

Research Proposal:

“Devolution of Forest Management: An Analysis of Benefits of Local Farm Households in Daklak, Vietnam”

(Draft for comment only – please do not quote)

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1. Introduction

Writings in resource economics have given considerable attention to economic and social benefits from land reform. While the discussion about land registration and titling mostly focuses on their effects on access to formal credit, farm investment, and land productivity (Barrows and Roth 1990; Bruce 1993; Feder and Nishio 1999; Migot-Adholla et al. 1991), papers about devolution of forest management tend to give attention to benefits to people as incentives for them to protect the local resources (Agrawal and Ostrom 1999; Banana and Gombya-Ssembajjwe 2000; Fisher 1999; Hobley and Shah 1996; Meinzen-Dick and Knox 1999). Common belief is that land titling lead to better access to credit, improved investments in land, and increased farm output; however, for such results to show up, certain prerequisites are to be considered in the designing process of the land registration program (Feder and Nishio 1999). With regard to forested land, where forests are to be protected, land reform needs to offer immediate economic benefits to local people in order to get their interests in protecting these resources (Hobley and Shah 1996).

In Vietnam, forested land has for a long time been under state stewardship. Degradation of forest resources under management by state forest organizations together with the high costs of forest protection has stimulated the experimental devolution of forest management to local people. This forested land initiative has been tried out in Daklak, a central highland province of Vietnam, since 1998. The process deals with both land titling and devolution of forest management. Since the start of this initiative, also known as forest land allocation (FLA), forested land has been allocated with land title to different types of users (individual households, groups of households, or a whole community) in 6 districts in Daklak. By the end of the year 2000, fieldwork was completed in 14 villages.

To understand whether or not local people are sufficiently motivated to manage forest resources, the questions remain how and to what extent local households have benefited from the (favorable) conditions made available by FLA. In other words, the state is concerned about whether the intended incentives offered by FLA are economically and socially interesting enough for local households to manage forest resources.

This research proposal is organized as followed; after this introduction, I will present and briefly discuss the main objective of this research in chapter 2. It is then followed by the justification of the objective in chapter 3, in which I will discuss the relevance of the research to the situation in Daklak, Vietnam, and to the discussion in literature. In chapter 4, I will present and discuss the conceptual framework and main variables of the research. After that, I will present the research propositions in chapter 5, and the way how to measure main variables in chapter 6. Techniques for data collection and data analysis will be discussed in chapters 7 and 8, respectively. Chapter 9 will discuss about the timeframe and organizational issues of the research. Chapter 10 will conclude the paper.

2. Research objective

As mentioned in the introduction section, concerns of the authorities in Vietnam and elsewhere are to understand how and to what extent local people have benefited from land titling and devolution of forest management, and whether they are motivated to protect local forest resources. In this research, I want to examine *“the benefits that forest land allocation (FLA) in Daklak, Vietnam, has generated for local farm households/ people”*.

By examining the benefits of FLA in Daklak, I want to study the differentiated effects of FLA on the local households' living conditions and the incentives for them to protect the allocated forest resources. I will analyze local households'/ people's access to cultivable land and timber and non-timber forest products, and their livelihoods in relations with FLA. I will also study the non-material benefits, which are the symbolic significance of the allocated forest resources to the title holders, generated by FLA. With the findings from the research, I hope to be able to say that FLA in Daklak has (or has not) contributed to the improved livelihoods of the local households and that local households are (or are not) sufficiently motivated to protect local forests.

3. Justification of research objective

3.1. Relevance of research to Daklak, Vietnam

Before the discussion about the relevance of the research to Daklak, Vietnam, it is necessary to talk about Daklak, the local conditions, the land and forest management situation, and the FLA process itself.

3.1.1. Background to Daklak, its land use and FLA

Daklak is located in the central highland of Vietnam (see Annex 1 – Location of Daklak in the map of Vietnam, on page 21). It is a largest province in Vietnam with total physical area of around 1.9 million ha. Of which, more than half is classified under forest coverage. Agricultural land accounts for about 26% of the total land size. Daklak is home for about 1.8 million people from 34 different ethnic groups. Most of whom are migrants coming from other provinces. Migration to the province started before the end of the American War (1975), but the majority of migrants arrived during the last two decades. At present, indigenous ethnic groups are minor in number and mostly living in remote villages. The heterogeneity in Daklak's demographic structure enriches its cultural and ethnical facets but makes the local land and resource use a hot issue.

The main livelihoods of the local people are from forest and agricultural sources. Farm production is mainly from crop cultivation; contribution from livestock raising is partial. Forest products are mostly for home use and consumption. The degree of commercial farm production and market integration varies across different places, depending on the physical conditions (infrastructure, that is) as well as the demographic characteristics. Off-farm employment is not very common. Popular off-farm income sources are from minor trading, local teaching jobs, state administrative, and state subsidies.

In Vietnam, rights to land are claimed by the state but people can be entitled with use rights to land resource. According to 1993 Land Law, people can be granted renewable long term (20 years for annual crops and aquatic production, and 50 years for perennials) use rights to land, which are classified into rights to *exchange, transfer, mortgage, lease, and inherit land title* (Vietnamese National Assembly 1993, art. 3 and 20). In addition, people are entitled to compensation when the land is reclaimed by the state for public use (Vietnamese National Assembly 1993, art. 27). These conditions reflect the components for full land ownership/ tenure by the World Bank (World Bank 1996, p. 8). Land title, represented by Red Book Certificate (RBC), is therefore used as a proxy for land 'ownership' in Vietnam. In principle, agricultural and non-forested forest lands can be

allocated to people with RBC (i.e. with all the rights mentioned above) while forested forest land is not subject to allocation to people with land title.

Generally, land is an important asset for local farm households in Daklak. In the areas where in-migration is popular, access to cultivable land is in the top priority of many people; however, land may not be a hot issue elsewhere. Cultivated land is acquired through different ways. Legally, clearing of forests for cultivation and transaction of (cultivated) land is not allowed. This situation is, however, commonly found in practice. For the original people, cultivated land is mostly acquired through family inheritance (land from parents, which was cleared years ago, is transferred to children) or clearing of forests. Migrants acquire their land either from the state when they moved in (for assisted migrants only) or through land transaction (found in all non-assisted migrants) or both. A few migrants are said to clear forests for cultivation land themselves but most rather let the indigenous people do it and then buy the land from them (WWF 1998).

With regard to forest resources, forests in Vietnam in general are classified into three categories: protection forests, special use forests, and production forests. The first two forest types are subject to protection, and only the third for production. In Daklak, like in other parts of Vietnam, forests have long been formally under the management of the state forestry organizations. Daklak's state forest enterprises (SFEs) manage a large area of forest resources that can be used for production purpose (mainly timber production). Most of the 65% of the total forest areas claimed by local SFEs are production forests. Other forested areas are managed by either other forestry organizations and or local authorities (Tran 2000). However, understaffed SFEs have not been able to manage large area of forest resources and their tasks mainly focus on exploration of timber. Local people involve in forest management activities through annual contracts, which provide them a cash payment of about 3US\$/annual/ha for protecting forests. Often no longer term (more than one year) contracts or other engagements with local people for forest management are available. People, thus, have little incentive to actively protect local forests. Though forests are formally claimed by the state, forest resources in reality are close to open-access where local people can collect forest products as well as clear forest trees for cultivation.

