Forest Devolution and Maize Production: An Analysis of Benefit Distribution along the Commodity Chain in Dak Lak, Vietnam

Paper submitted to the 11th Biennial Conference of the International Association for the Study of Common Property (IASCP) in June 2006 – Bali, Indonesia

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Abstract

Since late 1990s, policy reforms in Dak Lak province, Central Highlands of Vietnam, have attempted to devolve responsibility of forest conservation to local communities. The reforms were based on the assumption that by transferring the ownership of forests to local communities would protect the allocated forest against unauthorized use and improve their livelihoods from forest based activities. Local communities are entitled to collect timber and non timber forest products and to use limited area of forest land for cultivation.

This paper undertakes a commodity chain analysis to contrast the decision by local communities to convert areas within devolved forests into cropping land, to detail how forest devolution shaped the benefits derived by local people and how these benefits were distributed along the commodity chain. The study also provides full account mechanisms that various actors along the commodity chain use to access, maintain, and control of natural resources. It emphasizes on the role of market in providing cash income for rural (poor) people. In addition, the paper brings attention to the important linkages between forest management and agricultural production. For upland farmers in Vietnam, it would be difficult to separate these two as they are integrated parts of their livelihoods.

Keywords: devolution, maize production, commodity chain, Vietnam

Introduction

Forest resources in Vietnam have for a long time been managed by the state. Deforestation and degradation of forest resources under state management along with the country's orientation toward people-centered forestry regime have contributed to the experimental devolution of forest management to local people. This initiative has been tried out in Dak Lak province, Central Highlands of Vietnam, since 1998. By involving local people in forest management, Dak Lak aimed to improve the management of local forests and the livelihoods of local people, particularly the poor. Local forest recipients were expected to protect the allocated forest against unauthorized use. In return, they were entitled to collect timber and non-timber forest products (NTFPs), and to use limited area of forest land for cultivation purpose (Nguyen 2005). An important question that arises is to what extent these intended benefits have become an incentive for local people to protect the allocated forest.

This paper looks at the acquisition of benefits from devolution by local households. I have discussed in detailed elsewhere (Nguyen 2005, in press) various types of benefits that people acquired from devolved forest. This paper will focus on the benefits from farmed land in the devolved forest that local farmers opened after the completion of forest devolution program. I will discuss the expansion of maize cultivation when the market price of coffee – the most important cash crop for Dak Lak during the 1990s – continued to fall and when the forest devolution policy offered an opportunity to covert forest into agricultural land. The paper will then continue with an analysis of how maize produced in the study site continued its way to

the market through various levels until it reached the final consumers. Through this analysis, a picture of how benefits from maize cultivation and trading have been distributed along the commodity line will be developed. Based on which, the linkages between forest management and agricultural production and the incentives for local people to protect allocated forest will be identified.

The paper proceeds as follows. After this introduction, a review of literature on forest livelihoods, property rights, access, and devolution will be presented in Section 1. In Section 2, the study methodology will be discussed. After that, Section 3 will provide background to Dak Lak province, its forest devolution program and maize production. Brief introduction about the study village will be provided in Section 4. In Section 5, the process of forest devolution in the study village will be elaborated. Section 6 will go into details the market chain of maize product 7. After that, an overall discussion of the important findings will be presented in Section 8. In the Conclusion Section, a summary of major findings from the study and their policy implications will be provided.

1. Forest livelihoods, forest devolution and market

Property right and access

In academic writings, the term 'property' is used to refer to right or a set of rights to things (Bromley 1989b; Bruce 1998; Cronon 1983; Furubotn and Richter 2000; Hann 1998; MacPherson 1978), which has the connotation of a claim to a benefit stream (MacPherson 1978; Meinzen-Dick and Knox 1999). The term 'property right' is used to make the connotation of 'property' clear (Bruce 1998). These two terms are used interchangeably in academic writings.

Rights to certain thing are only meaningful if other people abide these rights (Bromley 1989a, 1989b; 1992; Cronon 1983; Schlager and Ostrom 1992). In other words, the duties of other people to respect make the meaning of rights. Rights and duties are governed by a set of rules or "rules specify both rights and duties" (Schlager and Ostrom 1992, p. 250).

Property rights are multifunctional and multi-layered. Property relationships are manifest in the layers of culture, institution, social relationship, and practice (Benda-Beckmann and Benda-Beckmann 1999). In addition, property includes not only economic function but also social and political functions (Benda-Beckmann and Benda-Beckmann 1999). It is, therefore, important to pay due to the variety of functions and layers of property in the description and analysis of property rights and their significance in different societies (ibid., p. 40).

In addition to property, access is also important in the analysis of benefits. Merriam-Webster's Collegiate Dictionary defines access as "freedom or ability to obtain or make use of" (Merriam-Webster's Inc. 1999 p. 6). In academic writing, access is referred to as a bundle of powers, which is about ability to benefit (Ribot 1998). The term 'access' has generally been used as closely related to 'property' (Ribot 1998) as they are both about benefits from thing. There is, however, a difference in the terms 'right' and 'ability' in common use. The former is broader than the latter (Ribot 1998; Ribot and Peluso 2003) but either one does not necessarily mean the other (Agarwal 1994). According to Ribot and Peluso (2003):

> "A key distinction between access and property lies in the difference between 'ability' and 'right' […] Access is about *all* possible means by which a person is able to benefit from things. Property generally evokes some kind of *socially acknowledged and supported* claims or rights - whether that acknowledgement is by law, custom, or convention" (pp. 155-156, emphasis in the original).

Following Ribot and Peluso (2003), it is insufficient to focus only on property in the analysis of benefits from resources. Attention should be paid to the role of access in the benefit derivation process (see also Ribot 2000). 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 (Ribot and Peluso 2003). Furthermore, there exist a number of important factors that mediate the process through which benefits are acquired, controlled, and maintained, including access to technology, capital, markets, labor, knowledge, authority, identity and social relations (Ribot and Peluso 2003, pp. 165-172).

Forest devolution

Devolution refers to transfer of power, rights and responsibilities to user groups at local level (Fisher 1999; Meinzen-Dick and Knox 1999). It is about reallocation of power or authority to contribute to decision making away from the central location (Fisher 1999; see also Agrawal and Ostrom 2001; Ribot 1999, 2002), which involves the transferences to individuals or user groups at local level (Fisher 1999; Meinzen-Dick and Knox 1999). In the light of the property and access theories discussed above, 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, true devolution requires also transference of benefits from the resource away from the government (Shackleton et al. 2002).

There are at least 60 countries in the world with some forms of devolution in natural resource management (Ribot 2002; World Resource Institute 2003). An important reason to call for devolution is to respond to the ineffectiveness of state forestry in managing natural resources (Edmunds et al. 2003; Katon, Knox, and Meinzen-Dick 2001). So far, state forestry in most of the developing countries has failed to deal with forest degradation (Edmunds et al. 2003; Peluso 1992) and to involve local people whose livelihoods largely depend on the forest resources in the forest management (Bruce, Fortmann, and Nhira 1993; Peluso 1992; Potter 1991; Pratong and Thomas 1990; Rocheleau and Ross 1995; Vandergeest and Peluso 1995).

