RESEARCH REPORT

112

The Impact of Government Policies on Land Use in Northern Vietnam:

An Institutional Approach for Understanding Farmer Decisions

Floriane Clément, Jaime M. Amezaga, Didier Orange and Tran Duc Toan

International Water Management Institute

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Cover Photograph by Floriane Clément shows a view of the uplands surrounding the fieldwork area in June 2005, Dong Cao village, Tien Xuan Commune, Luong Son District, Hoa Binh Province, Vietnam.

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Contents

Acronyms and Abbreviations

5MHRP	Five Million Hectare Reforestation Program
ADB	Asian Development Bank
CIRAD	Centre de coopération Internationale en Recherche Agronomique pour le Développement
DURAS	Promotion du Développement Durable dans les systèmes de Recherche Agricole du Sud (Promoting Sustainable Development in Agricultural Research Systems)
GIS	Geographic Information System
IAD	Institutional Analysis and Development
IRD	Institut de Recherche pour le Développement
IWMI	International Water Management Institute
MSEC	Management of Soil Erosion Consortium
NGO	Non-Governmental Organization
NIAH	National Institute for Animal Husbandry
SFE	State Forest Enterprise
SFI	Soils and Fertilizers Institute
WFP	United Nations World Food Programme

Summary

Deforestation has become an issue of increasing concern in many tropical countries. In Vietnam, the response of policymakers has been embodied in several policies and programs, including land classification, land use rights devolution and reforestation schemes. Understanding how these state initiatives have affected the farmer's land use decisions is essential to further guide policymakers in developing national planning strategies.

Stemming from the study of three villages in the Northern Uplands of Vietnam, we analyze the course of actions and decisions that have taken place between policy implementation and documented reforestation. We use a qualitative approach that focuses on the role of institutions, which has not hitherto been utilized in the context of land use change in Vietnam. A revised version of the Institutional Analysis and Development (IAD) framework, coupled with a historical perspective, provides the basis for analyzing the relative influence of policies on the behavior of farmers.

Our results indicate that, in the study area, policies have impacted on land use change, but not in the way that was planned by policymakers. The decision of farmers to cease cultivation of annual crops was neither the result of the government ban on upland cultivation nor the result of reforestation incentives. Instead, policies disrupted local land use practices and particularly collective rules governing land management, which ultimately led farmers to stop cultivating. Discussions held with farmers suggest that a majority of them do not consider tree plantations as a viable option. It is, thus, likely that reforestation in the area will only be a temporary phenomenon and not a sustainable process as intended by policymakers.

Findings show that one should be extremely cautious when analyzing macroscale factors to explain human-induced environmental change, when final decisions on natural resources management are taken at the individual and community level. Only a micro-level analysis could explain the behavior of farmers by capturing the local factors that were prominent drivers for land use change. Other lessons learned, such as the importance of locating individual behavior within the larger context of a community system, can be applied to further policy development and research on land management.

The Impact of Government Policies on Land Use in Northern Vietnam: An Institutional Approach for Understanding Farmer Decisions

Floriane Clément, Jaime M. Amezaga, Didier Orange and Tran Duc Toan

Introduction

Management of the uplands is an issue of critical importance in Vietnam. Mountainous regions represent 75 percent of the country's total area, and in Northern Vietnam, rural communities still rely heavily on agriculture, often on steep slopes, for their livelihood. For the last twenty years, policymakers have paid special attention to upland areas. Improving (or substituting) the land management systems of ethnic minorities and reforesting barren hills have been two major aims of rural development policies (cf. The Comprehensive Poverty Reduction and Growth Strategy, Socialist Republic of Vietnam 2002: 102-103), and have often been supported by donors, research projects, and Non-Governmental Organizations (NGOs). Most of these government initiatives have been officially justified by a twofold concern for economic development and environmental protection – although some scholars (Sowerwine 2004; Zingerli 2003, 2005) argue that the true reasons also encompass political concerns.

Thus far, the stated success of these government policies, both in alleviating poverty and protecting the environment, has been widely challenged (Dang Thanh Ha and Espaldon 2001; Gomiero et al. 2000; Tran Duc Vien et al. 2005). While Vietnam has accomplished impressive progress in improving agricultural productivity and reducing poverty over the last two decades, the economic gap between delta and northern montane regions has widened, and a large part of the upland population still suffers from food shortages (Rerkasem 2003). Environmental benefits are questionable as well, since forest policies are often based on exaggerated assumptions[1] on the impacts of reforestation. Indeed, despite strong and long-established scientific evidence, some myths are still present in Vietnam among policymakers and the Vietnamese research community[2]. One of the most widespread and still vivid narratives is that reforestation increases runoff. Research studies (e.g., Calder 1998; Hamilton and Pearce 1988) have demonstrated for a long time that, on the contrary, forests decrease water yields. Fast-growing tree species, such as pine, acacias and eucalyptus are known to be particularly water-consuming (Bruijnzeel et al. 2005; Jackson et al. 2005). However, these species constitute the majority of tree species in new forest plantations in Vietnam. This is not to say that forests do not in themselves provide environmental benefits. It is, however, a matter of concern when reforestation programs are not based on sound arguments, as they might lead to opposite effects and adversely impact the livelihoods of people (Forsyth 2003).

[1]Such as "forests always reduce erosion", "forests always reduce floods and landslides".

[2]This assertion is based on evidence collected through interviews.

As the forestland allocation process and the Five Million Hectare Reforestation Program (5MHRP) are still under implementation, it is important to understand how these national policies have actually impacted on the strategies of farmers and land use so far. Stemming from the study of three villages of Northern Vietnam where uplands have recently been reforested, this approach analyses the course of actions and decisions that has taken place between policy implementation and land use changes. Our aim is to provide new insights into the role of land policies on land use change in Vietnam, by using a qualitative approach focusing on the role of institutions. Coupled with a historical perspective, the Institutional Analysis and Development (IAD) framework provides a basis for analyzing linkages between implemented policies and the behavior of farmers. In addition, we explored how discourses of local authorities on forests and land degradation shaped farmers' perception of their environment and how it might have affected their decisions.

Results indicate that policies have indirectly impacted land use, but in a way that was probably not predicted by the Vietnamese government. Local factors were found to be more prominent in specific outcomes in land use change than national policies. From these results, lessons and recommendations for further policy development and research on land management are proposed.

Methodology

This study is part of a research project integrated within an international research program called Management of Soil Erosion Consortium (MSEC). MSEC was a component of the Asian Development Bank (ADB) supported project "Catchment Approach to Managing Soil Erosion in Asia" (ADB-RETA 5803). The objectives of the program were to promote sustainable land management systems, evaluate the biophysical, environmental, and socioeconomic effects of soil erosion, and generate reliable information for the improvement of catchment management policies (Maglinao et al. 2001). Coordinated by the International Water Management Institute (IWMI), it has been implemented in six Southeast Asian countries including Vietnam since 1999. MSEC collaborating research institutes in Vietnam – the French Institut de Recherche pour le Développement (IRD) and the Vietnamese Soils and Fertilizers Institute (SFI) – have been collecting soil, hydrological, and land use data in a 50 hectare (ha) watershed in the Northern Uplands for six years (Tran Duc Toan et al. 2003).

