

# **Forest Devolution in Vietnam: Patterns of Differentiation in Benefits among Local Households**

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## **Abstract**

Proponents of forest devolution have argued so far that by involving local people in the course of forest management, forest devolution can improve economic efficiency in resource management. While empirical evidences show that outputs of devolution at local level remain unclear across different cases, the issue of how benefits from forest devolution is distributed among local people within a community arises. To this aspect, an important question is whether or not different households are in the position to get an equitable share of their benefits from forest devolution or is it the rich and powerful who reap most of these benefits, leaving little to the poor and powerless.

This paper subjects this question to empirical analysis. The purpose of this paper is to examine the links between household productive resources and the endowments and entitlements from the devolved forests. With the help of the environmental entitlement framework, the paper applies a combined approach of institutional and econometric analyses to examine the outcomes of forest devolution in thirteen villages in Central Highlands of Vietnam. Forest devolution introduces institutional changes in property rights governing access to and control over forest resources. The environmental entitlement framework enables an in-depth look into the complex institutional arrangements in the study area. The econometric approach is then employed to identify and quantify the different patterns of benefits from the devolved forests. Findings from the study show a wide differentiation in the benefits acquired by different households in the study area. Among other factors, wealth, power and control over cultivated land are influential to the distribution of forest benefits.

**Keywords:** forest devolution, Vietnam, environmental entitlement, differentiation, endowments, entitlements

## **1. Introduction**

Writings in natural resource management have given considerable attention to benefits from forest devolution. In general, forest devolution proposes a change in the land and forest tenure that opens a new window of opportunity for many local people. Yet, whether or not the opportunities can be translated into real economic benefits depends on the factors at both household and village levels. Empirical evidence from current literature shows that there has

been considerable variation in benefits derived from forest devolution among different actors involved in the forest resource management and that it is the wealthy and politically powerful who reap most of the benefits from devolution, leaving little for the poor and the powerless.

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 Dak Lak, a central highland province of Vietnam, since 1998. In this forest devolution program, forested land has been allocated with land title to different types of users (individual households, groups of households, or a whole community) in five districts in Dak Lak. By the end of 2000, fieldwork was completed in thirteen villages.

This paper examines the differentiated distribution of economic benefits from forest devolution among local households in Dak Lak province of Vietnam. Its main purpose is to *examine the patterns of differentiated distribution of benefits from forest devolution among local households*. In addition, I also try to understand the relationship between household's control over productive resources and the benefits derived from devolved forest.

After this introduction section, I will introduce the background information about Dak Lak forest devolution and the study villages in Section 2. After that, I will review the important literature related to the research in Section 3. Section 4 will discuss the research framework and data used in the analysis. In Section 5, I will empirically examine the distribution of benefits from devolved forest among local households and relate the variation in benefit distribution to the household's control over productive resources. Finally, Section 6 will summarize major findings from the research.

## **2. Forest devolution in Dak Lak and the study sites**

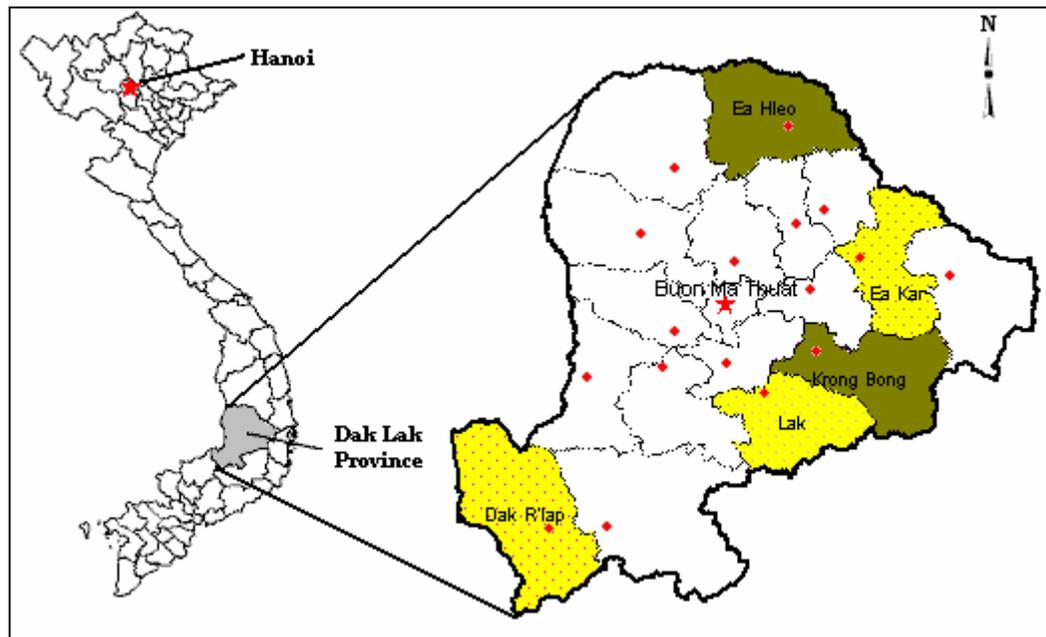
Dak Lak is located in the Central Highlands Region of Vietnam<sup>1</sup> (see Figure 1). It is a largest province in Vietnam with total physical area of around 1.9 million ha. Of which, more than half is classified as forest land. Agricultural land accounts for about 26% of the total land size. Dak Lak is home for about two million people from more than 40 different ethnic groups. Most of

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<sup>1</sup> In January 2004, Dak Lak officially split into two provinces: Dak Lak and Dak Nong. The name Dak Lak used in this paper, however, refers to Dak Lak as one province that existed before this separation.

whom are migrants coming from other provinces. At present, the indigenous ethnic groups (i.e. Ede, Jarai, and M'ngong) are minor in number (around 18% of the province total population) and mostly living in remote villages.

