite the steady growth in GDP due to agricultural and economic transition (largely based on the extension of the hydro power and mining sector), Laos registers a decline in poverty acknowledged by the UNDP (2010b). However, it was stated that this GDP increase has not resulted in comparable growth in employment and household income. Besides this, income inequalities are rising in particular in urban areas and are correlating with high disparities in rural areas. Poverty dominates rural areas of Laos with more than 40% of the rural population being poor (Rigg, 2005). The UNDP (2010b) frames this as 'social challenges' that continuously affect the development outcomes of the country. There has been little improvement in the high rates of child malnutrition and maternal mortality over the past decade and migration patterns are increasing due to population pressures and economic vulnerabilities. Rigg (2005) acknowledges that the reason is based on a failure of agriculture to meet the growing needs of the population with a strong link between market accessibility and poverty. Remoteness thus became a key explanatory factor behind the patterns of poverty observed in Laos. These spatial dualisms referring to uplands versus lowlands and accessible versus remote areas do also have cultural and social dimensions which are manifested in the concentration of minority groups[2] mainly located in remote and inaccessible upland areas of the country. Hence, poverty in Laos is framed by complex dynamics reaching from social and agricultural but also spatial challenges.

The process of agricultural transition from subsistence farming to commercial smallholder production is the major objective of the agricultural development strategy in regard to particularly alleviate poverty in rural areas. The aim is to increase diversity in order to reduce vulnerability of smallholder farmers to ensure food production (MAF, 2010). The GoL has identified the agricultural industry, which includes the plantation industry, as one of the most important tools for alleviating poverty and raising standards of living by developing rural areas (Voladet, 2009). According to Rigg (2005) these transition processes are leading to an increase in inequality and the depth and severity of poverty. In order to elucidate the complex picture of poverty he refers to 'old' poverty, meaning the lack of market integration, and 'new' poverty caused by market integration itself. With the creation of new markets through agricultural transition new patterns of marginalization are identified, creating winners and losers.

Apparently, market integration in rural areas of Laos is identified as not dominated by economic aspects. There is a deep connection related to political issue of gaining or regaining control over remote areas in regard to people and resources (Fox et al., 2009). The historical influenced of relative autonomous provinces with own political structures lead to a virtual loss of control of the central government over the provinces with a lack of monitoring systems to ensure that national priorities and targets are implemented.

[2] Laos is a multi-ethnic country with 49 officially recognized ethnic groups. These ethnic groups fall into different ethno-linguistic language groups, each with their own distinct customs. Thus, the Lao population is characterized by the altitude of their location: Lao Loum (lowland Lao), Lao Theung (midland Lao) and Lao Soung (highland Lao).

Hence, decentralization is a response by the GoL to transfer responsibilities for development planning and budgeting to local administrations (Stuart-Fox, 2005). Throughout the 1990s, policies and legislation of the GoL promote environmental protection, enforcing restrictions on the access of upland people to agricultural plots dominated by shifting cultivation systems which were made responsible for deforestation by the GoL (Fox et al., 2009). The governmental discourse acknowledges this process as rural development and modernization however many studies revealed that the issue of control is much more severe. In countries where agriculture plays a major role in the economy, a classical tool for modernization are reforms of the land system (Ducourtieux et al., 2005). Rural development and modernization in regard to increasing agricultural productivity acknowledges the investment in plantation as a possible solution. Laos already gained experiences in the cultivation of jatropha as a potential cash crop as will be elaborated in the next section.

1.4 Development of a Jatropha-based Biofuel Sector

The production of biofuels has been increasing in recent years in developing countries and is likely to expand at a rapid rate because of the scarcity of fossil fuels (Steenblik, 2006). In regard to the import dependency of Laos requiring 100% of its fossil fuels from abroad, mainly through Vietnam and Thailand, biofuels are receiving special attention by the GoL (Gaillard & Rietzler, 2009). The production of biofuels is a strategy in order to increase the security of supply on one side, but also as an income generation for the rural population on the other side. Laos provides agro-ecological conditions for a variety of potential crops, suitable for biofuel production with a particular focus on jatropha. Jatropha is pictured as the 'ideal' source for biofuel as acknowledged by the Lao Institute for Renewable Energy (LIRE). Jatropha has been identified by the *international* scientific community as the most promising biofuel crop with high capability for biodiesel production (LIRE, 2008). Further advantages are that jatropha is in abundant supply throughout Laos, traditionally used for medicine production and mainly planted as living fences around agricultural plots.

Background information about jatropha as a potential biofuel source and the development as well as relevance within the Lao context will be elucidated in the sections below. Particular attention will be given to the agricultural performance of jatropha. Thereafter, the development of the boom and bust cycle of jatropha in Laos will be explored and related to the engagement of various actors. This chapter will be completed with actual challenges Laos is facing in regard to the production and processing of jatropha.

1.4.1 The Crop Species Jatropha

Jatropha or physic nut is a drought resistant large shrub or small tree that produces oil containing seeds. Due to the toxicity of the crop, jatropha is planted as protection hedges around arable land and houses. Furthermore to its toxicity jatropha oil is not edible and hence is traditionally used for the production of soap and medicine. The oil is only

suitable for further industrial processing or the production of biofuels (Jongschaap et al., 2007). Jatropha has been promoted as a potential renewable energy source for many of its advantageous properties in comparison to other biomass feedstock, containing between 30 and 40% of oil in the seeds. It is claimed to survive under harsh climate and soil conditions and to control wind, water and soil erosion (Eijck van et al., 2010). The crop can be reproduced by sexual (seeds) or vegetative (cuttings) reproduction and bears seeds between one and three times a year, depending on rainfall conditions and temperature. Until now, the mechanization of the harvest process is still in its pilot phase and in particular for small-scale farmers not an option. Hence, harvesting is time and labor intensive since picking fruits and removing the fruit shells is done manually in developing countries (Rietzler et al., 2009). The variation of yield expectations are a constraining factor, in regard to literature about the Lao context, the ADB (2009a) estimates seed yields up to 3 tons/ha. This estimate is high and mostly not reflecting reality where 0.5 up to 1.5 tons/ha are more likely. However, emphasized by LIRE the high variety of yield expectations and speculations are pointing to the essential lack of agricultural research to produce reliable and context specific information.

Figure 2 - Jatropha plant and seeds

1.4.2 Jatropha Boom and Bust

The boom and bust cycle of jatropha development in Laos correlates with the fluctuation of the world oil price. In the Vientiane Times (VT), the main English language newspaper in Laos, an article stated that the oil price needs to be between 90 and 100 US$ per barrel to make investment in biofuel profitable. According to a quote of the Manager of Lao State Fuel Company, investors are waiting for an increase of the oil price because if it is lower than 90 US$ biofuel production is not viable at a competitive price (VT, 2010). This was also supported by the Lao Institute for Renewable Energies (LIRE), acknowledging a raise of foreign companies interested in jatropha by receiving an increasing amount of requests to provide information about investment opportunities in Laos. Thus, the world oil price regulates the amount of investment, promotion and interest of a diversity of business companies and governmental, multilateral and development organizations.

However, a lack of information and documentation about this sector development is reflected in a low amount and availability of publications. Thus, this section provides an

overview of policies and decrees established by the GoL, partly supported by international organizations, in regard to facilitating this boom and bust of jatropha promotion in Laos. Issues related to the development of this sector are also addressed directly and indirectly in policies, strategies and regulations of other ministries.

The first governmental intervention was the formulation of a decree on fuel saving by the GoL (2006). This decree recognizes the strong correlation between the oil price and socio-economic development due to the intense import dependency of fossil fuel. In order to reduce the impact of an increasing oil price on the living status of the Lao population, the GoL has undertaken following measures. Firstly, the GoL particularly regulated the wholesale and retail of oil prices, subsidized oil import by providing tax exemption and provided incentives for oil-importers. Secondly, oil consumption savings and efficient use was promoted. All ministries were encouraged to implement this decree and support research of renewable energies.
In 2007, the Ministry of Energy and Mines (MEM) formulated the first draft of a strategy of developing a biofuel sector (MEM, 2007b). This strategy acknowledges in particular that investment and cultivation of jatropha is supported and encouraged, however without any specific regulations. In this policy draft, jatropha was identified as a suitable crop for biofuel production due to experience of Lao farmers and suitable agro-ecological conditions. This paper already includes the target of 5% (10%) blending of biofuel by 2015 (2020), however lacks a proper outline how to achieve this target.

In 2008, the New Energy and Industrial Technology Development Organization (NEDO) assigned the Department of Energy (DoE) under the MEM to draft a policy document on biofuels promotion and development in Laos. The study was conducted by LIRE and intended to stimulate an exchange of knowledge within the key stakeholders involved in the biofuels sector and to suggest strategic orientations that would assure the viability of the policy. As well in this report, jatropha had been identified as a potential crop to fulfill these needs (LIRE, 2008).

Currently the MEM is formulating in corporation with external consultants and funded by the Finnish Ministry of Foreign Affairs the Renewable Energy Development Strategy. This Strategy includes the promotion of hydro power, wind, solar and biomass sources with the objective to develop a social and environmental sustainable renewable energy sector (GoL, 2010).

In regard to the private sector no publications or grey literature are available. However, all policies and strategies acknowledge that Kolao is the leading company investing and promoting jatropha in Laos. The Vientiane Times is the only source presenting articles about actions and developments of Kolao.

1.4.3 Challenges of Production and Processing

Agronomic challenges are widely represented in the literature and are reflecting the Lao context. The unknown amount of seed expectation is still presented as a main challenge in regard to high dependency on factors such as quality of the planting stock, climate, rainfall and soil fertility. Furthermore, harvesting is labor intensive regarding different maturing intervals. In regard to the low population density, characterizing rural areas, the lack of labor is an essential restriction. Besides, the dominant involvement in agricultural income activities occupies rural population in particular during working peaks that partly overlap with jatropha harvest. In general, research on the agronomic aspects on biofuel crop production is important in order to reduce these challenges.

In regard to the private sector, challenges of jatropha production and processing are common. A presented overview in 2009 reveals investors from China, Thailand, Vietnam, Korea, Italy, France and Japan that are involved in the establishment of jatropha plantations throughout the country. According to Rietzler et al. (2009) "the failure rate has been high, with many projects facing serious agronomical challenges or having abandoned their activities due to (1) improper business models, (2) lack of understanding of the local context, (3) lack of experience with jatropha cultivation or (4) overestimated expectations". A variety of cultivation and business strategies reaching from large-scale plantation models to small-scale contract farming have all encountered difficulties resulting in an insufficient performance of seed yield (Gaillard & Rietzler, 2009). Infrastructure and processing facilities in the country are poorly developed which leads to a dominated export oriented production, in particular the export of raw materials. LIRE conducted another study commissioned by the FAO on existing financial mechanisms regarding bio-renewable energy in Laos reviewing financial options and broaching only some political challenges (LIRE, 2010).

The challenges, presented in literature focusing on the Lao context, are largely referring to technocratic and economic explanations of jatropha production and processing within the Lao context. Social and political challenges are considerably less addressed within Lao publications and grey literature. Hence, this thesis will add to another dimension of social, political and environmental explanations in regard to the promotion of jatropha.

1.5 Outline of the Thesis

This thesis aims to elucidate the variety of politics involved in the promotion of jatropha on national and local levels in Laos. After the provision of the historical, political and social environment in which jatropha promotion evolves, Chapter 2 will elaborate on the theoretical framework dominated by the approach of political ecology. The concepts environmental discourse, embedded autonomy and territorialization place the cross-scale dimensions of environmental change induced by jatropha promotion in the center of research. In addition, it includes a description of methods applied in order to collect empirical data to answer the research questions. Chapter 3 and 4 are providing the empirical data, however are different from the methodological approach taken and the

level of analysis. On the national level an actor-profile and the collection of policy narratives are presented in Chapter 3. Chapter 4 then focuses on the institutionalization of the private sector and practices as well as interactions of jatropha companies on local level. Chapter 5 discusses the empirical findings and places these in the broader Lao context. In addition, reflections on the applied concepts are provided in light of the approach of political ecology and the applied concepts. Finally, Chapter 6 presents additional recommendations for further research and towards a political ecology of biofuels as well as the overall conclusion of this thesis.

Chapter 2: Theoretical Framework

2.1 Introduction

This chapter will provide the theoretical and analytical framework in order to operationalize the promotion of jatropha within the Lao context. The approach of political ecology, as an essential contribution to gain a comprehensive overview of environmental change, provides a framework that fits in the study of jatropha promotion in Laos. Jatropha promotion will be placed in the context of environmental change combined with issues of political processes and socio-economic impact. Its conceptualization is both an object of political debate shaped by a variety of actors, policy narratives and economic forces as well as a social and material outcome that reorganizes rural population and natural resources. It implies an analysis of cross-scale dynamics including the national and local level and perspectives of actors on a variety of scales. Additional concepts are applied to confine the politicized environment and make it researchable.

In regard to the lack of knowledge about actors and policy processes relevant for jatropha promotion the first sub-section elaborates on the concept environmental discourse combined with the actor-oriented approach as a structural tool to identify interests of individual actors and policy narratives. Phraxayavong (2009) elucidates an economic dependency of the GoL on international development aid in regard to policy formulation. The role of this dependency and the influence of international organizations will be explored within the formulation of the Renewable Energy Development Strategy and correlated with the interests and power relations of other actors.

In the second sub-section the role of the private sector identified in the previous chapter as a dominant force manifested in an un-transparent interaction with the GoL is analyzed. G. Evans (2002) and Barney (2008) acknowledge that the rapid growth of the private sector in Laos is lacking clear directives and guidelines and therefore supports a shadow economy. In order to explore the coincidence of this shadow economy with the environment of the private sector promoting jatropha the concept embedded autonomy illustrates these interactions revealed in the provision of economic and social incentives by the GoL.

The third sub-section explores the local level. Rural areas are characterized by remoteness and poor infrastructure and prevailing challenges are, beside social and agricultural issues, also of spatial dimensions as elaborated by Rigg (2005). Agricultural transition is identified by Rigg as a process increasing state control over rural populations. In regard to the land concession process for jatropha plantations the concept territorialization analyzes the material and social outcome induced by a spatial reorganization of land resources creating new economic and political zones.

Further sections elaborate on the conceptual framework of this thesis and how empirical data was collected. The methodology section provides an overview what methods are applied to collect the information. In addition, this section includes an elaboration on the

scope and limitations relevant for this research. The last section provides a conclusion which restates the research questions in theoretically terms.

2.2 The Politicized Environment in Political Ecology

Tracing the historical development of political ecology provides an enhanced understanding of the formation of this body of thought. In its first generation, around the 70s and 80s, political ecology was encouraged by neo-Marxist theories of production, wherein the access to and control over natural resources was central (Blaikie & Brookfield, 1987). Dominant critics on this early approach emphasized its underdeveloped sense of politics and it was perceived as neglecting attention to politics, class interest and social struggle (Peluso & Watts, 2001). In the 1990s new emphasis was on the means by which environmental control, access and poverty rights were defined in the context of social relations and especially negotiated and contested within political processes (Bohle & Fuenfgeld, 2007). A new interest in the relationship between environmental conflict and power relations emerged and the notion of a politicized environment moved into the center of attention of Third World political ecology, with the focus especially on developing countries (Bryant, 1998; Bryant & Bailey, 1997). In this sense particular attention is given to the process in which conflict over access to environmental resources is linked to political and economic systems. According to Bryant (1998), related studies emphasize an increasing marginality and vulnerability of the poor as an outcome of such conflicts. Besides this emphasize, the impact of perceptions and discourses on the specification of environmental problems and interventions is gaining attention and feeding debates about the relative assets of indigenous and western scientific knowledge (Bryant, 1998). From this perspective, environmental change induced by the promotion of jatropha is assumed as a manifestation of power relations and environmental discourse. Power is as a concept will be analyzed in order to specify the notion of a politicized environment.

Power relations of human-environmental interaction can be made researchable according to Bryant and Bailey (1997) by focusing on the interest and interaction of different types of actors. Applying the actor-oriented approach hence supports the understanding of political-ecological conflicts in regard to environmental change. External interventions (such as jatropha promotion dominated by the private sector) are causing structural change and affecting individuals as well as social groups. However, the same actors and structures are mediating and transforming this external determination. The interplay and mutual determination of internal and external factors and relationships are calling for this dynamic approach which recognizes the central role of human action and perception (Long, 2001). These relations are unequal as individual actors are manifesting different power capacities in struggles over access to environmental resources (Bryant, 1997). Different power relations are defined as the notion of agency that attributes to the individual actor that has the capacity to process social experiences and to create ways of coping with even extreme forms of life. Despite the limits of information, uncertainty and other constraints - emphasizing the information-poor environment of Laos - all actors

possess ‘knowledgeability’ and ‘capability’ in order to cope with these constraints and hold power themselves to intervene in these rigid structures around them (Long, 2001).

In addition, the contribution of different actors is strongly connected to different scales (Bryant & Bailey, 1997). The notion of scale is applicable to examine the social aspect of a particular phenomenon and process underlying the promotion of jatropha from a demographic perspective, political organized perspective and the linkages between these created by institutions, politics or other social means (Cash & Moser, 2000). Moving between different scales and cross-scale dynamics is essential in order to understand environmental change and its local impacts. This is applied by Adger et al. (2001) to explain environmental issues by conducting global and local levels of analysis and as well as by Biersack and Greenberg (2006) to emphasize the dynamics of local-global articulation as being in line with political ecology. The combination of the actor-oriented approach with the awareness of different scales, ensures that interaction of actors located at diverse scales are included (Cash & Moser, 2000). Hence, it takes in account actors on local, district, provincial and national level in Laos. Actors are differently involved at any given scale: one actors’ involvement might contribute to an environmental problem, another might be involved in providing solutions and another actor might be affected by the problem (Bryant & Bailey, 1997). Therefore, the socially defined and constructed term of scale, combined with the actor-oriented approach, frames global as well as local environmental problems (Cash & Moser, 2000).

In addition, policy discourses on environmental problems that are manifested in uncertain conditions especially in the information-poor environment dominant in Laos, influence and are influenced by these actors. Discourses are reflected in shared meanings of a particular issue of different actors on a local, national, international and global level. Actors participate in a various degree to its production, reproduction and transformation through written and oral statements (Adger et al., 2001). The key to understand environmental problems and its induced change within society is to explore how taken-for-granted concepts of the world are framed in discourses and how social systems, policies and institutions make them true (Robbins, 2004). Additionally acknowledged by Peet et al. (2011) is that discourses provide specific causations and empowers and disempowers different actors. Therefore, behind every story is a narrative of political and social control.

Within the debate of political ecology, an often criticized aspect is the focus on discourse as a primary tool for discussing environmental science and politics. The importance of the analysis of discourses should not be denied. However, concerns state that this leads to distraction from the material or biophysical agency. An in depth examination of this issue is essential because environmental policy is based on the belief that explanations and scientific accuracy have already been established (Forsyth, 2003). Also Peet et al. (2011) acknowledge that ideas are insufficient for change, but in addition a material system must be addressed. The inclusion of materiality provides the option to say something about material practices of actors involved in environmental problems (Bryant & Bailey, 1997).

Combining a discursive analysis with the understanding of an ecological reality is, according to Forsyth (2003), an essential approach to analyze environmental change.

This research contributes to the notion of a politicized environment by applying political ecology to the promotion of jatropha in order to elucidate the 'chain of explanation' (Blaikie & Brookfield, 1987) of social, environmental and political processes and on global, national and local scales. The assessment of this process will be estimated by applying concepts of (1) environmental discourse to elucidate narratives, agency and power relations in the process of policy-making, (2) embedded autonomy to illustrate the institutionalization of the private sector in this promotion and (3) territorialization to describe the material and social outcome of environmental change.

2.2.1 Narratives and Power of Environmental Discourse

Global environmental problems are defined dominantly by international and national environmental policy and action. The link between international aid through Multilateral Organizations (MLO) and other Non-Governmental Organizations (NGO) has facilitated socially and environmentally disruptive policies and practices in developing countries. Hence, much of this environmental change associated with state policies is partly attributed to such interstate cooperation (Bryant, 1992). Besides policy-making the attempt to address environmental change on a local level is mainly neglected (Adger et al., 2001). By setting priorities on the practices of the State, policies help to structure discourses about environmental change and are crucial in order to gain a comprehensive understanding of the politics involved in such processes. However, these policies do not develop neutrally they result from different power relations and struggles between competing actors seeking to influence the formulation (Bryant, 1992). Investigation of these environmental discourses is a form of deconstruction and questioning dominant 'truth' claims (Robbins, 2004) by applying the actor-oriented approach as a structural tool in order to elucidate narratives, agency and power relations of involved actors.

Many political ecologists adopt the concept of environmental discourse in order to identify how dominant perspectives on certain domains are perceived by various actors, to explain environmental change and the relation to policy-making. For example, Fairhead and Leach (1996) falsify the dominant discourse of blaming the locals for impact of shifting cultivation as and the main cause for the destruction of forests by combining historical methods with paying attention to local perspectives. Adger et al. (2001) identify and compare major discourses associated with global environmental issues of deforestation, desertification, biodiversity use and climate change. These are analyzed in terms of main characteristics, narratives and social outcomes and are framed within the general approach of political ecology by linking the underlying discourses of environmental change to policies and institutions. Different discourses contribute to a certain extent to policy-making however with discrepancies between simplification and the diversity of reality. As well Béné (2005) compares discourses and contributes to the ongoing debate on shrimp farming aquaculture. According to Béné, the concept of

discourse reveals itself as a particularly powerful tool when applied to the domain of policy process analysis. The analysis revealed the crucial role of science and scientific knowledge in shaping the policy debate and the network that links policy-makers and industry to support the adoption of a policy agenda which suits the interests of the most powerful within the sector.

The additional notion of a *critical* political ecology focuses on the co-production of scientific and political knowledge and critically assesses the variety of perspectives and knowledge in order to reveal different approaches to environmental improvement. The construction of environmental policies is dominantly based on scientific and political knowledge neglecting the biophysical and environmental reality. This might not contribute to a solution for the identified environmental problem and even constrain marginalized actors (Forsyth, 2003). In particular in an information-poor environment, which is dominated by a chronic lack of information on which to base policy decisions prevailing in Laos, the focus on different perspectives is essential. Hence, by elucidating the 'chain of causation', wider patterns of these explanations are obtained providing a clearer distinction of contextual knowledge.

In regard to the promotion of jatropha and the lack of contextual knowledge in Laos, the applied chain of causation explores and compares the purpose, justification and solution of provided interests and discourses of different actors. The focus on the political ecology discourse places the *purpose*, which is assumed to be political, central to social marginalization and environmental change will be adopted in this study. In order to present different perspectives of the obtained discourses, the *justification* for the purpose and the provided *solution* reveal a complementary picture. Supplementary to this approach focusing on actors on national level is the inclusion of the local perspective in order to overcome the discrepancies between simplification and the diversity of reality and relate it to policy narratives in order to recognize potential gaps. This again comes back to the inclusion of cross-scale dynamics relevant and essential within political ecology.