However, we consciously took a step back from the MSEC framework by looking at social constructions of environmental processes. MSEC objectives are based on the assumptions that (a) the land use practices of farmers in Southeast Asian uplands have become environmentally unsustainable (Maglinao et al. 2001), (b) local people are not aware of this degradation, and/or (c) they do not know how to make their practices sustainable. A previous IWMI report stemming from MSEC research activities already strongly challenged some of these assumptions (Lestrelin et al. 2004). In the present study, the authors have paid critical attention to dominant discourses and narratives on uplands management in Vietnam, being aware of how the latter could be used by different stakeholders to defend or promote their interests. For instance, advocating the inability of local communities to manage the land is an argument often used by governments to restrict and/or control land access and land management (e.g., Committee on the Human Dimensions of Global Change et

al. 2002). Although the purpose here was not to investigate how ecological arguments might have been used for political or economic reasons – this would have required a more rigorous political ecology approach – we take a critical look at how explanations of environmental processes have been constructed.

The research encompasses a multilayered level of analysis: village, provincial, and national level. As demonstrated by Gray (1999), a multi-scale analysis enables the investigation of different driving forces for land use change. The village level is the scope of the present research report. Specific attention was given to the decisions of households and the community and a qualitative approach using household interviews and qualitative analysis was selected as the best way to decipher human decision complexity.

Reconnaissance fieldwork was carried out in three villages of the Northern Uplands, first following a broad line of enquiry, with a particular interest in upland natural resources management and rural development issues. One of the selected villages, Dong Cao, is the location where MSEC research activities have been carried out. The two other villages Dong Dau and Que Vai are the closest neighboring villages. They were selected because they are similar in their socioeconomic assets (distance from the main road, livelihood activities, population size, familial ties) but distinct in environmental variables (access or not to the water reservoir, access to smaller or larger upland areas). It allowed interesting comparisons in the study of patterns of livelihood activities and natural resources management. The aim of this fieldwork phase was to construct a general picture of the activities of farmers and the use of natural resources, to understand how and why they had evolved over the past 50 years, and to assess which incentives farmers had responded to when making decisions affecting their local environment. Transect walks, participatory exercises (participatory map, wealth ranking, historical and classification matrixes) with focus groups, 32 key informant interviews at the village, commune and district level[3], and 82 household interviews were carried out over a six-week period in the three villages. Complementary information on local institutions governing uplands management was gathered via semi-structured interviews with a sample of ten households from two villages during a second stage of fieldwork.

In the present study, institutions encompass the rules governing access to and use of natural resources in the uplands. Here we follow the most common academic definition: institutions are the "rules of the games" (North 1990: 3) and are distinguished from organizations, which are compared to the "players" of the game who will use the rules in a way to win the game (ibid.). The rules are defined as the "shared understandings that refer to enforced prescriptions about what actions (or states of the world) are required, prohibited or permitted" (Ostrom 1999: 50). Though the decisions of farmers on livelihood activities are dependent on a wide variety of factors – labor force, available capital, environmental conditions, etc. – institutional change brought about by national policies appeared to be prominent in the explanation of land use change during the interviews conducted. In Vietnam, most studies of land use change have integrated spatial modeling and quantitative analyses (Muller and Zeller 2002) or have considered macroscale factors as driving forces (Cramb et al. 2004). A few of them have qualitatively examined the role of institutions on land use at the local level (Castella et al. 2005; Sikor 2001), but not following a rigorous institutional framework. The authors hope to provide new insights into land use change by using an institutional framework that contextualizes the decisions of households within the community in which households interact.

Several approaches for institutional analysis have been developed and used in the context of natural resources management. We particularly examined the environmental entitlements framework (Leach et al. 1999), the IAD framework, and the sustainable rural livelihoods (SRL) framework, which has been used recently

[3]Administrative units in Vietnam are respectively from the higher to the lower level: province, district, and commune.

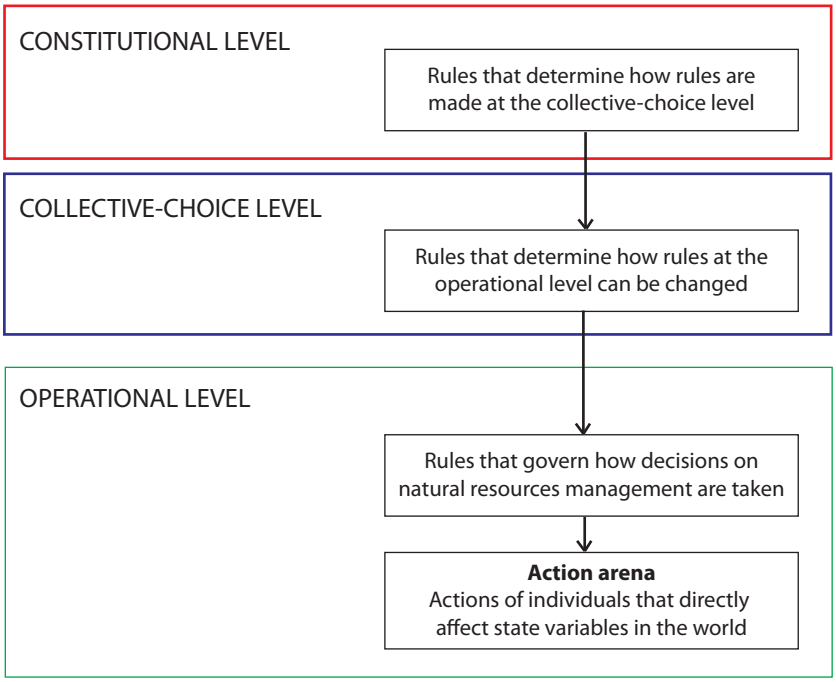
as a basis for institutional analysis (Messer and Townsley 2003). Compared to these approaches, the IAD framework holds several comparative advantages.

The IAD framework was developed by Elinor Ostrom and her colleagues in the early 1980s (e.g., Kiser and Ostrom 1982; Ostrom 1990; Ostrom et al. 1994) and has been used for a wide range of institutional settings. Notably, it provided a basis to develop a theory of common-pool resources management. Its long term use and refinement has allowed a rigorous and reliable assessment to be made (Ostrom 1999).

Compared to the SRL framework, it is particularly efficient in linking local with higher decision levels i.e., those, where central (governmental) policies and rules governing policymaking are decided. It is structured from the operational level, where decisions directly affect natural resources management to the collective-choice level, where decisions impact the rules that affect the operational level. The collective-choice level is finally linked to the constitutional level, where decisions impact the rules that govern how decisions are taken at the collective-choice level (Figure 1). As the whole research project will look at a bigger picture of land use change at a later stage, this was an essential feature. The present report focuses on the operational and collective-choice levels as a first step of analysis, but higher levels of decision-making will also be considered and then linked with the results from the present study.