**Figure 1: Map of Dak Lak and the study site**



Source: Dak Lak DARD with author's edition

Forest devolution in Dak Lak was initiated by Dak Lak People's Committee at the beginning of 1998 with two major objectives: 1) to maintain and improve the existing forest cover in the province, and 2) to improve the livelihoods of local people. In general, there are two important questions that gain interest of not only Dak Lak but also in the Vietnamese forestry sector with regard to forest devolution: who should receive what kind of forests, and what arrangements of rights can be devolved with different categories of forests (i.e. production forest, protection forest, and special use forest). To address the first question, Dak Lak's devolution program devolves the rights to manage the production forests which are currently managed by local State Forest Enterprise (SFE) to either individual households or groups of households. In the later stage (i.e. 2001-2002), the program also tries to devolve forest management rights to local communities. As for the second question, Dak Lak People's Committee (PC) grants long term land use title (or RBC) for forested land to local people as the evidence of state's recognition of the legal rights (to *exchange, transfer, mortgage, lease, and inherit land title*) stated in the land

law. In addition, there is a contractual agreement between the state forestry representative, local authorities and local people attached with each forest land use title. This contract specifies benefits from devolved forest that people are entitled to, which include rights to harvest timber and non timber forest products (NTFP), and access to limited area of cultivable upland in the devolved forests. In other words, the attached contract clarifies the benefits people are entitled from forest devolution and sets the constraints on what people cannot do with the devolved forests in addition to what is implied by the RBC.

In general, forest devolution in Dak Lak makes two breakthroughs in the devolution process in Vietnam. It first gives local households the rights to natural forest resources along with long term land use title for forested land. Under the framework of Decree 02/CP dated January 15 1994, local people can be granted long term forestry land use title, however, for non forested forest land or plantation forest only. Secondly, Dak Lak devolution program puts forth the discussion about direct sharing of timber benefits with and using land for cultivation purpose by local people who manage forests. This has given a new focus for the policy discussion about the incentive for people to participate in forest management. In fact, these two points have already been under discussion before but it is Dak Lak forest devolution program that they are realized. By doing this, Dak Lak has changed the policy discussion into a new direction. As a matter of fact, forest devolution in Dak Lak has created an important platform for discussion about forest policy in Vietnam. So far, Dak Lak's forest devolution program has gained attention by international donors as well as forestry policy makers from the ministry level as well as from other provinces.

This paper examines the effects of forest devolution in all the thirteen villages where management of forest resources was shifted to (part of) local people in 1999-2000. Of the thirteen villages, two are covered by an in-depth study and the other eleven by an extended study. The two in-depth study villages are chosen from two different districts with different local conditions and pressure on devolved forest resources, roughly representing two extreme conditions in terms of resource extraction in the devolved forest. The other eleven villages are simply the remaining number of villages where forest devolution completed by 2000.

Administratively, study villages are located in five communes in five different districts in Dak Lak (see Figure 1, two districts with dark color are the ones with in-depth study villages (and

four extended study villages), the other three districts with light, dotted shade are only with extended study villages). There are slight variations in biophysical conditions among villages within the same district but more significant differences between districts. In terms of ethnicity, indigenous people are the major ethnic group in eleven villages. There are four Jarai villages, five M'ngong villages, and two Ede village. The two remaining villages consist of migrants coming to Dak Lak during 80s. Population also ranges across villages, between 42 to 115 households or around 290-590 people, per village.

All study villages are located in the economically poor zone according to Vietnamese system. Within each village, there is variation in economic status among households. As for livelihoods, there are various sources but the most important one is from agriculture. Farm production is mainly from crop cultivation, which includes both cash and staple food crops. Normally, rice (both paddy and upland rice) is cultivated for home consumption. In some villages, local maize is also planted and consumed domestically. Cash crops include annual crops like hybrid maize and beans, and perennial crops like coffee, pepper, and cashew. Forest products are also collected mostly for home use and consumption. Besides cropping, off farm income also plays a role in these villages. The most popular sources of off farm are salary and allowances from the state, and returns from trading and servicing activities. In some cases, local people earn an income from hiring their labor.

Forest devolution happened in the study villages in 1999-2000. In three villages (including one in-depth study village), forest was given to groups of households. In the others, local people received forest by individual households. By 2001, official forest land use title (RBC) was given to all households or groups of households receiving forest in these villages.

### **3. Literature discussion**

In this section, I will discuss the literature relevant to my research. Since property and access play important role in forest devolution and derivation of benefits from devolved forest, I will start with a review of the relevant discussion about property and access in the current literature. After that, I will discuss the environmental entitlement framework, which will be adapted in my research as a conceptual framework. Finally, I will review the theoretical discussion related to forest devolution and summarize empirical evidences on effects of devolution on local people.

### **3.1. Property and access in natural resource**

Perhaps property is the most confusing term in the literature. Yet an understanding of the essence of property, its complexity, and politics is important to this research. The term 'property' is commonly used in the current daily language to refer to assets, or things (Bromley 1989b; Hann 1998; MacPherson 1978). Academic and legal use of this term, however, is to refer to right or a set of rights to things (e.g. Bromley 1989b; Bruce 1998; Cronon 1983; Furnivall 1909; Furubotn and Richter 2000; Hann 1998; MacPherson 1978), though the wording is slightly different with different authors. The term 'property right' is used to make the connotation of 'property' clear (Bruce 1998). In contemporary writings, however, these two terms are used interchangeably.

Property rights to resources are classified into different kind of rights. Bromley (1989b) considers rights to possess, to use, to manage, the income, the capital, security among other terms that make the essence of property rights. Contemporary writings in the field of property and the commons – prominent ones include works by Elinor Ostrom and her colleagues – define five classes of rights: rights of access, rights of withdrawal, rights of management, rights of exclusion, and rights of alienation. The level at which one can have these rights defines his/her status (Meinzen-Dick and Knox 1999; Ostrom 2000; Ostrom and Schlager 1996; Schlager and Ostrom 1992). Holders of these rights can be individuals, groups or state. Depending on the prevalent resource manager that types of property can be classified into state property, communal (or common) property, private property, and open access or non-property (Bromley 1989a, 1992; Feeny et al. 1990; MacPherson 1978).