Environmental discourse is applied in this study as an approach to explain and structure the development of national jatropha activities and its contribution to policy-making in Laos. With regard to the involvement of international development aid in this policy formulation, the influence of this aid on the economic dependency as acknowledged by Phraxayavong (2009) will be analyzed. The collection of narratives, agencies and power relations of involved actors elucidates and explains the diffusion of jatropha promotion from the national to the local level. By placing the political purpose of this environmental change centrally, the deconstruction of the discourse explores the development and means of policies and state interactions in the context of jatropha promotion and is in line with the notion of a politicized environment.

2.2.2 Embedding the Private Sector

Within research on a politicized environment in developing countries, the role of the State is one of the main investigated actors. While states have grown in power over the centuries, the role as an environmental manager only served to enhance environmental degradation. A given reason is that states use their political power to promote economic development over environmental conservation (Bryant & Bailey, 1997). In light of globalization, interstate relations need to be framed in a broader context that implies the role of global capitalism. Cross-border interaction of global and national capitalism and the desire to attract foreign direct investment (FDI) by many governments, contribute to environmental change by seeking profit maximization, business growth and market control (Bryant, 1992). Therefore nowadays, in order to understand what is happening to the environment it is essential to understand the origins, development structure and dynamics of capitalism (Peet et al., 2011).

Next to the State, also a diversity of economic activities of local or transnational businesses of the private sector contributes to environmental change and plays a crucial role in the development of a politicized development. The growing power and influence of private business today is linked to the development of global capitalist systems and their role is the promotion of economic practices. Hence, Bryant and Bailey (1997) call attention to the importance of embedding the private sector as a crucial type of actor in analyses of political ecology. P. Evans (1995) provides the underlying structural basis for a 'successful state involvement' in industrial transformation. He labels it as embedded autonomy meaning that the provision of appropriate incentives for the private sector supports it to evolve and become strong enough to compete effectively on the regional and global market. This provides an interesting framework in order to identify relationships and interactions between governments and the private sector as emphasized as important actor and within political ecology. This emphasize is also encouraged in recent literature of political ecology. In light of capitalism Peet et al. (2011) acknowledge a change of focus from looking mainly at the discourse of environmental change to a deepening into the basic and structural causes which are receiving more attention within political ecology. Capitalist production systems destroy the environment with a clear purpose of making profit and profit means power in its multiple forms of control over other people. The increasing economic power of the private sector enables massive influence over political processes. This shift in attention to the role of the private sector is also reflected in more recent literature related to the Lao context. Barney (2008) acknowledges that the GoL attracts FDI, therewith increases its economic dependency and also lacks in institutional capacity to sufficiently deal with the impacts of the booming regional and global economy. Hence, the private sector is operating in a weak controlled and monitored business space, referring in particular to low land prices and tax incentives.

A critical point of incorporating embedded autonomy within a political ecology approach is manifested in the objective to develop a 'successful' private sector supported by the government. However, the term 'successful' is lacking the questions what governmental

structures are supporting the private sector development and under what specific social and environmental conditions. As already elaborated, business profit is mainly at the expense of the environment and less powerful people. Hence, this thesis includes the concept territorialization, which will be elaborated in the next section, in order to elucidate the influence and change of the environment and the people caused by the private sector.

The interaction of the GoL with the private sector i.e. foreign and domestic jatropha companies, is analyzed by elucidating the economic as well as socio-political incentives and feeding the broader discussion of economic transition. The focus will be on the private sector which is the key driver, next to the influential role of the GoL and international development aid, of jatropha developments in Laos. This will be analyzed in order to explore practices and interactions with the government and locals combined with the implications of a shadow economy as stated by G. Evans (2002) and Barney (2008) dominating the business environment in Laos. This provides input for discussion to what extent jatropha promotion is facilitated by the private sector and how approaches taken by the GoL and the private sector are supporting or constraining a shadowed economy.

2.2.3 Territorialization as Material Evidence

Scientific approaches to understand the development of the modern State are giving more attention to internal territorialization and natural resource control. So far, the focus was on the spatial distribution of activities with little attention to the State's territorial strategies in controlling people and their relations to natural resources (Vandergeest & Peluso, 1995). According to Vandergeest and Peluso (1995) 'territorialization is about excluding or including people within particular geographic boundaries, about controlling what people do and their access to natural resources within those boundaries.' (p. 388). Hence, by including the notion of materiality, it provides the option to say something about material practices of actors involved in territorialization processes (Bryant & Bailey, 1997). These processes are framed in something people do and can be perceived as a set of practices that describe the problem (Peet et al., 2011). It can be measured by analyzing the change of the biophysical agency, meaning land resources, from the perspective of different actors.

In regard to developments in Laos, land reform, resettlement policy and agricultural development strategy represent major instruments for the state to territorialize its power and to strengthen its control over upland populations and resources in particular (Lestrelin, 2010). The granting of land concessions is considered by the GoL as a tool to make un- or underutilized land productive and is in line with a number of other policies (Hanssen, 2007). In this case, granting land concession is analyzed as one instrument of the GoL to territorialize its power and control as well as to create new political and economic zones. Considering that concessions are one aspect of a much broader process of territorialization and production of new patterns of marginalization, this thesis aims at investigating the agency of granting jatropha land concessions as a tool to influence state

power and controlling rural population and resources as well as analyzing the creation of a new form of poverty due to agricultural transition as acknowledged by Rigg (2005). In addition, this study will explore how the rural population in particular, but also other actors, respond to the reorganization of land and are able to intervene in these structures by making use of their agency.

2.3 Conceptual Framework

Influenced by the approach of political ecology the conceptualization of the promotion of jatropha in Laos combines a discursive analysis with a material analysis. On national level a variety of interests are manifested in policy narratives influencing and shaping the local level and revealing social as well as material outcomes. In addition an institutional analysis of the private sector unpacks the practices and interactions and outlines the importance to incorporate a cross-scale analysis in regard to the influence on a variety of scales. Figure 3 below describes the conceptualization graphically and consists of two main parts. The upper and the lower part are reflecting the national and local level respectively, these together account for the material outcome of jatropha promotion as part of the process of territorializing new economic and political zones.

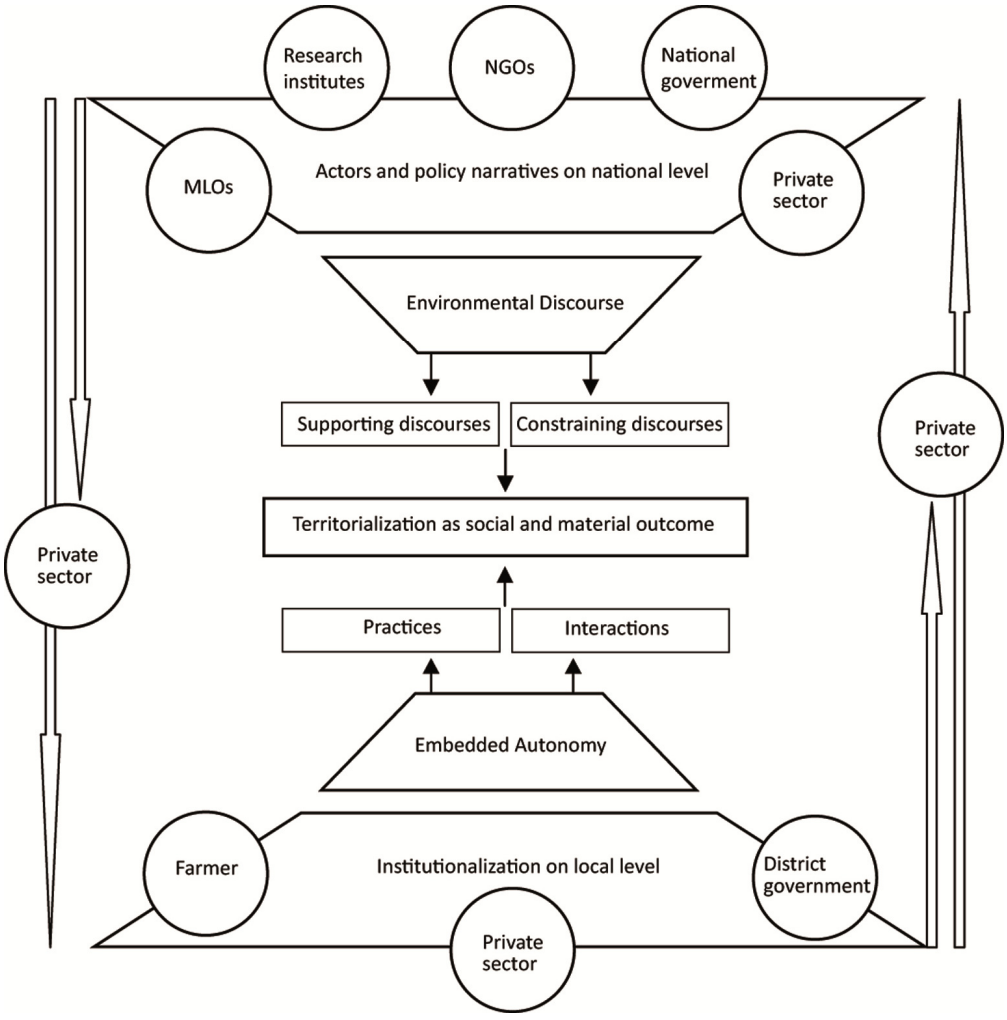


Figure 3 - Conceptual framework

The upper section, presenting the discursive analysis, shows that *environmental discourse* combined with the actor-oriented approach is applied in order to present an actor-profile including strategically used discourses to establish interests. A variety of *actors* are contributing to the process pursuing different interests manifested in political backgrounds. Thus, narratives on national level are received by governmental and research institutions, the private sector, MLOs and NGOs. Based on a comparison of these interests, supporting and constraining *discourses* are obtained separating the actors in two positions. The elucidated discourses are translated into local context and are influencing the material and social outcomes of *territorialization*.

The lower section, incorporating the material analysis, will provide an overview of the actual situation in the field, applying the concept *embedded autonomy* by analyzing practices and interactions of the private sector. Extending the actor-profile obtained on national level to the local level, some key *actors* are still involved in the promotion of jatropha. A variety of *practices* are emerging on local level manifested in the degree of *interaction* between different actors. Large-scale and small-scale cultivation practices and the degree of relationship with national actors are influencing the contribution to *territorialization*.

The institutional analysis applying the concept embedded autonomy is presented by the arrows and the private sector circles in the graph. This emphasizes the crucial role of the private sector and illustrates the link between national and local level. The private sector is the only actor that spans across national policy to local implementation. This process is presented in both ways showing that the private sector influences and participates on national as well as on local level, incorporating different agency to move between levels in either direction.

2.4 Methodology

The collection of empirical information is the dominant method applied to gain data and mainly consists of semi-structured in-depth interviews conducted with actors on national and local level complemented by secondary literature. Because of a restricted time frame information on provincial level could rarely be collected and is neglected in this thesis but does not imply that actors on provincial level present a minor position. Hence, the national level provides the arena for the first research question and the local level, referring to district and village structures, the arena for the second research question.

On national level the participation in consultation meetings with actors involved in the formulation of the REDS provides the basic input to answer the first research question. Interviews and secondary data were collected in order to receive an overview of interests manifested in a variety of discourses and the relation to the political background. In addition representatives of MLOs and NGOs were interviewed partly by face-to-face interviews and partly by personal communication in form of emails. Direct actors were

identified by talking to major actors in the field of jatropha promotion and researching in reports, studies and newspapers to identify other direct but also indirect actors.

In order to answer the second research question, three field trips provided insights on local level. Each trip lasted of about one week and was designed to gain a complete picture of practices and interactions of the private sector involved in jatropha promotion in three different target areas in Laos.

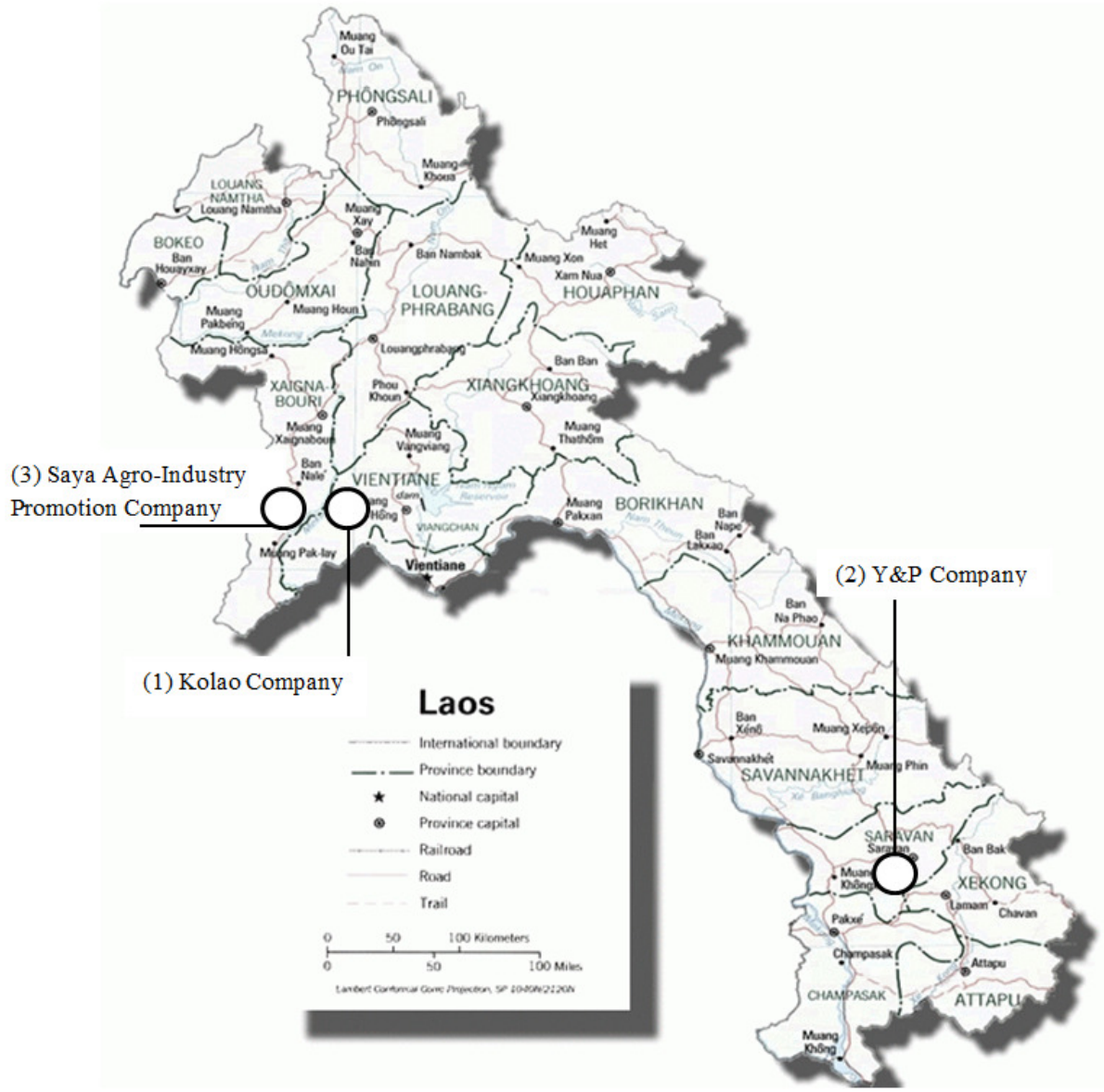


Figure 4 - Location of case studies (Google Maps, 2011)

The target areas were chosen based on different reasons: The first case study, (1) Kolao Company in Met District, Vientiane Province, was selected because Kolao is the biggest and most active jatropha company in Laos and a representative case for large-scale jatropha plantations. An inventory of large-scale land concessions in Vientiane Province was just conducted and Met District showed the highest amount of jatropha plantations.

The second target, (2) Y&P Company in Tateng District, Salavan Province, was chosen because of an available thesis focusing on this company in 2008 and hence it was assumed to be of interest to analyze its development. Furthermore, Y&P presents different cultivation practices than Kolao and is active on small-scale. The third case, (3) Saya Agro-Industry Development Company, Paklay District, Sayabouly Province, was chosen because it is a promoter of jatropha on small-scale incorporating the farmer with 2+3 contracts[3]. In regard to evaluating and comparing these cases, the Kolao case, mainly involved in large-scale cultivation, will be confronted with the two other small-scale cases. These comparisons provide insights in how scales of cultivation practices and interactions influence and modify the contribution to environmental change.

There are a variety of scopes and limitations in regard to this research. The research was conducted within a six month time-frame combined with working at the Lao Institute for Renewable Energy (LIRE). This provides on one side helpful and interesting insights because of the strong network and expertise of LIRE in regard to renewable energy developments in Laos, on the other side it is difficult combining work and research due to different perspectives of each scope.

The author already gained several years of working experiences in Laos having been involved in a variety of projects and organizations and hence is familiar with the Lao culture and context. The ability to speak the national language, Lao, supported the collection of information without requiring a translator and hence reduced misunderstandings and misinterpretation. Furthermore, it created a pleasant environment and actors showed interest in sharing information and knowledge. However, in regard to the multi-ethnic environment prevailing in Laos, in particular in rural areas, interfering with people from ethnic groups is challenging and requires patience and time.

Three case studies cannot reflect the situation of the whole country it only provides a snap shot hence the external validity of this research is low. Thus, in-depth data was collected combined with observations and complemented with national and international literature in order to reduce this limitation. The amount of interviews conducted with representatives of MLOs and NGOs was limited and might not reflect the complete involvement and objective of international organizations in Laos. Despite other limitations of difficult accessibility of rural areas, the information-poor environment in Laos and time constraints, this research still consists of a valuable amount of information to provide insights in the development of jatropha on the national and local level as well as within the broader Lao context.

2.5 Conclusion

Political ecology provides the broader theoretical framework of this thesis by placing environmental change induced by the promotion of jatropha at the center of research. The

[3] 2+3 contract farming refers to each contribution of the farmer and the company; 2 refers to land and labor provided by the farmer and 3 to plant material, technical input and a market secured by the company.

combination of a discursive and a material analysis are manifesting the two research questions. Thus, the first research question elucidates actors and policy narratives and the second research question explores the social and material outcome. Emphasizing the cross-scale dynamics prevalent in the process of jatropha promotion, the institutional analysis of the private sector connects the discursive and material analysis.

The next chapter, guided by the first research question, provides empirical information about the variety of interests of actors and policy narratives differing in supporting and constraining discourses. Applying the concept environmental discourses will provide insights on how jatropha promotion is framed and influenced on national level. Thus, Chapter 4 explores the second research question by unpacking the practices and interactions of the private sector. The concept embedded autonomy structures the focus on the interaction between private sector, governmental authorities and farmers on the one hand and the various applied cultivation practices of jatropha on the other hand. The interrelation of the discursive and institutional analysis are both influencing and revealing the material and social outcome explored and guided by the concept territorialization.

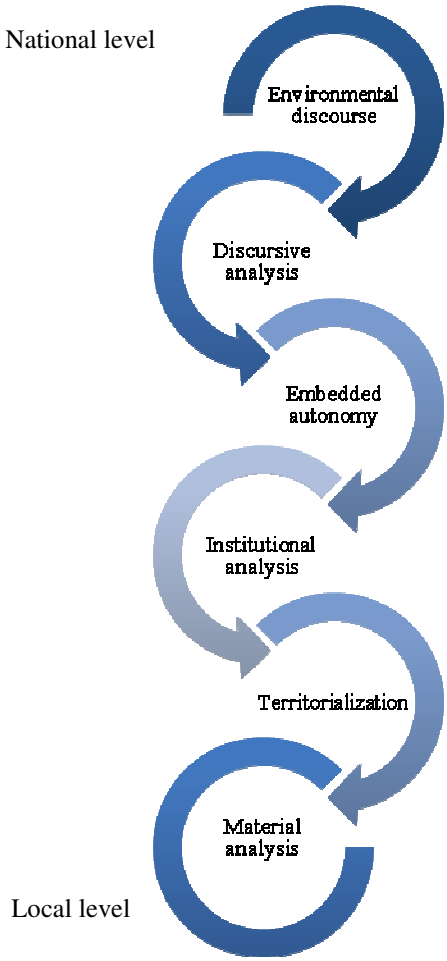


Figure 5 - Cross-scale analysis

Chapter 3: Actors, Policies and Narratives of Environmental Discourse

3.1 Introduction

This chapter will outline that promotion of jatropha is perceived differently by involved actors and can be understood by analyzing their political background and interests, manifested in dominant narratives supporting but also constraining the promotion. The collected empirical findings on national level will answer the first research question *"What actors are involved in jatropha promotion and how are discourses constructed on national level"*. In order to answer the question, this chapter is divided in two sections.

The first section presents a descriptive analysis of actors in order to answer the first sub-research question *"What are interests of involved actors and why do they promote or not promote jatropha"*. An actor-profile will be provided by explaining why governmental agencies, the private sector, research institutes and action research of MLOs and NGOs in Laos contribute or not contribute to a jatropha development. The applied analytical framework to elucidate the degree of involvement of each actor identifies the purpose, the justification and the solution in regard to the contribution based on each actor's political background. Hence, focusing on the purpose of either or not contributing to the promotion, the justification for the resulting action and the proposed solution for a sustainable implementation of each actor, reveals certain forms of interest and intervention. In addition to statements of actors, policies are an essential source to structure interest of involved actors and are providing insights of the political background dominating such processes.

The second section, after emphasizing the political interests and interventions manifested in statements and policy documents, elucidates dominant discourses that emphasize strategically reasons for these interests or disinterests. These findings are explored by the second sub-research question *"What are dominant discourses and how are these constructed by actors"*. As a main aspect of discourse analyses, the analysis of regularity in expressions will be applied to identify dominant discourses. These regularities in expressions are divided in supportive narratives, emphasizing opportunities of jatropha promotion, and counter narratives elucidating its constraints. In order to structure the collected narratives, the analytical framework used in the first section, focusing on the purpose, justification and solution will be applied. On national level, the main expressed supportive narratives are rural development and the reduction of energy dependency by the promotion of jatropha as a cash crop. This is contrasted by the constraining narratives, expressed in the concern to compete with food security and the utility of degraded land.

The presented findings are based on the collection of statements within two expert consultation meetings, wherein ministries and partly the private sector participated in order to contribute to the formulation of the Renewable Energy Development Strategy (REDS). Statements of actors involved in the meeting, the policy draft of the REDS and

related policy documents are main sources of information, complemented with interviews of representatives of ministries, jatropha companies, research institutes, MLOs and NGOs in order to illustrate the variety of interests in contributing to policy-making and hence, to the promotion of a jatropha-based biofuel sector development in Laos.

3.2 Actors and Policies involved in Jatropha-based Biofuel Promotion

The Government of Laos (GoL) promotes the development of renewable energies (RE) as an important component of the national economic development. Its implementation aims to ensure energy security and to reduce import dependency on fossil fuel, sustain socio-economic development and enhance environmental and social sustainability as it is acknowledged in the first REDS draft (GoL, 2010). Actors from different sectors participated in the formulation of this policy by attending expert consultation meetings[4] organized by the Ministry of Energy and Mines (MEM). However, the initiative of these meetings and the formulation of this policy in general are only partly due to interests of the MEM. The implementation to develop a renewable energy (RE) sector is donor driven by an external budget provided by the Finnish Ministry of Foreign Affairs. In addition, external consultants were hired to coordinate the formulation of this strategy in cooperation with the MEM. It is aimed to carefully implement the REDS ensuring social and environmental sustainability. Currently the strategy is still in its developing phase and will be further processed and completed in detail.