Consequently, devolution has taken place in many countries as a measure to involve local people in the public decision-making and management of local forest resources (Edmunds and Wollenberg 2003; Edmunds et al. 2003; Meinzen-Dick and Knox 1999). 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 2001; Ngaido and Kirk 1999; Ribot 1999). Nevertheless, empirical findings shows that devolution outcomes are mixed (Edmunds and Wollenberg 2003; Edmunds et al. 2003; Katon, Knox, and Meinzen-Dick 2001; Shackleton et al. 2002). Benefits from devolution varies among and within villages (Agrawal and Ostrom 2001; Dev et al. 2003; Richards, Maharjan, and Kanel 2003; Sarin et al. 2003; Shackleton et al. 2002). In most cases, the benefits are captured by the local elites (Edmunds and Wollenberg 2003; Sarin et al. 2003; Shackleton et al. 2002).

Forest livelihoods and market of forest products

Forests has a potential to make important contribution to the life of the rural people (Cavendish 2000; Scherr, White, and Kaimowitz 2004; Sunderlin et al. 2005). The most important services and products from forest include timber, non-timber forest products, land, and environmental services. However, the actual contributions of forests to rural livelihoods vary (Angelsen and Wunder 2003; Arnold and Pérez 2001; Cavendish 2000; Nguyen 2005; Sunderlin et al. 2005; Warner 2000), and is inadequate to its potentials (Scherr, White, and Kaimowitz 2004; Wunder 2001). In addition, farmers still prefer land for agricultural purpose than forests, though the latter are highly valued for both economic and social reasons (Goebel et al. 2000).

Among factors influencing the contribution of forest to rural livelihoods, market of forest products (for the rural poor) is increasingly recognized as an important determinant (Belcher 2005; Scherr, White, and Kaimowitz 2004). Without adequate access to market, devolving property rights over forest resources does not produce sufficient benefits for the local people. Based on the experience from Eastern Senegal, Ribot (2000) indicates that "property rights – or any other forms of direct resource control – do not confer benefits from forests on local populations unless the populations also have access to markets..." (p. 154). In Nepal, restriction in marketing activities by local people has undermined the contribution of community forestry to the livelihoods of the poor people (Malla 2000). One important reason is the over-caution of governments, and development and conservation organizations in supporting commercialization of forest by low-income producers (Scherr, White, and Kaimowitz 2004). While the environmental gains of such cautions are unclear and dubious, "it is unacceptable to sacrifice the potential for forest assets (especially those in the 90 percent of forests lying outside biodiversity reserves) to be used for poverty reduction" (Scherr, White, and Kaimowitz 2004, p. 138).

In the end, an important issue that arises is for forest devolution to contribute to improve the livelihoods of rural (poor) people, it may not be sufficient to only formalize their property rights over resources. Support to commercialization of forest resources and access to market by poor farmers should also be available. This paper will investigate along this line. It will discuss the possibility for commercial production of maize related to devolved forest resources by smallholder farmers. Furthermore, it will provide an analysis of the marketing of maize products from the study village through various links in the market.

2. Methodology

The analytical approaches

The main analytical approach used in this paper is commodity chain analysis using access mapping. Following Ribot (1998, p. 313), access mapping along a commodity chain provides two maps: distribution of profit and mechanisms, structures and processes at work in the control and maintenance of that distribution. In a more concrete term, it consists of: 1) identifying the actors involved along the commodity chain, from extraction, production, processing, exchange, transport, distribution, final sale and end use of the commodity in question; 2) evaluating income and profit at each level of the commodity chain; 3) evaluating the distribution of income and profit within each group along the chain; and 4) using the distribution of these benefits among and within groups to trace out, or map, the mechanisms by which access to benefits is maintained and controlled.

The commodity chain analysis will be completed by an institutional analysis in this paper (see Leach, Mearns, and Scoones 1999). Institutional analysis will yield a concrete picture of the forest devolution and the involvement of various stakeholders in the whole process. As institutions are defined as rules of the game (Leach, Mearns, and Scoones 1999, p.237), institutional analysis will provide a discussion on what local rules are extant and how access to the devolved forest and its benefits is mediated by different set of rules. In addition, the analysis will give a description of the institutional changes introduced by forest devolution policy and the implications of these changes.

Data and data collection

This paper focuses on one village, namely Cham B, in Krong Bong district of Dak Lak province (see detailed background to the village later). The village was chosen because it was one of the 13 villages in Dak Lak where forest devolution completed by the end of 2000. In

addition, the village represented the efforts of ethnic communities in Dak Lak in engaging in commodity maize production and marketing as an alternative to coffee when coffee price dropped. As the expansion of commodity maize production in Cham B was well related to forest devolution, selection of the village would be able to provide a good picture of how forest devolution can or cannot contribute to local livelihoods and involve people in forest management.

Data for Cham B was collected through three rounds of field visits. The first visit, which was for exploratory purpose, was made in May 2001 when forest devolution just finished in the village (see Nguyen 2001). An in-depth field work was done a year later, in March – June 2002. During this round of field visits, data on forest devolution, local institutions, utilization of devolved forest resources, and household production was collected (Nguyen 2005). The third round of fieldwork was conducted in March 2006, focusing on the maize commodity chain beyond the village.

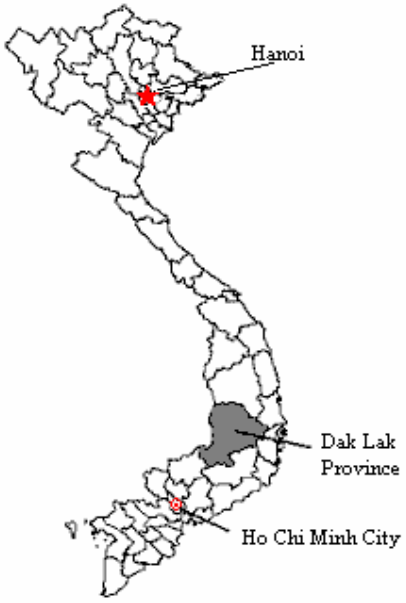
In addition to Cham B, data from a neighboring village, namely Cham A, where forest devolution did not take place, was also collected and used in this paper to provide a comparative evidence of the with and without devolution situation. Cham B and Cham A used to be in one village until 1988 and they still share a lot of cultural and traditional values. The two villages also have similar market and market chain for their maize products (Nguyen 2005; Tran 2004).

3. Back ground to forest devolution and maize production in Dak Lak

Dak Lak province and its devolution program

Dak Lak province is situated in the Central Highlands Region of Vietnam[1] (see Figure 1). As of December 2003, the total physical area of the province was 1.96 million hectares (ha). More than half of which was classified as forest land. Agricultural land accounted for about 26% of the total land size. Population was about two million people, most of whom were migrants coming from other provinces. Main indigenous ethnic groups were Ede, Jarai, and M'nong, accounting for around 18% of the total population and mostly living in remote area.

Figure 1: Location of Dak Lak



Since the end of the American War (also known as Vietnam War in Western literature), state management of forest has been practiced in the whole Dak Lak. State forest enterprises (SFEs) were set up as the state organizations in charge of forestry activities at the field level. Forest cover in Dak Lak declined rapidly during this period. Around 242,000 ha of natural forests were lost between 1982 and 1999 (Nguyen 2005). In addition, forest quality also decreased. Area with rich quality forest declined from 73,000 ha in 1982 to 15,000 ha in 1999 and poor forest increased from 278,000 ha to 411,000 ha in the same period (Dak Lak Department of Agriculture and

[1] On 1 January 2004, Dak Lak was 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 division as most of the discussion in the paper referred to the time before this date.

Rural Development (DARD) 2001b).