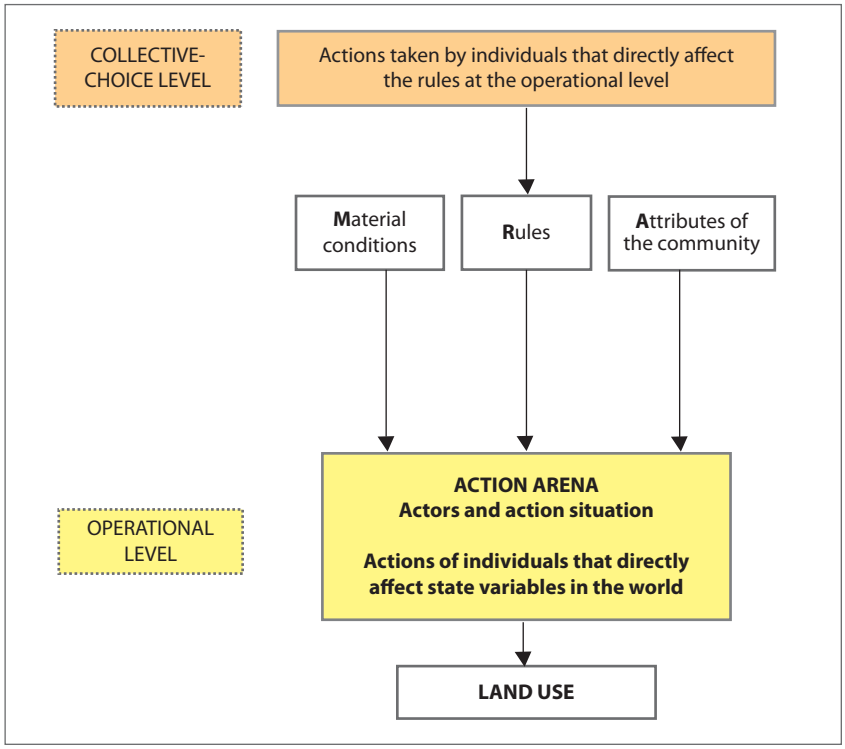
Furthermore, we found that the IAD framework was better suited for the analysis of collective action than the environmental entitlement and the SRL frameworks. In the IAD framework, actors are located in an action arena within which they interact according to an action situation (Figure 2). The external factors impacting on the action arena are determinant of the collective action of a group of actors rather than being determinant of an isolated individual. In addition to the rules, these are the material conditions (the physical state of the environment where actors evolve) and the attributes of the community (cultural determinants). For instance, the characteristics of the material conditions will

FIGURE 1.
The three levels of analysis in the Institutional Analysis and Development (IAD) framework.



Source: Ostrom 1999

FIGURE 2.
One level of analysis of the IAD framework.



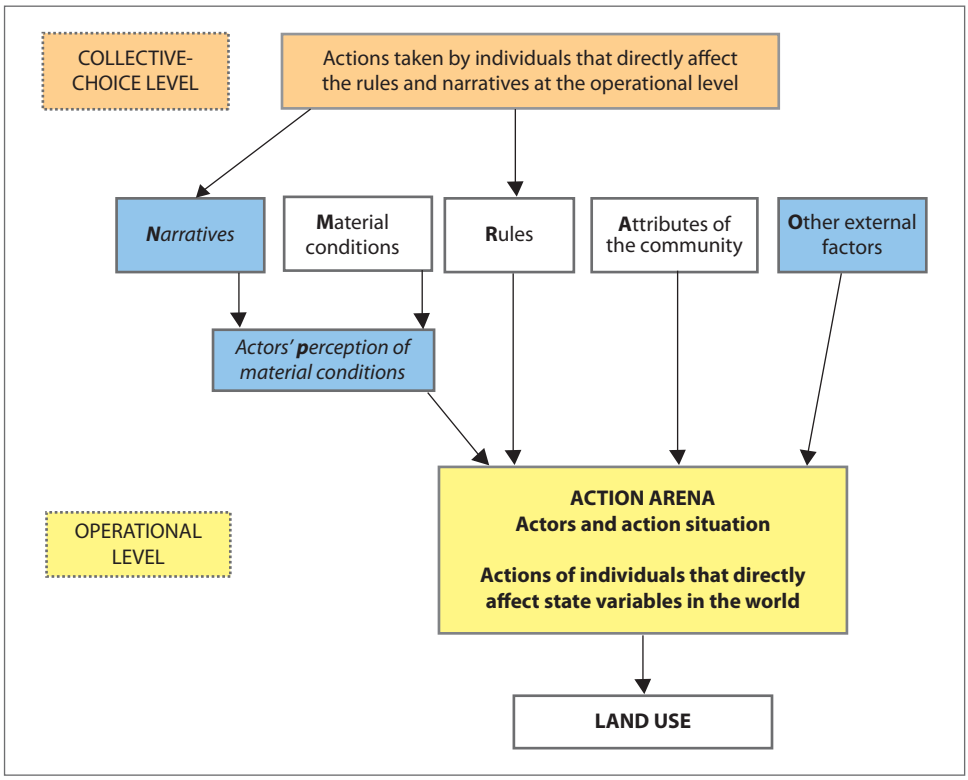
Source: Ostrom 1999

significantly affect how rules determine the behavior of people within a community. Rules that do not include any control and accountability are likely to lead to free-riding, in the case of resources with a low excludability. The other two frameworks include factors (assets or endowments) that are well suited to the analysis of the decisions of individual households and have offered very good insights into household strategies. However, the factors considered do not specifically address issues raised by collective action. Since, until the allocation of forestland took place, upland management was ruled by the community, the emphasis on collective action is particularly relevant in the present analysis. As further illustrated, the consideration of all external factors and more precisely the analysis of their co-action were proved to be essential.

Considering the context of land use change in Vietnam, a certain number of modifications were made to the external factors (modifications appear in blue in Figure 3). Macroscale socioeconomic factors (selling prices of agricultural products, off-farm work availability, etc.) were added. Moreover, it was considered that not only rules but also narratives[4] spread by national and local authorities through discourses could significantly affect the action arena. The focus on discourse and on the importance of narratives over the strategies of farmers justifies the inclusion of this factor. Finally, the importance of social framings was further emphasized in this analysis by considering that, more than the material conditions themselves, their perception was a key determinant in the decisions of actors. These additions intend to capture driving forces that might have remained hidden otherwise.

[4]The term narrative refers to a message that tells a particular story. It establishes causal links between a set of events or a particular environment with human action (see Roe 1994).

FIGURE 3.
Framework used for this analysis, adapted from the IAD framework.



Located in the action arena, actors are the central variable in the analysis. It is, thus, essential to select a relevant model for the behavior of actors, as this will determine whether actors respond weakly or strongly to different external factors. The neoclassical economic model of rational behavior has been commonly used by a wide strand of the new institutional economic analysis (Dequech 2006). Yet, there are a number of limits inherent to the maximization of behavior (a review of these criticisms is proposed in van den Bergh et al. 2000). North argued that neoclassical economic theory fails to account for "behavior in which calculated self-interest is not the motivating factor" (North 1981: 11) and proposed a theory of institutions that combined a theory from human behavior with a theory of the costs of transacting (North 1990). More recently, Vatn (2005) advances that the fact that information held by individuals is incomplete, challenges the basis of neoclassical approach, i.e., optimization and individual rationality. Some Vietnamese cultural characteristics (e.g., as underlined by Tran Duc Vien and Rambo 2001) led us to consider actors as following a norm-guided behavior rather than a rational one. For instance, in Vietnam, the whole society is thought of as a family. As expressed in Vietnamese language, Vietnamese people do not perceive themselves as single, isolated individuals in a wider society but always refer to their own position vis-à-vis their family, their friends, their work colleagues, the community in which they live and the whole society with which they interact. Second, spontaneous emotions and feelings have always been taught to be subordinated to obedience, morality, and duty to one's family and to society (Jamieson 1993). The needs and aspirations of individuals are framed by an individual's role in society and society's overarching rules. For these reasons, it is suspected that farmers will preferably act according to what is considered normatively correct than only by comparing costs and benefits for different choices. Whether norms and perceptions are shared by actors or not thus become particularly important.

A Case Study Investigation of Land Use in Northern Vietnam

Tien Xuan Commune is located in Luong Son District, Hoa Binh Province, 40 kilometers (km) west from Hanoi (Figure 4). It lies at the edge of the Red River Delta and at the bottom of hills and mountains.