Actors from the governmental, research and private sector were invited to these meetings. However, the participation did not indicate a mutual interest in the formulation of a policy. This is derived by applying the analytical framework to identify purpose, justification and proposed solution of each actor in regard to the contribution to develop a jatropha-based biofuel sector. Focusing on these indicators provide a chain of explanation leading to a particular interest. Hence, it supports the deduction of an actor-profile and enhances the option to compare actors based on each purpose, justification and solution to support or constrain the promotion of jatropha. In addition, the particular role and interest of MLOs and NGOs, which did not participate in the formulation of the REDS, is presented and elucidated to provide a complete actor-profile and the related political interest.

3.2.1 Government of Laos

The GoL pays special attention to RE and sets a target of a 10% share of the use of biofuels by 2025 and regulates this development by formulating policies. Ministries and related departments, each representing different interests and pursuing different goals, are involved to various degrees in the development and consider the promotion of biofuels differently. Currently, several actors are supporting the finalization of a REDS draft which develops a RE sector - wherein the promotion of biofuels is addressed - in order to

[4] Two expert consultation meetings on the 23rd and 25th of November 2010 were organized and implemented by the MEM in order to formulate the REDS.

reach this target. Input for this strategy is based on former policy documents as well as supported by the expertise of actors discussing and finalizing the REDS in expert consultation meetings. In regard to the aspect that jatropha regulations are in its initial stage, the MEM is assigned by the Prime Minister's Office, to take over the leading position in the development of this sector. Hence, the MEM, in particular the Environment and Renewable Energy Division[5], is the main actor in promoting renewable energies in Laos with the main interest to formulate a policy to develop this sector. This was stated during interviews with an official of the MEM acknowledging the "need to have a clear strategy in order to promote biofuels without having negative impacts on livelihood and environment". This statement can be expected by an official involved in the promotion of a renewable energy sector and coordinating the formulation of a policy. But it also shows the initial stage of policy development due to a lack of specific content on the one hand, however underlines the openness to include a variety of expertise to ensure a sustainable implementation on the other hand.

Applying the analytical framework elaborating on purpose, justification and solution identifies that the promotion of energy security and import dependency of fossil fuels are prioritized purposes as acknowledged by representatives of the MEM and included in the REDS draft. This leads to the provided justification to reduce import dependency by sustaining social and economic development. Regarding the provided solutions, different options were discussed in the expert consultation meetings.

Discussions in the meetings mainly focused on suitable ways to implement the policy without having negative impacts on livelihood and environment however without including opinions of producers and how specifically it can improve rural incomes. The only comment regarding the importance to include the rural population, meaning farmers that are actually ensuring feedstock production and supply, was raised by the representative of the Lao Women's Union (LWU). She acknowledged that this strategy is still too vague and needs clear statements in order to ensure that locals are also benefiting of the implementation. This essential point was acknowledged but not further commented by representatives of the MEM. More common ground was actually found on jatropha cultivation on small-scale and as living hedges, to support and develop private businesses and smallholder associations by providing incentives and tax reductions, as acknowledged in the policy draft (GoL, 2010) and supported by all participating actors.

However, the solution to provide incentives and tax reduction is mainly driven by the private sector, so far there are no smallholder associations cultivating jatropha, hence this regulation would only benefit the private sector. This leads to the importance to assess and consider different power relations of actors involved in the process. Though, information based on policy documents and interviews are considered as not providing deep insights in power relations and hence cannot be assessed in detail. But it elucidates

[5] In 2008 the Environment and Renewable Energy Division under the Department of Electricity was established by the Prime Minister's Office due to high fossil fuel prices in order to develop a renewable energy sector.

different power relations between the involved actors. This unequal power distribution is also made visible by the fact that producers were not invited to the policy formulation. The LWU was the only participant referring to this absence, with no real attention given to this point by the other participants. This might be explained on one side by the difficulty to invite farmers living in rural and hardly accessible areas outside of Vientiane or, more realistic, the lack of interest to include the perspective of farmers regarding a potential disinterest to be involved in jatropha cultivation on the other side. Furthermore, no provincial and district authorities were invited in the formulation. It can be concluded that participating actors do already possess a certain extent of influence regarding the aspect that meetings were organized by the national government. Furthermore, the degree of active participation correlates to the degree of benefit each actor is gaining by the promotion of this sector. In regard to the donor driven development of a REDS by the Finnish Ministry of Foreign Affairs it biases the interest and role of the MEM. The MEM receives a budget and hence needs to achieve the set goals.

Besides the MEM additional ministries participated in the meetings. This underlines the significance to include diverse sectors in the development of this policy. As already addressed in the REDS, next to the leading role of the MEM, further ministries are assigned with particular tasks to push the development of this green energy sector. Particular key roles are developed for the Ministry of Agriculture and Forestry (MAF) and the National Land Management Authority (NLMA).

The official Agriculture and Forestry Development Strategy 2011-2020 (AFDS) acknowledges an increasing demand for biofuel feedstock but does not make a clear statement on its integration in the agricultural sector. Central interest, stated in policy documents as well as mentioned in statements during an interview with one official of the MAF, is the focus on the production of food crops with the main target to ensure food security. The ministry doubts that it is possible to ensure sustainable jatropha implementation to be in line with a livelihood and environmental friendly implementation. This is stated by an official of the MAF in an interview that “jatropha should be promoted only on small-scale, integrated in existing farming systems. Land has become scarce and compared to neighboring countries prices are very low in Laos, which increase vulnerability for locals and the environment”. This points to the difficulty to ensure a sustainable environmental and social implication due to the high amount of land needed to achieve the set target of a 10% biofuel share, which requires 2% of arable land based on the calculations of the external consultants. In addition, it is noted in the REDS that no arable land is supposed to be used for the cultivation of jatropha. It is referred that only degraded and unused land is recommended for the extension. These aspects will be outlined and challenged in more detail in the second section in regard to the degraded land use narrative.

The assigned task for the MAF, within the REDS, is to be the biofuel promoter and provider of extension service, acting on provincial and district as well as on village cluster level. In addition, production targets for biofuel feedstock should be developed on

district level and hence included in the MAF strategy paper (GoL, 2010). Considering the lack of knowledge on proper cultivation techniques of jatropha, as mentioned by consulted farmers involved in jatropha cultivation, the MAF is given an essential task for a successful development of the biofuel sector. Moreover, this knowledge gap was recognized by the Director of the MAF stating that neither material nor results of jatropha cultivation trials are available which makes it difficult to fulfill the task of providing extension service. The importance to extend the focus also on biofuels, in form of a potential cash crop for smallholders, was also acknowledged by him however, neither included nor picked up by the MAF in detail within policy documents. A potential reason for this disinterest in the promotion is that the AFDS was already officially released during the time of formulating the REDS. The content for developing the agricultural and forestry sector has already been elaborated before the MEM considered the development of a biofuel sector. Officials emphasized that food security and the promotion of cash crops, which are considered as suitable regarding climatic and biophysical conditions and included in the production target of each province, are of interest to the ministry.

As already pointed out by the MAF, another crucial aspect is the need to manage land resources in order to cultivate jatropha to meet the set target, with the essential requirement of a sustainable land allocation. This might be secured by carrying out participatory land use planning and local land use zoning assigned to the NLMA, another selected key actor, within the REDS (GoL, 2010). Currently, the NLMA is involved in a GIZ[6] funded and coordinated land concession inventory throughout the country in order to map all land lease and concession projects bigger than 100 hectares.

The interest of the NLMA is to provide land titles and to grant land concessions however, as well as the MAF, with no particular concern to jatropha concessions. The interviewed Director of the NLMA acknowledged that priority should be on the proper allocation of land nationwide, which requires time and resources. Furthermore, he pointed out that after the provision of an overview of the use and availability of land, suitable land for jatropha cultivation could be identified. Though no specification on potential characteristics to identify suitable land is neither provided nor included in other policies. The decree on land concessions only acknowledges that the NLMA and its line agencies are responsible to ensure the use of waste, denuded and barren land and degraded forest (NLMA, 2009a). However, interviews with the District Land Management Authority (DLMA) identify a lack of knowledge and responsibility on district level in regard to fulfill these tasks and to ensure sustainable land use.

Referring to the REDS, the purpose of the NLMA to interfere in the development of jatropha promotion is to ensure an effective use of land for the cultivation of energy crops. Currently, as already addressed above, the NLMA is conducting an inventory of land use and concessions nationwide, but with no particular focus on jatropha. However,

[6] In January 2011 GIZ (German International Cooperation) was formed by the merging of GTZ (German Technical Cooperation), DED (German Development Service) and Inwent (Capacity Building International, Germany).

it needs to be admitted that concessions with agricultural activities are mapped, with a declination of crops, hence mapping out also jatropha plantations. Though, in regard to a difficult accessibility of these plantations located in rural and remote areas, data about locations of the plantations are measured only and the complete size of the plantation is not provided. Information about the total size of each plantation is based on information in documents provided by line agencies or jatropha companies however these figures are differing and are partly not complete. This underlines again an unclear task of the DLMA and a lack of human and financial capacity in the field, as mentioned by the Vice Director of the DLMA in an interview, to fulfill these tasks adequately.

A well jatropha companies showed a disinterest in the provision of a land overview. During a field trip it turned out that concessions for jatropha are granted on large-scale though not all land is cultivated with the crop. It can be assumed that land speculation is a potential reason however this aspect cannot be proofed further. Another disinterest in a transparent land mapping of the private sector might be that jatropha is cultivated as a cash crop. Contradicting a popular discourse that jatropha grows on marginal lands the site manager of Kolao, who is involved in jatropha cultivation for more than four years, acknowledged that the higher the quality of the soil the higher the yield. This identifies a reason for the disinterest in ensuring the use of denuded or degraded land for jatropha plantations.

Besides these elaborated ministries, other agencies are also addressed with specific tasks in the REDS, such as the Ministry of Planning and Investment, the Ministry of Finance, the Ministry of Industry and Commerce, the Ministry of Public Works and Transport, the Ministry of Information and Culture and the Ministry of Education. However, these were only partly participating in the meetings and showed no interest in developing a RE or more specific a jatropha-based biofuel sector, as could be taken from either not participating in the meetings, or contributing to by statements or addressing related issues in policies.

3.2.2 Private Sector

The involvement of the private sector in jatropha business is correlating with the world oil price. In 2007, when the oil price started rising the amount of jatropha companies increased however most business activities failed and in 2010 not many companies were left, as summarized in table 1.

Table 1 - Overview jatropha companies: Comparison between 2007 and 2010

Company	Source 2007	Size (ha) & Location	Source 2010	Size (ha) & Location	Business Status
Kolao	(Jelsma, 2008)	240,000 ha nationwide	Interview Director	240,000 ha nationwide	Extension of cultivation
Y&P	(Jelsma, 2008)	100 ha Sekong	Interview Director	45 ha Sekong	Crop diversification
Saya Agro-Industry Promotion	Unknown	unknown	Interview Director	2,350 hhs Sayabouly	Small-scale and hedges
Agriculture Handicraft Promotion Association	unknown	unknown	Interview Director	1,540 ha Savannakhet	Small-scale contract farming
Xaisomboun Agriculture Development	(Jelsma, 2008)	100,000 ha nationwide	Phone interview with employee	2,200 ha Vientiane	Business failed, seeking for new investor
Phetdala Agriculture	(Jelsma, 2008)	1,000 ha Salavan	Phone interview	Unknown	Business failed

Kolao Farm & Bio-Energy Co., Ltd (Kolao) is the largest and most active jatropha company in Laos and the only private company that participated in the formulation of the REDS. The Korean-Lao Company was established in 2007 due to a degree of the GoL to push the renewable energy sector in the country. With the primary focus on jatropha, the company established plantations in six provinces along the Mekong River referred to as 'the Mekong Jatropha Belt'[7]. This widespread business network and the "close cooperation with the Lao government", as highlighted by the Director of Kolao in an interview, place the company in a leading position and represent the main actor in actively contributing to the development of a jatropha sector. An additional interest in the promotion of jatropha is based on the engagement in the automobile business and hence connected to the potential utility of biofuels.

According to the Director, the main purpose of promoting jatropha is rooted in good business opportunities. In addition, the aspect of being supported by the GoL in form of tax reductions and subsidies included in the REDS are essential and next to positive business expectations an important purpose for investing in jatropha. This business is considered by the Director to have a good perspective to develop probably in the country due to the increasing oil price, a high feedstock demand and crop suitability in regard to biophysical conditions in Laos. Furthermore, the company already established a processing factory to produce jatropha-based biofuel which, however, runs under its capacity based on a lack of a continuously feedstock supply. So far, the production is only export-oriented due to a lack of capacities for the utilization of jatropha oil within the country.

[7] The "Mekong Jatropha Belt" refers to six Northern Provinces along the Mekong: Vientiane, Sayabouly, Luang Prabang, Oudomxay, Bokeo and Luang Namtha Province.

Besides the MEM, Kolao is an essential actor in the promotion and the most important one of the private sector. However, this is not the case within the formulation of the REDS. Kolao provided insights to difficulties due to a lack of labor, but did not provide deeper insights about business strategies. The company supports aspects stated by the MEM, however, does not make additional interests explicit. Kolao already established an intense relationship with the government and mainly ensured a monopoly position in jatropha business throughout the country.

There are more private companies involved in jatropha business (as identified in table 1), but these did not participate in meetings to finalize the REDS. The main reason is that these companies are operating in different provinces and are smaller and less powerful. This does not reduce the importance and will be addressed in detail in Chapter 4, focusing on the institutionalization of the private sector on the local level.

3.2.3 Research Institutes

Jatropha cultivation as a potential, high-yielding cash crop is still in its initial development stage in Laos and requires research on agricultural issues as well as on further production and utilization of the oil. There are several research institutes that could, according to their mission and policy, be involved in research on the crop and jatropha-based biofuel, although in practice there are only a few and the scope of research is limited.

The National Agricultural and Forestry Research Institute (NAFRI) acknowledges in its strategy that jatropha, as a booming crop, needs more detailed research however there is no detailed outline under what specific conditions. The focus is only on the increased productivity and identification of supporting technology (NAFRI, 2008). Within the REDS the role and task of the NAFRI is not explicitly addressed (GoL, 2010). During the expert consultation meeting, representatives of the research institute were not present and according to the organizers no research on jatropha is currently conducted at the research institute. The author attempted to contact the research institute a few times however NAFRI did not show any interest to provide insights. Hence, it is inferred that NAFRI is not interested despite including jatropha promotion in its strategy. This, although, is not conclusive because no primary information of representatives of NAFRI was received. Also interesting is that not even the REDS acknowledges the need of the research institute to conduct agricultural research on jatropha.

The Lao Institute for Renewable Energy (LIRE) is a government-authorized non-profit organization with the aim to explore renewable energies and is investigating the potential of biofuel crops since 2006. Particular focus, next to researching the potential use of other feedstock sources, lays on jatropha as the crop itself is familiar to Lao farmers due to its long but wild existence in Laos (LIRE, 2011). LIRE is consisting of national and international experts and interns in order to develop a renewable energy information platform among others for Laos. Some research focused on breeding trials on different

test fields however these did not continue due to a lack of financial support and human capacity.

Currently, the main research on jatropha is project-related and hence differs in location and scale, implementing two biofuels projects. One project is a detailed assessment on the viability and opportunity of bio-diesel production and utility on district level and the other implements a feasibility study on biofuels production for rural electrification on village level. These projects are designed by foreign organizations, including LIREs expertise and experiences in the formulation of the context, with these organizations determining the research scope and commissioning LIRE to implement the project.

Therefore, LIRE plays a leading role in providing background information and expertise on jatropha development, actively participated in the development of the REDS, and was contacted by the consultants of the REDS occasionally to gain insights in the work of the research institute. However, it lacks in providing basic data about proper cultivation techniques based on long-term research. In order to fill this knowledge gap, LIRE is interested in sharing knowledge and experiences with the private sector in order to extent the information platform for biofuels developments in Laos. In this context LIRE attempts to interchange information with Kolao and regularly invites the company. Kolao is attending these meetings but the provided information is limited and Kolao does not show own initiative for regular meetings or to cooperate. A potential reason for this disinterest is that Kolao does not see business benefits by cooperating with LIRE. Furthermore, it seems that Kolao did not understand the role and function of LIRE. LIRE is considered as a competitor and not as a potential partner for a mutual advantage of sharing information in order to jointly develop a biofuel sector in Laos.

Lao State Fuel Company (LSFC) has been designated the official testing organization for biofuels according to the Director of the Renewable Research Unit. In order to be approved, all biofuels will have to be tested by them. LSFC is also conducting research on a 15 hectare plantation focusing on different spacing and manure trials. However, currently major research focus is on cassava as a feedstock for bio-ethanol, due to a shift in actively involved companies in jatropha business as was pointed out by the Director within the interview. On the one hand this might represent a shift from the jatropha boom to a cassava boom, but on the other hand this might imply the increasing amount of investing companies and hence more demand for research.

The Renewable Energy Technology Institute (RETI) is conducting research on different renewable energy technologies and is established by the Prime Minister's Office. Main focus of the governmental institution is the production of jatropha oil and the conversion to biodiesel based on different seed varieties from a test field and from different locations within the country. The objective is to collect data by using the oil for internal trials. However, due to a lack of financial support by the GoL, data cannot be collected regularly and technical equipment is provided by international donors only as was acknowledged by the interviewed Director.

Acknowledging the importance of long-term research for a sustainable development of a jatropha sector, research institutes are actually situated in a more reserved position within the formulation in particular and the development in general. However, the availability of reliable long-term data about jatropha cultivation is still lacking. An example can be provided in regard to yield expectations. So far, these expectations are mainly based on experiences of other countries and there is no proper research on yield expectations under different climatic and soil conditions in the country. In regard to this aspect, the Director of Kolao was consulted and he provided the information that also Kolao does not conduct research. The Director even mentioned that calculations of yield expectations are based on internet research. The company calculates with 2 tons per ha, regarding proper pruning, weeding and fertilization as well as high soil quality. Comparing this figure with information retrieved of jatropha farmers of about 0.5 tons per ha, an essential gap between calculation and reality becomes clear.

Concluding, it is emphasized that research institutes are important actors in regard to a sustainable promotion of jatropha. Evaluating the role of research institutes based on policy papers and interviews identifies a disinterest of institutes that, according to mission and capacity, conduct research on jatropha and an interest of institutes that are involved to a certain degree. However, there is a lack in financial and human resources to conduct research on a long-term. Referring to the low availability of reliable data about jatropha, increases the essential need to contribute with further research, and is considered as a missing aspect in the REDS.

3.2.4 Multilateral and Non-Governmental Organizations

In 2007, correlating with the jatropha boom in Laos, several international organizations conducted action research and explored potential of jatropha promotion for local farmers. Hence, in order to complete the actor-profile the role of MLOs and NGOs needs to be elaborated. Although, following organizations were not present in the formulation of the REDS due to the withdrawing from mainly all jatropha activities. It is still essential to present their contribution on the actual discourse of jatropha promotion in Laos. There might be more projects and organizations involved in jatropha development however only reports of the following organizations were obtained to provide insights.

The Netherlands Development Organization (SNV) explored the potential to develop a biofuel sector in Laos. Several studies investigated different options and links with the private sector (Schill, 2009) however SNV concluded that there is very little evidence that Lao farmers are taking up Jatropha as a commercial crop. Unfortunately, further investigations in order to receive more background information were not successful, responsible contact persons involved in related projects could not be reached. The general statement that there are currently no large-scale jatropha plantations in Laos was shared by all contacted SNV representatives.

The ADB was also involved in investigations on the benefits of biofuels development in Laos and published a report focusing on the potential for the development of biofuels (ADB, 2009a) however further investigations elucidated, that ADB did not continue developing this sector. Unfortunately, also in this case, no additional information on potential reasons for withdrawing could be retrieved.

The Japan Development Institute (JDI) in cooperation with the Japan Bio-Energy Development Corporation (JBEDC) explored the potential of a decentralized biofuel supply chain in 2007. Results of the report were very promising and implications and recommendations reached from agricultural extension, governmental coordination and the promotion of large-scale plantations. In case of a small-scale biofuel production, the supply chain may be created but the price of biofuel is not on a feasible level without heavy subsides due to the relatively expensive production cost as assessed by the JDI (JDI, 2008). However, based on the information provided by a consultant of JDI in 2010, all pilot plantations of jatropha related to research were just stopped outside of Vientiane due to the poor growth at the site. At this moment, JBEDC does not have any jatropha fields and does not conduct research in Laos. JBEDC presently still focuses on jatropha research and relocated operations to Myanmar[8]. JDI is still active in Laos for policy advices in economic development at this moment.

The dominant discourse among the international development community in regard to the promotion of jatropha is explicit. Based on a variety of interviews with MLOs and NGOs, the main statement is that the jatropha boom faded away and no large-scale jatropha plantations are established. With regard to private companies, Kolao was the only mentioned jatropha company by the development community and described as the one with the biggest influence. However, business failed based on the expertise of the interviewed development workers, due to the oil crash and no real process was registered in regard to large-scale jatropha cultivations.

In general, all investigations of MLOs and NGOs stopped due to the conclusion that jatropha is not benefiting small-scale farmers and not supporting rural development, which is the priority of these organizations. An interesting finding, however, is that according to these organizations the jatropha boom faded away and no plantations are left. Though, based on field observations, there are still companies investing in jatropha development and even large-scale plantations are operated. Reasons for this misinformation are on one side, that these organizations are not interested in the development of this sector or shifted attention to other development projects and hence did not follow up on the general expansion of the biofuel sector in Laos. On the other side, the information-poor environment dominant in Laos evokes a lack of continuity of information on the development of all kind of activities in the country.

[8] Retrieved from interviews with business actors and the JDI, information was provided that a relocation of jatropha promotion to Myanmar is undergoing. Argued by the availability of unused and degraded land in Myanmar, this shift might identify a relocation of land acquisition.

3.2.5 Evaluation of a Broad Set of Interests

In order to compare and evaluate the degree of interest of each actor, the analytical framework focuses on elucidating purpose, justification and solution of each actor. This provides a helpful tool in regard to assess each actor's contribution to the promotion of jatropha. By its application, the chain of explanations identifies reasons for the purpose for either or not promoting jatropha, via the justification of the resulting action to the provided solution. Evaluating the analytical framework identifies that interests are not a coherent entity there is a broad set of different interests strategically used and rooted in a variety of purposes. Furthermore, the provided purposes are identified as main discourses that are on the one hand supporting and on the other hand constraining the promotion of jatropha.

Based on the analytical framework the analysis shows that the main actors who are interested in supporting the promotion are the Ministry of Energy and Mines and Kolao. It is interesting that the stated purpose, justification and solution are not coherent although these are not mutually exclusive. The main reason is that both actors have different triggers in order to become involved in jatropha promotion activities.