In response to the deforestation and degradation of forest resources, Dak Lak initiated an experimental forest devolution program. The initiative started in 1998, aiming 1) to maintain and improve the province's existent forest cover and 2) to improve the livelihoods of local people (Nguyen 2005). The idea of Dak Lak's devolution program was to devolve the rights to natural production forests from local SFEs to either individual households or groups of households. Later on (i.e. from 2001), the program also handed over forest management rights to communities. By the end of 2000, fieldwork of forest devolution was completed in 13 villages in five districts, with approximately 7,100 ha of forest having been devolved to 339 individual households and 19 household groups consisting of 149 households (DARD 2001a).

A bold step that Dak Lak undertook in its devolution program was to grant long-term land use titles (RBCs) for the natural forest. Compared to other forestry land allocation programs that only allocated bare land, forest devolution in Dak Lak was rather advance. For the forest land owner in Dak Lak, possession of forest RBC was a legal proof for their rights to exchange, transfer, mortgage, lease, and inherit the title as stated in the land law[2]. Another bold step that Dak Lak took was to put forward the issue of benefit sharing between the state and local people in forest devolution program. To increase the incentive to protect the forest, forest recipient households were entitled a quota of ten cubic meters of round log for housing purpose every 20 years[3], a benefit of 6% of the after-tax value of timber (upon harvest) for each year of protection, collection of NTFPs in the forest, and conversion of limited area of forest for agricultural purpose[4]. Nevertheless, the program did not specify what mechanisms were available and how to realize these conditions.

Maize production in Vietnam and in Dak Lak province

Maize is the second most important staple crop in Vietnam, next to rice (Dang et al. 2004; Dang 2006). Over the last decade, rapid increase in maize production has been observed. Total maize production has almost tripled, from 1.17 million tons in 1995 to 3.5 million tons in 2005 (FAOSTAT 2006, accessed on 15 April 2006). At present, (commercial) maize production mainly focuses in the upland regions and only small area is found in the deltas. Beside the expansion in maize harvested area, which almost doubled during the same period (see Figure 2), adoption of hybrid high yield varieties (HYV) has made an important contribution to this production growth (Dang et al. 2004). Dang et al. (2004) estimates an average amount of 89% of the total maize grown are from hybrid varieties, which can yield a harvest of 180-220% that of local or open pollinated varieties (OPV) on average.

Most of the maize produced in Vietnam is consumed domestically, mainly to meet the increasing demand from the livestock sector. Export of maize continues to decline proportionately with production, from around 7-10% of total production in mid 1990s to below 2% in recent years. At the same time, maize production has not been able to meet domestic demand and Vietnam has become a net maize importer since 1998 (Hoang and Neefjes 2005). In 2002, total maize import volume was 373,000 ton (FAOSTAT 2006), mostly from China.

[2] In addition to the RBCs, a contract was signed among the state forestry representative, local authorities, and local forest recipient household(s). This contract specified the benefits from devolved forest that people were entitled to and the duties that they were expected to perform.

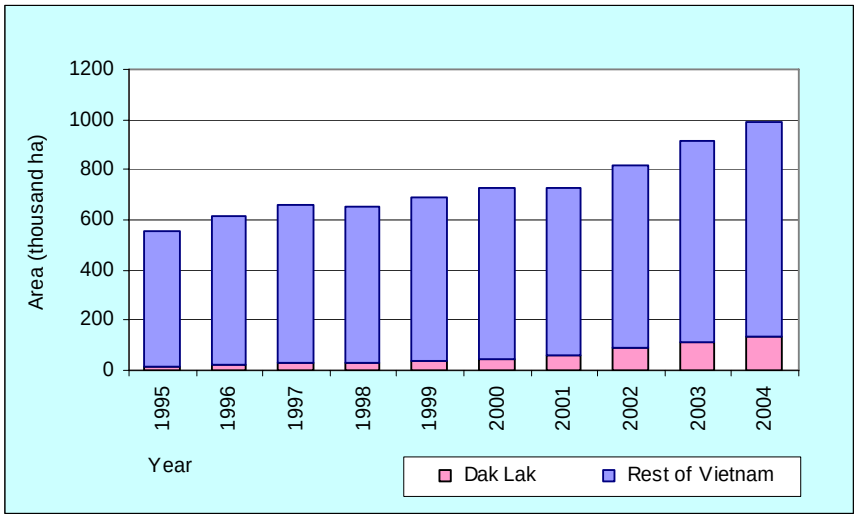
[3] At the beginning of the program, this quota was five cubic meters. The provincial authorities later increased to 10 cubic meters but no amendment was made on the forest contracts with Cham B people.

[4] There was, however, no specification on how much forest one could use for cultivation.

Within Vietnam, a significant quantity of maize is consumed by the livestock. Mai (2002) estimates around 80% of total maize production being consumed by livestock sector. Human consumption of maize is rather low, at no more than 13% of the total production on average, and varies significantly across different socio-ecological zones (Dang et al. 2004). While most of the traditional/ local varieties of maize are used for human consumption, hybrid maize varieties are for animal feed and other purposes (Dang et al. 2004).

In Dak Lak, rapid increase in maize production and planted area over the last decade has also been observed (see Figure 2). Area planted to maize expanded from 18 thousand ha in 1995 to 46.5 thousand ha in 2001 and 131 thousand ha in 2004[5]. Maize production increased from 58 thousand tons to 203.5 thousand tons and 473 thousand tons in the respective years. Most of the maize in Dak Lak has been grown in around eight, including Krong Bong, of the total 19 districts in the province. Although commercial maize production has been promoted in Vietnam since 1991 (Dang et al. 2004), cultivation of maize in Dak Lak has only expanded for the last five years, after the drop of coffee price in the market (Hoang and Neefjes 2005).

Figure 2: Expansion of Maize Area in Dak Lak and Vietnam, 1995-2004



Source: FAOSTAT 2006, Vietnam Statistic Yearbook 2004, Dak Lak Statistic Yearbook 2002.

At present, the major constraints for commercial maize production in Dak Lak include biotic (e.g. pests), abiotic (e.g. soil and weather), markets of inputs and outputs, and technical support. According to Dang (2006), lack of credit and accurate market information and poor market infrastructure are influencing commodity maize production farmers, particularly the poorer, in the remote regions of the province.

4. The study village

Cham B village is located in Krong Bong district. It is about 85 km Southeast of Dak Lak's capital city, 31 km from the district center, and about two km from the commune center. By mid 2002, Cham B had 278 people living in 42 households. The major ethnic group in the village was Ede (38 households or 90.5% of the village). The mainstream Vietnamese – the Kinh – was rather small in number (four households or 9.5% of the villagers)[6]. While the Ede households are the indigenous people whose life has been connected with the history of the

[5] For comparison, data of 2004 includes the new Dak Lak and Dak Nong provinces (see also Footnote 1)

[6] By March 2006, there were 58 households (52 Ede households and six Kinh households) in the village with a total population of 424 people

village, the Kinh are migrants joining the village within the last decade. Until November 2003, accessibility to the village was difficult during rainy season as the road from the district through the commune center to the village was an earth road, which was susceptible to rain.

Until the end of the war, people in Cham B village depended on the currently devolved forest for shelter and farmed land. At that time, they lived together with people of Cham A, their currently neighboring village. In 1976, all people moved out of the forest to their current place under a state assisted sedentarization program to set up Cham village and start a more sedentary life. By 1987-88, Cham village became crowded and people were mobilized to split into two villages: namely Cham A and Cham B. Since then, people in both villages have been encouraged to practice sedentary farming in designated areas.