Beside the failure of SFEs to provide good forest management, a various number of inter-dependent socio-economic factors also contribute to the forest degradation and deforestation in Daklak. There are three major factors. First, absence or poor participation of local people in resource management has been the most urgent problem. Since forests are claimed by the state and legal rights to forest resources are hardly in the hand of the local people, people have little incentive to participate in forest management activities. Second, high population growth rate is attributed by continuous in-flows of migrants, both assisted and non-assisted, from other provinces, mostly from the North. The needs for cultivated land and timber by these migrants have accelerated the deforestation process. Third, the coffee boom in mid 90s has brought in high cash return for local coffee growers and changed significantly the face of rural economy. However, it has turned a large area of forests into coffee plantation. Poor management of local SFEs along with all these socio-economic factors has caused forest coverage in Daklak to fall 11%, representing a loss of more than 220,000ha of forest, between 1993-2000 (Tran 2000).

Forest degradation, deforestation, overloaded costs for the state to protect forests, and increasing recognition of the role of local population in resource management have

stimulated the experimental devolution of forest management in Daklak. The process, known as FLA, started in 1998 and has been covering six districts in the province. Its main idea is *to involve local people in resource management by recognizing their rights to forest resources*. For the first time in Vietnam, land use titles for forested land are granted to local people as the evidence of state's recognition of all the legal rights (to *exchange, transfer, mortgage, lease, and inherit land title*) vested in the right holders. Title holders may be individual households, groups of households, or a whole community, depending on the form of forest management. Other benefits offered to people, from state's point of view, include recognized rights to harvest timber¹ and non timber forest products (NTFPs), and access to up to 2ha² of upland per household for agricultural production. For households whose cultivated land is insufficient, the offer of up to 2ha of upland from FLA would be interesting to improve their agricultural production. By the end of 2000, FLA program basically completed the field work in 8,241.7ha in 6 districts (Dang 2001).

3.1.2. Research to address the concerns of the authorities

Concerns of the Government of Vietnam in general and of Daklak authorities in specific in the land allocation have been expressed as to vest the land use rights to local people in order improve the economic activities on land. With regard to forested land, it includes the maintenance and improvement of forest resource quality and quantity. Or put it other way, by allocating forest land to local people with land use certificate the governments, local and national, expect people to make use of the land to improve their livelihood while maintaining (and improving) the forest resources. The concerns from the state thus include the issues of rural economic development, poverty alleviation, and efficiency in forest resource management. Further discussion about these issues follows:

First, with regard to farm economic development after land allocation, the idea of vesting land use rights to local people is to provide them security to harvest from what they invest on the allocated land. It is expected that improved security will lend wing to more investments (both long and short terms) for better farm productivity. The government, thus, finds it important to know if FLA improves land use security, investments on the land, and consequently farm household economy. By investigating the different aspects of household livelihood in relation with FLA, the research program expects to answer these questions. In case the effects are not obvious due to short duration from the completion of FLA to the time of the field work, the research program should be able to sketch a direction for future study to monitor such impacts.

Second, since variations exist within a community, effects from FLA may not be the same for different households. For example, while a rich farmer with ample capital resources may start making investment on the land soon after FLA, a poorer farmer may take more time to accumulate capital or to acquire credit for investment. Thus, benefits for the rich may be different from those for the poor. Similarly, benefits may also be different between forest dependent people and those who are less dependent on forest. Availability of off-farm incomes may also be another cause for the differentiation of benefits from FLA. In general, differences in holdings and capabilities among local households have causal relationship to such differentiation. The wealth gap between the rich and the poor may consequently be widened. At farm household level, the concerned research will give a description of the differentiated benefits among different households. Such information

¹ Withdrawal of timber products is, however, subject to prior approval from juridical (forest) authorities.

² This land includes the existing upland area and the to-be converted upland from forested land.

will be useful for the local authorities to, first of all, understand the mechanisms and patterns of differentiation in benefits from FLA. It, subsequently, helps better target any assistance policy, including rural poverty alleviation program.

Third, concerning the management of the local resources, the idea of the FLA is to improve the cost efficiency in resource management. Since the costs to do good forest protection exceed the capability of the state alone, it is expected that devolution of forest management shift part of the costs to the local people. Therefore, it is clear that local people will have something to gain and something to lose from FLA. Costs for individual households may include labor cost to go patrolling the forest and other transaction costs. The research expects to provide an in-depth look into the benefits gained as well as costs incurred by individual households. Such outcome will provide an economic explanation for people's rationale to participate (or refuse to participate) in forest protection activities. For the local forest authorities, it may help make better strategy for forest management.

3.2. Relevance of research to current literature

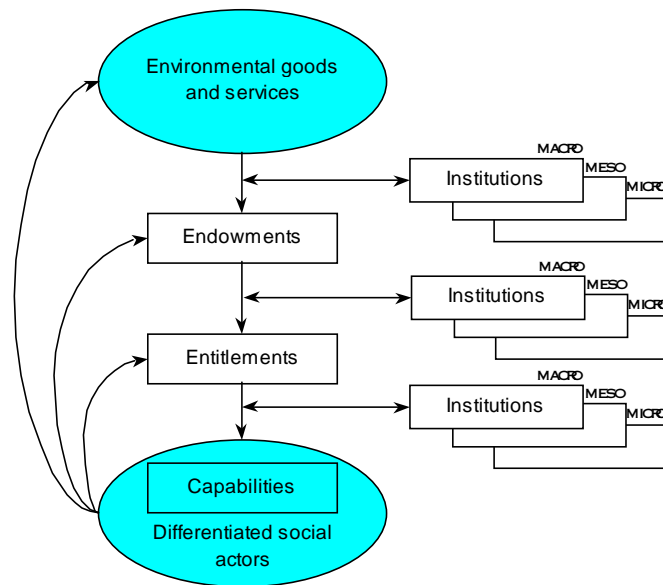
Discussion about resource management and economics of land titling has been given great concerns from current writings. As relevant to this research, two major bodies of literature, which are complementary to one another, are of interest. First, writings from qualitative researches are centered around the property right concepts and institutional changes to understand the differentiation process. Interested discussions are about the *environmental entitlement analysis* (Sen 1981, 1988; Leach, Mearns, and Scoones 1999); the *politics of property rights* (Bruce, Fortmann, and Nhira 1993; Cronon 1983; Ganjanapan 1994), and *rural differentiation process* (Berry 1989; Hart, Turton, and White 1989). Second, the other concerned body of literature focuses on the quantitative approach to economics of land titling. Of all, popular discussions are, to mention a few, from Barrows and Roth (1990), Bruce (1993), Feder et al. (1988), Feder and Nishio (1999), Gibson and Becker (2000), and Migot-Adholla et al. (1991).

3.2.1. Qualitative researches on property rights

Let's start the literature discussion with environment entitlement framework. The environment entitlement framework describes the interaction between people, as social actors, and the environment through embedded systems of property rights. In this interaction, both social actors and the environment influence and are influenced by each other. Important terms to be noted are endowments, which are "*the rights and resources that social actors have*" (Leach, Mearns, and Scoones 1999, p. 233, emphasis in original), environment entitlements, which, according to Leach, Mearns, and Scoones, "refer to *alternative set of utilities derived from environmental goods and services over which social actors have legitimate effective command and which are instrumental in achieving well-being*" (1999, p. 233, emphasis in original), and capability or well-being, "*which are what people can do or be with their entitlements.*" (Leach, Mearns, and Scoones 1999, p. 233, emphasis in original). Entitlement framework was first introduced by Amartya Sen (1981, 1988), who uses the theory of property rights to explain how poor command over food causes famine. He views rights under three different ways: instruments, constraint, and goals; and places property rights as important tools in the entitlement mapping process (Sen 1981, 1988). Sen's entitlement analysis, however, focuses only on entitlement mapping and pays little attention to endowment mapping (Fine 1997; Leach, Mearns, and Scoones 1999).