Uplands represent large areas compared to the local population (Table 1).

Rainfall is unevenly distributed: about 85 percent of the rainfall occurs between May and October (Figure 5).

FIGURE 4.
Location of the case study area.

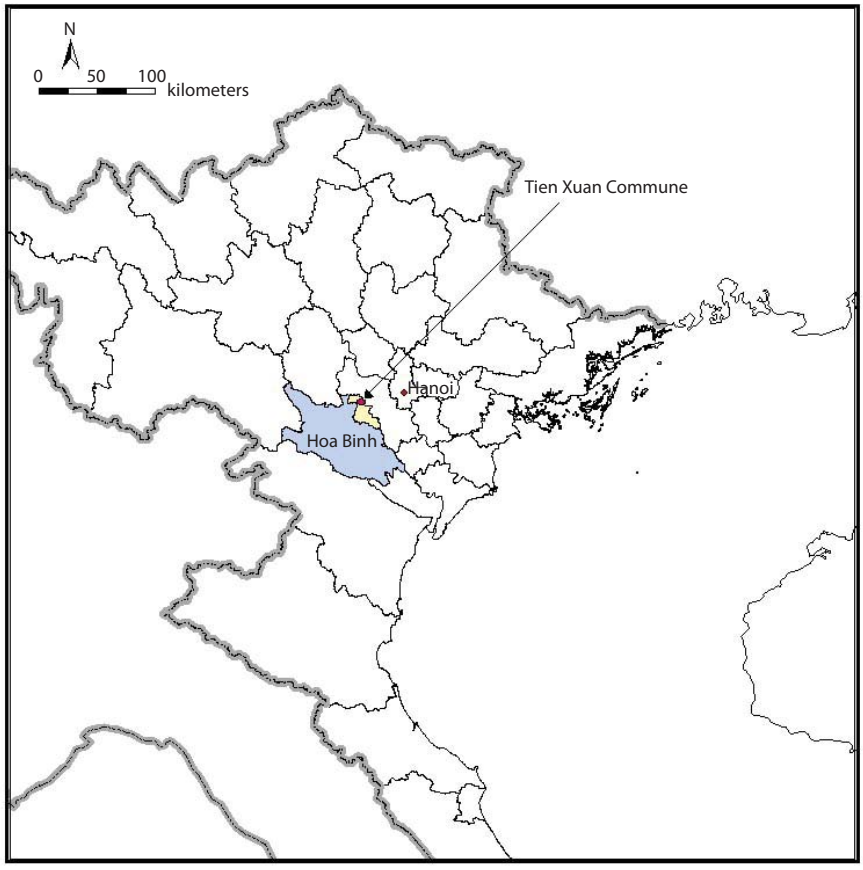


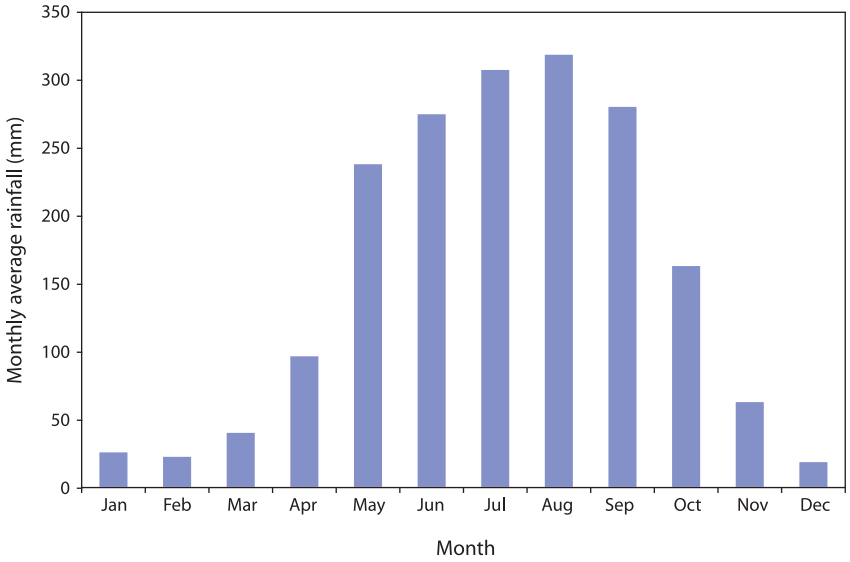
TABLE 1.
Some general characteristics of Tien Xuan Commune.

Location of Tien Xuan administrative centre	Population in 2004	Yearly average temperature and rainfall	Lowland area	Upland area	Main upland soil types	Slope[1]	Elevation[1]
20°58'N 105°29'E	6,300 inhabitants	25°C; 1,800 mm	320 ha	978.12 ha	Ferralsols and Acrisols	15 to 60%	125 to 700 m above the sea level

Notes:

[1]These figures are measured only from Dong Cao experimental watershed but are representative of the landscape in the whole study area.

FIGURE 5.
Average monthly rainfall (mm) in Hoa Binh Province from 1969 to 2005.



Source: Statistics Department, Hoa Binh Province

The dominant upland soil types in this area are Ferralsols and Acrisols (Tran Duc Toan et al. 2001). Both are acid soils, inherently infertile with low resilience, which means it is hard to restore their capability, and moderate sensitivity, which implies that they are quite easily subject to change (Stocking and Murnaghan 2001).

Seventeen villages constitute the commune, the principal of which are Dong Cao, Dong Dau, and Que Vai, where the fieldwork was carried out. During the interviews, farmers described how these three villages were created approximately a century ago by a few Muong[5] families. They have traditionally cultivated irrigated rice in the lowlands and have relied on husbandry (pig and buffalo breeding) and aquaculture as a means of living. In the 1960s, under the New Economic Zone government program, a few Kinh[6] families migrated into the three villages (Table 2). Regardless of ethnicity, today, all farmers are engaged in a wide range of activities from rice cultivation and husbandry to forestry and aquaculture. Non-farm based employment has also increased over the last few years, especially construction work. Livelihoods diversification has thus been adopted by farmers in the area. According to a growing body of literature (Barrett et al. 2001; Ellis 1998), this strategy commonly adopted by rural households accelerates income growth and increases resilience to external shocks.

TABLE 2.
General data on the population of the villages.

Village	Number of households	Ethnic groups living in the village	Proportion of Kinh households in each village (%)
Dong Cao	42	Muong, Kinh	36
Dong Dau	64	Muong, Kinh	5
Que Vai	78	Muong, Kinh	7

[5]The Muong form one of the largest ethnic minority groups in Vietnam.

[6]Kinh form the majority ethnic group in Vietnam and represent 80% of the total population. They predominantly hold power positions at the provincial and national level.

In this study, the action arena focuses on the upland area and on the decisions of farmers regarding upland management in the three villages. It does not infer that other action arenas (lowland activities, husbandry, etc.), on which farmers rely, are ignored. Many action arenas overlap and it is difficult to draw sensible boundaries between them. For example, grazing land availability in the uplands considerably affects husbandry development: in Que Vai, where large grazing areas are available, households own on average three buffalos. In Dong Cao, where most upland areas were recently sold to Hanoians and access to grazing land is consequently limited, households own on average one buffalo.

Actors, here, refer to every person who has access, use or control over uplands. It encompasses all the villagers living in the studied geographical area, local authorities in charge of implementing laws and monitoring land use, and Hanoian investors who have recently purchased some of the surrounding land.