Until now, the most important source of livelihoods for Cham B people has been cropping. Rice (both paddy and upland rice) is cultivated for home consumption. Cash crops including short duration crops like hybrid maize and beans, and long duration crops like coffee and cashew are also cultivated. Coffee used to be the most dominant cash crop in the village during mid 1990s. However, as coffee price declined, hybrid maize has become an important cash crop and the area of land under maize has expanded rapidly. Cash income from maize also makes an important contribution to the household economy. In 2001, for example, the cash income from hybrid maize was around 78% of all on-farm cash income and 39% of total cash income of the whole village. Forest products are also collected, mostly for home use and consumption. Off-farm income also plays a role. The most popular off-farm sources are salary and allowances from the state (for the civil service work or contribution during the war), and returns from trading and servicing activities.

5. Forest tenure and forest devolution in Cham B

Forest tenure before devolution

Before devolution took place, most of the forest resources in the area around Cham B were managed by Krong Bong SFE, which had a branch office near the village. The rest of forest resources around the village were under the management of the communal authority. Of all the forest resources, timber gained the most attention by the state forest organizations. In general, timber with high commercial value was the primary target of state's logging activities. Claims on timber resources by local people were restricted to timber of less commercial value. Among local households, claims to timber trees were based on a 'first see, first own' basis (i.e. those who saw the tree first had the right to it).

As for land, all forest land was claimed by the state. Local people were expected to practice sedentary agriculture in the designated areas. Local staff of Krong Bong SFE was responsible for keeping their forests from being converted into agricultural land. Nevertheless, some people also set their claims on the local forest, including the nowadays devolved forest.

By contrast to timber and land resources, the state did not place a strong claim to NTFPs. Local claims on NTFPs were also regulated on a 'first see, first own' basis. In Cham B village, NTFPs were used as open access. There was no clear distinction on who could claim what NTFP in the forests. Local inhabitants, indigenous ethnic and migrants alike, could collect NTFPs as needed.

Forest devolution in Cham B and its implication

Forest devolution program started in Cham B at the beginning of 2000 (see Table 2). Cham B and another village, namely Thon 6, were jointly selected as targets of the devolution program in Krong Bong district. The forest area where Cham B and Cham A people used to

live and cultivate in the past, which was around four km from the current location of Cham B, was chosen as target area of devolution. By early 2001, field allocation was completed and forest RBCs and contract papers were handed over to forest recipients in June 2001. A total of 569.2 ha of evergreen forest and bare land formerly under the management of Krong Bong SFE were devolved to five groups of 38 Ede households in Cham B[7] (see Table 1).

Table 1: Allocated forest land in Cham B

Group	***Number of households***	***Total Area*** (ha)	***Forested Area*** (ha)	***Timber volume*** (m^3)
Group 1	10	149.3	101.6	14,295
Group 2	9	117.5	62.4	8,180
Group 3	7	93	61.9	6,385
Group 4	6	108	79.6	8,201
Group 5	6	101.4	72.2	5,315
Total:	***38***	***569.2***	***377.7***	***42,376***

Source: Krong Bong SFE – fieldwork 2001

In general, there was strong presence of state officials in the implementation of forest devolution. Krong Bong SFE made decision on the area of forest to be devolved to the local people and communal authorities influenced the selection of villages involved in the process. In addition, Krong Bong SFE proposed to allocate forest only to ethnic people in Cham B and communal authorities readily agreed with it. Cham B village officials were rather active and influential in the process. They participated in meetings at district and communal levels and ran most parts of the meetings in the village. In addition, the distribution of forest for specific recipient groups was recommended by the village cadres. Some participation of Cham B villagers was also observed in the devolution process. Local people were informed of the program and invited to participate in village meetings. However, people had no say in who could and who could not receive forest as the decision to allocate forest to only Ede households in the village had already made beforehand.

Table 2: Chronology of events in forest devolution process in Cham B

Time	**Events**
End of 1999	Plan to devolve forest in Krong Bong district approved
May 2000	Meeting with the commune about forest devolution
May 2000	Planning workshop for devolution program
May – Jun. 2000	Preparation for field devolution
Jul. 2000	Village meeting to discuss form of forest management. Villagers propose group management
Jul. – Aug. 2000	Preliminary fieldwork to delineate forest plots.
Sep. 2000	Village meeting to discuss organization of forest management groups

[7] At the time of forest devolution, 42 households were present in the village: 38 Ede and four Kinh

Oct. 2000	Village meeting to discuss the distribution of forest plots among groups
Dec. 2000	Field allocation of forests to group leaders
Dec. 00 – Jan. 01	Delineation of forest plots and placement of boards for each forest plot.
Feb. – Mar. 2001	Completion of devolution file and submission for issuance of forest RBC
Jun. 2001	Handing over of forest land use title (RBC) to five user groups

Source: Nguyen (2005), Table 6-2, p. 163.

With forest devolution, forest recipient households are holders of forest RBCs and become the 'owners' of the devolved forest. In principle, forest owners are entitled to all the benefits as described in Section 3. Besides rights, forest devolution implies duties for forest recipients. They are required to follow state regulations on the use of forest resources, which include but are not limited to acquiring permission for timber logging and land conversion and regularly patrolling their forest to detect, stop and report unauthorized uses of the devolved forest resources. By contrast to forest recipients, households who did not receive forest, including people in neighboring villages (e.g. Cham A) and the Kinh people in Cham B, do not have any legal rights to this forest. Forest devolution program implies no change in the legal position with regard to devolved forest of these households. They are still not legally allowed to use the devolved forest (Nguyen 2005).

6. Expansion of maize production in Cham B after devolution

Since the completion of devolution, various resources from the devolved forest have been extracted by local people, including timber for housing, land for agricultural purpose, and NTFPs. Of all these resources, land for cultivation appeared to be the most important benefit that people in Cham B acquired from the devolved forest. I will now elaborate the concrete expansion of upland field to the forest by the local people and discuss the linkages between upland field expansion and maize production in the village (see also Nguyen 2003). For a discussion on the acquisition and distribution of all the benefits from devolved forest among local households, see Nguyen (2005, 2006, in press)

Clearing of devolved forest and expansion of maize growing in Cham B

In 1999, just before the forest devolution program started in Cham B, the village had in total 67 ha of dry land or 1.6 ha per household on average. Of this total area, there was 1.3 ha of upland field in the forest which would be devolved to the village later. Around 40% (27 ha) of the land was under coffee. Hybrid maize was grown on around 21 ha or 31% of the total dry land. Around 14 ha or 20% of the land was grown to upland rice. The rest was for other crops, such as beans and cashew[8].

When forest devolution was on going in the village, seven households already started their field in the devolved forest with an area of 7.89 ha (see Table 3). Soon after forest devolution was completed, people rushed to the forest for a share of upland. In 2001, 17 households started new fields in the devolved and one household opened a second plot. In 2002, three households started new fields and eight others who already had upland field in the forest cleared new plot(s) of land. By mid 2002, 29 out of 42 households living in Cham B had

[8] The size of land under each crop was only approximate as it is calculated by dividing the total quantity of seed (or trees) grown by the average planting density. No exact planting area was available due to the intercropping habit of the local people.

cleared around 37 ha of upland fields in the devolved forest. Fourteen of them had one plot, eleven households had two plots, three households had three plots and one household had four plots. Plot size in the devolved forest ranged between 0.3 to 3ha. Over four years (1999-2002), an average household in Cham B village opened around 1.27 ha of upland with an average plot size of 0.68 ha.