Leach, Mearns, and Scoones (1999) later take into account the limit from Sen’s work of entitlement analysis and extend this framework to explain how the consequences of environmental change are socially differentiated. The environmental entitlement framework by Leach, Mearns, and Scoones (1999) gives attention to both the way how people transfer their endowments into entitlements (entitlement mapping) as well as how these endowments are acquired (endowment mapping). This framework disaggregates the environment into particular goods and services and places institutional changes in the central of the analysis (see Figure 1). Figure 1 presents the environment entitlements framework by Leach, Mearns, and Scoones (1999). The framework starts with the environmental goods and services. People get rights to these goods and services through different ways, which are governed by institutions at different levels. The mapping of entitlements from endowments for each social actor is also influenced by set of rules and regulations at different levels. These entitlements are used to improve the capabilities of the social actors, which have feed-back influence on the environment. The concept of property rights is embedded in both the endowment and entitlement mappings.

Figure 1: Environment entitlements framework



Source: Leach, Mearns, and Scoones (1999) – Figure 1, p. 234.

According to Leach, Mearns, and Scoones (1999), the focus of the environment entitlement analysis is not on a particular endowments, entitlements and capabilities of any social actor but principally on the dynamic mapping processes underlying these sets, which are influenced by different forms of macro, meso and micro level institutions. In addition, Leach and her colleagues are concerned about the feedback loop of the social actors to the environment. In their view, “the environment provides a setting for social action but is also a product of such action.” (p. 239).

Since the entitlement framework gives considerable attention to property rights, let’s now turn to the discussion about property rights to natural resources. Property, in Bromley’s view, “is a benefit (or income) stream and a property right is a claim to a benefit stream...” (1992, p. 2). According to Bruce (1998, p.1), property is a bundle of rights. Cronon (1983, p. 58) argues that property is rights which are recognized by other people. He implies a relationship between the right holder and other people. Basically, property right refers to a set of recognized rights that make up the essence of ownership. The entitlement framework discussed above helps identify the differences in rights to resources, in economic benefits derived from these rights, and in the influences from such economic benefits to people’s capabilities.

Empirical studies show that property rights have become a political issue when a common notion of property right is not often understood between local people and outsiders, including state officials. Cronon (1983) describes a case in New England states where different perceptions of property and usufruct rights have led to the loss of resources from

native Indians to English people. Bruce, Fortmann, and Nhira (1993) show that differences in the understanding of property rights lead to conflicts between state and local people in Zimbabwe. Similar case is found in Thailand where Ganjanapan (1994) shows that conflicts exist between customary and national laws.

With regard to forest resources, writings have proved how complex the situation of property rights related to forest resources is due to a wide range of different products and services created by forests as well as different interests in these goods and services (Bruce, Fortmann, and Nhira 1993; Christensen and Rabibhadana 1994; Cronon 1983; Fortmann 1985; Ganjanapan 1994; Moore 1993; Rocheleau and Ross 1995). Main services and products in discussion are *timber* (Bruce and Fortmann 1988; Ellen 2000; Fortmann 1985; Pratong and Thomas 1990; Peluso 1992; Potter 1991), *non-timber products* (Ellen 2000; Peluso 1992; Fortmann 1985), *land* (Bruce and Fortmann 1988; Cronon 1983; Ellen 2000; Pratong and Thomas 1990; Peluso 1992), *game* (Bruce, Fortmann, and Nhira 1993; Cronon 1983; Ellen 2000), and *environmental control* (Christensen and Rabibhadana 1994; Ellen 2000; Peluso 1992; Potter 1991; Pratong and Thomas; Suryanata 1994). Another important thing that forest renders is its cultural or symbolic value to local people (Bruce, Fortmann and Nhira 1993; Fortmann 1985; Moore 1993). These forest products and services are connected to the security in livelihood of the forest people in one way or another. Conflicts are seen in the substitutability of these products and services and differences in interests in gaining access to and control of these products and services between the state and commercial companies on one side and local people on the other side as well as between the local people. Christensen and Rabibhadana (1994) describe the conflicting situation between the *de jure*, the official law enforced by the state, and the *de facto*, the customary practices by the local people, about the use of forest land in rural Thailand. Conflicts and insecurity in land and resource use in Thailand are also discussed by Ganjanapan (1994) and Pratong and Thomas (1990). In Indonesia, conflicts over tenure of tree and land, as discussed by Peluso (1992), Potter (1991), and Suryanata (1994) and some others, become political issues when they induce the resistance of local forest people to any outsiders, including state officials.

With regard to agrarian transformation, the environmental entitlements framework shows that the ability of local people to generate benefits from a policy program depends on their endowments, entitlements and capabilities, or “their access to productive resources and their ability to control and use resources effectively” (Berry 1989, p. 41). White (1989) argues that differential control over production resources and, often but not always, unequal access to land cause some groups to gain the products of their own or other’s labor, which constitutes the differentiation process. The effects of policy programs on local people, thus, are differentiated among different households and individuals according to their status and resources. The environmental entitlements framework also helps researcher to focus on specific products or services in the hosts of factors and conditions influencing rural differentiation.

Rural differentiation, a dynamic process about changing kinds of relations among peasantry (Hart, Turton, and White 1989), is influenced by different cultural, socio-economic and political factors. The differentiation process is linked to changes in institutional arrangements governing access to and control over resources and people, which are connected to larger economic and political forces (Hart, Turton, and White 1989). Contreras-Hermosilla (2000, pp.5-6) supports this idea and argues that power structures are the underlying cause of different effects on rural economy and resource

depletion. Sara Berry (1989) describes the strategies applied by African farmers in dealing with changing conditions and how these changes affect the resource use and resource access process. She shows that social actors in African society use their economic resources to attain higher social position (in both formal and informal organizations) and thus better access to resources, which, in return, improves their economic resources, and argues that differences in social and economic status create the differences in access to and control over resources among local people, which are the potential causes of rural differentiation (Berry 1989). With illustrations of Southeast Asian countries, Hart (1989) shows that state policies influence and are influenced by local level arrangements; consequently, state policies unintentionally become source of agrarian changes. On the other hand, through field study about effects of decollectivization on differentiation in three Thai villages in the Northwest of Vietnam, Sikor (1999) finds out that changes in political economic structures altered the differentiation among but not within villages, and that household wealth followed family cycle.

In sum, the literature discussed in this sub-section focuses on the significance of entitlement framework in analyzing property rights and institutional changes in the agrarian transformation process. The entitlements framework identifies differences in people's endowments, entitlements, and capabilities as potential sources of differentiation. It pays attention to the fact that endowments and entitlements are not given to people, and that acquisition of endowments and entitlements depends on people's economic, political and cultural resources. In addition, this framework helps focus attention to specific products and functions of the environmental resources.

3.2.2. Quantitative researches on economics of land titling and devolution

Unlike the qualitative researches discussed in the previous sub-section, which try to understand the mechanism of differentiation in rural economy, quantitative writings tend to focus on identifying the economic impacts from land titling and devolution of forest management. Works by Barrows and Roth (1990), Bruce (1993), Feder et al. (1988), Feder and Nishio (1999), Migot-Adholla et al. (1991), and many others provide rich evidence about this trend.