The categorization of property rights, positions, and property regimes provides a useful way to look at property. However, it is insufficient for an insightful analysis of the nature and operations of the property relationships as reality is much more complex (Benda-Beckmann and Benda-Beckmann 1999). According to Benda-Beckmann and Benda-Beckmann, it is important to pay due to the variety of functions and layers of property in the description and analysis of variations in property rights and their significance in different societies (ibid., p. 40). Benda-Beckmann and Benda-Beckmann offer an insightful look into the variations in the ideologies, normative rules and the constellation of actually existing property relationships. They emphasize on the distinction between legally constructed and actual constellations of property relationships in the analysis of property. Furthermore, they call attention to the significance of looking at different

aspects of property, which include not only its economic but also its social security, social continuity, and political functions (ibid.).

Let's now turn to the issue of access. The term 'access' has generally been used as closely related to 'property' (Ribot 1998), which can be understood as a set of rights as discussed earlier. There is, however, a difference in the terms 'right' and 'ability' in common use. The former is broader than the latter (Ribot 1998) but either one does not necessarily mean the other (Agarwal 1994). In addition to property right, access is essential in the derivation of benefits from the resources in question. Ribot and Peluso (2003) emphasize access as the ability to benefit from things and bring attention "to a wider range of social relationships that can constrain or enable people to benefit from resources without focusing on property relations alone" (ibid., p. 154). They offer a way to "understand *why* some people or institutions benefit from resources, *whether or not* they have rights to them" (ibid., emphasis in the original), through access analysis. According to them, the process through which benefits are gained, controlled, and maintained is mediated by right-based access (i.e. legal and illegal access) mechanisms on the one hand, and by the structural and relational access mechanisms (including technology, capital, markets, labor, knowledge, authority, identity and social relations), on the other (ibid.).

Ribot and Peluso (2003) make three important contributions to my research. First, they inform me that it is insufficient to focus only on property right in the examination of benefits from resources. They draw my attention to the role of access in the benefit derivation process. Second, Ribot and Peluso (2003) provide a useful discussion on the access mechanisms at work. Their classification of right-based access mechanism into legal and illegal access informs me that benefits from a resource are not only to those who have legal rights and access to this resource but also to those who do not have these rights and access. Third, Ribot and Peluso (2003) provide a useful discussion on a number of important factors that mediate the process through which benefits are acquired, controlled, and maintained. As they point out, these factors include access to technology, capital, markets, labor, knowledge, authority, identity and social relations (ibid., pp. 165-172).

To sum up, the discussion in this section shows the roles of property and access in natural resources. I have showed that it is not only property but also access that need to be taken into account when examining the derivation of benefits from a resource in question.

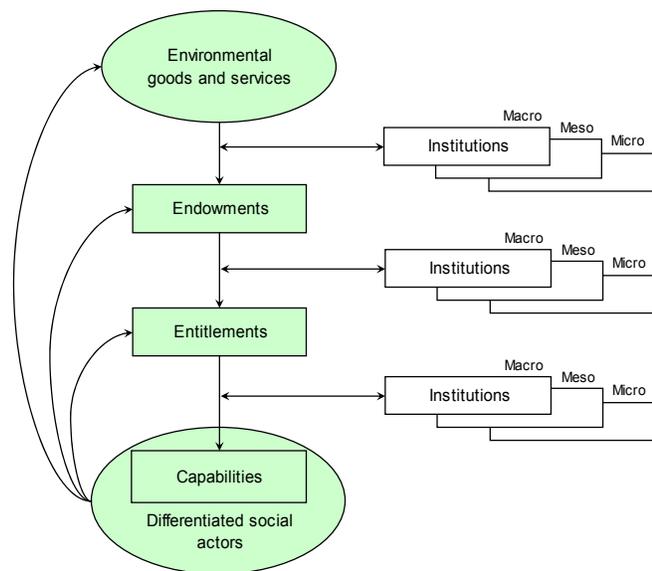
### 3.2. Environmental entitlements

The entitlement literature starts with Amartya Sen’s entitlement approach to famine. Sen (1976, 1981a, 1981b) introduces a new way to look at the cause of famine through entitlement failure. Later on, Leach, Mearns, and Scoones (1999) develop Sen’s original idea to the environmental entitlement framework to explain how the consequences of environmental change are socially differentiated. The environmental entitlement approach allows an insightful look into 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 (Leach, Mearns, and Scoones 1999).

Terms that have produced confusion in Sen’s works are redefined by Leach and her colleagues. Important terms are ‘endowments’, which are “*the rights and resources that social actors have*”, ‘environment entitlements’, which “*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*” (Leach, Mearns, and Scoones 1999, p. 233, emphasis in the original). According to Leach and her colleagues, the distinction between endowments and entitlements is not *a priori* but on the empirical and spatial contexts (*ibid.*).

Unlike Sen, 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) in their environmental entitlement framework. The framework disaggregates the environment into particular goods and services and places institutional changes in the central of the analysis (see Figure 2). The framework starts with the environmental goods and services. People acquire rights to these goods and services

**Figure 2: Environment entitlements framework**



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

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. The environment entitlement analysis does not focus on a particular endowments, entitlements and capabilities of any social actor. Instead, it gives attention to the dynamic mapping processes underlying these sets, which are influenced by different forms of macro, meso and micro level institutions.

The environmental entitlement framework by Leach, Mearns, and Scoones (1999) makes one important contribution to my research. It proves to be a useful framework for the examination of the connection between forest devolution and the associated benefits (for clarification, I will hereafter use endowments and entitlements to refer to the rights to and concrete benefit from devolved forest, respectively, as specific types of benefits from devolution). I find its disaggregated and institutional approach very useful to gain insights in the differentiated distribution of forest endowments and entitlements in a complex system of interacting and multilayered institutions. In addition, I find environmental entitlement framework a useful framework to examine in detail the socially differentiated dynamics in the course of natural resource utilization by the social actors. The environmental entitlement framework allows me to look beyond the differentiation in forest endowments and entitlements among social actors, to the differentiation in the agrarian society.