Slash and Burn Cultivation: Initial Structure of the Action Arena

Uplands in the region were first covered with primary forests, and populated with wild animals. As a response to overcome poverty and famine, local people started to cut trees and sell timber from the 1960s. Progressively, uplands were also opened up for agricultural purposes and from the mid-1970s, farmers cultivated annual crops: cassava, arrowroot, taro, and maize. They were practicing rotational shifting cultivation with ten to fifteen year fallow periods.

The information and perception farmers had on uplands was essentially based on their own experience. Interview results suggested that uplands were seen by villagers as an unlimited resource, but that they were also aware of its fragility. Many farmers mentioned the inherent low soil fertility of the area and the sensitivity of uplands to degradation: *"when there are heavy rains, water flows with humus".* They also knew that cassava cultivation was an aggravating factor behind soil erosion:

> *"when we plant cassava, we have to weed. But when we cultivate on steep slopes, soil runs with water and there are only stones left".*

Selling prices of cassava, arrowroot, and taro were low[7] and work in the uplands was hard, this being especially pertinent to newly migrated Kinh families who were not used to living in a mountainous environment. However, upland cultivation was the only source of cash income and equally raised the living standards of farmers significantly.

According to farmers, no formal rules governed upland management; work in the uplands was neither managed nor controlled by the cooperative or the district State Forest Enterprise (SFE). Instead, farmers had designed their own rules. Everyone was free to clear as much land as they wanted; how much land farmers could open only depended on their will and available labor force. Access to uplands was not restricted to any individuals or group of people, and included not only villagers from the three studied villages, but also villagers from other villages that had no direct access to uplands. As land was abundant, there was very little competition to open new parcels. Farmers used to simply make a mark on the area that they wanted to open up, to signify to other people that they should not start clearing that place.

From the time that farmers first started cultivating the uplands, they were confronted with damage from freely grazing cattle. As cultivated plots were often located far from their dwellings, they either had to build a shelter and stay in the field all day or to create collective rules that could more efficiently cope with this issue. Many farmers decided to create and follow collective arrangements. Cultivated fields were regrouped and fences could be built collectively to protect

[7]Cassava prices, for example, ranged from 300 – 400 Vietnamese dong (VND), i.e., approximately USD 0.02 per kilogram(kg).

the whole cultivated area. The cost of building fences to protect the fields was shared by all the farmers. Farmers could also guard the whole cultivated area when working on their own plot in order to prevent cattle damage. Furthermore, if animals entered the fields, the costs resulting from the damages caused were divided between different owners and thus reduced for each farmer.

Collected data reveal that the period of shifting cultivation was characterized by a land use system collectively managed with a minimum set of rules and with no need for enforcement. Because farmers were aware of the inherent low soil fertility, they adopted shifting cultivation practices that enabled the soil fertility to regenerate. Generally, as long as large upland areas are available, shifting cultivation practices are seen as a good option in terms of economic and environmental costs/benefits in this type of highly sensitive environment (Do Dinh Sam 1994; Ives et al. 2002; Sivakumar and Valentin 1997).

From Cessation of Annual Cropping to Reforestation: Changes in Rules, External Factors and Narratives

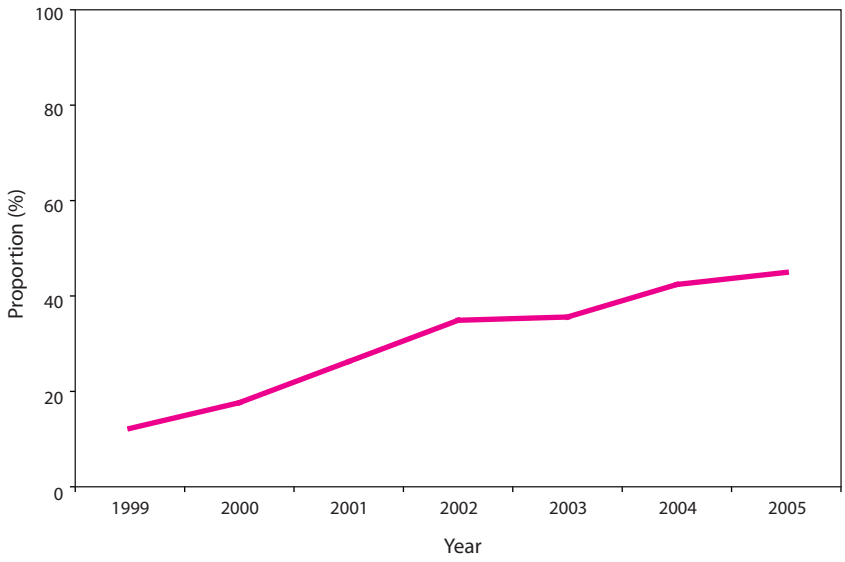
From the 1990s, decisions taken at the collective-choice action level resulted in dramatic changes in rules. In 1991, the Law on Forest Protection and Development divided forestland into three categories: special-use forestland, protection forestland and production forestland (National Assembly of Vietnam 1991). Procedures and guidelines for forestland allocation were provided with the new Land Law (National Assembly of Vietnam 1993, amended in 1999), and Decree 02-CP (Government of the Socialist Republic of Vietnam 1994, replaced by Decree 163 in 1999). Rights to use land with or without forest cover could be allocated to organizations, households, or individuals for 50 years. In the three villages Dong Cao, Dong Dau and Que Vai, forestland was zoned, classified and allocated from 1996 to 1998 according to what had been previously cleared up and cultivated by every family. Land with a slope greater than 25° was classified as forestry land and its use was restricted to forestry. However, villagers were not very willing to stop their major source of monetary income, and the task of the commune authorities for enforcement and control was enormous. A team of twenty persons had to control a 978 ha territory in addition to their usual administrative tasks. Even though many villagers were fined, a large majority of farmers kept on cultivating arrowroot, taro, maize, peanuts, and cassava several years after annual crop cultivation was banned.

Most farmers acknowledged that there were few conflicts during the land allocation process. Actually, many of them refused to claim land because they feared that they would be liable to pay more taxes if they were given land use rights. Furthermore, the advantages of getting official land use rights for land were not very clear, as uplands had previously been freely used and accessed. In 1998, the process of land allocation was completed and land tenure certificates (so-called Red Books) were given to households.

In the same period, reforestation programs were launched in the study area and all over Vietnam. Pertinent schemes included the United Nations World Food Programme (WFP)[8], which operated in Vietnam from 1975 to 2000 (de Jong et al. 2006), and the Program 327 (Council of Ministers 1992), which started in the early 1990s. In 1998, the Program 327 was replaced by the 5MHRP, also called Decision 661 (Prime Minister of the Government of Vietnam 1998). During the government programs, financial incentives were provided to households to promote reforestation. Depending on the program, the district usually paid for seedlings, fertilizer, and labor costs (which in turn were deducted from the sales benefits). During the WFP, rice was provided for each tree planted. The SFE, that managed program implementation with the local support of

[8]This program encompassed six forestry projects and managed to restore some 450,000 ha of production forest.

FIGURE 6.
Evolution of planted forest area in Tien Xuan Commune. Proportion (%) of planted forest area for land classified as forestland.



Source: Forest Protection Organization, Luong Son District, Hoa Binh Province

the commune authorities, promised to ensure the purchase of timber to the farmers. The household had to sign a contract with them, and to conform to specific requirements such as cutting time or planting strategy.