On the national level, the MEM is the main and only actor that is interested in the promotion of jatropha. However, regarding the donor driven development of the REDS, the interest and involvement of the MEM is biased. The purpose of the MEM is to reduce energy dependency and increase rural development. These purposes are in line with objectives and agendas of MLOs and hence budget is made available, in this case, by the Finnish Ministry of Foreign Affairs. Besides this prejudiced actor, the purposes of Kolao are based on business intensions as reason to promote jatropha. The company is involved in this business since long time and interested in extending and developing the sector. Facing the aspect that tax reductions and incentives are also on the agenda of the REDS formulation meetings increases active participation of Kolao.

The justifications, as well as the purposes, are rooted in different reasons, although are not mutually exclusive. The MEM justifies the promotion because it contributes to socio-economic development in rural areas. Kolao is promoting jatropha due to a high demand on the international market and its presumable crop suitability in regard to the biophysical conditions in Laos. Hence, investments of Kolao in the extension of jatropha activities are in line with the justification of the MEM that jatropha is contributing to socio-economic development. However, as will be elaborated on in the following chapter, discrepancies between statements and reality need to be considered.

The provided solution elucidates that the private sector is already much more developed than the governmental actor. Kolao is involved jatropha business since 2007 active in 2+3 contract farming and already established a processing factory. However, the MEM started to formulate the first comprehensive policy regarding a sustainable implementation only in 2010. This reveals the necessity to cooperate in the formulation in order to include

aspects and experiences from the field. The following table provides an overview of the major actors involved in the promotion of jatropha.

Table 2 - Purpose, justification and solution of major actors

Actor	Purpose	Justification	Solution	Interest
MEM	Rural development and energy security (external budget)	Reduction of dependency and socio-economic development	Develop a renewable energy policy for sustainable implementation	Development and coordination of a biofuel sector
Kolao	Business intensions (support of GoL)	High demand and crop suitability	2+3 contract farming and processing factory	Business expansion

Other governmental actors are the Ministry of Agriculture and Forestry and the National Land Management Authority, which are minor actors in the policy formulation representing a broad set of interests. Furthermore, these interests are differently stated in policies of the ministries and in the REDS which elaborate on the specific task of each ministry within the promotion process. These interests manifested in policy documents even differ from statements made in the meetings in regard to the position within the promotion of jatropha. Hence, the table below provides a direct comparison of the Agriculture Development Strategy of the MAF and the Decree on Land Concessions of the NLMA in regard to the detailed role within the REDS.

Table 3 - Purpose, justification and solution of minor actors

Actor	Purpose	Justification	Solution	Interest
MAF (Agricultural Development Strategy)	Rural development	Market-oriented cash crop production	Balanced production to meet food and energy security	Secure food security and promote cash crops, no particular interest in developing a biofuel sector
MAF (REDS)	Rural development	Energy security without competing with food production	Biofuel promotion, extension service and production targets	
NLMA (Decree on Land Concessions)	Effective management of land nationwide	No data available	Concessions only on degraded land including social and environmental impact assessment	Land use allocation, no particular interest on jatropha concessions
NLMA (REDS)	Effective use of land for energy crop plantations	Sustainable land use and reduction of conflicts	Develop policies, participatory land use planning and local land use zoning for energy crops	

With regard to the MAF, comparing the two main policy documents, the REDS which outlines an active role and the agriculture development strategy outlines a more reserved

role of the MAF, shows that the purpose and justification for the promotion are overlapping, though identifying a gap between the proposed solutions. REDS identifies the MAF and its line agencies as the promoter and provider of extension services but they are not included in the strategy of the MAF. Within the meetings, officials of the MAF stated that there is no interest in the promotion of jatropha due to competition to food production. This broad set of aspects is mainly influenced by a conflict of interests. The main target of the MAF is food security however also the promotion of a diversity of cash crops in order to increase rural development. Referring to this aspect, the MAF is contradicting in policy and statements. This influences the implementation of the policy because, according to the REDS, the MAF is taking an important role. The reason for this disinterest might be that the MAF is not included in the financial support to formulate this policy on one side and the lack of knowledge about jatropha plantation and experienced extension service on the other side. Furthermore, a main discourse that constrains the promotion is clarified due to this framework, the food security narrative which will be elaborated in detail in the second section of this chapter.

In regard to the NLMA, a similar position and interest is identified. The purpose of contributing to the development of jatropha is coherent in the REDS and the decree on land concession to manage and organize land resources. However, the particular focus on jatropha as the provided solution is not coherent. Within the REDS, the NLMA takes over an important role to make effective use of land for so called energy plantations by developing policies and conduct participatory land use planning and local land use zoning. The NLMA authority is coherent on this point however lacks in knowledge and interest regarding jatropha development in particular. This disinterest is mainly based on the discourse that constrains the promotion which considers jatropha development as a threat to the availability and use of degraded land. This narrative about degraded land use will be elaborated, as well as the food security discourse, in the following section of this chapter.

Research institutes, MLOs and NGOs will be neglected in this evaluation because they did not participate or were not included in the formulation of the REDS. Each perspective was already provided and presented within the specific section above. However, the described involvement in jatropha projects of some international development organizations was justified by the rural development and pro-poor discourse, as will be elaborated on in more detail in section 3.3.1.

3.3 Dominant Narratives of Jatropha-based Biofuel Promotion

After providing an overview of actors and specific interests and interventions manifested in dominant narratives that either support or constrain the promotion, this section outlines and analyzes the identified narratives in detail. By analyzing the statements within interviews, the focus on purpose, justification and solution helped to emphasize and structure these supporting and constraining narratives.

On the national level, dominant narratives to support the promotion are rural development and the reduction of energy dependency. Dominant constraining narratives are referring to the competition to food security and the use of degraded land for jatropha production. In addition, other narratives were elucidated however these are not as dominant and explicit as the above ones mentioned. The export narrative is an argument for jatropha promotion used by the MEM, which refers to potential export opportunities of raw material and/or biofuel with resulting revenues for the government and presumably the country. These export options are a crucial aspect for the implementation and export of biofuels and therefore is on the agenda of discussion and partly determined in the REDS but still in its developing stage. It is interesting that currently the majority of jatropha activities are based on export, just a small amount is actually processed and utilized in the country. It seems there are no regulations and export taxes in order to gain from these revenues.

3.3.1 Rural Development Narrative

The overarching national goal is to graduate from the Least Developed Country (LDC) status by 2020. In order to achieve the set aim, the GoL considers the eradication of poverty as a prioritized objective. The National Growth and Poverty Eradication Strategy (NGPES) is the strategic framework under which all of the government's future growth and poverty eradication programs will be developed and implemented. Within the strategy the idea is that hydro power, mining, tourism and agricultural industries receive highest priority for investments leading to economic growth and increased revenues. The private sector, domestic and foreign direct investment, is expected to be the prime factor in driving the economy. The NGPES acknowledges a particular focus to support and ensure a positive business environment. On micro level as mentioned in the strategy, in order to guarantee the transition from subsistence to commercial farming, farmers are assisted by governmental extension service to diversify cash crop production and hence secure rural development (GoL, 2003). In regard to the aims elaborated in the NGPES, the promotion of jatropha-based biofuel is in line with governmental objectives. Land concessions to cultivate jatropha are granted by the GoL to the private sector in order to encourage domestic and foreign direct investment and facilitate rural development.

Besides being an important governmental objective, pro-poor and rural development is a common goal and dominant terms manifested in projects of MLOs and NGOs. As already elaborated above, some of these organizations already focused on the potential of jatropha in order to benefit rural farmers and hence encourage rural development. These organizations produced many studies and reports about advantages and disadvantages. SNV made the statement that jatropha and related activities are not economic and environmental viable for local farmers. Other organizations, such as the ADB and JDI, also discontinued investigations presumably based on the same reasons. Evaluating the statements and the degree of involvement of these organizations conclude that Jatropha promotion is not benefiting the rural population in particular and therefore does not support rural and pro-poor development. The MEM is facilitating the development of this

sector and it is not clear to what extent these experiences are included in further activities related to the jatropha sector.

Pushing the development on national level, the promotion of jatropha as a cash crop is lacking support of governmental line agencies on local level. This is supported by the centralized governmental structure which leads to a lack of communication networks and infrastructure between the national and district level. As included in several policy papers to ensure extension service in reality there is a lack of knowledge as well as human and financial capacity. As already elaborated on in the previous section, the MAF is assigned to assist rural farmers in this transition process aiming at a more diversified cash crop production. In order to provide extension services more research needs to be conducted and awareness and responsibility needs to be clarified and strengthened. So far, the private sector is taking the leading role in the promotion with less support by the GoL than manifested in diverse strategy papers. The interest is to extent business activities, which can be in line with rural development, however without rules and regulations from the government the private sector has space for interpretation and no defined boundaries. This might lead to the exploitation of human and environmental resources, increasing benefits of the company and preventing rural development. These statements are summarized in table 4 below.

Table 4 - Rural development discourse from different perspectives

Rural Development Discourse	Purpose	Justification	Solution
GoL	Graduate from LDC Status	Jatropha is a potential cash crop	Provide extension service and business regulations
MLOs and NGOs	Explore jatropha production as potential cash crop	Jatropha not social and environmental sustainable	Discontinue engagement in jatropha development
Private Sector	Business extension	Invest in rural development	No intervention of government on district level

3.3.2 Energy Dependency Narrative

With regard to the requirement to import 100% of fossil fuels, the reduction of energy dependency is an additional supporting narrative in order to promote the development of a jatropha-based biofuel sector in Laos. The economy of the landlocked country without own petroleum resources and production is vulnerable to fluctuations of fossil fuel prices. Throughout the country fossil fuel is mostly used for transport with a growing demand due to the increasing amount of vehicles. In rural areas, however, diesel is dominantly used for lighting and electricity generation. This identifies a twofold utility of fuel, which is divided territorially in rural and urban areas: in the urban areas fuel is dominantly used for transportation and in rural areas where electrification rates are still low, fuel is used in generators for electricity production.

In line with the promotion of jatropha, this dependency is assumed to be reduced and the local production of biofuels for internal consumption could have substantial economic benefit in terms of foreign exchange savings. Surpluses can be exported with additional revenues for the companies and the government. This narrative is supported by the MEM to underline the benefit for all involved governmental ministries and institutions. The private sector, in particular Kolao, is supporting this due to export revenues and subsidies that might be implemented and benefits the company.

However, the counter aspect is still the available capacity to cultivate and process jatropha in Laos to fulfill internal and even external demands. There is only one processing factory established (by Kolao) which actually faces the problem of an unsecured supply of jatropha feedstock and hence operates below capacity. Export dominates the use of jatropha-based biodiesel due to a lack of utility capacity of the oil within the country. These aspects lead to the conclusion that this narrative is still far away of reflecting reality and is mainly a strategic tool to interest a variety of actors in the promotion. However, the majority of governmental actors are not interested and the low development stage of the utility and internal capacity supports a discontinuity of extending and promoting a jatropha-based biofuel sector in Laos. These statements are summarized in table 5 below.

Table 5 - Energy dependency discourse from different perspectives

Energy Dependency Discourse	Purpose	Justification	Solution
MEM and Private Sector	Reduce energy dependency	Jatropha biofuel for internal and external markets	Promotion of jatropha and regulation of business and market
Other Ministries	Low development stage of biofuel development	Lack of internal capacity to meet internal and external demand	Discontinued engagement in jatropha development

3.3.3 Food Security Narrative

In the center of biofuels debates are conflicts to ensure a balanced energy and food production as occurring in many countries worldwide. Addressed in various governmental policies, the first goal of the GoL is to approve and ensure food security through agricultural activities (MAF, 2010). The improvement of household food security receives special attention, as recognized in the National Growth and Poverty Eradication Strategy (GoL, 2004). Acknowledging the need to include new ways to ensure energy security, the GoL develops policies in order to support an appropriate balance in meeting food and energy needs however clearly pointing out, that in case of land related conflicts, food security receives priority (MAF, 2010).

The facts that jatropha is not edible, requires land for cultivation and yield correlates with the quality of soil, feed the dominant constraining discourse that jatropha cultivation is competing with food security. This concern is mainly pointed out by representatives of

the Ministry of Agriculture and Forestry and is in line with its policy to prioritize food security. As addressed above, the MAF is not focusing on jatropha as a potential cash crop for Lao farmers in particular. On the national level dominant narrative is, as stated by one official, that the "main worry is due to negative impacts of large-scale jatropha production on the production of food crops and main target is to ensure food security". The expansion of jatropha is, according to the official, reducing this security due to additional land and labor claims. Also on provincial level, food security and the achievement of production targets are arguments for not including jatropha in agricultural systems, as pointed out by the Provincial Agriculture and Forestry Office (PAFO) in Sayabouly the "priority is to ensure food security and the production of common cash crops which are already included in the production target". The primary focus on food security and not including jatropha in production targets leads to the conclusion that the MAF does neither show interest nor any kind of intervention in order to develop a jatropha-based biofuel sector based on the food security discourse.

This argumentation differs on district level. The closer to local reality, the more variation and openness does the District Agriculture and Forestry Office (DAFO) present in considering jatropha as a potential cash crop. The Director of the DAFO located in Tateng District made an interesting statement that jatropha could be a potential option, if a market and a stable price is secured however so far other crops (mainly addressed in the production target of each district) are more economic due to an existing market, good and stable income and experiences in cultivation from the farmers perspective. In a different district, jatropha is already included in intercropping systems with upland rice. This is not considered as a threat to food security acknowledged by the DAFO official in Met District but also not supported in terms of providing extension services. The DAFO official explains that this development is due to the promotion of jatropha by involved traders with no involvement of the DAFO. The trend to have a diversified crop production, points to the need on village level to cope with fluctuating market prices supported by the lack of proper contracts between farmers and traders.

Table 6 - Food security discourse from different perspectives

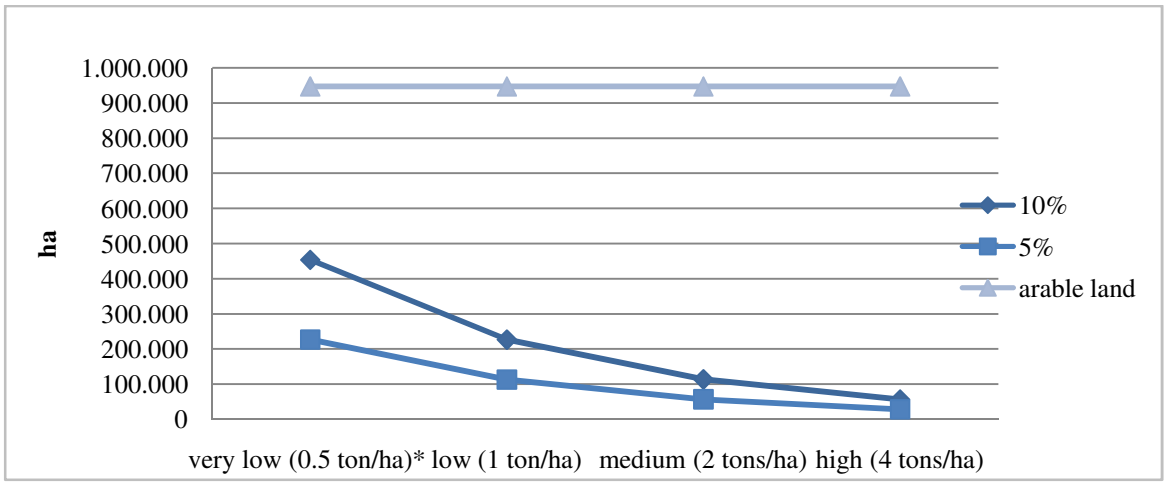
Food Security Discourse	Purpose	Justification	Solution
MAF and PAFO	No involvement in jatropha activities	Competition of large-scale jatropha plantations	No jatropha-based biofuel development
DAFO	Jatropha is a potential cash crop	Diversified production to ensure income	Intercropping and diversification are potential options, need for extension service

Table 6 above shows that on national level, the dominant discourse is that jatropha production is a competitor to food production and therefore is the major constraint for not supporting the promotion by the MAF and the PAFO. However, as revealed in interviews with the DAFO, which is closer connected to local reality, the need for diversified agricultural production to secure income of rural farmers is acknowledged. Though, next

to the acknowledgement no practical support for farmers is provided by the district line agencies with the main reason being a lack of knowledge on proper jatropha cultivation and of experienced extension services. Hence, the collection of narratives of governmental actors shows the uneven diffusion of jatropha promotion from the national to the local level and identifies a variety and nuanced interests of governmental actors located on different scales with providing a more precise reflection of local reality on district level than by national authorities.

3.3.4 Degraded Land Use Narrative

The Asian Development Bank (ADB) presents Laos as a country with "a great opportunity to capitalize on its advantageous climate and plentiful land[9] and labor to initiate a national strategy for renewable energy (ADB, 2009a)". This creates the image of a high availability of land and is in line with the encouragement of the GoL to attract foreign direct investment (FDI) by granting land concessions to foreign companies in order to facilitate economic growth. Precise figures about the total availability of arable land and its use or non-use are difficult to obtain in an information-poor environment dominant in Laos. However, calculations, prepared by the consultants of the REDS, provide scenarios of potential requirements of land dedicated to jatropha plantations including different yield expectations in order to achieve the set target of a 10% share by 2025. The consultants recommend a nuanced increase to achieve the set target hence a 5% target is added.



*based on yield calculations of farmers

Figure 6 - Potential land requirements of jatropha plantations

Figure 6 only provides potential scenarios because jatropha is not the only feedstock source, which can be used to achieve the set target. Though, it is interesting that yield expectations are higher than the real results obtained by farmers in the field nowadays. The represented peak amount of 454,000 ha, assuming very low yield expectations, accounts for 2% of the total amount of land (23,680,000 ha) available in the country. This

[9] The term "plenty of available land" is also used in World Bank documents, as well as in policies of the GoL.

seems to be a small figure however taking into account that the total amount of arable land account for only 4% (which equals 947,200 ha) of the total land mass (CIA, 2011), calls attention if jatropha promotion can ensure social and economic sustainability.

The National Land Management Authority is the primary actor that raises concerns about land availability. An official pointed out that the image of Laos being a land rich country is not true, all land is already used and other projects like mining, hydro power and logging are receiving more attention due to high revenues for the GoL. The aspect of competing sectors over land resources and power relations of different sectors are potential reasons for these ministries to be disinterested in the development of a jatropha-based energy sector. Further concerns are related to the land concession process, which is the task of the NLMA and its departments. The Director of the NLMA acknowledged in an interview that difficulties of land concession processes are a main problem due to the rushing of investors through the process. There are still no clear regulations which lead to confusion for locals. Another problem, according to the Director, is that still many villagers do not have land titles hence even villagers do not know the exact amount of used or unused land in the field which causes conflicts. The participatory land use planning project is currently implemented throughout the country however the overall provision of land titles is still undergoing and is requiring time as mentioned in an interview with the Director of the NLMA.

Besides these concerns, another narrative on classification indicators for land will be examined. Within the Decree on Land Concessions, the NLMA is authorized to grant concessions for agriculture and forestry business, as constituted in the articles 26 to 29 that "concession for industrial tree plantation or cash crop should be carried out in the area of waste land or denuded land and degraded forest land which cannot rejuvenate naturally" (NLMA, 2009a). A more specific definition about denuded or degraded land/forest is not given in the Decree, which increases the risk to ensure a proper implementation and provides space for misinterpretation. Social and environmental impact assessments are included as mandatory in the Decree to ensure social and environmental sustainability. In reality, these assessment studies however are often neglected, as was pointed out by the DLMA in Met District. In addition the Deputy emphasized that the department was neither involved in the identification of land suitable for jatropha concessions nor in mandatory social and environmental assessment studies. In this case officials of the Provincial Land Management Authority were involved in this process. The summary of the degraded land use discourse is presented in table 7 below.

Table 7 - Degraded land use discourse from different perspectives

Degraded Land Use Discourse	Purpose	Justification	Solution
GoL	Land resource rich country	Rural development due to Foreign Direct Investment	Environmental and social assessment studies; Land concession inventory
NLMA and line agencies	Land becomes scarce resource	Rushing of investors and lack of proper regulations	Secure proper implementation and monitoring

3.4 Conclusion

The interests of national actors involved in the policy formulation of the Renewable Energy Development Strategy reflect a broad set of interests which, in general, do not coincided with the political background. This policy does not develop neutral, though is a result of different power relations and struggles between these competing actors that seek to influence the formulation of the REDS.

The main actor on governmental level is the MEM which aims to implement the REDS. However, external funding and support are biasing the interest of this ministry. Other important ministries such as the MAF and the NLMA that should be, according to policies and objectives, politically interested in this formulation do not show interest. National research institutes are also taking a reserved role within policy-making. Although, research institutes that show interest are lacking financial and human capacity. MLOs and NGOs that are active in Laos already withdrew from jatropha investigations concluding not to be social and environmental viable. Hence, by elucidating interests of involved actors, it is concluded that the private sector, primarily Kolao which is the largest company, is the major trigger and most experienced actor in the development of this sector and the essential role of international funding is present.

The applied analytical framework identified major discourses that on the one hand support and on the other hand constrain the promotion of jatropha. These discourses are manifested in the political background of the actors however adjusted to different interests. Hence, supporting discourses are promoted by actors that are directly benefiting from the policy formulation. The MEM and indirectly Kolao are supporting the discourse that jatropha promotion encourages rural development and is in line with objectives of national actors. The additional supporting discourse elucidates the reduction of the energy dependency as a major benefit for the country.

The constraining discourse refers to the competition with food production by the promotion and extension of jatropha. This concern is mainly raised by the MAF since food security is the prioritized objective of the ministry. The additional counter discourse raises awareness about availability and utility of degraded land resources for jatropha cultivation promoted by the NLMA which is responsible for the sustainable coordination of land resources in Laos. Hence concluding, conflicts of interests of involved actors are manifested and emphasized in strategic discourses and dominate the policy process on the national level.

Chapter 4: Institutionalization and Local Reality

4.1 Introduction

The previous chapter identified the national level being characterized by a variety of involved actors representing by a broad set of interests. These interests are conflated in supporting and constraining discourses. In particular Kolao is identified as an experienced force in the process. As a result this chapter will focus on the private sector and elucidate realities of jatropha promotion with a specific regard to unpack practices and interactions of jatropha companies as well as other actors and assess the reflection of elucidated discourses on local level.

The involvement of jatropha companies with a particular focus on the relationships between company, government and farmers will be outlined in this chapter as well as how these are manifested in jatropha plantations. The presented empirical findings will be explored by the second research question *"What jatropha promotion strategies are exercised by the private sector and how are discourses translated into local context"*. In order to answer this question, this chapter is divided in two sections.

The first section aims to provide a detailed description of jatropha companies and agricultural cultivation systems by answering the first sub-research question *"What jatropha promotion practices are applied by the private sector"*. There is a variety of cultivation systems to promote jatropha reaching from large-scale plantation concessions, over a diversified cultivation system, to small-scale farming. The scale of these agricultural practices is manifested in the interaction between the private sector and the GoL on one side and the farmer on the other side.