Overall, the new fields in the devolved forest made an important contribution to the total land under cultivation by the villagers. By mid 2002, total dry land in Cham B was 114 ha, at 170% of that in 1999. New upland fields in the devolved forest made up 78% of the incremental acreage or 32 % of the total dry land.

Maize cultivation also expanded in 2002. The estimated area planted to hybrid maize in Cham B was around 77 ha or almost four folds of that in 1999. The increase in cultivation land from the devolved forest influenced this expansion of maize both directly and indirectly. In a direct way, hybrid maize was planted in the new field in the devolved forest. It is estimated that around 20 ha or 26% of the total area planted to maize in 2002 were in the devolved forest. In a less direct way, increase in cultivation land from the devolved forest made it possible for local households to spare some of the land which was formerly used for upland rice for maize and other cropping purposes.

Legitimacy of forest encroachment

Not only clearing the devolved forest that belonged to the village, Cham B people also encroached forest of Thon 6 village (see also Section 5). Forest encroachment in Thon 6 started in 1999 and continued in parallel with conversion of Cham B's forest. By mid 2002, 20 plots with the size of around 12.69 ha (41% of the total number of plots and 34% of the forest area opened by Cham B people) were in the forest devolved to Thon 6 (see Table 3). Of the total 29 households with upland fields in the devolved forest, 15 households encroached Thon 6's forest (five households had two plots and ten had one plot). Four households had fields in the forests of both villages.

In addition, forest encroachment also occurred with Cham B's forest. By mid 2002, 26 households from outside of Cham B were having some cultivation land in Cham B's forest. Each of these households had one plot of land and the total estimated size of the 26 plots was 17 ha. Most of the households who encroached Cham B's forest were from Cham A[9] and only three households were from the nearby Kinh village. The latter opened the land before the start of forest devolution, however.

Table 3: Conversion of devolved forest by Cham B villagers over years

Year	HH clearing new field		No of plots		Total cleared area (ha)	
	Total	Cham B forest	Total	Cham B forest	Total	Cham B forest
1999	2	0	3	0	1.30	0
2000	7	2	9	3	7.89	3.1
2001	18	12	23	17	19.80	13.5
2002	11	6	14	9	7.88	5.78
		Total:	***49***	***29***	***36.87***	***24.18***

Source: Fieldwork 2002

[9] Around eight households from Cham A also had upland field in the other village's forest.

For the Ede households in Cham B and Cham A villages, clearing of the devolved forest area (of Cham B or Thon 6 villages alike) was backed up by their local tradition. The devolved forest area was locally known as 'their forest', in which they used to live and cultivate for many years before they moved to the current location. In this forest area, most Ede villagers still found mango trees that they or their parents planted decades ago to symbolize their traditional ownership of the land (see more details in Nguyen 2005; Tran 2004). With forest devolution, the chance to reclaim former land was possible and many of people took the opportunity to (re)open their field in the devolved forest.

Nevertheless, with no prior approval or permission from competent authorities, all the land conversion activities (including the ones by Cham B households who received forest) were regarded as 'illegal' under the state law. Recognizing this fact, some households with officials wishing to keep a good relationship with the state did not want to clear devolved forest. They feared that their occupation of the devolved forest land without permission would be known and their good relationship with the state jeopardized. As one official in Cham B village put it:

> "My wife's parents used to live and cultivate in Pang Greng [the devolved forest area] and I know I could go back to reclaim the field[10]. However, I daren't do it because I don't want them (state forestry staff) to call me a forest destructor" (direct communication – fieldtrip 2002).

7. Maize production in Cham B and its market chain

Maize production in Cham B

For Cham B villagers, maize became the most important cash crop after the drop of coffee price. All of the maize planted in the fields was from hybrid varieties. Despite the possibility for two crops of maize per year, Cham B people mostly cultivated one crop as the harvest of second maize crop was often unreliable due to lack of investment to overcome less favorable conditions (than the first crop).

Maize cropping in Cham B started with land preparation in early April. For fields of first year, land clearing was done in March. On average, it took around 35 labor days to clear trees in one ha of (young and secondary) forest (see Table 4). Seven days would then be needed to make the land ready for cultivation. For existing fields, around 20 labor days were necessary to prepare one ha of land. In upland fields near the village, tractor was often hired for land preparation at the cost of 500,000VND[11] per ha (in 2002). However, upland fields in the devolved forest were prepared by hands (with hoes) as the area was inaccessible to tractor. Minimal land preparation was often applied to save labor and conserve soil (Nguyen 2005).

With the first rain of the season, often by late April, seeding was done. Seeding density of hybrid maize that farmers in Cham B applied was around 16 kg of seed (monoculture of maize), which cost 20,000VND per kg (cash on delivery). It took around two labor days for the farmer to seed one ha of land. Once seeding was done, labor investment in the field dropped until harvesting season as the farmers applied a rain-fed extensive farming practice in these new fields. Except for a few days of field visits, there was little labor investment during this period as neither weeding nor fertilizer application was done (though application of fertilizer for the field near the village was also observed, however, but not on regular basis).

[10] Ede people are matrilineal and girls are known traditionally as the heirs of their parents' properties.

[11] The exchange rate of Vietnamese Dong (VND) versus the United States Dollar (US$) was 15,000VND≈1US$ in 2002 and 15,900VND≈1US$ in 2006.

Harvesting season took place around 90 to 110 days after planting. Around ten labor days were needed to harvest one ha of maize. On average, maize from the fields in devolved forest yielded around 4.2 tons and 3.7 tons (fresh maize) per ha in 2001-2002 for field of first and second year after fallow, respectively. Most farmers chose to leave the harvest in the field and waited for the trader to come for the purchase.

Table 4: Costs and returns from maize production in Cham B in 2001

Items	First year		Second year	
	Amount (per ha)	In cash	Amount (per ha)	In cash
Labor	55 days	1,450,000VND†	33 days	660,000VND
Seed	16 kg	320,000VND	16 kg	320,000VND
Harvest	4.2 tons	3,780,000VND	3.7 tons	3,330,000VND
Net margin		2,010,000VND		2,350,000VND

Source: Fieldwork 2002

†: Labor cost was 30,000VND per day for felling tree and 20,000VND per day for other work.

Most Ede households in Cham B producing commodity maize was involved in some kind of informal credit with local input suppliers cum maize traders (S&T). There were five S&T operating at the commune center, two of them mainly dealt with Cham B people. Villagers received farm inputs (maize seeds and fertilizer) from their frequent S&T on credit at the start of cropping season. Sometimes, S&T also advanced rice, cash and other supplies for their customers in case of need. On average, a farmer in Cham B received between four to seven million VND worth of seeds, fertilizers, rice, and other home supplies from his S&T. At the time of harvest (at maximum five months since the start of the cropping season), farmers sold their maize to their S&T and cleared the debt. The costs for such delay payments and credits were rather high, however. Interest rate for cash advance was at 3% per month (compared to 1.25% per month of the local bank). Delay price for seeds, fertilizers and rice was around 150% of the cash on delivery. Softer interest was also offered for credited customers (see discussion below).

In principle, villagers could sell their products to any other traders and cleared the debt in cash with their S&T. However, they often chose to sell maize to their S&T, even at lower price than the market, just because they wanted to keep in good relationship for the future.