Lastly, local authorities vaunted forest environmental benefits to justify the implementation of government policies – especially the ban of annual crop cultivation that was quite unpopular – and encourage villagers to follow the reforestation programs. For instance, villagers were told that the upland allocation program was implemented by the government for ecological reasons (as stated by one Dong Cao villager):

> *"because villagers have destroyed the mountain too much, now we have to reforest to keep water in the mountain and to reduce soil erosion"*

Progressively from the 1990s to 2003, farmers stopped annual cropping in the whole upland area and the planted forest cover has expanded steadily since 1999 (Figure 6). Today, most of the upland area is under fallow or reforested.

Understanding Land Use Change from an Institutional Perspective

When reading the previous account of land use change, one could conclude that forestland allocation and reforestation programs attained the pursued official objectives: fostered reforestation by households. However, this rather simplistic view is solely based on observations of land use change at the village level without exploring the dynamics of each individual farmer's decision.

Household interviews shed a contrasting and different light on the reasons why farmers

stopped cultivating annual crops. Table 3 lists the reasons given by farmers when they were asked why they had stopped cultivating the uplands.

The above data clearly show that farmers did not stop cultivating because they preferred to plant trees. This hypothesis was further reinforced during discussion with focus groups (see further) during which farmers expressed that exotic tree plantations were not a profitable land use option.

Previous studies of land use change in the uplands have highlighted the role of agricultural intensification in the lowlands (Ohlsson et al. 2005; Sikor 2001) and of alternative market opportunities (Ohlsson et al. 2005). According to the interviews held with farmers, agricultural intensification in the three studied villages started in the early 1990s. Since then, rice yields have remained relatively stable. Indeed, the expansion of cash crops cultivation in the uplands occurred together with agricultural intensification. The diversification of livelihoods does not arise as a possible explanation in the present case. The cultivation of annual crops was not actually replaced by an equivalent income-generating activity, and households, particularly newly installed couples who own a small area of paddy field, are still searching for new sources of income. Husbandry was developed, but for many poor-average households, buffalo and cow breeding is rather a safety net than a regular source of income. Some households engaged in off-farm work. However, this concerns only a minority of households (20 to 30% in Dong Cao). Hence, we considered it as a factor accelerating the decision-making process rather than as a decisive factor. New market opportunities for land appeared recently, but land sales started after reforestation. Lastly, as underlined later, tree plantations are not viewed as an attractive option for most farmers. Further research and visits in other northern provinces reinforced the assumption that under the current economic context most farmers prefer cultivating cash crops rather than planting trees (see also Ohlsson et al. 2005).

Then, if not agricultural intensification or new market opportunities, what were the actual reasons that led villagers in the three villages to stop cultivating? Here, institutional analysis coupled with a historical approach was particularly powerful in understanding the decisions of farmers. When examining data from a chronological perspective, we found that farmers did not stop cultivating annual crops in the uplands altogether. The end of cultivation ranged from the mid-1990s through to 2003. We also found that the first farmers stopped cultivation for different reasons rather than the farmers that followed. Data collected show that the first group

TABLE 3.
Driving forces leading to the end of annual crop cultivation.

Reasons given by farmers[1]	Percentage of respondents (%)
Damage caused by cows and buffaloes to crops	51
Soil was poor	40
It was forbidden (government ban)	22
They sold the land	13
It is what others did	9
Not enough labor force	8
Low cassava selling prices/cultivation was not profitable	8
Work was too hard	2
They wanted to plant trees	2

Notes:

[1]Figures from a sample of 45 household interviews

of farmers did so because they observed – through a decrease in yields, soil hardness, loss of the fertile top-layer of the soil and emergence of stones and rocks – that the soil had become very poor. Some farmers decided to stop cultivating and let the land revert to a natural fallow. In 1995 and 1998, when Program 327 was launched, farmers were encouraged to plant trees because of government subsidies. However, few farmers decided to plant trees at this time. The primary driver for land use change was thus a decrease in soil fertility and the resulting decrease in productivity. Later on, of more significance was the way informal rules changed, in turn affecting costs and benefits of annual cropping systems.

The changes caused by these few farmers ceasing cultivation of annual crops impacted upon the informal collective arrangements governing cultivation and grazing cohabitation. It created a domino effect with dramatic consequences on land use practices of all farmers (Box 1). As some fields were no longer protected from free grazing cattle, neighboring fields were grazed by marauding livestock. Some farmers reported that losses could amount up to 60 percent of the crop. The costs of protecting one's individual parcel of cultivated land became too high compared to expected benefits from agricultural product sales. As a result, all farmers progressively stopped cultivating cassava, taro, and arrowroot. Changes in material conditions and reforestation incentives together with changes in rules governing land access affected costs and benefits of annual cropping. Behind this rational choice, one can also speculate how much farmers were tempted to imitate others who were considered as the most innovative in the area.

As mentioned previously, very few farmers (2% of the sampled population) stopped cultivating because they preferred to reforest. The end of cassava, taro, and arrowroot cultivation was a first step in land use change, and should be distinguished from the next step: reforestation. The reasons why farmers chose to plant trees were distinct from the factors that led to the end of annual cropping. During the interviews, farmers in the three villages were also asked why, once they stopped upland cultivation, they decided to plant trees. They provided the following reasons: the soil was poor, so nothing else could grow; it provided fuel wood; it was subsidized through a government program; and they had no other choice. This suggests that reforestation has appeared to farmers as the "least bad solution". This assumption was reinforced during focus group discussions with farmers, presented further in this report.

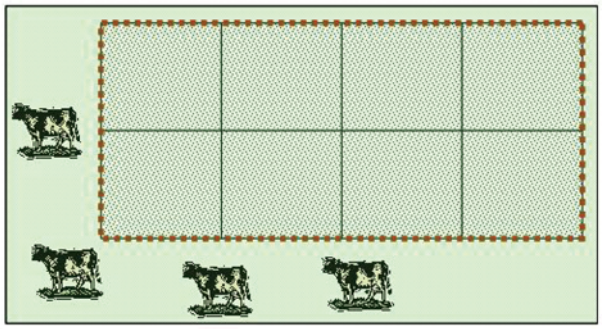
One can also wonder to what extent narratives on forests spread by the Vietnamese government have impacted the decisions of villagers. As suggested before (see quotation p. 11), farmers were accused of being responsible for a supposed ecological disaster. They were pointed out as the people who *"destroyed the mountains"* and, following this argumentation, it was logical in the conscience of people that they had to atone for their faults by reforesting the hills. All farmers think that runoff from the watershed increases with forest cover. This belief is so entrenched in the minds of people that some farmers use them to explain all land management problems. As an example, when asked why cassava yields had decreased in the uplands, a farmer replied that it was because there was not enough water in the soil due to the forest being cut. Poor inherent soil natural fertility and further soil fertility decline due to soil erosion are more likely the primary and prominent factors for yield decrease in this area. It is difficult to assess how much the farmer's belief in forest environmental benefits weighed in reforestation, but they were powerful enough so that today farmers rely more on them than on their own observations.

A synthesis of the factors that led to land use change is presented in Figure 7 with the IAD framework.

The above framework underlines the range of factors involved in the farmer's decision and the resulting land use. First, a decrease in soil fertility led a few farmers to stop annual cropping (arrow 1 in Figure 7). Because of land allocation, rules for upland access and use were less

BOX 1.