### **3.3. Devolution of forest management**

To begin with, it is necessary to devolution from decentralization. Decentralization “is the process where a central government relinquishes some of its management responsibilities or powers to a local government, local leader, or community institution” (WRI 2003). Devolution refers to transfer of power (Fisher 1999), rights and responsibilities to user groups at local level (Meinzen-Dick and Knox 1999). By definition, decentralization differs from devolution in the sense that the former refers to the reallocation of *administrative functions* away from a central location while the latter to the reallocation of *power or authority to contribute to decision making* away from the central location (Fisher 1999, emphasis added; see also Agrawal and Ostrom 1999; Ribot 1999, 2002). In a more concrete sense, both decentralization and devolution

refer to the transference of rights, responsibilities, and powers away from the central location. Devolution, however, involves the transferences to individuals or user groups at local level while the transferences that occur within decentralization process are from higher to lower levels of government (Meinzen-Dick and Knox 1999, see also Fisher 1999). As my research is about forest devolution, I will focus the discussion hereafter on the devolution.

Under the light of the property and access theories reviewed earlier, devolution is about the shift of property and power from the central government to the local people. Since both property and access are related to the benefits from the resource in question, a true devolution requires also a transference of benefits from the resource away from the government (see also Shackleton et al. 2002). In addition, given by the complex nature of property and the multifunction and multilayeredness of access, devolution that involves the transferences of rights and power is also complex in nature and has to deal with a variety of functions and layers of access (see also 3.1)

The ultimate purpose of devolution is to improve economic efficiency, social and economic equity, and sustainability in forest resource management and conservation (Agrawal and Ostrom 1999; Ngaido and Kirk 1999; Ribot 1999). The achievement of this purpose is based on a number of assumptions. On the efficiency aspect, it is assumed that participation in decision making and management of local resources allows local communities who bear the cost of resource use decision to make the decisions themselves instead of putting the decision making in the hands of somebody else (Ribot 1999, 2002). In addition, since the local people live in or around the resource areas, the administrative and management costs can be reduced and local skills and knowledge made used (ibid.). Devolution increases the effectiveness of coordination and flexibilities among state agencies in the development and conservation planning and implementation (Agrawal and Ostrom 1999). As of equity aspect, it is assumed that participation can increase equity through more equal distribution of benefits (Ribot 1999, 2002). Overall, in order for devolution to improve sustainability, equity and efficiency in forest management, it is assumed that local people have voice in and control of significant decision making (ibid.) and that local communities take the role formerly from the state (Katon, Knox, and Meinzen-Dick 2001; Ngaido and Kirk 1999).

At present, at least 60 countries in the world have some forms of devolution in natural resource management (Ribot 2002; WRI 2003). However, empirical studies show that outcomes of forest

devolution at the local level are mixed and rather disappointing (Edmunds and Wollenberg 2001; Edmunds et al. 2003; Katon, Knox, and Meizen-Dick 2001; Shackleton and Campbell 2001; Shackleton et al. 2002). In general, state forestry organizations still maintain key control over the forest resources (Edmunds and Wollenberg 2001; McDemott 2001). In many cases, forest devolution fails to improve people's livelihoods (Contreras 2003; Conyers 2002; McDemott 2001). Forest entitlements, which are used by the state to create incentive for local communities involving in devolution, are often meager and unreliable (Edmunds and Wollenberg 2001; Shackleton et al. 2002). In addition, the distribution of forest entitlements varies among villages (Agrawal and Ostrom 2001; Dachang and Edmunds 2003; Ribot 2002; Sarin et al. 2003; Shackleton and Campbell 2001), and within villages (Dachang and Edmunds 2003; Dev et al. 2003; Richards, Maharjan, and Kenal 2003; Sarin et al. 2003; Shackleton and Campbell 2001). Furthermore, devolution result in empowering local élites, who are not necessarily the representative of the local communities (Edmunds and Wollenberg 2001; Fisher 1999; Shackleton et al. 2002; WRI 2003). According to Edmunds and Wollenberg, "local élites - large landholder, traders, traditional leaders, and other individuals who have had power to influence many of their neighbors in matters of forest management - are informal policy makers. They shape the outcome of devolution policies in every country, generally against the interest of the poor" (2001, p. 194). Consequently, the entitlements from devolution are strongly differentiated among local people, and most of the forest entitlements are captured by the local élites (Edmunds and Wollenberg 2001; Shackleton et al. 2002; Sarin et al. 2003).

Empirical studies on forest devolution show that forest endowments are not sufficient to acquire forest entitlements (McDemott 2001; Shackleton et al. 2002). Lack or absence of ability prevents local people from benefiting from forest devolution (see also discussion by Ribot and Peluso 2003 ). The derivation of forest entitlements is not only influenced by the devolved endowments but also by the capability of the local people as well as a system of various institutions, including state laws, NGO, and local conditions and customs (Contreras 2003; Conyers 2002; Dachang and Edmunds 2003; Sarin et al. 2003; Shackleton and Campbell 2001; Shackleton et al. 2002).

To sum up, empirical literature on forest devolution shows two important points to my research. First of all, empirical studies emphasize on the differentiation in forest entitlements from devolution among and within villages. The differentiation within villages may be influenced by wealth and political power, and the differentiation among villages by local conditions and

customs. Secondly, these studies recall my attention to the point Ribot and Peluso (2003) make about the role of access in the derivation of benefit (entitlement) from a resource. They highlight the fact that forest endowments are not sufficient to derive forest entitlements. My research should not expect that the ‘ownership’ of forest endowments be automatically translated into forest entitlements. I will need to examine the influences of different access mechanisms in the derivation of forest entitlements as well (see Ribot and Peluso 2003 for discussion).

### **3.4. Summary of literature discussion**

Review of theoretical and empirical discussion gives important guidance to my research. First of all, empirical studies highlight the outcomes that I may expect from forest devolution in Dak Lak. Studies shows that there has been *differentiated distribution of entitlements from forest devolution among different actors* and that *devolved endowments are not sufficient for local people to derive entitlements from devolution*. Local élites are the ones who capture most of the entitlements from forest and the rural poor are still left aside. Secondly, literature review guides me what to focus in the examination of the derivation of endowments and entitlements from forest devolution. On the one hand, since property rights are complex by nature, it is important to avoid working with too schematic and simple categories of property and holding to quick and simple assumptions about property and social and economic practices and changes (Benda-Beckmann and Benda-Beckmann 1999). On the other hand, literature discussion gives attention to not only property rights in the resource management but also to the ability of the local resource users to benefit from the resource.