In the second section, the derived conclusion will be assessed in detail by answering the second sub-research question that focuses on *"What are interactions of the private sector with the government and farmers"*. The question is answered by assessing the provision of social and economic incentives to the private sector in order to support its evolvement and effective competitiveness on the market. Hence, the concept embedded autonomy helps to assess and balance the degree of contribution of government and private sector to rural development in Laos.

In order to unpack practices and interactions of the private sector, a diversity of significant jatropha companies are providing empirical evidence in this chapter. Three different case studies located throughout the country are characterized by different forms of organization in regard to practices and interactions. The case of Kolao presents large-scale jatropha concessions that dominate the general jatropha situation in regard to authority and scale. The other two cases, the diversified system of Y&P Company and contract farming exercised by Saya Agro-Industry Promotion Company, represent small-scale jatropha cultivation with little authority and influence. First, the Kolao case will be presented in detail focusing on practices and interactions. Then the two small-scale cases are illustrated, concluding each with a comparison to the Kolao case. This comparison

supports the understanding of advantages of the influential Kolao Company on one side, but also identifies coping strategies of smaller and less influential companies on the other side.

Data was retrieved based on six interviews with officials of district line agencies in particular with the DAFO and the DLMA in the three relevant districts. Three interviews were conducted with the Directors of jatropha companies combined with informal chats with employees as well as field observations in each district. Furthermore, seven interviews and participatory observations with farmers involved in jatropha cultivation are empirical data sets. Complementary to this information are pictures and maps, which are providing additional evidence to prove a development caused by the promotion of jatropha plantations. In addition, governmental policy documents that structure business activities and relations are providing fundamental insights.

4.2 Practices and Interactions of the Private Sector

In general the power and influence of the private sector is growing due to an increasing promotion of economic practices supported by objectives and policies of the GoL. Up to date a handful of active companies are promoting jatropha in Laos, pursuing different missions and objectives. By identifying and comparing practices and interactions, an analytical framework is provided in order to categorize and evaluate different promotion strategies. To assess these concepts of 'practices' and 'interactions', sub-categories are established. In regard to the concept practices, two sub-categories are used as an analytical tool to present the empirical findings. First, the particular focus will be on the purchase and utility of land resources, elucidating land concession processes and cultivation systems. Second, the purchase and utility of jatropha feedstock will be investigated, focusing on internal market regulations and the actual processing of the crop. The concept interaction is applied to identify the decree of involvement of each actor and the relationships between these. Hence, first the awareness about jatropha activities and the provided incentives will be assessed from governmental actors. Second, the role of farmers will be investigated by focusing on benefits and disadvantages of jatropha cultivation. Complementary information to present a complete picture will be provided by elaborating on the role of the companies within this network.

Three case studies in different locations throughout the country are the foundation for the collected data based on interviews with directors and managers as well as with employees. The first study is about Kolao focusing on the branch in Met District. The activities are characterized by large-scale jatropha plantations based on land concessions. In depth data was collected during a one week field trip, consulting representatives of the company, involving line agencies and farmers. The second case study is about Y&P Company located in Tateng District as an example of a diversified cultivation system, intercropping jatropha with other crops. The third case study is about Saya Agro-Industry Promotion Company in Paklay District. This company is characterized by the promotion of small-scale systems involving farmers under 2+3 contracts. Examples of jatropha

plantations of these companies were visited, accompanied by company employees and farmers. A profile of each company will be presented below in order to assess to what extent promotion of jatropha is facilitated and approached by the private sector and the GoL.

4.3 Kolao Company

Kolao Farm & Bio-Energy Co., Ltd (Kolao) is involved in jatropha promotion since 2007 and active in six provinces summarized as the "Mekong Jatropha Belt". It is the largest jatropha company in Laos with 240,000 ha of jatropha plantations dominated by small-scale 2+3 contract farming, according to the Director. Kolao was already presented in detail in the previous chapter focusing on the contribution to the policy formulation of the REDS. However, in this chapter particular attention is given to the business activities of Kolao in Met District, one of the poorest districts of Vientiane Province located along the Mekong.

Currently, the company claims a monopoly in the district. This business status makes the Manager confident, as can be supported by his statement: "We have a monopoly and no problems, business is going well and we have plans to expand". In regard to the option to be the regulator of contracts and prices, Kolao is controlling all jatropha activities in the district. It is inferred that this confidence is also rooted in a deep relationship with representatives of the national government. The huge amount of land dedicated to jatropha concessions is additionally supporting this assumption. However, besides this optimism, the company also refers to some drawbacks of jatropha cultivation. Jatropha was planted in the southern Province Champasak but due to bad soil quality the company ceased from all jatropha related activities and sold the land. This already provides a tension that business, even if gaining a strong position as Kolao holds, is not the only regulating factor for success. Hence, the following sections will point out to other key elements of this business with regard to land resources, feedstock supply and interactions of actors.

4.3.1 Purchase and Utility of Land Resources

This section provides a particular focus on the purchase and utility of land resources by Kolao and elucidates different findings. Key findings are that the land concession process is still an un-transparent and inefficient process. Roles and objectives of involved actors are not clear. Another finding analyses to what extent the process on paper reflects reality and identifies certain gaps. There is evidence of deforestation in order to cultivate jatropha and granting concessions partly on upland rice fields. Hence, the elucidated constraining discourses on degraded land use and food security will be analyzed in regard of being a reflection of reality. Finally, a hidden discourse on actual cultivation systems - which again reveals the strategic use of discourses - is elucidated and promoted by Kolao.

Land concessions on paper do not reflect reality

Kolao received land concessions of 18,786 ha for the production of jatropha plantations in Vientiane Province. In regard to the study area in Met District, the inventory identified 8,286 ha of jatropha concessions, presenting the district with the highest amount of jatropha activities and hence a representative study location. This information is stated in the land concession inventory conducted by the NLMA in 2009. However, based on the conducted interviews with government officials, different information was collected. An interesting finding for Met District is that even if land concessions are obtained for 8,286 ha, it does not assure a transfer into land cultivated with jatropha. The land concession inventory report acknowledges that it was not always possible to access all plantations. In some cases, if accessible, just one GPS point was taken to identify the location of the plantation which leads to an unknown amount of the total size. This is reasoned by the fact that the team was unable to walk around the total area due to limited budget, bad infrastructure and time constraints (NLMA, 2009b).

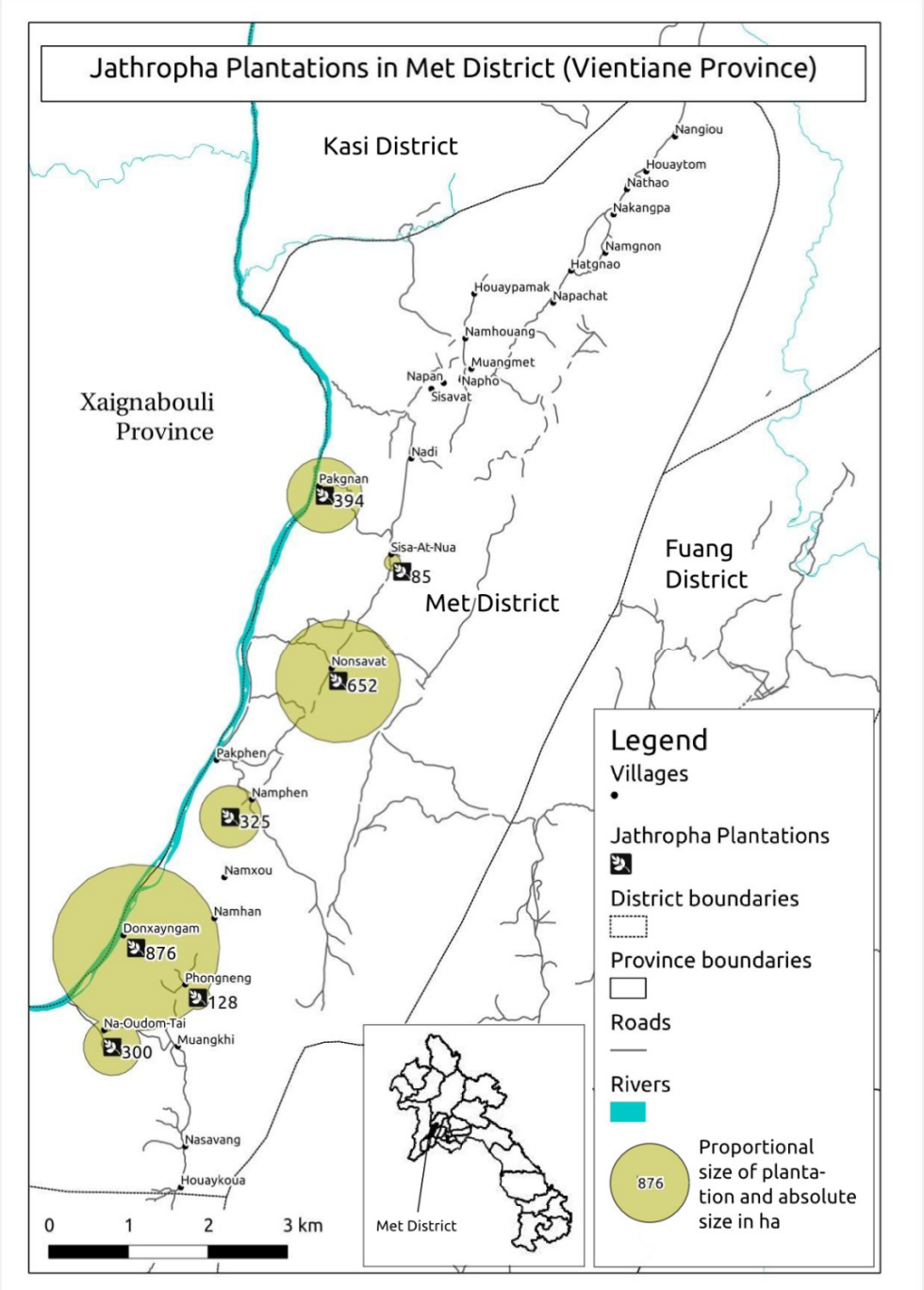
Based on observations and interviews with a representative of the District Agriculture and Forestry Office (DAFO) in Met District, discrepancies between sizes of jatropha plantations in this report and actual cultivated plantations are elucidated. According to the DAFO, only 2,076 ha are cultivated with jatropha in Met District. Verifying this information with Kolao was not possible because no clear data was provided on the actual cultivated amount of land. Based on these findings it is inferred that land speculation is a potential reason for this discrepancies.

Un-transparent and inefficient land concession processes

The GoL, in particular the Ministry of Energy and Mines (MEM), is cooperating with Kolao in order to achieve the set target of biofuel production. The intense relationship with the MEM is the main reason for the provision of a huge amount of land concessions for jatropha cultivation. According to the Manager of Kolao Met District, the company received land concessions for 8,286 ha to cultivate jatropha plantations, distributed over seven villages in Met District. This process was not transparent to the Manager because he was not involved in the procedure, hence he could not provide detailed information. Tasks related to land concessions are controlled directly by the head office located in the capital Vientiane, where the Director contacted the MEM to receive information about the availability of potential land. It can be inferred that Kolao has good relationships to the MEM and hence these are essential in regard to the purchase of land. When consulting the Director of Kolao in Vientiane, he did not go into detail in explaining the process of obtaining land concessions for this case. There is a lack of information, but still it can be inferred that Kolao has powerful relations to key authorities of different ministries.

The Decree on Land Concessions contains detailed regulations on the proper allocation of land concessions. According to the Decree, it is determined that concessions up to the size of 150 ha dedicated to agricultural business and tree plantations can be granted by the District or Provincial Land Management Authority. Everything from above 150 to 15,000

ha is explicitly granted by the NLMA only, with a duration of concession between 30 and 40 years (NLMA, 2009a). However, the land concession report identified that Kolao obtained approval for jatropha concessions which are larger than 150 ha as can be taken by figure 7 below showing that in five villages plantations exceed this benchmark. These plantations were granted by the Provincial Governor and not the national as stated in the Decree (NLMA, 2009b). Hence, it can be deduced that concession granting in this case was not conducted properly and can be considered as another evidence for inefficiency in the concession process.



Map-Layout: Stefan Sylla 2011

Figure 7 - Map of proportional plantation size in Met District (NLMA, 2009b; own data)

Furthermore, compensation for villagers is acknowledged in the Decree. It is noted that "in the case of agricultural land for planting industrial trees, compensation must be calculated and paid by adding the estimated value of the land to the estimated value of the trees or other plants planted on such a plot of land" (NLMA, 2009a). This definition is vague and creates space for misinterpretation. The compensation must be assessed with the participation of line agencies, local administrators, village chiefs and villagers being involved by preparing a written document which is signed by all. Village chiefs and involved villagers were interviewed in regard to compensation of land. In all cases, interviewees mentioned that no compensation was received by the government or the company. Furthermore, representatives of the village were not involved in the identification of potential land. The process was dominated by the company and governmental line agencies from the province. In Ban Nonsavat the village chief was involved to identify suitable land, but was not further incorporated in final decision-making. All interviewed village chiefs and villagers did not feel comfortable to disagree on this development mainly due to the representative of high government officials.

Translation of constraining discourses

Another important point that proofs inefficiency but also verifies an elucidated discourse is the doubtful use of degraded land for jatropha concessions. The Decree on Land Concession acknowledges that concessions should be carried out in the area of waste land or degraded forest land (NLMA, 2009a). The potential use of arable land for jatropha concessions regarding the lack of proper classification indicators was already identified as a dominant discourse constraining the promotion of jatropha. Furthermore, jatropha plantations are located close to the Mekong River which are areas consisting of soil with high quality. Translating this discourse of national level to local reality indicates the tendency that this discourse reflects reality to some extent.

Additional evidence for deforestation, besides statements of village chiefs and farmers, are pictures taken by the NLMA in 2009 in Ban Namphen where 325 ha of land concessions were obtained by Kolao. As can be taken from the pictures below, primary forest was cut and jatropha was already planted. The land concession inventory report (NLMA, 2009b) acknowledges that in this case land had been cleared not only on the approved area designated by the NLMA. It was mentioned that Kolao will be fined on this misbehavior, however it cannot be assured that this actually happens. This was also identified by Baird (2009) in regard to large-scale rubber plantations in Southern Laos, acknowledging that foreign investor and the political elite are the benefiting actors at the expense of locals and resources.

Figure 8 - Deforestation by Kolao in Met District (NLMA, 2009b)

The degraded land use discourse is closely linked to the food security discourse. According to statements of village chiefs and farmers, majority of land for jatropha plantations was covered with forest which was used for the collection of Non-Timber Forest Products (NTFP), an important source of nutrition and commodity for the rural population. Hence, it is inferred that jatropha land concessions present an indirect threat to food security. In Ban Nonsavat the village chief mentioned that concessions were even granted on upland rice fields. This development was also acknowledged by the Manager of Kolao. If concessions were granted on upland rice fields, mainly characterized by shifting cultivation agriculture, farmers received a lowland plot for paddy cultivation. It is inferred that this indicates a direct threat to food production. The involved farmers belonging to a variety of ethnic groups, however, did not complain because they received another lowland plot for the production of paddy rice. This required a high amount of labor and flexibility of the farmer to make the new plot productive. Hence, the discourse constructed on national level is translated into local context to a certain degree. This development is in line with another important objective of the GoL. Shifting cultivation is identified as the main reason for deforestation and hence prohibited by the government. In regard to the location of a variety of ethnic groups active in jatropha cultivation and affected by the plot change, the aspect of control over marginalized ethnic groups will be elaborated in the discussion.

Strategic use of discourse

Investment in agro-industry, mining and hydro power projects were increasing rapidly in the last years in Laos. The provision of large-scale land concessions to mainly foreign investors is in line with different policies and objectives of the GoL to support economic development and to graduate from the Least Developed Country status by 2020 (MAF, 2010). So far, large areas of land concessions have been granted primarily to foreign companies for plantations in agriculture and forestry.

An identified dominant discourse that constrains the promotion of large-scale jatropha is the concern of competition with food production. In regard to this competition, Kolao is officially promoting small-scale 2+3 contract farming, in order to reduce this threat, as was stated by the Director during an interview in Vientiane. The Director mentioned that Kolao started with large-scale jatropha plantations however changed this strategy after realizing that this is not working under Lao conditions. In reality there are still large-scale

plantations existing, as identified by this research. However, regarding the information-poor environment dominant in Laos mainly, detailed information about existing plantations is difficult to retrieve. Based on the collected information it is inferred that Kolao strategically promotes the discourse of small-scale jatropha cultivation in order to avoid negative image conflated with large-scale plantations among ministries and international organizations.

4.3.2 Purchase and Utility of Jatropha Feedstock

This section investigates the purchase and utility of jatropha feedstock focusing on internal market regulations and the actual processing of the crop. At first data will be presented on how Kolao is organized in Met District in regard to the planting and maintaining of jatropha plantations. By focusing on the internal market regulations an un-transparent economic chain is illustrated, showing contradictory statements mainly related to payments and yield expectations. The main threat for the unsecured supply chain is the lack of labor and the high dropout rate of farmers. Late or reduced payments and the overlapping of agricultural working peaks are main reason for this occurrence. Kolao pursues different strategies in order to reduce this threat making use of relations on the national as well as on the local level.

Business organization

Besides the need for land resources, the actual coordination of human resources by Kolao is interesting. The rural area in Met District, as it is in the rest of rural Laos, is dominated by bad infrastructure, mainly referring to a lack of proper roads, bridges and electricity supply, in particular during the raining season. Hence, a successful coordination of the business is essential to ensure an adequate feedstock supply in regard to seven involved villages distributed throughout Met District.

Kolao started jatropha activities by establishing a nursery of jatropha seedlings recruiting villagers of the targeted villages. The small plants were then distributed regarding size of plantation in the villages and planted on the fields. Based on the information provided by the Manager and endorsed by statements of farmers, written contracts between company and farmers were signed and revised annually. These contracts include the name of the employee, the tasks and the amount of payment. However, none of the farmers could present these contracts when asked for during interviews.

Besides the Manager who is located in the head office in Ban Nasavang, farmers are supported directly by four field managers located in different villages in smaller village offices. The tasks of the field managers are to advice farmers, to explain and control cultivation as well as to collect the harvested seeds and bring it to the storage room at the head office. In 2009 pruning was conducted on all jatropha fields and interested farmers received training courses which was stated by the Manager and confirmed by the interviewed farmers.

When harvest is completed and demand of the processing factory persists, jatropha seeds are transported to the factory located in Kentao District, Sayabouly Province. The factory was established in October 2009 by Kolao with the potential to produce 40 tons per day of Straight Vegetable Oil (SVO) retrieved from jatropha seeds. Feedstock from all jatropha plantations of Kolao is processed in this factory. In addition, Kolao seeks to buy seeds from farmers dependently cultivating jatropha. In this case, seeds are mainly retrieved from jatropha hedges, planted around fields and houses or wild jatropha plants growing in surrounding areas.

Un-transparent economic chain

The economic chain of jatropha cultivation and processing is not transparent. Kolao did not provide insights neither was it clear if the company obtained comprehensive information about it. Important prices for jatropha seeds and the actual price for the selling of jatropha-based biofuel could be provided. However, no expenses on employees, transport and other inputs were available.

A detailed calculation of the prices paid to farmers for cultivation, weeding and harvesting, were provided. Comparing these numbers with the actual payments farmers received, discrepancies in payments were elucidated. According to the Manager, in the first year of cultivation Kolao provides 2,500,000 LAK/ha for field preparation, including cutting, burning as well as cleaning, and planting jatropha cuttings. In the second and following years 400,000 LAK/ha are paid for weeding activities. These farmers also harvest and sell the pealed seeds to the field managers for 1,500 LAK/kg. This price is fixed by the company and paid in cash after completing work. Though, this information is contradicted by statements made by governmental officials and in particular by farmers. In an interview the Deputy of the Administration Office mentioned conflicts due to late payments or fewer payments than promised after completing work. An official of the DAFO supported this fact and added that there were also misunderstandings in regard to the selling of jatropha in form of fruits or seeds. This led to a disruption of harvest by farmers, also because the price of 1,500 LAK/kg was considered as too low.

In 2009 the production of seeds started and the Managers calculated that 14 tons were harvested. Comparing this amount of seeds to the actual cultivated area of 2,076 ha results in only about 70 kg per ha. The yield increased in the following year, Kolao noted that by the time of interviewing the company already stored 13 tons of jatropha seeds however harvest was not completed. Hence, according to the Manager the yield will be higher than the previous year but no estimate for the total yield could be provided. Comparing this figure with information stated by the Director of Kolao, he provided an estimate of two tons per ha, it seems that reality is still far away of reaching this estimation.

As already mentioned, Kolao established a processing factory where the collected seeds of Met District are delivered to. So far the capacity of the factory to produce 40 tons per

day is not reached. Up to date, raw material from own plantations to produce only 300 tons was delivered. This shows that the factory is not operating to its full capacity with the main reason being that feedstock supply is not adequate. Due to the fact that there is still no internal market, the produced biodiesel is sold externally. These businesses are based on personal relationships as the example shows. In 2010 Kolao sold 40 tons of jatropha oil to Indonesia for a price of 1,000 US$ per ton, reflecting a higher price than fixed by the world market price.

Lack of proper labor force

Labor is essential for the purchase of jatropha feedstock and a severe problem of Kolao in Met District. The Manager stated in the interview that the amount of involved farmers is fluctuating and it is difficult to keep a constant amount of labor employed. Currently, the main problem of the company in Met District is the lack of labor force to weed plantations and harvest jatropha seeds. In the end of November, while conducting the field trip, rice harvest is in its peak and potential labor is occupied with cutting and thrashing. After rice harvest, majority of farmers will be unavailable because of the harvest of job's tears[10], the main cash crop in this region. These agricultural activities, presumed as priority by farmers acknowledged in interviews, are overlapping with harvest peaks of jatropha. Field observations showed that ripe fruits are not harvested and weed was increasing on the plantation. Partly overripe fruits were on the ground and according to the Manager this already causes economic damage to the company due to a reduction of oil content and quality of the seeds caused by attacks of insects.

The lack of labor force, identified on local level and communicated to the Kolao head office in Vientiane, is considered as a crucial problem by the company. The company is trying to solve this problem on two scales. On national scale, Kolao cooperates with national representatives of the GoL which already offered the provision of new labor. So far, information of this strategy was not provided in detail, it is not sure from which provinces the labor will be activated, but it will be Lao origin. Again in this case, the deep relationship between Kolao and the national government is essential to cope with these problems. However, the Director of the company did not provide more details to make this hidden relation visible.

On local scale, the Manager and his field workers are mobilizing pupils of the neighboring primary school to help to overcome this labor shortage as a short-term solution. According to the Manager, labor is currently needed in order to reduce economic damages and to fill the gap until support is provided by the head office. The field manager of Ban Muangkhi contacted the Director of the primary school in order to discuss potential options. It needs to be noted that schools in Laos have one activity day per week where pupils are recruited for cleaning and gardening activities in the villages. Kolao and the school Director agreed on cooperating, and during the time of research,

[10] Job's tears belong to the species of *Coixlacryma-jobi* which is an edible grain-bearing tropical plant of the grass family.

about 200 pupils, aged between 12 and 13 years, were harvesting jatropha seeds. The seeds are bought by Kolao for the usual price of 1,500 LAK/kg, according to the Manager. The money is provided to the teachers in order to buy equipment for the school that benefits all pupils. This strategy is confirmed by observation. While located in the village, children were observed drying collected jatropha fruits in the sun in order to make the peeling activity of the seeds easier.