Market chain of maize from Cham B

Maize from Cham B was mostly used to produce animal feed (see Figure 3). It was first collected by local collectors who lived in the commune. After drying, maize would then be sold to wholesalers/ traders in or near the district center. After that, maize went either to an animal feed processing company in Ea Kar district of Dak Lak via Dak Lak Food Company, or through transporters to animal feed processing facilities in the South (Ho Chi Minh city and Dong Nai province) as well as in the North (Hai Phong city).

Local collectors: Entry to the local maize market was open to anyone with sufficient capital (from several millions VND). Nevertheless, most of the maize products in Cham B were sold (fresh) to a network of local S&T, who had shops in the commune center and ran various other small businesses, including supply of inputs for farm production and retail selling of rice. Only small quantity of maize was sold to other collectors or visiting traders.

Local S&T maintained control of maize market in the commune by advancing inputs, rice and cash (see discussion above) for local maize producers. On average, one S&T advanced around 200-300 million VND per year for maize producers in the whole commune. Gradually, informal 'business relationship' was established between farmers and local S&T. Trusted farmers could advance more items (not only farm inputs for maize production but also rice and cash) and enjoy softer interest rate than the others. A villager in Cham B said that he paid only 250,000VND for a sack of rice (50 kg) in delay payment while other would have to pay around 280,000VND. In return, he always sold his maize to this S&T, accepting a loss of around 50,000-100,000VND per ton of maize sold comparing to market price.

Fresh maize collected from the local farmers was often dried before it was sold. Maize drying in the commune was done by diesel-operated kiln, which cost around 20 million VND to establish. Variable costs to dry one ton of maize were around 50,000VND. In addition, kiln owner had to pay 500,000VND fee per year for each kiln. After being dried, maize was sold to wholesalers or traders who lived in or near the district center[12], or Dak Lak Food Company (DLFC). On average, a S&T received a net margin of around 210,000VND per ton of dry maize or 150,000VND per ton of fresh maize that it traded[13]. Variation in profits among local S&T depended mostly on the amount of maize they collected from local producers, which was strongly influenced by the coverage of their informal credit.

Traders/ wholesalers: entry into wholesale market of maize in the district often required formal registration with the district Finance and Planning Section for operation in agriculture production trading business. Annual trade registration fee was 300,000 and annual tax was between one and two million, depending on the amount of products being traded. Credit appeared to be a barrier to enter into and particularly to maintain in control of the wholesale market of maize in the district. With an average traded amount of around 2,500 – 3,500 tons of maize in a season (ranging from one to five thousand tons), liquid capital of a wholesaler could not be less than several hundred million VND. In addition, traders organized into an informal network of friends and relatives to create a coalition to maintain control of the wholesale market of maize in the district.

Wholesalers/ traders in the district center collected maize from local collectors in the whole district. From here, maize were dried (if needed) and transported to animal feed processing facilities or sold to Dak Lak food company. The difference in buying and selling prices for the wholesale market was 240,000VND per ton on average, ranging between 150,000VND and 300,000VND. After subtracting the associated costs (including labor, transport, and depreciation of fixed assets), average net margin left for wholesaler/ trader was around 110,000VND per ton of dry maize.

Transporters: There were two kinds of transporters operating in maize market chain: trucker for land transport and shipper for sea transport from Nha Trang Port of Khanh Hoa province. Due to the limit of the research, detailed information about the sea transporter was not collected and the discussion here focuses only on land transport.

Entry into transporter class was open to all truck owners. In fact, due to the seasonality of maize, whose harvest only focused in a month, trucks were on high demand for maize transport during harvesting season. In most cases, a truck owner had to hire two drivers to make the best use of the vehicle during the peak period.

[12] In case the amount of maize collected was over the running capacity of drying kilns, local S&T also sold fresh maize to wholesalers from the district.

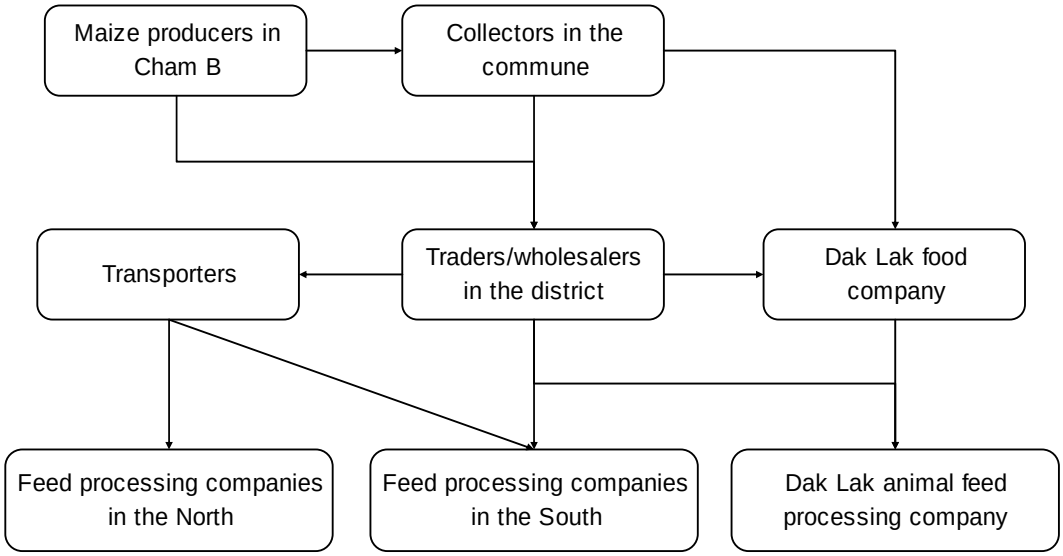
[13] This amount did not include the profit from informal credit that S&T provided to local farmers.

The price that trucker charged for maize transportation was between 700-800VND per ton per km (for truck of 10 tons), which was often added in the price charged to the (next) buyer. Less the running costs (e.g. driver and diesel) and depreciation, net margin for trucker was between 200-300VND per ton per km. Truckers often tried to increase margin by taking more than the manufactured loading capacity of the truck. An average overload of 20% the load limit would bring the net margin to 250-370VND per ton per km.

In addition to hired transporters, some wholesalers /traders also owned a truck and acted as transporter as well. In this case, the net margin of the transporter was added to that of the wholesaler/ trader.

Dak Lak Food Company: DLFC was a state owned organization operating in food trading in the province. In maize market chain, DLFC acted as a wholesaler who bought maize from local collectors/ kiln owners and sold to animal feed processing facilities in Dak Lak and Southern provinces. In addition, DLFC was also involved in the transportation of its collected amount of maize from the district to its clients. The size of maize trading by DLFC in Krong Bong was often below the average of wholesalers in the district center, at around 1.5 ton per year.

Figure 3: Commodity chain for maize from Cham B



Source: Fieldwork 2006

Animal feed processing facilities: According to Hoang and Neefjes (2005), by mid 2004 there were almost 200 animal feed processing facilities in Vietnam. Around 18% of them were foreign invested companies but produced 65% of total animal feed outputs. Most feed processing companies use only domestic maize. However, seasonal fluctuation of domestic maize production drove animal feed companies to import maize, especially during the off season period (Hoang and Neefjes 2005). In fact, the price of domestic maize in Vietnam was also influenced by the price of imported maize from China and the United States (Hoang and Neefjes 2005; Dao et al. 2002; Dao, Le, and Vu 2005). For domestic maize, animal feed processing companies never bought directly from maize producers but mostly from wholesalers because they could provide bulk amount of dry maize, which helped reduce the transaction costs.