What is missing in devolution literature is a disaggregated look into the specific endowments and entitlements from forest devolution at household level and the dynamics of different households in the endowment and entitlement mapping processes. Little has also been on the quantitative approach used in empirical studies to identify concrete effects of forest devolution on local households.

## **4. Methodology and Data**

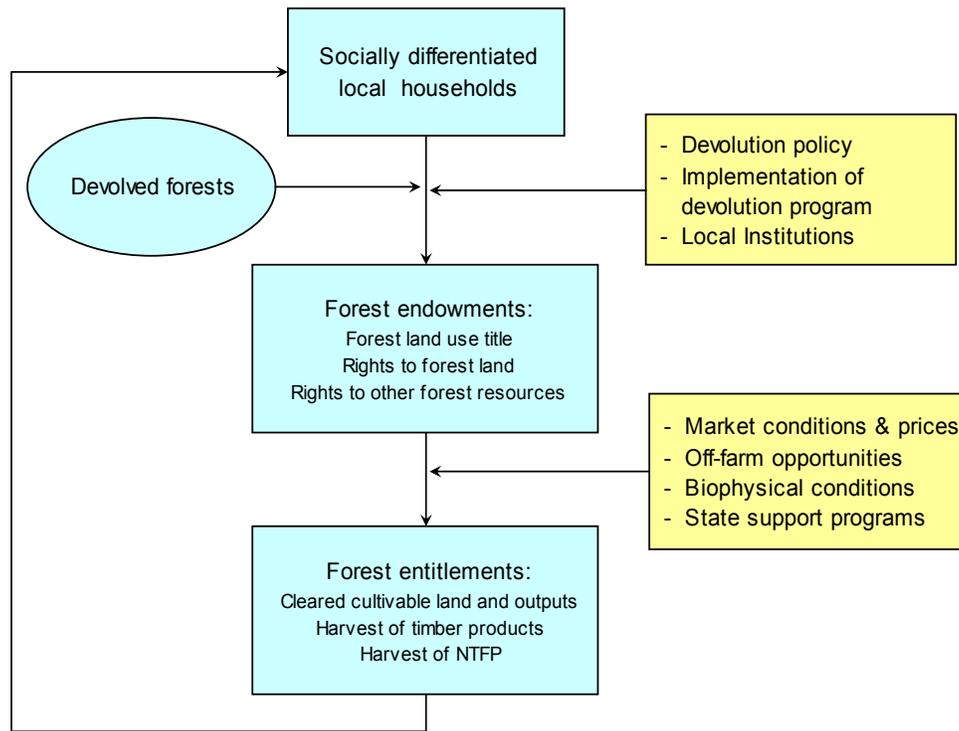
In this section, I will discuss the conceptual framework of the research and the data I use in the empirical analysis. I will present how I include the results of the literature review in the previous section in my research.

The environmental entitlement framework is adapted as a conceptual framework for this research. It helps to address four questions: 1) do people benefit from forest devolution, 2) how are benefits from devolved forest distributed among local households, 3) what factors influence the distribution of these benefits, and 4) what effects does devolution have on broader process of agrarian differentiation? The theoretical assumptions about forest devolution and its effects at household level in Dak Lak are presented in Figure 3.

Figure 3 illustrates the conceptual framework for this research, adapted from the environmental entitlement framework. In the devolution process, the acquisition of rights over devolved forest, or the forest endowment mapping, is influenced by the devolution policy, the implementation of this policy in the local context, and the existing local institutions. Local households, the main unit of study, are socially differentiated. Devolved forests are considered as the environmental goods. Important endowments from the devolved forest that local households acquire are rights to forest land use title, forest land, and other forest resources (e.g. timber and NTFP). These endowments are gained through different ways; either through customary practices, which is common in the pre devolution period, or through the *de jure* way (e.g. allocated by the state during the devolution process) or both.

The entitlements that local households get from devolved forest include cleared land for cultivation and the outputs from this land, and harvests of timber products and NTFP. 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 market conditions and prices (for labor, farm inputs and outputs), off farm opportunities, biophysical conditions of the area (including infrastructure, topography, soil and non devolved forest conditions), and state policies and support programs are influential. The entitlements derived from devolved forest are expected to contribute to the change in the household's status and assumingly influence the agrarian differentiation among households.

**Figure 3: The research conceptual framework**



Source: Adapted from Leach et al. 1999 (Figure 1, p. 234), for this research

Data for the research is from thirteen different villages in five districts in Dak Lak, covering by two different studies (see discussion in Section 2). In the first study, the in-depth case, two villages in two different districts were studied for six months, between March to September 2002. I spent around three months in each village to collect data. This data set contains qualitative information about a system of institutions operating in each study village and quantitative data about assets, resources and forest entitlements of all 95 households in the two villages. In the second study, the extended case, eleven villages in five different districts were studied between February to May 2003. In this phase, a team of hired enumerators spent four days in each village for data collection. This data set contains also qualitative data about the working of institutions in the village but mostly focuses on the household level quantitative data on assets, resources, and forest entitlements (of 228 households in 11 villages). In addition, secondary data about forest endowments in all the study villages was collected and used in this research.

In terms of analytical tools, the conceptual framework allows the application of institutional analysis to depict the changes in the institutions underlying all the social and economic activities in both processes of endowment and entitlement mapping. Put it another way, a household's behaviors in the acquisition of endowments and entitlement to devolved forest resources will be explained by means of institutional analysis. In addition, econometric tool will be used to examine the distribution of specific forest entitlements among households. Econometric analysis will help link up the variation in household acquisition of forest endowments and entitlements with its control over productive resources. On the basis of which, possible effects from forest devolution on the changes in household's social and economic status can be predicted. As for specific econometric techniques, I will use Heckman two-stage estimation model to estimate the relationship between forest entitlements and household resources. In addition, I will employ t-test and correlation analysis as complementary tools to multivariate analysis. All quantitative analyses are done with the help of Stata and SAS statistical software programs.