4.3.3 Interaction between Actors

This section identifies the decree of involvement of each actor and the relationships between these. Hence, first the awareness about jatropha activities and the provided incentives of governmental actors will be assessed. Second, the role of farmers will be investigated by focusing on benefits and disadvantages of jatropha cultivation. In both cases, complementary information to present a complete picture will be provided by elaborating on the role of the companies within this network.

Role of the GoL and line agencies

The GoL is represented by different ministries organized in departments and units. All these ministries are represented on provincial as well as on district level pursuing defined regulations and targets. These formulations in form of policies and strategies are conducted on national level with the aim that the implementation is administrated by provincial and district line agencies. However, the further away from the national level and the closer to reality, mainly the district agencies lack in awareness and support to implement these policies. This is also the case for power and decision-making capacity. The national level has more influence to make decisions and hence is a more important actor for Kolao in order to implement business. Due to this development, Kolao is mainly negotiating with ministries on national level in form of an intense cooperation with the Ministry of Energy and Mines. This relationship is reason for the provision of large amounts of land concessions, in addition tax reductions are provided by the Ministry of Finance to Kolao. This information was provided by the Director of Kolao however not confirmed by representatives of the ministry. Still, it is inferred that on national level ministries are aware of and support activities of Kolao. The provision of incentives is manifested in the support of land concessions and tax reductions.

On local level, the role between governmental line agencies and Kolao is different. An interesting finding is that this awareness and support is lacking on district level. Although, this disinterest is not presented by line agencies it is mainly by Kolao. This assumption is underlined by the initial business implementation of Kolao in Met District. Officials of Met District reported that in the beginning of establishing this business, only Korean representatives of Kolao were present in Met District. These Korean business men neither spoke Lao nor were trying to cooperate with governmental line agencies. In addition, in the beginning the main office was establishing in the district capital, where all line agencies are located. However, after some time, the main office changed location to

the southern part of Met District. Interviewing governmental representatives could not provide reasons for the move, this also point to the lack of awareness and knowledge about activities of Kolao from the perspective of district line agencies. However, the Director of the Administration Office explained that the new location is closer to economic institutions. Verifying this information, the Manager of Kolao supported this explanation and added that payments and other expenditures are now at lot easier to fulfill in cash. Thus, based on this geographical distance cooperation between district and Kolao, controlling and monitoring of the business operations decreased from the district perspective.

The business of Kolao can be described as a business dominated of the private sector and lacking in control and monitoring from the governmental side. Based on interviews with Kolao, the company does not require support from governmental line agencies. After receiving land concessions, the company prefers to work individually pursuing its own goal and strategy. If help is required, deep relation with the national government is more essential and reverts to when necessary. Based on the descriptions about Kolao and the involvement of the GoL in jatropha activities, it can be inferred that Kolao is the driving factor to develop a biofuel sector on local level. Regarding the implementation of large-scale plantations, Kolao obtains a better position to ensure feedstock supply and by claiming a monopoly it controls prices and labor conditions.

As already elaborated above, the relationship between Kolao and the GoL on national level is essential with no further insights how and based on what reasons this relationship is established and operated. Essential issues related to land concession and labor force are operated on national level without involving the district in these processes. This information is supported by interviews with the DLMA which was not involved in decisions about granting land concessions to Kolao. Furthermore, the DAFO only hardly communicates with Kolao and only receives data about jatropha yields by the company. Even the Manager of Kolao in Met District itself considers a relationship with district line agencies as not beneficial for the development of the company. Hence, interesting is that next to this essential but un-transparent relationship on national level a cooperation on district level is barely existing. Presented in interviews with district line agencies, this lack of awareness and capacity to implement and regulate policies is rooted in the unknown processes of policy-making on the national level.

Role of farmers

Income activities in rural areas of Laos are dominated by agricultural practices and nearly no off-farm income options are available. Market transition in direction to a largely cash crop oriented production is currently taking place however the production of food crops still receives priority by farmers. On district level the implementation of market regulations are lacking resulting in a poor negotiation position of farmers and make traders main beneficiaries. Although many farmers engaged in jatropha business with Kolao based on the provision of training courses for jatropha cultivation as stated by all

interviewed farmers. Furthermore, payments for the first year were very high compared to other common cash crops. These payments in the first year were acknowledged by farmers to have a positive effect on their livelihood, in regard to the purchase of food and the pay of school fees for children. Other stated reasons are that jatropha only needs to be planted once hence it reduces labor force. However, some mentioned that in particular harvesting is very time consuming due to different harvest intervals. But it is appreciated that husband and wife together with friends can mutually work on the plantations.

Main disadvantage from the farmers' perspective refers to payments. Comparing statements by Kolao, farmers and line agencies explores different statements. Inconstant information about payments in the first year of employment were provided referring to a higher amount of 2,500,000 LAK/ha stated by Kolao and a lower amount of approximately 2,200,000 LAK/ha by the farmer which will be split with around 10 farmers working together on the plantation. This causes a high dropout rate of labor with a result of economic damage for the company on one side but also waste of energy of farmers on the other side. Another big issue, rooted in miscommunication, was that farmers were not aware that payments are differing in the following years. The mentioned reason by Kolao that payments are reduced due to a decreased amount of work was not clear to farmers. Hence, the reaction was that all interviewed farmers discontinued working on jatropha plantations because payments were too low in the second year. The signing of contracts between the parties did not have consequences for the farmers. Thus, it underlines that farmers possess agency in order to make own decisions but still do not have enough to be treated as a mutual partner in business negotiations. The only option farmers have is just to stop cultivation, wasting energy and resources without any compensation. A general result of these aspects is that farmers loose trust in the company and are not interested in further jatropha cultivation.

A different positive point is that Kolao still acknowledged that a good relationship with farmers is important. This is lined out in the way how the company includes different ethnic groups and ethnic field managers. Based on the calculation of the Manager, 50% of involved farmers are Lao Loum, 30% are Khamu and 20% Hmong. In regard to the involvement of diverse ethnic groups, Kolao pursues the strategy to employ people of different ethnic groups as field managers in order to cope with different languages, cultures and cultivation habits. An interviewed field manager, who belongs to the ethnic group of the Hmong, acknowledged that this reduces conflicts between farmers and company and increases trust in the company by the farmers. This is an important point referring to the unbalanced relation between farmer and companies in general.

4.4 Y&P Company

Y&P Company is located in the South of Laos in Tateng District, Salavan Province and started to involve in jatropha business in 2007. According to the Director business is successful due to the availability of a good market. Jatropha business provides a good and stable price with little need of investment and labor. This situation is supported by the

monopoly situation of the company in the district. Referring to the interview with the Director of the DAFO, there used to be another jatropha promoting company. However, business failed due to low payments and hence farmers stopped cultivation.

The vision of Y&P is, according to the interview with the Director, to produce for the internal market however so far jatropha is produced for export due to a lack of an internal market. Hence, the company is dependent on the external market and raw material is sold to other foreign companies. Previously, seeds were sold for 3,000 LAK/kg to Kolao. Kolao takes over the role of a trader in this district and established a network throughout the country, in order to secure supply for the processing factory. However, if there are better options to sell seeds for a higher price Y&P takes the opportunity. The Director explained that since 2010 the company is interacting with a Thai company that purchases jatropha seeds for a very high price of 4,800 LAK/kg and processes the seeds to biofuel in a factory located in Loei District, North-East Thailand. This company prefers seeds of stone jatropha, a different variety of jatropha, because only 3 kg of seeds are needed to produce 1 liter of SVO, whereas in comparison 4 kg of jatropha is needed. Hence, Y&P Company included stone jatropha in the cultivation system. There are no contracts between Y&P and the Thai company however, the company provides training courses to the employees (not to farmers), focusing on different cultivation techniques.

4.4.1 Purchase and Utility of Land Resources and Jatropha Feedstock

Y&P Company is labeled as a jatropha company by all interviewed stakeholders. Similar information was provided by the Director of DAFO and Y&P Company that the company is cultivating jatropha on 45 ha. However, this information is contradicted by observation and field visits. Visiting the field, it turned out, that the company diversified its cultivation. The plantation reveals an intercropping system and next to jatropha, stone jatropha, coffee and maize are cultivated. According to the Director, the reason she mentioned to do intercropping is to be able to cope with fluctuating markets. Market prices are changing each year and there is no proper access to market information. Hence, the company reduces risks by investing in diversified income options to be able to supply various market demands.

Figure 9 - Intercropping system including jatropha, stone jatropha, coffee and maize

The 45 ha of land belongs legally to the company. Based on information provided by the Director, the land was owned by villagers and mainly rice was cultivated. However, the company legally changed land plots with the farmers. For the received plot the company provided the farmer another piece of land. According to the Director, the company has an official contract and pays land tax annually to the DLMA. Furthermore, the Director acknowledged that there were no conflicts in regard to these land changes, involved farmers agreed on the change and were satisfied with the received plot. It was not possible to identify farmers that were involved in these land change processes. The only information in regard to this issue was provided by the village chief of Ban Namkok. In an interview he confirmed the information provided by the company that the land belongs legally to the company. In addition he mentioned that this change was already conducted many years ago and that there are no conflicts up to date.

Compared to a study conducted by Jelsma (2008) who analyzed Y&P Company in its early business development, new information is representing a different situation. In particular the size of the plantations changed from 100 ha in 2007 to 45 ha in 2010. Whereas the 100 ha were claimed to be used for jatropha cultivation only and during this research it turned out that a diversified cultivation was applied by the company. Jelsma referred to conflicts between villagers and the company, however based on this research no conflicts were mentioned in regard to land. Main critique against the company nowadays referred to reduced payments and the involvement of children and elder people in weeding and harvesting practices as will be presented in the next section.

4.4.2 Interaction between Actors

The Director of Y&P stated that the company has a good relationship with the DAFO. This relationship is reflected in visits of the DAFO staff in order to collect information about crop and cultivation developments. The Director of the DAFO added that agricultural data is collected however no additional support is provided. Hence, the company is independently active in organizing and implementing business. From the governmental side, there are no restrictions or regulations despite the annual collection of land tax. Y&P Company is operating autonomously, receiving more support by the Thai Company than by governmental line agencies.

The company employs six field workers permanent however during working peaks of weeding and harvesting farmers from Ban Namkok and surrounding villages are hired to fulfill these tasks. These villagers are, according to the Director of Y&P stated in the interview, employed for 20,000 LAK/day conducting weeding and harvesting. This is less than the labor price of 25,000 LAK/day fixed by the government for the work of eight hours per day, mentioned by the Director of the DAFO. During working peaks the company employs 10 to 15 villagers, without proper contracts and mainly old women and children are involved in harvesting processes with, according to the Director, no problems between villagers working on the plantation and the company. This statement is contradicted by a villager providing her thoughts on Y&P Company. The women

mentioned in an interview, while visiting her at home, that she does not want to work for Y&P Company. She knows from neighbors that the company mainly employs children for weeding activities, because it is easier to reduce the price due to a weak negotiating position of children. Furthermore, she referred to other farmers working for the company receiving less than promised, about only 10,000 LAK/day than the assured 20,000 LAK/day. It is inferred that there are potential tensions in the relationship between the company and villagers.

4.4.3 Comparison to Large-scale Cultivation

This example of a jatropha company operating on small-scale elucidates some aspects which are linked to the strategy of Kolao working on large-scale. Y&P does not receive support from district line agencies. Business is running independently with nearly no cooperation with neither the district nor the provincial level. The company is making essential business networks based on own relationships with a foreign company and is not connected to any governmental intervention. However, as well in this case Y&P does not assess the involvement of the government as important. This is in line with statements of Kolao, district line agencies are not considered as supportive institutions. The link to the powerful national government does not reflect the case of Y&P Company, as it is an essential interaction between Kolao and the national government in order to possess large amounts of land for jatropha concessions.

Another reflecting aspect is that Y&P Company is only exporting jatropha raw material due to a lack of an internal market. There was some interaction with Kolao buying seeds however a Thai company provided higher revenues and hence Y&P goes for export. In comparison to Kolao, which has already established a processing factory in order to produce jatropha-based biofuel, is also exporting jatropha products. This concludes that there are no competing markets within the country and export is the only option to stay in business referring to all jatropha companies regardless size and power. Small-scale companies are in addition diversifying agricultural production as a coping strategy to deal with fluctuating markets and the lack of support by the national government. The aspect that Kolao bought seeds from the company, even if there were competing Thai traders, reflects the intense network of Kolao even in regions the company is not actively cultivating jatropha.

Y&P and Kolao do claim a monopoly in the districts the companies are operating. This makes the companies confident and both outline positive business expectations for the future. This point is linked to the treatment of employed farmers. In both cases the jatropha companies are providing income options for the rural population. However, due to the low negotiation position of farmers and the lack of other income options in rural areas, the company is only regulator of contracts and payments. This often results in reduced and late payments and the involvement of children and old women in cultivating activities based on their low negotiation position. District offices are aware of this occurrence, but do not react on changing it in favor of the farmer.

4.5 Saya Agro-Industry Promotion Company

The Saya Agro-Industry Promotion Company is located in Ban Namsong, Paklay District, Sayabouly Province which was established in the end of 2007 in cooperation with the GoL to promote jatropha on small-scale. Due to the rising oil price the GoL intended to support farmers to produce Straight Vegetable Oil (SVO) to reduce dependency and vulnerability on fluctuating diesel prices. SVO can be blended with diesel for tractors used for transportation and plowing purposes in rural areas. The vision of the company is that farmers sell jatropha seeds for the price of 1,000 LAK/kg to the company. Then the company produces SVO and resells the oil for the subsidized price of 2,000 LAK/liter to the farmers. Farmers can blend it with diesel and reduce costs, considering the high diesel price in rural areas of 8,000 LAK/liter during the time research was conducted.

4.5.1 Purchase and Utility of Land Resources and Jatropha Feedstock

Beginning 2008, the company started to involve in jatropha promotion in all districts of Sayabouly Province including 2,350 households in total. Jatropha activities are on small-scale not larger than one to two lai[11] per household incorporated in existing cultivation systems and patterns. In addition the use of jatropha as living fences is promoted in form of 2+3 contract farming. The activities are based on the agreement, that farmers are providing labor and land (2) and the company provides seedlings, technical support and a market (3).

Figure 10 - Jatropha as living fence (left) and intercropping with castor (right)

In 2009, the company received 20 tons of jatropha seeds after the first harvest period retrieved for 1,500 LAK/kg. However, due to the lack of an oil press not provided as promised by the GoL, the company had to revise its strategy and sold 15 tons of raw materials to an exporting Thai company, and 5 tons to Kolao for internal biofuel production. As already elaborated on above, Kolao constructed a biofuels processing factory in Kentao District (South of Sayabouly), which is located close to Paklay District. Kolao is advertising the buying of jatropha seeds even in television and is generally interested in the purchase of raw materials from that area. This information was provided in the interview with the Director of Kolao and confirmed by this Director.

[11] 1 hectare equals 6.6 lai hence 1 lai equals 0.15 hectare and 2 lai 0.3 hectare.

In addition to jatropha activities, the company is diversifying its income by trading the bio-energy crops castor and cassava mainly for export purposes to Thailand. The reason for the diversification is mainly rooted in a high competition with Kolao, as explained by the Director. After a successful start of the processing factory, Kolao provided a slightly higher price of 1,500 up to 2,000 LAK/kg to jatropha farmers. Certainly, farmers sell crops for the higher price which makes business operations difficult for the company. The Director complained about the ignorance of the farmers to acknowledge the economic benefits they would gain by using the subsidized SVO.

4.5.2 Interaction between Actors

The cooperation on national level with the GoL was an essential contribution to the implementation of this project to support farmers. Business relations between the company and the GoL are constituted in a contract, determining the company's role to be the promoter and the government's role to be the provider of financial and technical support. However, the GoL did not follow up the assigned task and hindered the success of this project. On district level, the company cooperates with the DAFO in form of meetings to inform about agricultural development. However, the DAFO was not involved in the promotion of jatropha and according to the Director the primary focus of this department is to ensure food security and the production of common cash crops as maize, job's tears and sesame. The Director complaint in the interview that the GoL did not provide an oil press and financial support is low, without providing deeper insights how this financial support is operated. However, he is still in contact and will meet representatives of the government (unknown institution) to discuss these inquiries.

According to the Director, farmers were easily convinced to start cultivating jatropha on a small-scale integrated in cultivation systems and as living fences. Jatropha is, according to one farmer cultivating 1 lai, a common plant and farmers possess knowledge about basic cultivation techniques. However, it turned out that some farmers lost interest in the cultivation, due to different reasons the Director explained. (1) Jatropha cultivation requires a high amount of labor force. In regard to common cash crops, like maize, job's tears and sesame, farmers are involved in the cultivation for a long time resulting in a strong network between farmers and traders. Hence, (2) farmers already have long-term experiences with the cultivation of these crops and concluded, after being involved in jatropha cultivation, to continue the cultivation of these crops. This leads to the explanation of (3) an overlap in working peaks of harvest between jatropha and job's tears and rice in particular. (4) The income for job's tears is in this season is 3,000 LAK/kg, white sesame 7,000 LAK/kg and black sesame even 7,800 LAK/kg. Anyhow the different labor intensity needs to be considered however the final benefit for farmers is higher than of jatropha. This point leads to the explanation that (5) farmers do not understand the benefit gained from selling jatropha seeds and receiving subsidized SVO. Hence, the Director mentioned, that villagers need to see the production process in order to understand the complexity of retrieving oil by jatropha seeds. The general cause for the

drawback was according to the Director rooted in constraints in communication and in ensuring a mutual understanding.

This company is the only case that does not claim a monopoly. Kolao is also active in this province and even the processing factory is located in close distance. This is an essential occurrence for the drawback on jatropha promotion referring to the high competitiveness of Kolao. The company made an effort to contact Kolao in order to cooperate on this issue, but Kolao did not show any interest. Hence, the selling of the raw material and diversification is the only option of the company described by the Director, and is drifting away from the origin objective of rural development.

4.5.3 Comparison to Large-scale Cultivation

The findings of this small-scale operating company are overlapping with the ones obtained by the case before. Also in this case there is nearly no cooperation on district level. However, in this case interactions with the national level occur in regard to the involvement of the national government based on the initiative of a rural development project. But still, the national government did not continue its support with the result that the company cannot fulfill its objectives.

Besides this reason for the drawback of the project, the high competition with Kolao also operating in the district was an important cause. Due to more influence and power of Kolao, Kolao is able to pay a slightly higher price than Saya Agro-Industry Promotion Company. The company tried to cooperate with Kolao in order to find agreements however Kolao was not interested and refused any cooperation. The Director of the Saya Agro-Industry Promotion Company however did not only blame Kolao for the drawback. He also referred to the farmers, that they did not understand the benefit of this cooperation. Hence, he is acknowledging an aspect to involve famers more intensively by establishing a jatropha processing site.

As well as the other case studies, this company is exporting the raw material due to a lack of an internal market. In order to cope with an underdeveloped domestic market and fluctuating market prices, the company also diversifies income as a coping strategy. However, the Director is not satisfied with that due to the initial objectives to support rural development, concluding that good intentions are not taken into account in a business environment.

4.6 Conclusion

Practices and interactions are varying between companies investing in jatropha promotion mainly in regard to the scale of business involvement. Regulations to control and monitor business activities are manifested in policies however the private sector is operating independently. The district agencies are represented in a weak position of exerting control over business activities, leaving the private sector space for action. This results in a lack

of protection of the farmer presenting the last member in the chain. Farmers are an important actor to ensure feedstock supply however their poor negotiation position reduces the option to make full use of their agency.

Different cultivation strategies mainly vary in size and are reaching from large-scale land concessions to small-scale contract farming. It is inferred that land property and size of companies correlate with the influence and power to successfully operate and extent jatropha business. The bigger the companies the more power and hence more influence in decision-making processes are elucidated in regard to the policy, national and local level. This is strongly reflected in the Kolao case, where the deep but still hidden relationship with representatives of the national government causes advantages in particular regarding the granting of land concessions and provision of financial incentives. In this case, the elucidated constraining discourses are actually translated into the local context. The other two small-scale cases have less influence and support thus built on the coping strategy to diversify income in order to stay in business.

In regard to the variety in cultivation systems which is closely linked to influence of the company, it is inferred that Kolao provides a stable income position and supply to support rural development, but on environmental and social costs. However, stronger support and control of district line agencies need to monitor these activities in order to make locals also beneficiaries of jatropha promotion. From the environmental aspect, small-scale plantations are much more sustainable due to the incorporation of jatropha in existing cropping systems. However, in regard to a secured feedstock supply, which is a lack in the value chain of jatropha, the feedstock source cannot satisfy the huge demand necessary to reach the set target in the Renewable Energy Development Strategy.

Chapter 5: Broader Discussion and Implication

5.1 Introduction

This chapter will discuss the empirical findings presented in the previous sections, placed in the broader Lao context and combined with reflections on the applied theoretical concepts and its implications.

The first section will elaborate on main aspects of the empirical findings divided into main arguments presented on the national and the local level. A description of actors on the national level including their agencies and power relations will be provided manifested in interests and strategically used discourses. The identified key actor, Kolao, is the only one that possesses agency to move and connect both levels. On local level, practices and interactions of the private sector are elaborated and discussed in light of business implementations. Scale of the practices and the intensity of interactions with governmental actors will discuss the material and social outcome of jatropha promotion in rural areas of Laos.

The second section will place these empirical findings in the broader Lao context structured by an implication of the applied concepts. In this context, decisions and interests in policy-making on national level regarding effects for the rural development will be discussed by addressing roles of governmental agencies and the involvement of international development organizations. It will be argued that on local level the reorganization of land resources creates new political and economic regions whereas power and control of the district government to influence these regions is reduced combined with an increase of guidance and control of the private sector. In regard to the rural population, a discussion of the contribution of jatropha promotion to the livelihoods will complete this section.

The third section will provide a reflection of the applied concepts. Political ecology, as the overall theoretical framework of this thesis, is made researchable by applying the concepts environmental discourse, embedded autonomy and territorialization. These concepts supported the comprehension of processes on national and local level, by elucidating particular interactions of actors. The implication of the applied concepts will be reflected and discussed in regard to contribute to the knowledge of political ecology and the better understanding of processes and actors involved in environmental change.

5.2 Presentation of Key Findings

In order to unpack the promotion of jatropha empirical data was collected on national and local level. This provided insights in different perspectives and realities represented by a variety of actors and manifested in certain degrees of power. Development organizations present a reserved position within the promotion on local level but dominate the policy formulation on national level. The role of the GoL and related governmental institutions are presented in regard to internal heterogeneity and divisiveness. Interest and disinterest

correlate with the benefits for each actor and regulates the degree of participation in policy formulation processes. Actors possess a certain degree of agency which enables them to move between levels and scales and to exert different interests related to the promotion of jatropha which is incorporated by the private sector. The comparison of these levels and scales, connecting local and national interests, presents the material and social outcome of the reorganization of the environment and the people. This outcome is a result of an un-transparent and inefficient land concession process and the inconstant manifestation of agency supported by an environment of a shadow economy practiced by the GoL. These obtained empirical findings are presented in detail in the following two sections divided in the national and the local level.