With respect to land titling and devolution of rights and responsibilities to manage forest and land resources, common belief is that they enable local people to enjoy more secure land tenure, to have better access to formal credits, to do more long term investment on the land, and consequently to improve farm productivity. Reality shows that such expected results are not often achieved, however. Except for improved land tenure security, which is observed in most empirical studies, other effects vary across locations (Feder and Nishio 1999). Studies on access to credits after land reform show different results. Research in Thailand by Feder et al. (1988) shows that land title successfully qualifies people in rural Thailand to better credits, and that farmers with land title using land as collateral are offered more credit than farmers without land title. On the other hand, land title has little effects on access to credits for farmers in India (Pender and Kerr 1994, cited in Feder and Nishio 1999). Failure of land titling to improve access to credit in Kenya, Ghana, and Rwanda is discussed by Barrows and Roth (1990), Bruce (1993), and Migot-Adholla et al. (1991). Basically, land title is not sufficient for farmers to qualify for a loan since a number of other conditions are also required.

Similarly, as reviewed by Feder and Nishio (1999), effects of land reform on long term investment and farm productivity have also different results in different study areas. In Costa Rica, Brazil, Ecuador, and some other countries, farm productivity significantly increases after land reform (cited by Feder and Nishio 1999 from the works of Salas, Knight, and Saenz 1970; IDB 1986; and Alston, Libecap, and Schneider 1996). However, evidence of unclear impact on farm productivity by land reform is found in Rwanda, Ghana, and Kenya (Migot-Adholla et al. 1991). Holden and Yohannes (2001) study the effect of land reform on farm production in southern Ethiopia and find that long term investment (in perennials) is significantly correlated with farm size, livestock owning, labor force, and basic education. Byamugisha (1999) shows that in the short run land registration has negative influence on the economic performance of local farms in Thailand, but positive impacts are observed in the long run.

Another issue related to the economic benefits of land titling and devolution is people's participation. It is perceived that the costs and benefits related to local people's involvement in a state initiated program are the key point for their participation. Local people are believed to be rational about their decision based on the perceived value of the resources (discount rate). Previous studies show that when the costs are higher than the expected benefits, farmers are unwilling to collaborate. Gibson and Becker (2000) show that in Western Ecuador even when the conditions are in favor of collective management of forest resources, local people still refuse to cooperate because individually they all see the costs to participate higher than the expected benefits. Study by Christensen and Rabibhadana (1994) in Thailand provides another example of failure to involve local people in a state forestry program when farmers did not see their benefits to join. Ostrom (1999) and Meinzen-Dick and Knox (1999) argue that the decision for a farmer to participate in resource management or not depends on the benefits and costs.

In summary, the quantitative literature discussed in this sub-section shows useful aspects for researches in the field of devolution and land and forest management. Empirical researches in this trend try to identify and quantify the various benefit linkages between land titling and registration and farm household economy. Based on which, the incentive for people to organize collective actions in resource management is justified. In addition, since quantitative tools are employed, the estimation results are often unambiguous.

3.2.3. Summary of literature discussion

The literature review in this section focuses on two major bodies of writings relevant to the research in Daklak. The first body of literature applies a qualitative approach to understand the differentiation process in rural society. Concerned literature in this trend build up on the relevance of environmental entitlement framework to property rights to natural resources and to rural differentiation. These papers try to understand the differences in social, political, and economic resources, which are the potential sources of differentiation, of the rural people. This approach, however, relaxes on the quantitative identification of factors influencing the whole process.

The second body of literature, on the other hand, is quantitative oriented. Writing in this trend take into account the quantitative measures of factors influencing to and effects from land registration and devolution. Employment of such quantitative measures in the analysis makes the estimation results unambiguous. The quantitative approach is,

nevertheless, loose on the interaction between people and the environment through systems of property rights and institutional changes.

For the research in Daklak, a combination of both qualitative and quantitative approaches will make use of their strengths. The research will apply qualitative approach to depict a picture of farm production and livelihoods in relations with forest resource use and FLA. The quantitative approach will then be employed to identify and quantify the benefits from FLA to local people and the factors influencing the generation of these benefits. The following chapters discuss how both qualitative and quantitative approaches can be combined in the research in Daklak to study the benefits from a land policy program.

4. The conceptual framework

In general, the environment entitlements framework discussed in details in sub-section 3.2.1 on page 5 is adopted as a conceptual framework for this research. Entitlement analysis is employed to analyze how local people access, use and benefit from forest resources, how the devolution of forest management influences entitlements, how people are differently influenced by devolution and land titling policy, and what mechanisms of differentiation are. With regard to FLA, this framework illustrates the legal rights to resources (i.e. cultivable land and forest products) and the economic benefits from such rights for differentiated households and people in the study area (see Figure 2). The framework helps analyze the ways how local households improve their livelihoods from their acquisition of legal rights to resources in FLA.

Figure 2 illustrates how the conceptual environment entitlement framework is adapted to describe the case of FLA in the study area. In the FLA process, local institutions play an important role. Local households/ people, the main unit of study, are socially differentiated. Local forests, the target of FLA, are considered as the environmental goods. Two important endowments in this case are access to cultivable land and forest resources (e.g. timber and NTFPs). Rights to these endowments are gained through different ways; either through customary practices, which is common in the pre-FLA period, or through the *de jure* way (e.g. allocated by the state during FLA) or both.

The entitlements from access to cultivable land is the harvest of the crops or the output from the land in general, and the entitlements derived from forest resources are timber³ and NTFPs. Both agricultural outputs and forest products can be used domestically or sold for cash; thus, the entitlements include both kind and cash returns. In the entitlement mapping, the roles of external factors like state policies, support programs, market conditions, infrastructure, etc., are also influential.

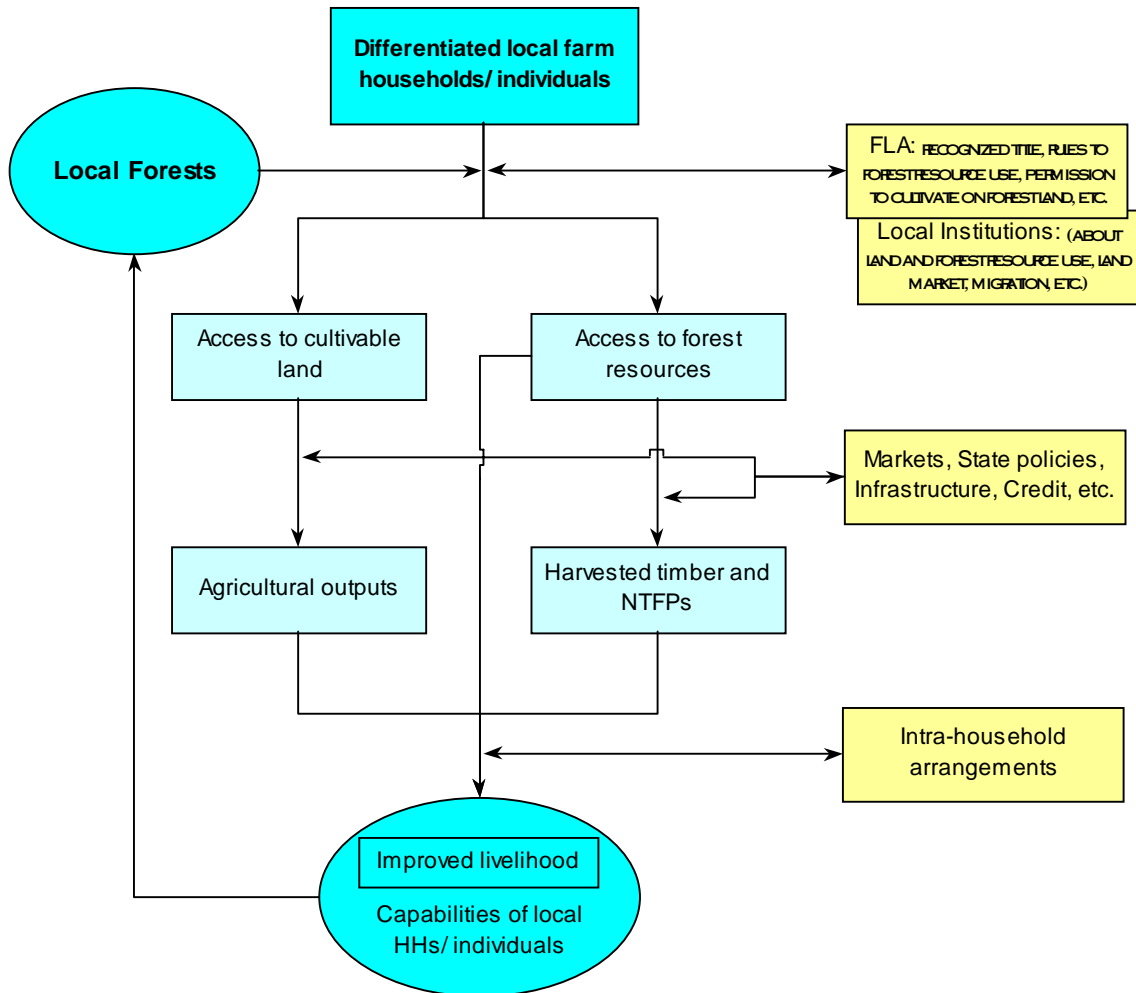
Harvests from agricultural land and forest products contribute to improve household's capabilities or, in general as Deere and De Janvry (1979) put it, its means of consumption and means of work. How the harvests and cash income can be used, however, depends on the intra-household arrangements (e.g. to purchase furniture or to spend on education, to invest in children equally or to give priority to sons).