## **5. Differentiation of forest endowments and entitlements**

In this section, I will discuss the empirical evidence on the differentiation in endowments and entitlements from devolved forest from Dak Lak and link the differentiation in forest endowments and entitlements with the differentiation in household control over resources. I will start with a brief discussion about the differentiation in household resources and production outputs. After that, I will describe the differentiation in forest endowments among local households and relate it to the household control over resources. Finally, I will describe the variation in forest entitlements among households and link it with household resources.

### **5.1. Differentiation in household resources and production outputs**

#### Differentiation in household resources:

In the study villages, there are significant variations among study households in terms of wealth, political power, labor capacity, off-farm income, historical links to devolved forest, control over land, and asset ownership. These differences are not independent from each other. For example, households with political power (i.e. a member, often the head, is an official in the village or higher) often have off-farm income and better control over land and labor. In addition, this politically powerful group also was in the possession of larger land size and more assets than

households without political position. On the other hand, few households with political power still do not own a house nor durable asset items. These are young households and new in the position. Table 1 summarizes important information about resource access and control by political position for the study villages as of the year 2002.

**Table 1: Household resource control and political power**

	In-depth study villages (95 HH)		Extended study villages (228 HH)	
	With official	W/o official	With official	W/o official
Number of households	12	83	44	184
Wealth index <sup>†</sup>	0.33	0.25	0.23	0.10
Yearly off-farm (‘000 VND) <sup>2</sup>	2,713	2,486	1,686	876
Labor capacity type I <sup>††</sup>	3.42	2.61	2.70	2.48
Labor capacity type II <sup>††</sup>	5.00	3.67	3.98	3.30
Upland and home garden (ha)	3.18	1.90	1.85	1.61
Paddy land (ha)	0.09	0.07	0.33	0.19
Forest link (% in group)	42	39	n/a	n/a

Source: Fieldwork

<sup>†</sup> wealth index ranges from 0 (very poor) to 1 (very rich) and is calculated based on ownership of solid timber house and luxurious items like motorbike, sofa, wardrobe, etc.

<sup>††</sup> labor type I refers to only adult laborers (usually capable of doing hard job), labor type II includes both labor type I and household members who can do supplementary work on the farm

#### Differentiation in production outputs:

Not only are the local households differentiated in their control over resources, they are also different in their production outputs. In the study villages, there is a wide difference in the distribution of both food and cash crop production among households (for example, see Table 2). There is a clear difference in distribution of crop outputs between households with and without political position. In most cases, a household with political position has significantly larger returns from crop production than the one without political position. Similarly, rich households in the study villages also have significantly more rice and get significantly more income from cash crops than poor households.

<sup>2</sup> 1US\$ is equivalent to around 15,000VND

**Table 2: Correlation between crop outputs and wealth and political power**

	In-depth study villages (95 HH)		Extended study villages (228 HH)	
	Political power	Wealth	Political power	Wealth
Rice outputs	0.3803 <sup>***</sup> (0.0001)	0.2995 <sup>***</sup> (0.0032)	0.2466 <sup>***</sup> (0.0002)	0.3735 <sup>***</sup> (<0.0001)
Cash crop outputs	0.2139 <sup>**</sup> (0.0374)	0.4109 <sup>***</sup> (<0.0001)	0.0989 (0.1365)	0.3463 <sup>***</sup> (<0.0001)

Source: Fieldwork

Note: <sup>\*\*\*</sup>, and <sup>\*\*</sup> denote the significance levels of 1%, and 5%, respectively. The numbers in parentheses measure the significance levels of the corresponding correlation coefficients.

## 5.2. Differentiation in forest endowments

The forest endowments presented in Section 4 (i.e. forest land use title, rights to forest land and other resources) will be examined in details in this section. Since no data is available for NTFP resource, I will focus the discussion on rights to forest land use title, forest land, and timber resources. I will start with the discussion on the variation of forest endowments among *all* households in the study villages based on secondary data from forest devolution. After that, I will discuss the relationship between the differentiation in forest endowments and household resources, based on the surveyed households.

### Distribution of forest endowments

First of all, forest land use title (RBC) is only granted to households who receive forest during forest devolution process. Of the 95 households in the in-depth study villages, there are 55 households with forest RBC and 40 without it. The situation is different within villages. In one village, 35 out of 42 households have RBC while in the other village only 20 out of 53 households have RBC. In the extended study case, 391 out of total 931 households have RBC (126 out of 228 surveyed households have RBC). Within the village, the situation is also different. While in most of the villages, around 40-60% of the households have RBC, four villages have less than 40% of the households with RBC. On the other hand, one village has 97% of the households with RBC.

In terms of forest land, there is significant variation among local households. In the in-depth study villages, the total forest area of 901ha have been devolved to local households. However, there were only 55 out of 95 households with legal claims to this forest, ranging from 10.6-

21.6ha but mostly between 13-20ha. In the extended study villages, 391 out of 931 households have received around 5,450ha of forest. The distribution of forest size per household with forest varies significantly between 3- 31.8ha. Most households with forest had between 5-20ha. Below 5ha or above 20ha, the distribution was diverse. Only two households had more than 30ha.

Similar to the case of forest land, only households with RBC have legal claim to timber resource. Among these households, however, the distribution of timber varies. In the in-depth study villages, a household with forest had approximately 1.1 thousand m<sup>3</sup>, ranging between 0.5-1.6 thousand m<sup>3</sup>. The distribution in the extended study villages is much more diverse. Households in one villages are excluded from this discussion because no timber data is available for them. Among the rest, the distribution of timber resource is highly disperse, spanning from as low as 21m<sup>3</sup> (for households with bamboo forest) to as much as 3.5 thousand m<sup>3</sup>. Most households with timber endowment have below 1.8 thousand m<sup>3</sup>, above this number, the distribution is sparse.