5.2.1 National Level

Jatropha promotion on the national level is characterized by the formulation of the Renewable Energy Development Strategy. The participation of only national actors within this policy formulation investigates the importance of agency and power relations within this process. Participating actors provide a variety of interests which are manifested in supporting and constraining discourses. These discourses are strategically used within the policy formulation and correlate with the degree of benefit in regard to develop a jatropha sector in Laos. Independent of the extent of benefit from the REDS however is the private sector as the executive actors in the promotion. Kolao is the only actor that possesses agency to connect the national and the local level.

The formulation of the REDS is dominated by the participation of actors active on national level. In Chapter 3, the provided actor-profile identifies that participants of governmental actors were particular represented by the national government. The Ministry of Energy and Mines, the Ministry of Agriculture and Forestry and the National Land Management Authority participated however not the related provincial and district authorities. This is identified as a missing aspect in regard to the more precise reflection of local reality on district level than by national authorities elaborated in section 3.3.3 and hence knowledge that is important for policy formulation. The Lao Women's Union, as presented in 3.2.1, was the only actor mentioned this missing issue in order to ensure an implementation benefiting locals. This trend is also recognized in regard to the participation of the private sector whereas Kolao, interacting with the national government, was the only jatropha company involved in the formulation. As identified in 3.2.2 more companies are active in Laos but neither represented nor involved in policy-making.

This unbalanced participation of actors is related to the importance of agency and power relations. Centralized governmental structures on the one hand and a lacking communication network and infrastructure between national and district level on the other hand, as elucidated in 3.3.1, are increasing the gap of power relations between national and district level. Governmental actors on national level possess more agency and power than actors on district level. Furthermore as presented in 3.2, important form of agency is

incorporated by the external consultants hired by the Finnish Ministry of Foreign Affairs. The involvement of development aid dominates objectives and interests in the formulation of the REDS. In regard to the private sector, Kolao is a more powerful actor than other companies, based on a deep relationship with the national government as presented in 3.2.2. Hence, interests and interactions of these actors, external consultants, national ministries and Kolao, are dominating and influencing the content of the REDS.

The presented variety of involved actors however is not characterized by a coherent set of interests. As elaborated in 3.2.5 a variety of interests are manifested in supporting and constraining discourses. These discourses are used strategically by actors in order to preserve different interests. The MEM is the governmental initiator of the REDS and interested in the formulation as well as implementation. Hence, the presented supporting discourses of rural development as existing in 3.3.1 and energy security in 3.3.2 are emphasizing social and economic benefits of jatropha promotion, indirectly supported by Kolao. Contrary to these discourses, the disinterest of the MAF and the NLMA is highlighted by constraining discourses that illustrate jatropha promotion as a threat to food security as presented in 3.3.3 and to the secured use of degraded land elucidated in 3.3.4. Furthermore, in regard to the MAF, this disinterest is also rooted in the objective and target of the ministry. Presented in 3.3.3 the prioritized goal of the MAF is to ensure food security and the extension of jatropha is reducing this security due to additional land and labor claims. The conflict of interest in regard to competing sectors over land resources, as elaborated in 3.3.4 is supported by the discourse on degraded land availability in Laos to attract foreign direct investment on the one hand however increases also the fear of land exploitation due to expanding hydro power, mining, agricultural plantations and logging activities on the other hand.

This strategically use of discourses is emphasizing a variety of interests but also the correlation to the degree of benefit emerging by the promotion of jatropha for each actor. As elucidated in 3.2.1, the MEM is responsible for renewable energy developments and the formulation of the REDS which is funded externally by the Finnish Ministry of Foreign Affairs. Therefore, the MEM receives a budget in order to formulate and implement the strategy supported by external consultants. This strategically use of discourses is also elucidated referring to jatropha related activities of MLOs and NGOs. In 3.2.4 it was elaborated on the active involvement of these organizations however it was concluded that jatropha does not contribute to rural development. Hence, further development projects did not include jatropha promotion and it was not part of their development objectives. The private sector presented by Kolao is indirectly benefiting due to the determination of tax reductions and subsidies by the GoL as presented in 3.2.2, hence also encourages supporting discourses. The MAF and the NLMA are presented in the REDS as significant actors essential for a successful implementation of this strategy. However, these do not benefit by the formulation of the strategy as presented in 3.2.1. These ministries will face an increased work amount providing agricultural extension service and participatory land use planning on district level in regard to jatropha.

However, these are elected within the REDS as the executive force in the field to ensure a social and environmental sustainable implementation of jatropha expansion.

In reality, as elucidated in 3.3, Kolao is the only actor that connects the national and local level and is able to make use of its agency on both levels. The government presents a strong actor on national level however on district level the governmental authorities are characterized by a weak position. This emphasizes the dominant role of Kolao in particular and represents the reserved role of the GoL in actually promoting as well as expanding jatropha development in rural areas of Laos.

5.2.2 Local Level

The identified key actor that links national and local level is the private sector, referring to Kolao as the most influential company. However, more companies are promoting jatropha throughout the country that can be distinguished in the scale of cultivation practices and interactions with governmental actors on national level. The low involvement of district authorities results in an un-transparent implementation and monitoring of land concessions in the field. This is supported by a weak negotiation position of farmers, even if they possess agency in order to escape rigid structures of the companies. The elucidated discourses on national level are reflected in the reorganization of land resources and the rural populations as a material and social outcome of jatropha promotion.

A variety of different scales of cultivation systems are presented in Chapter 4. These are mainly distinguished based on the practices reaching from large to small-scale jatropha cultivation. Kolao promotes jatropha, as elaborated in detail in 4.3, on large-scale concession based plantations. The main reason for business success and expansion is due to the allocation of large amounts of land and claiming a monopoly. Representatives for small-scale cultivation practices are Y&P and Saya Agro-Industry Promotion Company presented in 4.4 and 4.5. These are dependent on labor and in the second case on land of farmers and rely on a diversified agricultural system in order to cope with fluctuating market prices as described in 4.4.1 and to increase income options in order to cope with competing companies as presented in the third case study in 4.5.1.

The interaction between companies and in particular actors of the national government is a regulating factor correlating with the scale of cultivation practices. In regard to the small-scale systems there are no interactions with the national level. Kolao is the only company that exercises an intense but un-transparent business relation with national authorities. This essential interaction is made explicit in a variety of aspects. Sub-sections of 4.3 elaborate on different reasons as are (1) Kolao is cooperating with the MEM to achieve jatropha targets hence interests are coincident, (2) problems regarding a successful business implementation in form of labor shortage are solved by cooperating with national authorities and (3) Kolao is the only company that receives official tax

reductions by the Ministry of Finance. These interactions with the national government are essential for a successful expansion of business.

Besides the strong link to some national government agencies, another supporting issue of an autonomous business is the lack of involvement of district agencies which represent a weak position. This is present in all three case studies however most explicitly in the Kolao case in regard to the land concession processes. Consequences of a weak district authority as presented in sub-sections of 4.3 are (1) the use of arable and forest land for concessions due to the neglect of social and environmental impact studies as well as a lack of a control and monitor system by the district, (2) farmers are not protected and are forced to change agricultural plots if located on selected concession land and (3) the district agencies are not considered as an essential actors by Kolao, as well as by the other companies, and hence excluded from largely all activities Kolao is conducting on district level. The main reason for the weak district authority is the lack of awareness and capacity to implement policies. This is supported by the neglect of district agencies within policy-making processes on national level as presented in 4.3.3.

The lack of participation within policy processes also reflects a weak position of farmers that are a fragile actor in the chain of jatropha promotion. In the Kolao and the Y&P case, farmers are complaining in regard to reduced and late payments and dominantly children and elder people are working on the plantations as presented in 4.4.2. However, these farmers still possess agency in regard to stop working on the plantations and for the company. The land does not belong to the farmer hence only disadvantage is based on previous investment in form of time and labor force. More agency, incorporated by the farmer, is investigated in the case of Saya Agro-Industry Promotion Company in form of breaking contracts and selling jatropha to another company. Kolao is also active in this region and able to pay a slightly higher price to the farmers. Hence, farmers are selling jatropha seeds for the better price disregarding contracts, as presented in 4.4.2. However, these are minor aspects compared to effects of the reorganization of land resources on the rural population.

Rules and regulations for a social and environmental friendly implementation are manifested in the Land Concession Decree however based on this research these are neglected in the observed cases. This was mainly identified in the Kolao case study where the land concession process was recognized as (1) widen up discrepancies between paper and reality, (2) being an un-transparent and inefficient process, (3) being manifested in national constraining discourses and (4) being a reflection of the strategic use of discourses as presented in Chapter 4. All these issues are supported by an information-poor environment dominant in Laos and in particular in rural areas, where communication networks are limited.

The material and social outcome of jatropha promotion on local level is explicit in the case of Kolao. The huge amount of land concessions, which was also granted on arable and forest land, reorganized the access and utility of land resources in rural areas. In 4.3.1

this process is explained and supported by the provision of pictures showing deforestation and maps of jatropha plantations. On the one hand, farmers experience a direct effect of the reorganization of land based on a change of upland rice plots and deforestation presented in 4.3.1. On the other hand, also presented in 4.3.1, an indirect effect on food security is elucidated based on the change of rice plots which requires labor force and time for new rice cultivation and on the reduced collection of Non-Timber Forest Products. Both are essential sources of nutrition in rural areas. The issue of reorganization can be explained by social control over the rural population representing an opportunity for the urban elite to gain better control over marginalized minorities. The high amount of ethnic groups as presented in 4.3.3 involved in jatropha cultivation is supporting this argument. Some famers mentioned in 4.3.3 some slight improvements of their livelihoods in the first year of working for Kolao due to relative good payments however based on miscommunication and reduced payments all interviewed farmers stopped working on jatropha plantations of Kolao.

5.3 Placing Jatropha Promotion in the Broader Lao Context

The political ecology of jatropha promotion is both an objective of political debate shaped by a variety of actors, policy narratives and economic forces as well as a social and material process that reorganizes rural population and natural resources. The presented empirical findings elucidated key arguments dominating and influencing the promotion on the national and the local level. These will be placed within the broader Lao context combined with the implication of applied concepts to support or constrain these arguments. Additional literature focusing on other development trends in Laos helps to explain and place jatropha promotion within policy-making processes on the national level, explore the institutionalization of the private sector and the material and social reorganization on the local level.

5.3.1 Strategically Use of Environmental Discourses

The GoL explores options to reduce import dependency on fossil fuel and encourages, due to the correlation with adopted rural development objectives, the involvement of multilateral organizations (MLOs) and non-governmental organizations (NGOs) on one side and by granting land concessions it encourages the investment by the private sector in rural areas on the other side. However, evaluating the empirical findings reveals the dominant role of international organizations within policy-processes on national level combined with a reserved role of the GoL. Following findings are relevant in the process and will be placed within the broader Lao context: (1) the role of development aid and the unbalanced participation of actors within policy-making, (2) the implication of agency and power relation explicit within these processes, (3) the broad set of interests that correlate with the benefit and (4) the strategically use of discourses.

Environmental discourses on jatropha promotion are varying in scale and perspective and are strategically applied by actors. International MLOs and NGOs incorporated jatropha

projects, due to the presumed benefits, for the poor population manifested in a rural development discourse. Presented in Chapter 3, different MLOs and NGOs implemented studies to assess the potential of jatropha for being a cash crop for poor farmers due to the presumed aspects of growing on marginal lands, requiring low investment and labor input as well as ensuring high yields supplying a stable market. However, this booming crop did not fulfill the expectations and many MLOs and NGOs withdrew from further investigations. Rural development is still on top of the agenda of these organizations however the way to reach this goal is changing and jatropha promotion is not included in their strategies.

Besides this withdraw, the involvement of international organizations in regard to the formulation of policies, strategies and projects is dominantly funded externally in Laos and therefore MLOs and NGOs are deciding on content and direction. The provision of foreign aid and grants - which is rooted far back in a history of economic dependency and a host of new problems including environmental change (Phraxayavong, 2009) - is a very significant contribution to the national budget and the long-standing involvement of international development agencies in policy advice and formulation. The GoL depends heavily on development aid which contributes up to 10% of the gross national income (GNI) in Laos and hence international development budgets are likely to influence the government's objectives towards the implementation of preferred policies and projects. By determining objectives and financing projects, international development organizations are adopting the role of a supplementary state function in protecting environment and promoting development (Goldman, 2001). However, based on this research the role of international aid in regard to protecting the environment and promoting development will be discussed.

The formulation of the Renewable Energy Development Strategy is on the one hand a representative process of this dominating and influencing role of foreign aid regarding objectives of policies and on the other hand presents the strategically use of environmental discourses to support and constrain the formulation. The dominant initiative in developing the REDS was exposed by foreign consultants including responsible representatives of the Ministry of Energy and Mines. The project and hence the implementers are financially supported by the Finnish Ministry of Foreign Affairs. These actors were responsible for the organization and formulation of the REDS and hence evoke an unbalanced participation of actors in form of excluding provincial and district representatives, additional jatropha companies and farmers.

This trend resembles policy-making in Laos which is dominated by the extensive involvement of development aid. Hence it supports the aspect that international interests and opinions are dominating development and content of policies as well as related projects in Laos. Barney (2008) provides an example of a policy-induced implementation and extension of eucalyptus plantations, based on policies to eliminate shifting cultivation supported by MLOs blaming shifting cultivation agriculture as reason for soil and forest degradation. Furthermore, Baird and Shoemaker (2007) are analyzing the role of

development aid in regard to internal resettlement with partly conflicting and confused responses. According to them, this ambivalent behavior appears to be a result of most aid agencies not having clear policies or strategies associated with internal resettlement which calls for a need to gain a relatively full understanding of the situation and its implications. Based on the findings of this research and the presented literature focusing on international aid within the Lao context reveal the involvement of development aid based on discursive justifications to support the rural and marginalized population. However, the lack of including local reality and the effects of policy implications on local population, pointing to the unbalanced participation within policy formulation, does not eventually benefit rural population as initiated within policies.

Furthermore, the unbalanced participation of actors identifies the implication of agency and power relations of participating actors. The lack of involving provincial and district agencies is causing discrepancies between policy and practices. Elucidated in this research, actors on district level are providing a more precise reflection of local reality than national authorities. Smits and Bush (2010) as well identified this disjuncture between policy and practice within the broader context of rural electrification by investigating the neglecting of pico-hydro power, common in rural areas, in policy formulations due to prioritized investment in large-scale hydro power projects. Lestrelin (2009) adds to this discrepancy by his study on the construction of land degradation and comes back to the argumentation that environmental discourse in Laos is less based on solid empirical evidence than shaped by the subjectivities and political-economic projects of the state, the political elite and their international development partners. In turn, policy interventions supported by this discourse have significant impacts on upland livelihoods and environments. These findings compared with the collected empirical data shows that environmental discourse shape policy-making on national level which are strategically used by the political elite and international development partner to justify and implement particular interests which widens the gap between policy and practice.

The application of the concept environmental discourse supports to make these interests and disinterests visible by the collection of statements in form of supporting and constraining discourses. The inclusion of different perspectives and interests of involved actors provides a more detailed description of the dynamics of these processes. Supporting discourses were only stated by actors that directly benefit by the promotion of jatropha which is the MEM and indirect Kolao. Constraining discourses were acknowledged by the MAF and the NLMA which were, paradoxically, appointed in the strategy as key actors to secure a sustainable implementation. Governmental actors are strategically using environmental discourse to prevent own interests within the REDS formulation. An explanation for the strategically use of discourses by governmental ministries that are not directly benefiting of this policy formulation can be inferred from the competition of different sectors and hence conflicts of interest.

Relevant sectors in Laos related to mining, hydro power, large-scale plantations (refers to rubber and eucalyptus plantations) and logging (which is illegal but still operated on a

large-scale) are competing in regard to different claims of land resources. All these sectors are based on export revenues rapidly filling the pockets of the national government and lacking in social and environmental impact assessments. Baird (2009) investigated rubber plantations in Laos and argues that foreign investors and local elites are largely benefiting at the expense of most villagers. Foreign investors have been acquiring land with rich soils for low state rents, often without having to appropriately compensate local people and assessment studies dominantly benefiting the foreign investors. This development represents the exploitation of resources that provides short term revenues to the GoL however long-term consequences, which are mainly neglected, only affect those people that depend on these resources to make a living. In return the jatropha sector compared to the dominating sectors mentioned above cannot compete with the influence of the high beneficial sectors and strong involvement of a variety of governmental actors due to the low cultivation scale, lack of feedstock and processing capacity and hence low revenues for the governmental elite.

In regard to the involvement of external funding and consultants responsible for the formulation of the REDS, this process resembles Ferguson's Anti-Politics Machine (1990) acknowledging discourses on 'development' projects and the 'target population'. 'Development' discourses about the country's economy and social situation are presented and shaped by development agencies with little influence of the government. According to Ferguson and Lohmann (1994), the state is described as an 'instrument' for implementing projects and the government the 'machine' for providing social service. The 'target population' is presented as an undifferentiated mass, reducing the level of individuality and diversity. Hence, there is no need to include their opinions assuming it is already known what is best for them. In this regard, the promotion of jatropha correlates with the interest of international development organizations and global discourses about the contribution of jatropha activities to general development concepts of rural development, pro-poor development and environmental sustainability. The external consultants and development funding are parts of this 'development machine', as these distribute donor money to implement development. These processes avoid to dispute with the complex institution of the government and to integrate the complete role of the State in 'development'. This concludes that the dominant influence of development aid and environmental discourse lacks in taking the local reality into account. Furthermore, this contributes to the dependency on development aid and widens the gap between policy and practices as acknowledged by Phraxayavong (2009) which does not improve the situation of rural population and even creates new problems of environmental change.

5.3.2 Embedding the Private Sector in Local Reality

The private sector is the executive actor on local level but only partly involved in policy-making on national level. The contextual environment of the private sector is defined and influenced by following key arguments: (1) the essential interaction with the national government, (2) the implications of a variety of cultivation scales and (3) the weak

district agencies lacking in awareness as well as controlling and monitoring systems. These findings are discussed in light of embedded autonomy estimating the provisions of incentives by the government to develop the private sector. The role of the private sector within the promotion of jatropha is manifested in an un-transparent process and differs in regard to support and influence of the national government on one the hand and of the district authorities on the other hand.

The private sector, in particular Kolao, is the only company involved in policy formulation on national level and in jatropha promotion on local level. In regard to subsidies and tax reduction Kolao showed interest in the formulation of a REDS. The participation within policy formulation is based on a deep but hidden relationship of Kolao with the national elite.

This essential interaction is reflected in the scale of jatropha cultivation and is varying based on the degree of interaction between actors. A variety of companies promoting jatropha however these are applying different cultivation systems characterized by large- and small-scale plantations. Assessing these agricultural cultivation practices present a direct link to the aspect of power and influence of the company and in particular the interaction with governmental actors on national level. Kolao, in charge of large-scale plantations, has very good relations with the national government. In regard to small-scale plantations interesting is that Y&P and Saya Agro-Industry Promotion Company do not interact or unsuccessfully interact with representatives of the national government. The lack of support for these companies, compared to Kolao receiving tax reductions and financial incentives, is reflected in the diversification of agricultural products in order to cope with fluctuating markets and prices. The essential relationship with the national elite exists and is made explicit in the Kolao case in regard to the provision of large amounts of land concessions. Correlating with the intense relation between Kolao and the national government, the company received land concessions throughout the country dedicated to jatropha cultivation. Hence, the provision of land concessions is estimated as an essential incentive by the national government to develop and support the private sector however only in regard to particular companies as Kolao. This argument of governmental assistance is supporting the proposition that embedded autonomy is occurring in Laos however is no equally accessible to the private sector. The importance of an un-transparent relationship between Kolao and the governmental elite on national level biases the embeddedness of the private sector's autonomy.

The centralized political control and the weak state power to exert control over rural areas is manifested in a lack of awareness and capacity to implement and monitor these processes which are in line with regulations contested in policy papers (Stuart-Fox, 2005). This was identified on the local level as an essential aspect of jatropha promotion manifested in the weak position and involvement of district authorities. The neglect of district line agencies within these policy processes results in this weak position of the district government in rural areas, lacking in regulation and monitoring systems to implement these policies. Hence, mainly the national government is providing the

framework conditions in form of land concessions however the executive force, active in the field, is the private sector. Farmers acknowledge that jatropha companies are a provider of income opportunities for the rural population. With regard to a lack of regulations and monitoring of business activities as well in this case, the negative aspect is that the companies are active without nearly any restrictions or support of district line agencies. Hence, beneficiaries are mainly the company while farmers provide labor force, time and flexibility with only little returns. The weak position of district agencies and farmers are supporting the success and development of the private sector and hence is in line with embedded autonomy from the perspective of a successful business involvement. However, success is based on the expenses of the farmers and the environment. This outlines that the idea of an embedded autonomy is lacking in regard to social and environmental equality.

Correlating with the statement of G. Evans (2002) and Barney (2008) of a shadow economy dominating activities of the private sector, the political and economic environment of jatropha promotion is still an un-transparent process which lacks in clear directives and guidelines as well as struggles in an overload of unprepared and narrowed bureaucratic system. Based on the findings of this research particular separations between the national government and the district authorities are essential. Stuart-Fox (2011) acknowledges that the worst corruption occurs where large areas of land are granted to foreign companies for concession. As land outside the urban areas legally belongs to the state local and national government officials can and do accept substantial payments to grant concessions. Businesses pay bribes for government contracts and for political protection can in addition avoid social and environmental impact assessments (Dwyer, 2011; Stuart-Fox, 2011; Barney, 2008). Partly this was also identified in the Kolao case where villagers reported that no social and environmental impact assessments were conducted either were they involved in the allocation of land resources for jatropha plantations. There is no evidence for bribing officials, but it still can be inferred from how this process was implemented lacking in local participation and allocation of actual used land for concession. Furthermore, the misuse of land concessions, and the discrepancy between assigned land and actual cultivated land which assumes land speculations, was found in this research. This identifies, if the private sector is powerful enough and willing to bribe governmental officials, rules and regulations are neglected and business savors the situation of a free market economy with no intervention from the governmental side in particular on district level.

In light with the concept embedded autonomy, P. Evans (1995) acknowledges in general a balanced involvement of the State and the private sector by the support of socio-political and economic incentives to evolve the private sector as a strong force to compete effectively on regional and global markets. In regard to the promotion of jatropha there are incentives provided explicit in form of land concessions and less explicit in form of financial incentives by the national elite. P. Evans (1995) elaborates on the role of the State by assessing its contribution to development characterized as a predatory state or a developmental state. Predatory states extract at the expense of society, challenging

development even in the narrow sense of capital accumulation. Developmental states, on the contrary, did not only control industrial transformation but can be argued to have played a role in making it happen. Applying these definitions on the role of the national elite of the GoL interacting with the private sector active in the promotion of jatropha, the GoL presents a predatory state. In the case of jatropha promotion by the provision of large amounts of land concessions, as well as in regard to other dominant sectors being hydro power, mining, agricultural plantations and logging, the development in form of revenues for the political elite are mainly extracted at the expense of natural resources and society. However, in addition to the government, the private sector is also gaining from this extraction. The weak district governments are not protecting farmers and the private sector is dominating business by increasing power and revenues. With regard to the interaction with the political elite on national level, the private sector is taking over an essential part in contributing to make the GoL a predatory state by representing the executive force of natural and social exploitation.