Discussion of main variables in the research conceptual framework follows (for detailed listing of related attributes and characteristics, see Annex 1 on page 21):

³ Withdrawal of timber products follows a certain set of principles. See also footnote 1 on page 4.

- Differentiated local households/ individuals: Local household/ individual is the unit of study. The research looks at households/ individuals as socially differentiated actors, whose economic, social, and political resources are different. They own labor, skill, knowledge, land, and other resources, which can be used to exchange for entitlements.

Figure 2: Entitlement framework adapted in FLA



Source: Framework adapted from Leach, Mearns, and Scoones (1999) – Figure 1, p. 234.

- Local forests: Local forests are existing areas claimed as forest, which include forests of poor, medium and rich state. In most of the cases, forests in discussion are in poor and medium state. Before FLA (and also after FLA for non-allocated forests), forests are formally claimed by local SFE. However, in practice, these forest areas have been the sources of timber and NTFPs as well as land for cultivation for the local people.
- Forest land allocation (FLA): FLA is a state initiated undertaking which contextualizes policies from central and provincial levels in the territory of a district. Generally, FLA is to entitle local households/ people rights to forest resources. Recognized rights include rights to *access* resources, to *withdraw* regulated products⁴ from resources, to *exclude* outsiders from appropriating resources, to *manage* resources⁵, and to *alienate* resource use title (RBC). By vesting these rights to local

⁴ See footnote 3.

⁵ Right holder's forest management plan is subject to approval by juridical authority before implementation.

households/people, FLA expects to create incentives for them to protect local forest resources. FLA, thus, involves the shift of costs to protect forests from the state to local forest manager. For local people, FLA necessarily implies a combination of both rights to resources and duties to protect resources.

- Local institutions: Local institutions consists of all rules, custom and practices in use in the study area. Concerned institutions in this variable are those that influence the acquisition of cultivated land (including local rules about land opening and land marketing) and protection and management of local forest resources. These institutions are based on local beliefs, cultures and traditions, and are influential to the way local households/ people acquire their endowments from local forests.
- Access to forest resources: This variable represents the endowments from local forests of specific manager. Rights of forest manager to harvest the timber and NTFPs are legally recognized through FLA. The expected effect of such rights is, together with rights to cultivable land discussed later, to compensate the right holder for his labor costs to protect the allocated resources. In addition, holding of forests is expected to improve holder's social and political position, and create a sense of territorial ownership, which contribute to the non-material benefits from FLA.
- Harvested timber and NTFPs: These products are the entitlements acquired, in accordance to the regulated rights and rules, by the resource manager from his forest resource endowments. Harvested timber and NTFPs may be for household use or sale. These entitlements, therefore, include both kind and cash income from access to forests. The harvests depend not only on the household who manages the forests, but also on factors outside the control of the household, like state policies, market, infrastructure, etc. The substantial return from such harvests is, however, not expected in the immediate term since most, if not all, of the allocated forests are technically not able to be logged in the near future. Immediate harvests are, therefore, mainly NTFPs, which are usually not substantial for household cash income.
- Access to cultivable land: This variable represents the agricultural endowments that local households/ people acquire, and refers to the total cultivable area, either under cultivation or under fallow, of such households/ people. This variable is considered the most influential factor to the amount of agricultural outputs, thus, to the economic benefit stream of a local farm household. A household's land endowments may consist of the land that has been cultivated by the household before, whether titled or not, and the forested land used for cropping purpose as regulated by FLA.
- Agricultural outputs: Agricultural outputs are entitlements derived from agricultural land, which include products for home consumption and cash income from sale of surplus. Farm households/ people gain access to these entitlement through exchange of their knowledge, skill, labor, inputs, land, etc. In this entitlement exchange, external factors like market conditions, local infrastructure, state policies, credit market, etc., play a role. Agricultural land size and quality also are important to farm production. Farm outputs and cash income from agriculture are, therefore, influenced by land and household characteristics as well as external factors.
- External factors: This set of variables represents factors outside the control of a household, which influence and are influenced by the entitlement mapping process in one way or another. Such influences can be positively (e.g. rise of price for farm product) or negatively (e.g. certain input or service unavailable when needed) related

to improvement of farm productivity and income. These factors include state policies, support programs, supply of inputs, market of products, credit, infrastructure, etc.

- **Intra-household arrangements:** This variable refers to relationships and arrangements within a household with regard to the forest and agricultural products. It includes the issues of allocation and distribution of products (or cash from sale of products), which influence the capacities of the household in general and of different household members in specific. For the moment, discussion about these arrangements remains vague, more specific discussion is expected when the field work is in progress.
- **Improved livelihoods:** This variable represents the capabilities of the local households/people. Improved livelihoods in this context refer to improved living conditions (material benefits) and symbolic value of holding forests (non-material benefits). The improved living conditions include better education for the children, more and/ or better quality furniture, more savings, etc.. Non-material benefits, on the other hand, imply prestige, pride, better (social and political) position, more power, or other influences of the land holder to other people in the community. It is expected that improved livelihoods will stimulate local people to cover the costs of protection of forest resources. This variable, therefore, is influential to the status of the local forests.

5. Propositions

5.1. Main proposition

The main proposition of the research is stated as: “*Local farm households/ people derive different benefits from forest land allocation (FLA⁶)*”

5.2. Supplementary propositions

1. Local households/ people are differentiated by their economic resources.
Alternative propositions:
 - 1.A. Local households/ people are differentiated by their political position.
 - 1.B. Local households/ people are differentiated by their cultural resources.
 - 1.C. Local households/ people are differentiated by their social resources.
 - 1.D. No significant differentiation is found among local households/ people.
2. People’s economic position determines the changes in their access to forest land in the FLA process.
Alternative propositions:
 - 2.A. People’s economic position has no influence on their access to forest land in the FLA process.
 - 2.B. Access to forest land in the FLA process is influenced by other various factors.
 - 2.C. Differentiation among local households/ people happens through access to forest resources other than land.
3. Households’/ people’s economic position shapes their ability to derive benefits from markets for agricultural products.