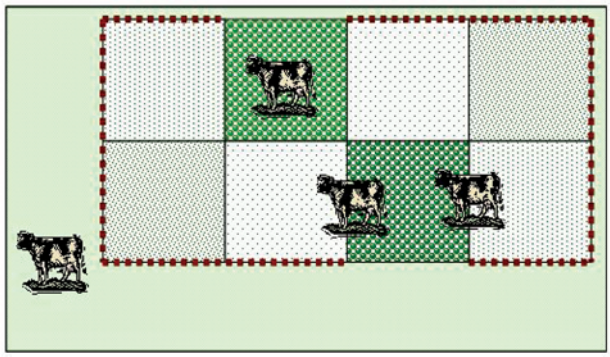
A simplified and schematic representation of the collapse of collective arrangements in the uplands.



Annual cropping
Fallow/grazing land

Situation 1.

From the 70s, farmers had adopted collective institutional arrangements to conciliate grazing and cultivation activities in the uplands. They grouped their fields together and built fences collectively to protect them from free grazing cows and buffaloes. Costs to prevent cattle from entering the fields were also reduced through these collective rules as one farmer could watch all neighbors' fields when working on his own field. Lastly, even if animals entered the protected area, damages were shared between the fields and landowners.



Annual cropping
Tree plantations/fallow
Fallow/grazing land

Situation 2.

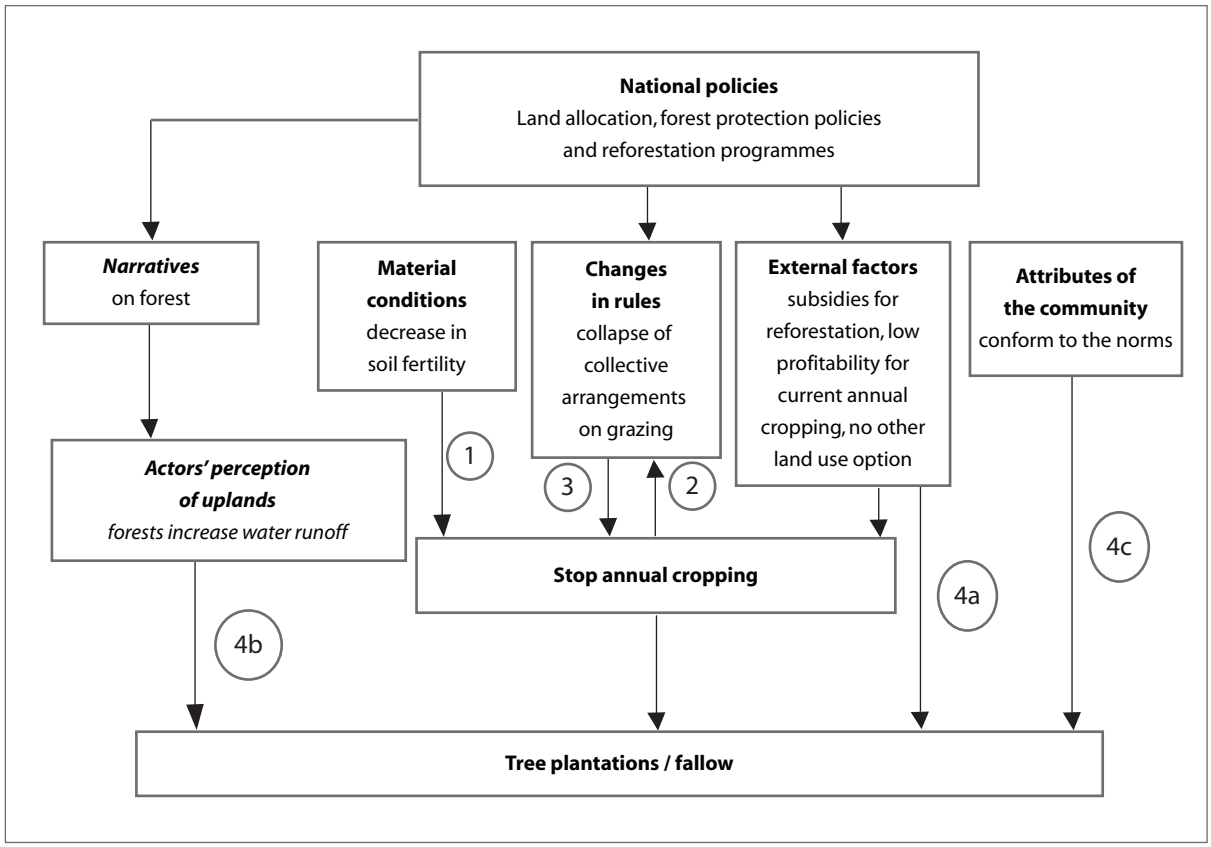
The decision of a few farmers to stop annual cropping impacted the whole collective rules. Farmers who stopped cultivating no longer needed to prevent cows and buffaloes from entering their plot. Neighboring fields were damaged (damaged fields are represented in the adjoining figure with the least dot density). Costs to protect one's field increased as landowners had to build fences individually. Farmers couldn't move their fields as land had been allocated. As a result, all farmers progressively stopped cultivating annual crops, as the costs of protecting one's field were higher than the expected benefits from the sale of crops.

flexible and the decision of a few farmers in turn impacted on the whole collective rules that governed the cohabitation of cultivation and grazing (arrow 2). This led a large majority of farmers to stop annual cropping (arrow 3). During a second stage, external factors (arrow 4a) and, to a certain extent, new beliefs on forest benefits (arrow 4b) impacted afterwards on the choice of the alternative land use. Choice of new land use was reinforced by a certain degree of imitation among farmers who tend to choose options already applied by a majority (arrow 4c).

This section has shown that the relative success of reforestation in the study area was due to the simultaneous occurrence of a range of diverse factors. It had been adopted more as the least bad option than as a clearly thought-out strategy. One can thus wonder if tree plantation will be sustainable in the future and under what conditions.

This question is all the more relevant as major changes have been occurring in the area under the influence of industrialization and urbanization since 2002. In the coming years, a new urban cluster will be developed only a few kilometers from Tien Xuan Commune. As part of this urban expansion, the Vietnamese National University will be transferred to Hoa Lac in 2007, a town located 9 km from Tien Xuan, together with the building of student, academic and administrative staff housing. Research institutes will also be built in the area. Furthermore, Tien

FIGURE 7.
An institutional explanation of land use change with the modified IAD framework.



Xuan is one of the communes that has been selected by the government as a 'New City'. In 2010, its territory will be the target to host industries and housing for workers. Today the premises of traces of urbanization are expressed by the sudden interest of Hanoian residents in this area, which is mostly driven by speculative reasons. Ecological tourism develops as well; Ba Vi National Park is not far and the area offers a quiet and peaceful environment to urban people at a reasonable distance from Hanoi. According to the Tenure Service Officer at the Tien Xuan Commune People's Committee, all villages in the commune have been affected by extensive land sales except Dong Dau and Que Vai, where the phenomenon is still very limited. In Dong Cao, nineteen families sold their lands, which accounted in total for 80 percent of the uplands village territory, to the extension commune worker or to Hanoian investors. On the other hand very few families sold their land in Dong Dau and Que Vai, due to lower accessibility and fewer social connections with Hanoi.

Since farmers have stopped cultivating the uplands, new market opportunities have arisen. In 2005, the District Extension Organization launched a new project based on sweet bamboo shoot cultivation in the village of Que Vai. Bamboo shoots are subsidized by the province and the district by up to 50 percent of the purchasing costs. Currently, there is a strong demand for this agricultural product and selling prices are quite high[9]. In Que Vai, thirteen families started cultivating sweet bamboo shoots.

[9]In 2005, selling prices for sweet bamboo shoots ranged between 3,000 – 5,000 VND, i.e., approximately USD 0.2 - 0.3 per kg depending on the season.