In regard to the intense involvement of MLOs, NGOs and other international development organizations in Laos, the mutual objective of these organizations and the GoL to implement social and economic development in the country, is reflecting a developmental state. However, in line with the discussion of Ferguson's Anti-Development Machine, the implementing force is not the government, policies and projects are implemented based on the interests and attitudes of international development organizations. Hence, as already elaborated on, the GoL is taking a reserved role within this development and MLOs are actors that implement development however with projects that are often not tailored on the particular social, political and economic situation in Laos.

In light of embedded autonomy, the interaction between the national elite and the private sector, Kolao, providing financial and material inventive to support the promotion of jatropha outlines an unequal involvement. The particular involvement of Kolao as the economic and executive force within the process of jatropha promotion is supported by the increasing attraction of foreign direct investment and the granting of land concessions supported by governmental actors on national level. These are taking over a major part of developing this sector though at the expense of social and environmental resources. Hence, the additional assessment of the State being a predatory or developmental state helps to categorize the implications of embedded autonomy for the population.

The dominant role of the private sector in the economic extension of jatropha and the continuous support of the key actors of the GoL presents a shift in the modes of development in regard to a decline of development aid and an increase of FDI. As well MLOs are concerned to attract private capital by fundamentally restructuring the GoL and its institutions to ensure an attractive investment and business environment as presented by Goldman (2001). This mode of development towards an economic transition is dominating actions of governmental actors, the private sector and MLOs and is continuously shaping and reshaping development in Laos.

5.3.3 Social and Material Territorialization

The concept territorialization analyzes the reorganization of land resources and control over local population in rural and marginalized areas in Laos. The creation of new economic and political zones is caused by agricultural transition in form of providing land concessions for jatropha plantations. This process supports, according to Rigg (2005), the creation of spatial challenges due to the reorganization of land resources causing a new form of poverty affecting the remote population. Land concessions for jatropha plantations will be discussed in light of an additional instrument of reorganizing rural populations and the coincidence with the statement of creating a new form of poverty caused by agricultural transition.

In regard to global market dynamics resource extractions mainly based on land resources are expanding in quantity and scale. Hence, correlating with the increasing scarcity of land, the demand for land resources dramatically increases which is encouraging the creation of new 'frontiers'. According to Barney (2009) frontiers refer to agricultural-forest transition zones, which is a way of conceptualizing boom and bust cycles of resource-based economic growth. Regarding the correlation between jatropha promotion and the fluctuating oil price, these boom and bust cycles are also reflected in the degree of extension of jatropha plantations and hence presents a continuously shaping and reorganizing of frontiers. This is supported, as well in this case, by the encouragement of FDI through the provision of land concessions. However, the uneven regulated exploitation of Lao land resources is leading to intensive patterns of ecological degradation and social marginalization in rural areas (Barney, 2009). The term 'territorialization' is adding to the meaning of 'frontier' regarding the dimension and scale. Territorialization is also incorporated in a much broader process and creates new political and economic zones. In addition, the aspect of State control receives particular attention (Vandergeest & Peluso, 1995). Rigg defines territorialization as "the mean and process by which the state extends its control over space, the population who inhabits the space and the natural resources found there" (Rigg, 2005, p. 109).

The promotion of jatropha presents the processes of territorialization. The material and social outcome of this promotion creates new economic and political zones in order to extent State control. This creation largely benefits the private sector dominantly Kolao due to the large scale of business involvement. Jatropha processing in the country only takes place in the Kolao case where a biofuel factory is established, which is actually not operating to its full capacity due to a lack of feedstock supply. Some of the produced biofuel is used internally but to a limited extent due to the lack of infrastructure and the produced biofuel is dominantly exported to neighboring countries. In the other cases only jatropha raw material, without adding value within the country, is exported to neighboring countries. Hence, the creation of economic regions are transferred to neighboring countries, mainly Thailand and Vietnam where raw material is exported to, which reduces potential benefits for the companies with the farmers being the last member in the economic chain.

Positive aspects are that the analyzed companies are establishing new communication networks and dynamics in rural areas, spreading knowledge about the cultivation of jatropha in different villages and connecting these by providing training courses. This aspect was also identified in a study related to rubber plantations by Baird (2009) indicating that the extension of training to villagers can bring various positive results, including sensitizing local government officials to legal frameworks that provide villagers with substantial rights. He acknowledges training courses as an important knowledge provider to empower local people and increase confidence to negotiate with government and private companies. This is also an interesting point in regard to the previous presented concept embedded autonomy. The aspect of a better negotiation position provides farmers agency to influence activities of the private sector and make it more social and environmental equitable especially in regard to weak district authorities.

Besides the creation of economic regions, new political zones supporting the reorganization and control over the rural population and the resources around them are constructed. In regard to the Kolao case, the provision of land concessions is identified as an instrument that supports the creation of new political regions. The policy determines that concessions for jatropha cultivation are granted on degraded land only however without clear characterization indicators for degraded land. This is also highlighted by Barney (2008), in regard to the inherent conflicts of interest when the private sector and governmental authorities have a direct financial interest in zoning forestland as degraded in order to develop plantations. In this regard the inclusion of famers in this allocation process seems important. These are experienced enough and are the ones who know the village area best in order to identify suitable and unused land. Furthermore, land that is defined as degraded is land that is traditionally used by villagers for basic livelihood activities as the grazing of cattle (Lang & Shoemaker, 2006). In the Kolao case villagers did not participate in land allocation processes. The process was dominated by representatives of the company and provincial government, which made the villagers unsecure in order to raise their voice when high governmental representatives are presence. This insecurity of villagers was also identified by Kenney-Lazer (2011) and elucidated as a strategic benefit of governmental authorities.

The weak district structures to secure the implementation of policies and the dominant involvement of the private sector as well as the national elite resulted in the fact that land concessions for jatropha cultivation were not consistently granted on degraded land. Concessions were also granted on forest land and upland rice fields as indicated by statements of village chiefs and villagers. In regard to the necessity to cultivate food crops and to collect NTFP essential to assure a livelihood, land and forest are crucial resources for the rural population to make a living. This is also emphasized by Lang and Shoemaker (2006), that forest and common land are key components of rural livelihood systems. Villagers affected by the reorganization did not receive compensation. Only farmers possessing upland rice fields received lowland plots for paddy rice production instead.

The process of reducing upland cultivation and extending lowland production reflects another prioritized objective of the GoL to prohibit shifting cultivation which is dominantly applied in upland areas. The government, as well as some MLOs, identified slash-and-burn as main cause for deforestation and eliminate it, among other strategies, by providing lowland based plots for agricultural production. An approach to stop shifting cultivation is through the promotion of intensive cash cropping and tree planning programs, where tenure rights are secured for villagers as well as domestic and foreign companies, and long-term investment can be planned. However, this approach also requires the exploitation of village, forest and agricultural land (Barney, 2009). In regard to the reorganization of land resources and rural people that belong to a variety of ethnic groups this evidence is consistence with a variety of other published articles related to the issue of rural control. Many reports identified the hidden reason of the reorganization of land allocations to exert control over rural population in particular marginalized ethnic groups (Lestrelin & Giordano, 2007; Ducourtieux et al., 2005; Rigg, 2005). Hence, new political zones in order to control and reorganize rural populations territorialize this remote and rural area.

This research about jatropha-based biofuel promotion in Laos reflects this defined process of territorialization in regard to a reorganization of people and resources and the extension of control. State control is exerted by the national government but not by weak district authorities. On the district level, instead of governmental authorities, jatropha companies are controlling and influencing the process of territorialization. Political and economic zones, in particular in the Kolao case, where controlled in regard to the dominant role in obtaining land concessions which was not only granted on degraded land. In regard to influence, supported by the monopoly position of Kolao, prices and payments were regulated by the company hence created a dependency of farmers. This again leaves the aspect of rural development open and once more increases the gap between the beneficiaries referring to the private sector and the disadvantaged group the farmers.

Rigg (2005) elaborates on a shift of poverty caused by agricultural transition and the integration in domestic and regional markets. ‘Old’ poverty relates to the lack of market integration and ‘new’ poverty caused by market integration, which resembles the promotion of jatropha, creates new patterns of territorialization and marginalization of the population and land resources in rural areas of Laos. The transition process of promoting jatropha as an additional cash crop for rural population identifies new patterns of marginalization based on changes in access to land resources and indirect effects on food security due to the change of NTFP collection and rice production. Based on the empirical findings and in regard to the aspect of control, land concession is considered to be an instrument of social and environmental control. In addition to debates on land reform, resettlement policy and agricultural development strategies, which are already elucidated in the Lao context as major instruments to territorialize state power and strengthen its control over population and resources in particular marginalized ethnic groups subsist in the upland, land concessions is recognized as an additional one. These

hidden aspects manifested in discourses are reflecting reality and hence provide material evidence, in form of maps and pictures, of a reorganization of rural population and the (re)shaping of natural frontiers. Territorialization is the material outcome of the discursive and institutional analysis, environmental discourse shaping interest and policy formulation on national level and embedded autonomy focusing on business relations and incentives in form of land concessions on the local level.

5.4 Implication and Relevance of Concepts

The conceptualization of the political ecology of jatropha promotion is both a discursive analysis of power struggles and environmental discourses as well as a material analysis elucidating the reorganization of land resources and the people, combined with an institutional analysis to make the particular linking role of the private sector explicit. The involvement of different levels makes the cross-scale analysis applicable in regard to a variety of involved actors with different interests on national level and the translation of these interests and practices on local level. This reveals that political ecology provides an overall framework and guideline for the collection of empirical data. Jatropha promotion is placed in the context of environmental change and the evaluation of the effects of this change on social, economic and political relationships supports to unpack the politicized environment. This politicized environment is presented on different scales and connects dynamics of national and international, political and economic and environmental and social levels.

Additional concepts help to elaborate on these scales. The concept of environmental discourse provides insights in a variety of actors' interests manifested in discourses within policy-making processes and how these are influenced by international objectives. Political and economic dynamics are assessed by the concept embedded autonomy in regard to the particular involvement of the private sector operating as a linking actor between scales. Territorialization provides the material evidence for the politicized environment and reflects social reality in rural areas of Laos.

5.4.1 Environmental Discourse

The political ecology approach of this thesis incorporates the concept of environmental discourse aiming at an actor-profile including the assessment of agencies and power relations. The *purpose*, which initially was assumed to be political, becomes more complex and includes other purposes manifested in supporting and constraining discourses. Comparing this diversity of discourses, as applied by Adger et al. (2001) as well as Béné (2005), reveal crucial roles of actors and underlying discourses linked to institutions.

The applied concept of environmental discourse identified dominant interests and perspectives expressed by various actors. In order to elucidate and explain environmental change, policy-making processes are providing insights of actors' interests and

perspectives which are strategically used. In regard to a chronic lack of contextual knowledge dominant in developing countries the concept of discourse is a form of deconstructing and questioning 'truth' by evaluation statements of a variety of actors is an important tool to gain insights. The inclusion of a variety of actors from different scales is increasing the diversified influence.

In regard to these aspects, a redefinition of the notion politicized environment is encouraged due to the strong involvement and domination of international development organizations and the more reserved and passive role of the national government and governmental institutions in the determination and formulation of policy on national level. The term politicized environment becomes a more complex dynamic, incorporating direct and indirect actors that are shaping and dominating actual environmental change. Another indirect actor within the constitution of change is the private sector. In order to asses this aspect in more detail the following section will elucidate the specific position of the private sector within the politicized environment.

Tracing narratives mainly on national level in regard to policy-making processes has proven to be a useful way to make a variety of interests visible that underlie the policies and actions of actors involved in the promotion of jatropha. On one side, the variety of narratives related to one topic provides a complex picture about the strategically use of discourses to achieve objectives as proved to be an essential tool in regard to an information-poor environment. On the other side, this strategic use of various discourses is of analytical interest and cross-referencing material practices with discursive content is necessary to exactly understand how those narratives are being used strategically. In order to understand the strategic use of environmental discourse, the application of the concepts embedded autonomy and territorialization has proven to be a useful way to elucidate how discourses are used strategically on local level.

5.4.2 Embedded Autonomy

The growing power and influence of the private sector today is linked to the development of a global capitalist system with priority on the promotion of economic practices. Developing countries are encouraging FDI in order to develop a competitive business environment and become part of the global market. Therewith these countries increase dependency on the private sector investors and often lack in institutional capacity to sufficiently deal with the impact of the booming regional and global economy.

Political ecology considers the private sector as an important actor within environmental change however the primarily focus on government and MLOs is still dominating this approach. In regard to the strong involvement of the private sector in the promotion of jatropha, it is concluded that the incorporation of the concept embedded autonomy is adding to this recognized gap by placing the private sector and interaction with the government in the center of research.

The concept embedded autonomy focuses on an additional field of research with the particular focus on the relationship with governmental actors and the private sector, which has proven to be useful in order to reveal and explore the essential role related to the promotion of jatropha. A drawback, however, is the low development stage of the GoL and hence, not much to say about the structural and institutional involvement. The GoL still needs to go a long way, in order to take over a strong role of being a developmental state.

Political ecology calls attention to the importance of embedding the private sector as a crucial type of actor. In regard to this research, the particular key role of the private sector in the promotion of jatropha elucidates the linking position between the national government and the rural population. In addition a correlation between the private sector and MLOs is elucidated with investment being the dominant interface and outlining a change in the mode of development. Furthermore, this focus helped to elucidate the passive role of the district governmental and hence the driving force of the private sector is based on the lack of monitoring and regulation systems on local level. In addition, paying greater attention to the specific context in which meanings and forms of power are constructed supports to consider paradox objectives and interests as prevailing objects of politics today.

5.4.3 Territorialization

This cross-scale analysis applied the material analysis of territorialization in order to provide evidence of environmental change induced and influenced by discursive and institutional processes. Regarding the lack of contextual knowledge of local reality in developing countries, the concept territorialization is a helpful tool to show how discursive and institutional processes are translated into the material reality. Thus, the provision of these material insights, supported by pictures and maps to show the actual change, are essential data for policy-formulation processes which are still dominated by national and international discourses and hence in line with political ecology.

Chapter 6: Conclusive Remarks

6.1 Recommendations

This research provided detailed insights in jatropha promotion on national as well as on local level and its implication within the broader Lao context and strives to investigate ways to improve the situation in regard to make it more socially and environmentally equitable. These recommendations will focus in the first section on practices and policy of jatropha development combined with follow up research topics in Laos. The second section outlines theoretical observations towards a general political ecology approach of biofuels.

6.1.1 Practical Recommendations

There are possibilities to improve and further develop practices of jatropha-based biofuel development in Laos. Jatropha is a common plant and grows naturally throughout the country. Hence, farmers are familiar with the species and traditionally use it as living fences or medicine production. In regard to the cultivation as a cash crop, however, which requires knowledge on suitable cultivation techniques, pruning and appropriate soil as well as fertilization practices, fewer farmers are experienced. In order to increase and ensure yield expectations training courses for interested farmers combined with decentralized research on jatropha is recommended. The inclusion of long-term research in governmental and independent research institutions is essential however the need to incorporate the necessities and perspectives of small-scale farmers are prevailing.

Regarding the low interest of labor force based on low payments but also on the overlap of working peaks some recommendations can be drawn. Compared to other cash crops, payments for jatropha seeds are low with still an un-transparent amount of labor force input. The private sector faces a lack of labor as its major problem hence the payments should be increased to attract labor. This would also partly solve the problem with overlapping working peaks, because then jatropha becomes more competitive to other cash crops. Technical improvement for harvesting and peeling are options to reduce labor amount and make jatropha more socially equitable. In addition, contracts between farmers and companies need to set regulations and secure both parties with an ensured compliance by governmental authorities. In this regard, the extent of implemented decentralization processes in Laos are still an unclear and interesting field to research the actual division of autonomy between national, provincial and district authorities in general and related to specific sectors.

Environmental concerns in regard to large-scale land acquisition for jatropha plantations are prevailing. The lack of environmental impact assessments and participation of villagers and only partly district authorities within land concession processes are increasing the use of arable land. Improved and ensured participation of villagers within these processes is essential due to tacit knowledge about utility and importance of village and surrounding land for livelihood security. The completion and an annual update of the

land inventory throughout the country are essential contributions and preconditions for further extensions of jatropha plantations and other crops in general. Identification and characterization of used and unused as well as degraded and arable land are important recommendations. Small-scale jatropha cultivation included in existing cultivation patterns and as living fences are more social and environmental sustainable. However, in regard to the increasing demand for jatropha feedstock small-scale is not economic viable. In regard to this issue, the extension to invest in a diversification of biofuel suitable crops, as for example castor, palm oil and cassava, is recommended. The availability and potential combination of biofuel feedstock sources in Laos is an understudied topic and interesting to explored different options.

There are possibilities to improve policy formulation which are dominated by actors on national level. The involvement of development aid in policy processes is biasing the interests and increasing the economic dependency of the GoL. A change in the mode of development is already presented by this research however the government, MLOs and NGOs should focus on the challenge to improve and ensure conditions for private sector development of jatropha or even biofuels development. As presented the private sector is the executive force and in order to turn this into strength support but also guidance becomes important. Knowledge about practices and interaction of the private sector in Laos in general is lacking and hence interesting to study as well in regard to other sectors.

Furthermore, actors on national level and involved in policy-making should base policies and actions on conceptual knowledge rather than narratives of national and international environmental discourses. This thesis shows that on national level there is a lack of knowledge of detailed information on the actual reality on local level. Policies are dominantly formulated to improve life of the rural populations without, paradoxically, including these perspectives sufficiently. This contains the main risk to fail the intended goals and even be counterproductive for the rural population and the environment. Hence, a recommendation is to conduct place-based research in order to link a material and discursive analysis on different scales and ensure both aspects included within policies. This is an option to reduce the gap between practices and policies.

The lack of awareness within jatropha promotion of weak district authorities should be attacked by decentralizing political control. This would mean to extent more decision-making power and autonomy to the provincial and district level. However, in regard to the weak status of provincial and district authorities this is a continuing process which is slowed down by the dominant role of international donor money and support. In regard to the high amount of influence, the role and action of these development organizations need to be researched in order to elucidate the degree of social and environmental benefit of the involvement.

6.1.2 A Political Ecology of Biofuels

This cross-scale analysis combines a discursive and a material analysis. The particular focus on the institutionalization of the private sector as the executive force in the promotion of jatropha is an essential contribution to gain an overview of politics and power-relations involved in this process. The combination of these analyses is suitable to address environmental change based on biofuels development and its implications in general. Issues of environmental discourses on national level, land allocation processes on local level and the important role of the private sector investing in an extension and development on a biofuels sector are prevailing.

This debate over jatropha promotion speaks to broader debates over the respective roles of the State, international development organizations, private sector and the role of the civil society within environmental change. A political ecology of biofuels investigates on the reproduction of biofuels development from a variety of perspectives. The combination of a discursive and material analysis elucidates processes on national level dominated by a variety of actors reaching from governmental organizations to MLOs. The focus on the materiality of specific resources but also technical aspects considers all of their particularities and complexities on local level. Thus, it provides contextual knowledge of material reality essential for policy-making in order to reduce implementation on social and environmental extraction. The dominant role of investment in biofuels is essential and the institutionalization of the private sector should be included to increase utility and knowledge about business structures, represented as a link between discursive and material processes. Hence, incorporating a discursive, institutional and material analysis supports to better identify and explain various types and scales involved in a political ecology of biofuels and the socio-economic and political dynamics around it.

6.2 Conclusion

The promotion of jatropha reflects a discursive analysis of environmental discourse, an institutional analysis including the concept embedded autonomy and a material analysis elucidated by the concept territorialization. On national level, the promotion of jatropha in Laos is a process dominated by a variety of actor involved by pursuing different interests manifested in the political background. Roughly, the involved actors, reaching from governmental authorities, research institutes, private sector and external consultants, can be divided in two positions. Based on presented narratives, some actors are supporting the promotion and some are constraining it. The Ministry of Energy and Mines (MEM) is main proponent of the formulation of the Renewable Energy Development Strategy (REDS) which includes jatropha. However, this interested is biased due to the financial support and provision of human capacity by the Finnish Ministry for Foreign Affairs in order to formulate this policy. An addition supporting actor manifested in a reserved contribution is the private sector, in this case Kolao was the only participating jatropha company. The MEM and Kolao expressed their interest in regard to the supporting discourses related to the contribution of rural development and the reduction of import dependency on fossil fuel by an extension of the jatropha-based biofuel sector.

Opponents of the promotion are mainly raised by governmental actors as the Ministry of Agriculture and Forestry (MAF) and the National Land Management Authority (NLMA). Their disinterest is made explicit by the constraining discourses of jatropha promotion presenting a threat to food security and to the secured use of degraded land only. These disinterests are constructed by statements which are not reflecting policies of the ministries this disinterest mainly derives from not benefiting by the implementation. Furthermore, other ministries and research institutes were participating however these did not actively participate and showed no interest in developing a jatropha sector.

On local level, the private sector is taking the leading role in the promotion of jatropha and is implementing its business network in a variety of practices and interactions. Three cases of jatropha companies were investigated, each involved in a variety of practices and a different extent of interaction with governmental authorities. Kolao is practicing on large-scale jatropha plantations and exerting a deep and intense relationship with the national government. This provides the company and strong position within business extension. The two other cases, Y&P and Saya Agro-Industry Promotion are smaller companies active on small-scale with no interaction with the national government. This lack of support is manifested in the diversification strategy of the companies to cope with fluctuating markets.

Rural development and energy dependency are prioritized discourses supporting the promotion of jatropha on national level. However, evaluating the empirical finding it is inferred that these discourses are contradictions. From the perspective of the rural development discourse, which primarily focuses on pro-poor and environmental friendly jatropha promotion, small-scale jatropha cultivation, incorporated in existing cultivation systems and as living hedges as in the case of the Saya Agro-Industry Promotion Company is primarily benefiting the farmer and the environment. Though, from the perspective of the energy dependency discourse a high and continuous amount of feedstock supply needs to be secured. As presented in the Kolao case currently the main constraint is reflected in an unsecured feedstock supply to feed the demand of the processing factory operating under capacity.

It is inferred that interactions with the national government is essential for business success however power relations of governmental authorities are important. The district line agencies are characterized by a weak position and lacking in monitoring systems on local level. This gives the private sector, regardless small or large-scale, an autonomous business environment in rural areas. The provision of large amounts of land concessions results in a reorganization of land resources and the rural population, creating new economic and political zones. However, this implementation is not benefiting the farmers, mainly the private sector benefits from the extraction of human and natural resources and the national elite from the provision of land concessions. Farmers in return provide energy and time with little return contributing to the livelihoods of the rural population in Laos.

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