⁶ See discussions in section 3.1.1 on page 2 and in chapter 4 on page 10 for description of FLA.

Alternative propositions:

3.A. Economic position has no influence on the derivation of benefits.

3.B. Households'/ people's ability to derive benefits is influenced by other factors.

4. Position in markets for agricultural products is the key determinant of local households'/ people's ability to derive benefits from agricultural production.

Alternative proposition:

4.A. Households'/ people's ability to derive benefits from agricultural production is determined by other mechanisms (e.g. access to government, access to credit).

5. Intra-household relations distribute benefits equally among household members.

Alternative proposition:

5.A. Male members in a household enjoy greater benefits than the female.

6. There exists a kind of symbolic value from forests, which provides non-material benefits about holding of land and forests for the local households/ people.

Alternative proposition:

6.A. There is no symbolic value attached to holding of forests; local people look at forest 'as is'.

7. Improved livelihoods after FLA are an incentive for people to protect local forests.

Alternative propositions:

7.A. Local people share the costs to protect forests regardless of derived benefits.

7.B. The benefits from FLA are not sufficient to motivate people to protect forests.

7.C. Improved land productivity makes people clear more forests for agriculture.

7.D. High value of forests products is an incentive for local people to accelerate forest exploitation.

6. Measures of main variables

6.1. Defining measures for main variables

This section discusses the measures of main variables concerned by the research. A summary of these measures is presented in Table 1 on page 17:

- Local forests: The measurement of forests is mostly based on quantitative data about forest size, tree density, spatial location relative to the village, etc., which can be collected from FLA data files, local SFE, and interviews of local people. In addition, qualitative information about tree species, quality of timber, and others, which can be collected from the same sources as above, is also useful.
- Access to forest resources: Access to forest resources by the resource manager can be measured through legitimate rights and duties, which include both the *de jure* and the *de facto*. Legal (*de jure*) rights and duties to forest resources are represented in the form of Land Use Certificate or Red Book Certificate (RBC) and stipulated in a contract as part of the FLA record book (a copy of this record book is kept by the title holder). Title may be owned by or shared among individuals, depending on the form of allocation. On the other hand, it is necessary to explicitly ask right holders about

their perceived rights and duties with regard to forest resources, and to observe from daily life how (*de facto*) rights and duties to forests being practiced.

- Local institutions: Local (*de facto*) institutions can be measured through the existence of rules, regulations, and practices related to use of forest resources, migration, land market, farm production, etc. in the study area. According to Becker and Leon (2000) these institutions can be seen in the local language and stories. In addition, their existence and influence can also be found in the production and living patterns of the local people through open-ended interviews and observations.
- Harvested timber and NTFPs: These products can be measured in kind and cash (from sale of products). However, since only few forest products can be harvested in the immediate term after FLA, measures of forest products may mostly be through prediction of expected harvests by the resource manager and the FLA team as well as by own calculation. Actual harvests of forest products, if available, will be collected through farmer interviews.
- Access to cultivable land: Legal (*de jure*) rights to cultivable land granted by the state can be found in the FLA record. However, since there may be differences between what is allowed by law and what is being practiced, it is necessary to look at the *de facto* access to cultivable land in reality during field days with farmers. For cultivated land, both existing and newly opened land can be measured quantitatively by land size, slope class, land quality and spatial location. Information about when and how the land was acquired and qualitative information about land quality is also useful. If the household has some land under fallow, similar data as above and information about fallow period (when, why and how the land is left fallow) should also be collected. (See Annex 2 on page 22 for detailed listing of concerned land characteristics).
- Agricultural outputs: Agricultural outputs in terms of kind and cash returns from agricultural land can be quantitatively measured. These information can be collected directly from farmers through interviews. It is, however, necessary to crosscheck with data about land, productivity and the market/ farm gate prices of farm products. Data about off-farm income, land and household characteristics, farm inputs, farm investments, and external factors is also needed for further analyses of farm outputs.
- External factors: These factors are various, including state policies (e.g., rule about extraction and marketing of forest products), support programs (e.g. extension, rural development), operations of farm input and output markets, credit market, and local infrastructure. The research will look at those most closely related to farm production. It will not make an attempt to conduct an in-depth analysis of such factors, but will give description of them, their coverage (as for support programs), and the linkages between them and farm production and forest resource use.
- Household characteristics: These attributes can be measured by direct quantities (e.g. family size, number of main laborers) or proxies (e.g. education level, wealth class). Qualitative information about household's history, experiences and the likes is also useful. (See Annex 2 on page 22 for a list of concerned household characteristics).
- Intra-household arrangements: The study will look at intra-household relations in resource allocation and distribution among household members, which include but not limited to food consumption, household spending, and education. These arrangements are difficult to measure quantitatively. Descriptive qualitative information will be used, instead.

- Improved livelihoods: This variable can be measured by comparing the household's existing level of living conditions, (social, political, etc.) position in the village, and other non-material benefits to those in the pre-FLA period. For living conditions, data about total household income (from both farm and non-farm sources), savings, affordability of furniture, education, food, etc., and qualitative information like quality of furniture can serve as good measures. As for non-material benefits, which are difficult to quantify, qualitative information that describes land holder's changes in (social, political, economic, etc.) position and voice in the village, his feelings about or pride of resource holding, the community's perception about the traditional values of forests, etc. will be used as measures.
- Effects of FLA: One of the ultimate aims of the research is to identify these effects. However, since FLA has just finished in the research area, only few effects can be observed quantitatively and/or qualitatively. Among them are: 1) change of cultivated land size and farm output, 2) harvest of timber and NTFPs, 3) change in labor distribution to meet the increased need of labor for forest protection, 4) investments (in forests and perennial trees), and 5) non-material benefits from forests. In addition, improved land use security, which can be measured by land holder's preparation for and/or deed of long term investment on the land, can also be an extra effect from FLA.

6.2. Selection of observations

Based on the conceptual framework for this research, the main unit of analysis will be household. However, disaggregated data and information with regard to the differentiation in benefits between men and women in the inter and intra-household relationships will be collected. Extra information at village, commune, and higher levels is also useful.

The research will cover all 14 villages where FLA fieldwork was completed by the end of 2000. There involve four steps. In the first step, the in-depth research, two villages will be studied consecutively. Information and data collected in this step will be analyzed and results will be generalized into theory in the second step. The third step will be a test-scale application of theory in two new villages. After that, a larger scale application in ten more villages will follow in the fourth, the final, step. (See also chapter 9 on page 19).

For the purpose of this research, two study approaches in each village are necessary. The first approach will be qualitative. It will look at general situation of the whole village and examine some specific cases (households) to gain in-depth understandings about how different households react to changes in land policy (i.e. FLA) and why they do that. This approach, therefore, concerns about the mechanisms of differentiation in benefits from FLA based on individual cases. Since it is assumed that household's economic status matters in the derivation of benefits from FLA, households to be studied will be selected as typical to the wealth classes. About two cases will be selected for each class in a village in the first step. No more than one case per wealth class per village will be studied in the third and fourth steps.