In Dak Lak, there was one animal feed processing company, namely Viet Thanh Animal Feed Processing Company. The company produced 21 different kinds of animal feed, of which around 40-50% of the contents were from maize. However, the company's production was low. In 2005, it only got 1,080 tons of dry maize for feed processing, all of which was purchased from within the province, via the wholesalers in the districts. Processed feed from the company was sold at the price of 3,000-4,600VND per kg for mixed feed and 6,700-8,500VND per kg for concentrated products.

In general, by the time maize grain reached animal feed processing facilities, the price increased around 130% of that the farmer received from local S&T, taking into account the difference between the prices of fresh and dry maize (market price of 2005). In terms of profit per ton of maize, maize producers received the highest at around 70.4% (same level of margin as in the Northern area of Vietnam – see Dao et al. 2002). Local collectors earned a net margin of 19.4% and wholesalers got 10.2%. Taking into account the interest that farmers had to pay for the advanced seed, the vertical distribution of maize profits changed, with 57.9% for maize producers, 31.9% for local collectors, and 10.2% for wholesalers. In terms of total profits from maize (trading), the order reversed as the scale of activities increased along the chain. On average, a maize producer in Cham B earned around 3-4 million VND per year, ranging between one to eight million. Average earning of 100-110 million VND was estimated for a local S&T, ranging from around 40 million to 160 million VND. As for wholesaler/ trader, an estimated amount of 250 million was received in profit, ranging between 80-500 million VND.

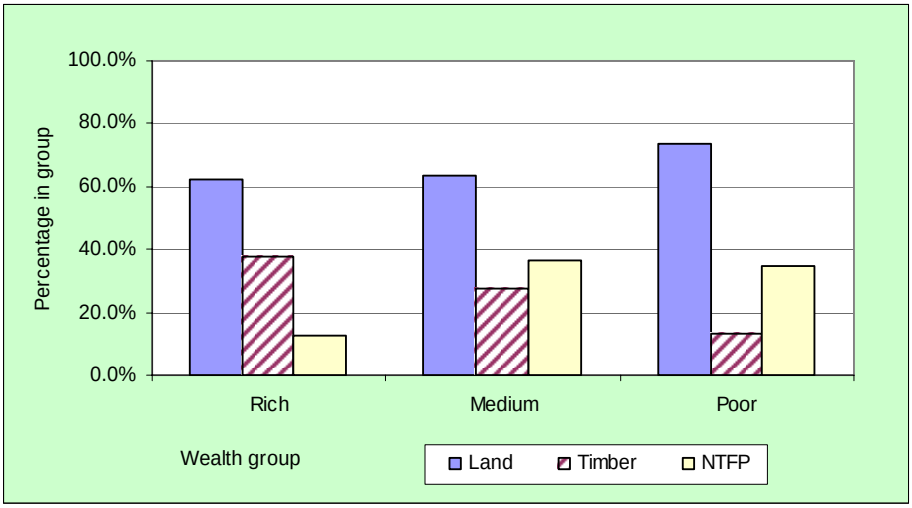
8. Discussion: devolution, commercial maize production and the environment

In the previous sections, I provided an analysis of the devolution process in the study village and how it was connected to the expansion of commercial maize production. I also investigated the market chain of maize from the study village and discussed how different actors entered and maintained their control in maize marketing. This section provides a discussion on the connection among commercial maize production, forest devolution and the environmental sustainability. I argue that in order to make contribution to the livelihoods of the local people in the upland area it is important that devolution not separate agricultural from forestry uses of the forest. Furthermore, in the production forest area as in Cham B, it is not acceptable to sacrifice the benefits for the poor upland farmers from commercializing forests without clearly specified environmental gains (Scherr, White, and Kaimowitz 2004), and workable environmental rewarding scheme.

Although devolved forest in Cham B was able to provide various material benefits, including timber for housing, land for cultivation and NTFPs for various purposes (Nguyen 2001, 2003, 2005; Pham 2003), the use of forest for cultivation purpose appeared to be the most important for local people. Firstly, upland fields in the devolved forest were accessible to large group of people in the village. Around 69% of the village had field in the devolved forest compared to 31% and 21% with NTFP and timber benefits, respectively (see Nguyen 2005, in press) for detailed discussion on quantitative distribution of forest benefits among households). Secondly, land benefits were widely reached by poorer group. As illustrated in Figure 4, 17 out of 23 households classified as poor in the village (74%) had access to upland field in the devolved forest. By contrast, timber benefits accrued more to the better off group in the village. Thirdly, upland field in the devolved forest brought not only benefits in kinds (e.g. rice) but also cash income for local households (e.g. from hybrid maize and beans). Although timber benefits were of high value comparing to harvest from land (Nguyen 2005, 2006), they were mostly in kind. Despite the fact that devolution policy permitted extraction of timber (for commercial purpose), it would take around 19 years from the date of devolution

till the time forest became mature enough for logging[14]. In addition, the existing state policies were not clear about granting permits for commercial logging and marketing of timber by individual households.

Figure 4: Access to forest benefits by wealth groups in Cham B



Source: Fieldwork 2002

On the one hand, devolution could be attributed to the increase in benefits from devolved forest for people in the study village, particularly in terms of cultivation land (see also (Nguyen 2005, 2006). On the other hand, devolution was only one of the various factors influencing the acquisition of forest benefits by local people. One factor was the traditional claims or the *de facto* property rights recognized by local rules. As Netting (1993) indicated, *de facto* rights recognized and respected by people around are, to a certain extent, more important than the formal rights created by the state. The reason is, legal ownership does not necessarily imply full control as it is also limited by social norms of the system in which the individuals live (Agarwal 1994; Cousins et al. 2005). This was the case of Cham A villagers who used to live together with people in Cham B and reclaimed their fields after the completion of devolution. Although they were no longer in the same village and forest was formally devolved to only Ede people of Cham B, the past connection to the devolved forest by Ede people in Cham A made it impossible for Cham B villagers to exclude them from the devolved forest. Local traditions granted Ede people in Cham A the rights to use the land in this forest (Tran 2004; Tran and Sikor in press). As Sick (1998) puts it "community recognition of rights may legitimize control of property by individuals who do not have legal title; a strong network of family and friends can ensure that those rights are protected" (p. 204).

The connection between local officials and the state also influenced the distribution of forest benefits (Nguyen 2005, 2006). In the context of land conversion in Cham B, some local officials even got 'worse-off' to maintain a good relationship with the state for long term benefits. As earlier discussed, some households with officials did not convert devolved forest into agricultural land when no permission was available, despite the fact that most households with available resources obtained a significantly large field in the devolved forest (Nguyen

[14] According to existing regulation, logging permit could be granted for forest in Dak Lak with the minimum timber volume of 130 cubic meters (m^3). With the average growth rate of 3.3% per year for the type of forest in Cham B, it would take 19 years to reach this threshold.

2005, 2006, in press). Such action could be regarded as a sacrifice of the short-term immediate benefits for the longer term in the future (Hart 1989).