#### Relationship between differentiation in forest endowments and household resources

Now I will relate the variation in the forest endowments discussed above with the differentiation in household resources, focusing on household political power, wealth, adult labor capacity, and historical forest link. The discussion that follows is based on the results of correlation analysis of the respective endowment and these household resources

First of all is relationship between legal right to RBC and household resources. In the cross village analysis, significant correlation coefficients between ownership of forest RBC and household adult labor capacity in both study cases, and between RBC and political power and forest link in the in-depth study case (no data about forest link is available for extended study villages). However, there is no significant correlation between household wealth and RBC in both study cases and between political power and RBC in the extended study case. Within villages, analytical results show that household wealth is insignificantly correlated with RBC in all study villages. Political power is positively and significantly correlated with forest RBC in 4 villages but insignificantly in other villages. Similarly, household labor type I is positively and significantly correlated with ownership of devolved forest in five villages but not in the others. Forest link is significant in one of the in-depth study villages but not in the other.

With regard to forest land, there is generally insignificant relationship between selected household resources and legal claim to forest land. Results of the cross village correlation

analysis show that the relationships between household resources and the distribution of forest size among households receiving forest are insignificant. No statistically significant coefficients were observed in both in-depth and extended study cases. For within village analysis, significant correlation between political power and ownership of forest is found in two villages (positively significant in one and negatively significant in the other) but not the other villages. Similarly, only two villages have significant correlation between wealth and ownership of devolved forest; but the relationship is positive in one and negative in the other. No other statistically significant correlation within village is found.

Finally, there is also insignificant relationship between concerned household resources and legal claim to timber resource. No correlation coefficients at the cross-village level are statistically significant. Within villages, positively significant correlation between political power and timber endowment is found in two villages but not in the others. A negatively significant correlation between household wealth and timber endowment is observed in one village. Between labor type I and timber endowment, positively significant correlation shows up in one village. No statistically significant correlation is observed elsewhere.

### **5.3. Differentiation in forest entitlements**

In this section, I will discuss in details the distribution of forest entitlements presented in Section 4 (i.e. size of cultivable land in the devolved forest and the outputs from this land, harvest from timber and non timber products). Similar to the discussion about forest endowments in 5.2, I will start the discussion in this section with the distribution of forest entitlements among local households. After that, I will relate the variation in the distribution of forest entitlements with household control over different resources. Since data for the in-depth study villages for outputs from cultivable land and harvests of timber and NTFP are not available for 2002, data of 2001 for these villages are used in the analysis.

#### Distribution of forest entitlements

First of all is size of cultivable land cleared by households in the devolved forest. By 2002, there were in total 39.77ha of upland field in the devolved forest area under cultivation by people in the in-depth study villages. Within these two villages, the distribution of field in the devolved forest varies significantly. There are 57 with no field in the devolved forest, and the 39.77ha of upland belong to 38 households in these two villages. Twenty-three out of these 38 households

have only one plot, twelve households had two plots, two had three plots and only one had four. No one has more than four plots in the devolved forest. In terms of field size, the variation among households is between 0.1-3ha. Most households with field in the devolved forest had up to 1.5ha. Over 1.5ha, the distribution was disperse. In the extended study villages, local households have both paddy and upland fields in the devolved forest. Of the 228 surveyed households, 91 households have either upland or paddy land or both in the devolved forest and the other 137 have none. Among the former, 13 households have both upland and paddy field, 68 have only upland field, and 10 have only paddy land in the devolved forest area. Most households with paddy land (20 out of 23 households) have one plot, and the rest three have two plots. For upland field, 59 households have one plot, 19 have two, two have three, and one have four. No one have more than four plots of either upland only or both upland and paddy field in the devolved forest area. In terms of size, most households with paddy land have no more than 0.5ha. Only two households have more than 0.5ha of paddy in the devolved forest, one of whom has an exceptionally large area of 3ha. For upland field, most households with upland field had under 1.5ha. Over this size, the distribution was disperse. Two households have between 3.5-4ha.

Secondly is outputs from cultivable land in the devolved forest. This entitlement is defined by the cash equivalence value of total harvests of all crops planted on this land in the year. In the in-depth study villages, the total value of this entitlement in 2001 is around 64mil VND. However, only 33 out of 93 households in the village in 2001 had access to this income. Distribution of this entitlement is random, ranging from 0.15-5 million VND per household. Most households with this entitlement have up to 3mil VND. Above this number, the distribution was sparse. In the extended study villages, this type of entitlement in the year 2002 is present in 77 households out of 228 surveyed households. Households with this entitlement have between 0.05-9.8 million VND. Most households with this entitlement have up to 3mil VND.

Thirdly is timber entitlement. Timber entitlement is defined by the total cash equivalence value of two to three most important timber species or products derived by household in the year. For in-depth study villages, the total value of timber entitlement of 2001 is around 85.6 million VND. The distribution of this entitlement varies significantly among local households. Of the total 93 households in the villages in 2001, only 30 households have this entitlement while more than two third do not. Among the former, the variation ranges between 0.1-16 million VND, focusing on the range of below two million VND. Above two million, the distribution was highly

disperse. In the extended study villages, variation in timber entitlement of 2002 is also high. Of the total 228 households, only 51 have this entitlement. Among these 51 households, timber entitlement varies between 0.08-15.28 million VND. Similar to the in-depth study villages, most households with timber entitlement have no more than two million VND value. There are a couple of households with between 2-7 million and one with 15.28 million VND.

Fourthly is NTFP entitlement, the value of NTFP entitlement of 2001 is around 1.6 million VND, a rather modest amount comparing to timber entitlement. Though many local households in general use some kind of NTFP, only 36 households collect 'considerable' amount of selected NTFP in the year 2001. Among these households, the value of NTFP ranges between 10-150 thousand VND, focusing between 10-50 thousand VND. Only a few number of households have more than 50 thousand, two of them have 150 thousand. In the extended study villages, the distribution of NTFP entitlement is highly diverse. Of the total 228 households, 109 collect 'considerable' amount of selected NTFP in the year 2002, ranging from as low as 20 thousand VND in cash value to as much as 2.7 million VND. However, similar to in-depth study villages, most households have no more than 50 thousand. Above this number, the distribution significantly varies.