The second study approach will employ quantitative tools. Based on a survey of a representative number of local households with pre-prepared questionnaire, this approach will look at the effects of FLA on local livelihoods and the patterns of benefits derived from FLA. Data from survey will be computerized and econometric tools will be used to estimate the economic relationships between variables. The analytical results will build up models of patterns of benefits generated from FLA to local households. As for selection

of observations for the household survey, random selection may be used. In the first two villages (step 1), it is intended to survey 30 or half of the number of households in a village, whichever is more⁷. Since the average village size is around 60-80 households, the number of households to be surveyed in each village will be 30-40 in this step. Around 15-20 households per village will be surveyed in the third and fourth steps.

7. Techniques for data collection

In general, a bundle of data collection techniques will be employed. Depending on each variable that a combination of specific techniques can be used. Basically, farm household survey with pre-prepared questionnaire (semi-structure interviews), group and individual interviews, interviews to key informants, and study of available statistics and literature will be the main activities for data collection. Participatory mapping, history trend, and pebble sorting are added techniques. Table 1 below presents a list of main variables, means of measurement, and data collection techniques for each of these variables.

Table 1: Summary of main variables and related data collection techniques

Variables	Measures	Data collection techniques
Local forests	Size, tree density, spatial location, forest quality, possible products and harvest time.	Study of documentation and FLA files, open-ended interviews with SFEs, semi-structured interviews with farmers, observations of actual situation of forests.
Local institutions	Rules, regulations and practices related to use of forest resources, migration, land market, farm production, etc.	Study of literature, open-ended group interviews with key farmers, interview with local authorities, history trend, home stay to observe daily activities and special events.
Access to forest resources	State of the title (own or share), <i>de jure</i> rights and duties specified in FLA legal papers, land holder's own perception of rights and duties, and the <i>de facto</i> rights and duties being practiced in reality	Study of FLA files and legal documents, interviews with farmers (both holder and non holder of land title), field day with farmers to observe forest management activities.
Harvested timber and NTFPs	Quantities and quality of harvested and to be harvested products, products for household use, cash return from sale.	Open-ended interviews with farmer group, semi-structured interviews with individual farmers, pebble sorting, field day with farmers to observe collected products, home stay to observe domestic use of products, observation of products for sale in village and market.
Access to cultivable land	<i>De jure</i> and <i>de facto</i> rights to cultivable land, land size, land quality, spatial location, slope class, irrigatability, when and how land was acquired, fallow management.	Study of FLA files and legal documents, open-ended interview with local authorities, semi-structured and open-ended interviews with farmers, participatory mapping, field day with farmer.

⁷ Econometrically, at least two degrees of freedom (the difference between the number of observations and number of parameters being estimated) are required in a regression. Larger degree of freedom is, however, preferred. Since data from these two villages will be regressed individually, a number of >30 observations (HHs) is recommended.

Agricultural outputs (and income)	Farm yield, outputs, products for home use, cash return from sale, farm inputs, farm investments.	Open-ended interview with local authorities, semi-structured and open-ended interviews with farmers, field day with farmer, observations of products for sale in village and market.
Household characteristics	Direct quantities or proxies (See Annex 2 on page 22 for a list of household characteristics)	Study of documents, open-ended and semi-structured interviews with farmers, observations of farm and house.
External factors	Description of factors (state policies, support programs, markets of farm inputs and outputs, credit market, infrastructure, etc.), their coverage, and their linkages to farm production and forest use.	Study of legal papers and literature; interviews with local authorities, staff from concerned organizations, and farmers; pebble sorting; history trend; village stay to observe the presence of these factors and their influence on village life.
Intra-household arrangements	Relations and arrangements in allocation of resources (food consumption, spending, education, etc.)	Study of literature, open-ended interviews with local authorities and farmers, pebble sorting, home stay to observe (daily) arrangements.
Improved livelihoods	Past and present information about living conditions (total household income, savings, affordability, etc.) and non-material benefits (land holder's changes in positions and voice, prestige, pride, etc.)	Study of archive and literature, open-ended interviews with local authorities, semi-structured interviews farmers, pebble sorting, observations.
Improved land use security	Land holder's feeling of security, preparation for and deed of long term investment on land.	Semi-structured interviews with farmers, observations of farm activities.
Effects of FLA	Quantitative and/or qualitative data about: 1) change of cultivated land size and farm outputs, 2) harvest of timber and NTFPs, 3) change in labor distribution, 4) investment, 5) non-material benefits from forests, and 6) improved land use security.	Through obtained results of other variables discussed above

8. *Techniques for data analysis*

Both qualitative and quantitative techniques will be employed to analyze the collected information. In general, the first study approach discussed in section 6.2 on page 16 will employ qualitative analysis technique to depict the mechanism of rent-seeking of the sample households and what makes the differentiation in benefits gained by households in different categories (the criteria for which will be later determined). Household history analysis can also be added to for a clearer look at the household's behaviors and their differentiated motivations to participate in collective activities. These analysis techniques are intended to be complementary to the one applied in the second approach.

Quantitative analysis will be the main technique employed in the second approach. Econometric tools will be used to estimate the relationship between land and household characteristics, external factors and the acquired benefits. An analysis of history of the

village will be employed to show a more complete picture of the local people's changes in their production strategies in response to externalities.

Detailed discussion on the data analysis techniques is presented below:

- **Qualitative analysis:** Qualitative analysis is case-oriented (Ragin 1987). It is intended to be complementary to quantitative analysis technique, which is discussed below. Qualitative analysis technique will be employed in the overall research and in the study of sample households to identify and examine the causations and conjunctures in space and time (Ragin 1987) that link to local people's lives. The results of this analysis will complement to the generalization of benefits from FLA.
- **Econometric analysis:** Econometric analysis looks for economic relationships between different phenomena. Put it another way, econometric analysis is about estimation and prediction of economic relationships between different variables from a host of awkward data (Kenedy 1998). With regard to this research, econometric analysis will be used to estimate the relationships between, but not limited to, farm outputs and other benefits (as dependent variable) and factors like farm inputs, land and household characteristics, and external factors (as independent variables) (see section 6.1 on page 14 for discussion about these factors). Econometric or statistic software packages (SPSS, Limdep, TSP, or SAS) will be employed in this analysis.
- **History analysis:** History analysis will cover both village as a whole and selected sample households. The use of this analysis technique helps find the chain of events happened in the village (or household) history, the villagers' (household's) response to these events and their experiences gained throughout the whole process. The results of this analysis will be helpful to better understand the mechanism of benefit generation of the whole village in general and of individual households in particular. Participatory mapping and open-ended interviews can be of help for this analysis.

9. Time frame and organizational issues

As mentioned above, the research will cover 14 villages where fieldwork of FLA was completed by the end of 2000. Fieldwork for the proposed research is intended to go through four steps over a total period of 15 months, from February 2002 to April 2003. Details of the steps are presented in Table 2 below:

Table 2: Tentative timeframe of the field research

Step and time	Work contents
Step 1: In-depth research in two villages (Feb 02 - Jul 02)	<ul style="list-style-type: none">• Understand the conditions in the villages and concrete measures of evaluation.• Collect and analyze information as discussed in chapters 4 and 8.
Step 2: Development of model (Aug 02 - Oct 02)	<ul style="list-style-type: none">• Summarize and compare findings from the villages• Define indicators and determine data collection and analysis techniques
Step 3: Application of model on trial scale in two villages (Nov 02 - Jan 03)	<ul style="list-style-type: none">• Apply methods and techniques defined in the previous step in two new villages• Evaluate, refine and adjust methods

- | | |
|---|--|
| Step 4: Large scale application of model in 10 villages (Feb 03 - Apr 03) | <ul style="list-style-type: none">▪ Apply refined methods and techniques in ten more villages▪ Summarize findings in the study villages |
|---|--|
-

As for organizational issues, the research will be supported by the Department of Agricultural and Rural Development of Daklak (DARD). Local contacts and assistance will be provided by DARD. Personnel from DARD and a local university, Tay Nguyen University, will assist the household data collection in the application steps (steps 3-4).