In addition, access to market played an important role. As discussed in the previous section, the availability of commercial maize market in the area provided a way for Cham B people to generate cash income from forest land. In the context of forest devolution, access to maize market was particularly important at the absence of a formal market for timber products and a poor development of markets for NTFPs (see also Pham 2003). For the local farmers, this was a valuable contribution to their livelihoods (Belcher 2005; Scherr, White, and Kaimowitz 2004). Access to market was necessary as devolving property rights alone was not sufficient to establish local participation in forest benefits (Ribot 2000, p. 135). Nevertheless, the discussion about the market chain of maize in the previous section indicated that total income of a maize producer was just a fraction of that of a local S&T or a wholesaler. Due to small scale of production and lack of post-harvest treatment (drying facility), local maize producers were not able to enter into the direct supply chain to feed companies. In addition, unavailability of cash to buy farm inputs (for maize production) and other items placed farmers in the position to accept a 'business relationship' with local S&T. The high interest rates charged for the advanced items and the loss of profits from selling maize at a price lower than that in the market took away the net margin from the farmers and transferred the maize benefits from (poor) villagers to (already rich) local S&T.

Unsurprisingly, the land title for the devolved forest did not help to improve the credit situation for the local forest recipient (Cousins et al. 2005). One reason is farmers did not like to go to the bank for a loan because of the unfamiliarity with bureaucratic procedures that they would have to go through. Furthermore, forest RBC was not sufficient as a mortgage for loan in the bank due to low market value of the forest and high expected cost of liquidizing this asset in case of default. A title for agricultural land or residential land, which had also been given to local people, would be easier accepted for mortgaging purpose than forest land use title.

From the environmental point of view, clearing of forest for maize production in specific and for agricultural production in general could lead to substantial loss of forest resources and environmental services (Angelsen 1995; Hoang and Neefjes 2005). However, previous logging activities (of the state) may have caused larger depletion of resources. Land clearing for cultivation in the Southeast Asia often followed logging frontier (Grainger 1993, cited in Angelsen 1995), following "a logging-shifting cultivation tandem" (Angelsen 1995, p. 1718). In the case of Cham B, the whole devolved forest area had undergone through selective logging by Krong Bong SFE in the past and its quality at the time of devolution had already gone down. In addition, total area of forest cleared by Cham B people until 2002 was only 6.5% of the forest area devolved to the village, representing a rate of 1.63% per year. This rate was still less than two third of the average annual deforestation rate of 2.59% in Dak Lak between 1992 and 1999.

Furthermore, local people applied farming practices that help minimize the environmental risk associated with maize cultivation. As discussed earlier, minimal preparation of the fields, particularly the newly opened ones, was often applied by local people. On the one hand, this practice saved labor, which was a scarce resource in extensive farming. On the other hand, it contributed to slow down the erosion of the topsoil in the field. Furthermore, monoculture of maize was rarely the case in the area. Local people often mixed maize with several other crops, including rice, beans and eggplants. The practice of mixed cropping did not only provide various products for self-subsistence but also protect topsoil and maintain soil

fertility. Mixed cropping with legumes species, for example, fixes nitrogen from the air and covers the soil between maize plants (Hoang and Neefjes 2005).

Nevertheless, the expansion of upland field in the devolved forest after the end of devolution program was alarming to local foresters. As an effort to counteract this activity, Krong Bong SFE has offered commercial forest plantation an alternative to maize production on the upland in the devolved forest since 2004. The SFE would pay for seedlings, fertilizer and fee for tending of the plantation (25,000VND per ha) for the first year. Labor cost for planting trees would also be covered by the SFE. In addition, SFE guaranteed purchase of timber from the plantation, which would be used for paper industry. Assuming the price of timber remain stable as present, the net present value of margin per ha per year for the farmers would be around 1.86 million VND at the theoretical discount rate of 10% or 845,000VND at the current interest rate of 1.25% per month[15]. Although it was still less profitable comparing to commercial maize production discussed in the previous section, commercial tree plantation could also provide a potential for cash income from the devolved forest. Nevertheless, as tree planting takes time to yield income, few farmers have so far planted trees on their field in the devolved forest. In addition, it is not clear whether such plantation scheme can bring in substantial environmental gains as Eucalyptus – the only tree species planted in the forest so far – has also been known for its negative impacts on the environment (Mai et al. 2001).

Last but not least, absence of a rewarding scheme for the environmental services that the devolved forest generates made the need for agricultural land in this forest area more legitimate. According to the current state regulation, local people have a possibility to receive a payment of around 50,000VND a year to conserve one ha of protection forest. However, this was not the case in Cham B as the whole devolved forest area was classified as production forest (i.e. forest mainly for economic purpose). Under such situation, the use of forest for cultivation purpose was been a main solution for cash income for the local people.

Conclusions and policy implications

The paper has so far gone in-depth in the acquisition and distribution of benefits from forest devolution in Dak Lak province of Vietnam. By providing local people the rights to forest, Dak Lak devolution program expected people to protect the allocated forest and improve their livelihoods from forest based activities. To facilitate livelihood improvement, local people were entitled to collect timber and non timber forest products and to use limited area of forest land for cultivation.

Findings suggest that forest devolution has a potential to improve the livelihoods of the local people. Among various uses of the devolved forest, the use of forest land for agricultural purpose appears to be most important for the local people. In addition, merely giving rights to forest and forest land title to the people does not automatically lead to benefits from forest. Various factors need to be present. Among which, access to the market is seen as an important determinant influencing the contribution of forest to local livelihoods. Furthermore, the paper also indicates that formal forest land title does not help improve the access to credit by local people.

Findings from the study have the important policy implications. First of all, legal permission to use forest land for cultivation can make important contribution to improve livelihoods of upland people in Vietnam. Policy should pay attention to the linkages between forest management and agricultural production of the local people, particularly at the absence of a

[15] With the average production of 100 'double steres' of timber per ha in seven year and all the associated costs born by SFE, gross margin for the farmer from a ha of plantation is 22 million at the time of harvest.

rewarding scheme for the environmental services and of a market for timber and NTFPs. Secondly, providing legal property rights to forest without taking into consideration the social embeddedness of property in the local context is unlikely to be meaningful. State policy should take into account the local traditions and practices that govern access to land and forest resources to avoid introducing conflicts with local customs. Thirdly, market plays an important role in the creation of cash income for household economy. Improvement of local people's access to existing market (e.g. for maize) and creation of new markets (e.g. for timber) can help improve the contribution of forest to local livelihoods. Fourthly, improvement of local people's access to financial capital can improve the net margin from their products. Lack of cash at the time of need and poor access to formal credit put local people in the position to take high interest advancement from informal sources. To improve local people's access to loan from the bank, state policy should pay attention to minimize the bureaucratic burden in getting formal credit.

In the conclusion, forest devolution is not merely the issue of forest management. In the local context, it is as well a matter of social embeddedness, livelihoods and politics. It is hoped that empirical findings from this study can bring some lights in this mist.

Acknowledgement

This paper was made possible through the generous funding from the World Resources Institute, under a research program entitled "Policy and Distributional Equity in Natural Resource Commodity Markets: Commodity-Chain Analysis as a Policy Tool". Fieldworks were done with financial support from the Tropical Ecology Support Program under the German Agency for Technical Cooperation (in 2001-2002), and World Resources Institute (in 2006).

The author would like to thank Jesse Ribot, Bradley Kinder and Elly Page from World Resources Institute; Thomas Sikor and Daniel Müller from Humboldt University Berlin; Mr. Phan Muu Binh, Dr. Tran Ngoc Thanh, Ms. Dao Thi Kim Oanh and many others from Dak Lak Department of Agriculture and Rural Development for their support.

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