A few months later they created the organization of the "Farmers who like cultivating sweet bamboo shoots". This grassroots association aims to attract financial support and technical help from local authorities and share experiences between farmers. This unique initiative of farmers voluntarily grouping in Tien Xuan Commune testifies to the will of farmers to count on this new activity as a major source of income.

Tree plantations have been progressively abandoned for other land use options. The following action arena variables tend to demonstrate that this trend will be reinforced in the following years. First, information regarding land use rights is quite poor: most farmers who engaged in a reforestation program with the district SFE do not know when they will be allowed to cut trees and to whom they will sell the wood. Second, when farmers receive support from the government in the establishment of new plantations they cannot choose which species to plant. The government only provided acacias or eucalyptus saplings. In addition to poor yield, farmers observed that eucalyptus degraded the soil. Scientific studies have observed a change in soil characteristics, e.g., a soil pH decrease after afforestation with eucalypt and pine trees (Jackson et al. 2005). Finally, very few farmers are satisfied with the financial benefits provided by silviculture. Though farmers acknowledge that silviculture is more profitable than cassava cultivation, they complain about income irregularity – with harvesting only occurring every five to seven years. Table 4 presents an extract from the table that was made by a women's focus group. Women were asked to list all natural resources used by village inhabitants. In the first column, they weighted each natural resource according to its importance for the livelihoods of villagers. In the second, third, and fourth columns, they were asked to weigh their importance relatively for the following groups of villagers: poor farmers, average farmers, and rich farmers.

Table 4 suggests that fast growing tree plantations are considered relatively unimportant for the livelihoods of people and only profit the richest farmers. These assumptions were further reinforced by other focus groups as shown in the tables below. Farmers were asked to list every activity that provided a source of income in the village. The group of poor farmers did not mention

TABLE 4.
Use of natural resources in Que Vai, women's focus group.

Natural resources[1]	Importance ranking (IR)	Poor	Average	Rich
Forest wood	0	10	4	3
Wild bamboo shoots	8	9	5	3
Banana tree leaves	3	10	0	0
Water springs	0	0	0	0
Cultivated bamboo shoots	3	5	5	5
Eucalyptus, acacias, styrax	**4**	**0**	**0**	**5**
Grazing land	9	5	5	10
Garden (fruits + vegetables)	7	3	3	10
Rice	10	9	9	10
Corn and sweet potatoes	8	0	0	5
Medicinal plants	3	7	4	4

Notes:

[1]Categories presented in the above and following tables were defined by the group of participants during the exercise.

tree plantations in their list (Table 5) and the group of average farmers only ranked it very low in their priorities (Table 6). Only rich farmers (Table 7) ranked it as average.

This analysis suggests that reforestation is likely to be a temporary phenomenon. Urbanization and land purchase offers are obviously a driving factor for the most recent changes in land management. However, land sales probably would have been less if farmers had considered the possibility that the uplands could offer a reliable and perennial source of substantial incomes in the future. Hence, none of the interviewed families who started cultivating sweet bamboo shoots is willing to sell their land.

Nevertheless, it is not argued that tree plantations cannot be a satisfying economic option for farmers. The commune extension worker has decided to plant various tree species with high market values and expects that these will bring substantial benefits – though ironically, he justifies his choice not on the basis of economic reasons but via ecological arguments, using once again the narratives on forest benefits. However, it appears that only rich farmers fully benefit from forest plantations. This group of society has access to financial capital, is able to make long-term investment, and since it is socially well-connected, knows which tree species are profitable, where to buy rare saplings, and whom to sell wood products.

TABLE 5.
Activities in Que Vai, poor farmers focus group.

	Importance ranking (IR)	Evolution in the future
Rice	10	+
Sweet bamboo shoots[1]	4	+
Cassava	3	-
Pigs	3	+
Chickens	1	+
Buffalos	2	+
Complementary work	1	=
Goats	3	+
Husking machine	4	+
Alcohol production	1	+
Fish pond	2	+

Notes:

[1]Sweet bamboo shoots are a variety of cultivated bamboo shoots.

TABLE 6.
Activities in Que Vai, average farmers focus group.

	Importance ranking (IR)	Evolution in the future
Rice	10	+
Pigs	5	+
Buffalos, cows	10	+
Chickens, ducks	3	+
Trees (eucalyptus)	**2**	**+**
Bamboo shoots	4	+
Fruits	2	+
Supplementary work	5	+
Winter crops	6	+
Cassava and arrowroot	1	-
Goats	5	

TABLE 7.
Activities in Que Vai, rich farmers focus group.

	Importance ranking (IR)	Evolution in the future
Rice	10	=
Cassava	3	=
Buffalos, cows	12	+
Chickens, ducks	8	+
Pigs	7	+
Eucalyptus, acacias	**6**	**+**
Supplementary work	4	=
Sell land	5	+
Lottery	/	=

Conclusion

The focus on the role of institutions highlighted new determinants in the decisions of farmers and land use change, and provided a few lessons for policy development.

First, the results reinforced the arguments that considering driving forces at the sole macroscale level might blanket complex local factors and lead to erroneous conclusions. From a macroscale analysis, it is tempting to conclude that reforestation programs and forestland allocation policies led to the increase of reforested areas in the studied territory. A detailed examination of factors at the local level could provide a more sound understanding of land use change. We ascertained that if national policies had an indirect impact on land use change through the disruption of land institutions, local factors (soil fertility, local rules governing uplands management) were prominent in explaining land use history. Reforestation was indeed not a well thought-out farmer's strategy.

Second, the findings highlighted the importance of considering community decision-making. Collective rules have been an essential basis for upland management in Vietnam and the application of a rigid system constrains land management significantly by restricting it to individually-based land use systems and practices.

Lastly, land allocation has also disrupted existing land use practices considerably by rigidifying the spatial flexibility of the upland farming system. Under these conditions, the traditional swiddening system has become environmentally or economically unsustainable – or both, as in the present case study. This is particularly salient in areas characterized by natural low soil fertility and has been observed by other scholars in different areas of North Vietnam (Castella et al. 2006; Nguyen Thanh Lam et al. 2004).

These two dimensions of community management: collective rules and collective space had not initially been considered by policymakers in the land allocation process. Until the recent revised Law on Forest Protection and Development (National Assembly of Vietnam 2004), the community was not considered as a legal recipient to receive land use rights. Even though *de jure* recognized, the devolution of land management to local communities today is still *de facto* very limited.

We demonstrated that one should be extremely cautious when analyzing macroscale factors to explain human-induced environmental change, when final decisions on natural resources management are taken at the individual and community level. However, it is difficult to draw general conclusions from local analyses because these are restricted to a limited geographical area with specific local determinants. It is also necessary to examine how different local factors can result or not in different outcomes. Further research is needed to verify, on a larger scale, the hypotheses proposed in this study. In future work, land use change patterns at the provincial level will be analyzed using environmental and socioeconomic data from each district. Quantitative analysis coupled with land use maps through a Geographic Information System (GIS) will assist in validating different hypotheses.

Finally, explaining how decisions are taken at the operational level is necessary but not sufficient to guide policymaking. Understanding how policies are designed at the collective-choice level is essential to provide scientific evidence with a high impact capacity. A policy-process analysis will enable mapping groups with different policy interests, actors' networks and influential narratives (following Keeley and Scoones 2003). Interviews with donors, NGOs, researchers, and policymakers will be carried out to examine how shifts in national policies occurred, how beliefs on forest benefits emerged and prevailed, and how science and policy are linked in the specific context of upland management in Vietnam.

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