10. Conclusion

Forest land allocation (FLA) in Daklak is a state initiated experiment that applies policy ideas from central and provincial levels in the district. It is the first time that local people are entitled full rights (to *exchange, transfer, mortgage, lease, and inherit* title) to forest resources. By allocating forests with all these rights to local people, the state expects local people to improve their household economy and to share the costs of forest management with the state. FLA, thus, means a combination of both rights and duties to forests resources for the local people.

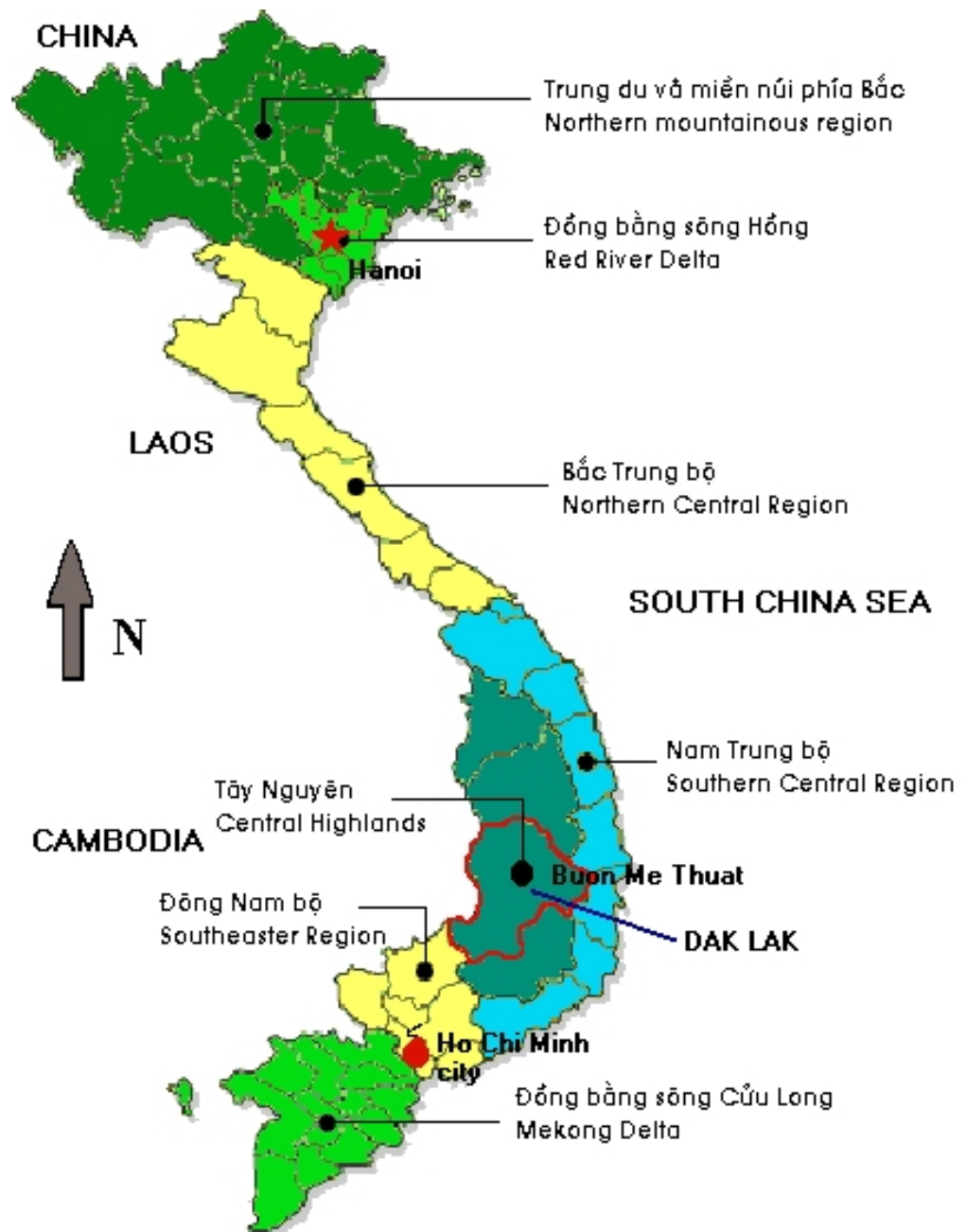
Within the context of FLA in Vietnam, the intended research aims to study the benefits that FLA generates to local farm households. In Vietnam, expected results from the research are to address the concerns of the local authorities (i.e. Daklak province) as well as of the Government of Vietnam in rural economic development, poverty alleviation, and forest resource management. As for current discussion in literature, findings from this research are expected to contribute to the discussion about entitlement analysis, politics of property rights, social differentiation process, effects of land title on farm productivity, and local people's participation in collective action.

The research will cover a total number of 14 villages; and household will be the main unit of analysis. In each of these villages, two study approaches will be applied. One will be case oriented with qualitative data analysis technique. This approach is to understand how different people respond to changes created by FLA, why they are doing it, and what mechanisms they have to derive benefit from FLA. The second approach will be in a form of household survey where econometric tools will be employed for data analysis. This approach will examine the differentiated patterns of benefits that FLA generates to local households and people. The two approaches are complementary and their results will fulfil the set objective of the research.

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Annex 1 – Location of Daklak in the map of Vietnam



Source: Vietnam Economic Information Network, <http://www.vneconomy.com.vn/en/basic_data/map>, with author's addition.

Annex 2 – List of detailed attributes and characteristics at household level

1. Forest resources
 - Size
 - Location
 - Traditional forest management practices in the local area (for indigenous people), or in the original place (for migrants)
 - Date of acquisition (forest and title)
 - Type of tenure (share or own)
 - Timber volume and major species
 - Rules for harvest of forest products
 - Possible and harvested products in short term
 - Expected year to harvest timber and its value
 - Sale/use of forest products
 - Investments in forest management (labor, capital, etc.)
 - Use of title for loan
2. Cultivation land
 - Size
 - Location
 - Slope class
 - Irrigatability
 - Soil quality
 - Date of acquisition (land and title)
 - Mode of acquisition (e.g. inheritance, occupation, transaction, rent)
 - Leased-out land (why, when, to whom, how much, how long land is leased, etc.)
 - Crops
 - Investments
 - Demand for technical support (extension) for cropping
 - Harvest from land and its value
 - Sale/use of crop products
 - Fallow land: land characteristics, title, acquisition, when, how and why it is left fallow, etc.
 - Use of title for loan
3. Animal production
 - Species
 - Number of heads
 - Date to start raising each species
 - Sale/lease/use of animals and their products
 - Investments in animal raising
 - Demand for technical support (extension) in livestock raising
 - Returns
 - Use of animal as pledge against loan

4. Family characteristics
 - Number of people
 - Sex of the family head
 - Number of male, female, children, adult, and elderly
 - Education of family members (particularly of the head)
 - Political position of family member(s) or head in the village or local authorities
 - Date of settlement
 - Place of origin
 - Previous non-farm experiences
 - Agricultural labor force and hired labor
 - Ethnicity
 - Wealth class
 - House (house type, date of construction, sources of main materials, etc.)
 - Other property holdings (machinery, TV, motorbike, etc.)
5. Non-farm employment and income
 - Number of household members having off-farm jobs
 - Type of jobs
 - Engagement in off-farm jobs
 - Earnings from off-farm jobs
 - Remittances and other non-farm income

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