Finally is the aggregated entitlements from values of outputs from cultivable land and harvests of timber and NTFP. In the in-depth study villages, the aggregated value of entitlements is around 150 million VND. Among the total number of households, 65 are able to derive this entitlement, ranging from as low as ten thousand to as much as 16 million VND in value. The majority of these 65 households have no more than four million. The situation in the extended study villages is similar. Of the total 228 households, 152 households have forest entitlements and the other 76 households have nothing. Among the former, the distribution of aggregated entitlement ranges from several thousand to as much as 15.3 million VND value. However, most households have no more than four million. Only a few households had over this amount and one of them had around 15.3 million.

#### Relationship between differentiation in forest entitlements and household resources

Now I will relate the variation in the forest entitlements discussed above with the differentiation in household resources and forest endowments. Major household resources are political power, wealth, land size, labor capacity, technology, and forest link. The discussion that follows is based

on the results of Heckman two stage estimation between respective entitlement and household resources (and endowments), using Strata<sup>3</sup>.

Firstly is size of cultivable land in the devolved forest. Results of regression analysis show a positive relationship between household wealth and upland in the devolved forest. In both in-depth and extended study cases, wealthier households have a significantly large area of upland endowments in the devolved forest. As for paddy land, however, it is not clear whether rich or poor households had larger field. On the other hand, the relationship between household political power and paddy land size is rather clear. Households with political power have significantly more paddy land in devolved forest than households without power. In terms of upland, however, political power has unclear influence on the upland in the devolved forest. Regression results show that none of the estimates of political power were statistically significant. Of other variables, legal claim to devolved forest (RBC) has a strong relationship with household's likelihood to clear some devolved forest but not with the size of forest that household would clear. However, among households cultivable land there is no evidence that the former clear more forest than the latter. For labor capacity, household labor is positively correlated with the likelihood that a household would clear devolved forest and the size of both upland and paddy fields. However, only in the case of upland that the estimates are statistically significant. Finally, in both in-depth and extended study cases, households with large upland outside devolved forest are more likely to not clear devolved forest than households with smaller upland holding. Similarly, households with large paddy field would also be unlikely to have paddy in the devolved forest. Nevertheless, the size of existing farm has insignificant effects on the size of land (for both paddy and upland) that a household would clear, once they have decided to clear forest.

Secondly is outputs of cultivable land in the devolved forest. The results of Heckman two-stage estimation show a strong correlation of crop outputs on cultivable land size. In both study cases, the size of upland fields in the devolved forest significantly correlates to a household's total value of returns from these fields. In addition, in the case of extended study villages paddy land also has positive and significant relationship with the quantity of crop output. Little is to say

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<sup>3</sup> Interested readers are requested to contact the author for specification of models and further discussion on the regression.

about other household resources under examination in the multivariate regression as they do not show up to be statistically related with cultivable land entitlement across study cases.

Thirdly is timber entitlement. In the in-depth study case, wealthier households significantly derive more timber entitlement than poorer one. Households with political power and tractor are more likely to have timber entitlement but do not have significantly more timber than the others. In the extended study case, households with abundant adult laborers and those in the pepper planting villages have significantly more timber entitlement than the others. Migrant households and households with forest RBC are more likely to collect timber from devolved forest but do not have significantly more timber entitlement than the others. Little can be discussed about other resources as their estimates are statistically insignificant.

Fourthly is NTFP entitlement. Results from the Heckman regression show that household wealth has positive and significant relationship with quantity of NTFP entitlement in the in-depth study villages. On the other hand, households without political power, migrants and owners of forest RBC have more NTFP entitlement than the other in the extended study case. In both study cases, there is a difference in the NTFP entitlement derived by households from different geographical locations. The estimation results also show that households with NTFP entitlement often have cultivable land entitlement and more household labor type II than the others in the case of in-depth study. Similarly, households with NTFP entitlement often belong to one of the indigenous ethnic groups, have field in the devolved forest, and earn less off farm income than the others in the case of extended study villages. Little can be said about other variables due to their statistical insignificance in the estimation results.

Finally is aggregated entitlements from crop outputs and harvests of timber and NTFP. The regression results show a positive and significant relationship between household wealth and aggregated entitlements. Across both study cases, wealthy households get significantly more forest entitlements than the poorer households. On the other hand, political power have insignificant relationship with entitlements from devolved forest in both study cases. Beside wealth, there is a difference between study cases in terms of household resources significantly related to forest entitlement. In the in-depth study case, off farm income shows up to be negatively and significantly related to the forest entitlements while forest RBC has significant relationship with forest entitlements in the extended study case. The estimation results also show

that households with forest entitlements differ from those without entitlements in both study cases by ownership of devolved forest and amount of off farm income. Little can be said about the relationship between other household resources and aggregated forest entitlements due to their insignificance in the estimation across study cases.

## **6. Summary**

This paper aims to examine the different patterns of differentiation in the distribution of endowments and entitlements from devolved forest. The discussion in the paper shows that there exist different patterns of forest endowments and entitlements that local households derive. Endowments include the legal claims to forest RBC, size forest land and volume of standing timber. Forest entitlements are the concrete benefits from devolved forest, which includes the size of cultivable land and value of the harvests from the cultivable land and from NTFP and timber resources.

The discussion also shows the significant variations in the distribution of these endowments and entitlements among the local households. The most important finding of this chapter is, in accordance with literature discussion, that the derivation of concrete benefits from devolution does not only depend on the devolved rights to forest but also on various factors. Among others are household labor capacity and land resources. Furthermore, the paper shows that wealthy households are the ones who significantly gain from the forest devolution program. Wealthy households are the heavy users of forest resources in terms of not only NTFP and timber but also swidden fields. Last but not least, the paper shows that the differences in household political power, economic status and productive resources had effects on the local households' ability to derive benefits from a policy program.

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