The declining role of ethnicity in farm household differentiation: A case study from *Ngoc Phai* Commune, *Cho Don* District, *Bac Kan* Province, *Viet Nam*

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Abstract

Farming has changed dramatically over the last fifty years in *Ngoc Phai* Commune, as in all of *Bac Kan* Province. Historically, ethnicity has long been the key determinant of access to land in northern *Viet Nam* uplands, and thus the determinant of farmers' agricultural practices. However, major external policy changes have periodically altered the environment in which farmers plan their livelihood strategies. Agricultural cooperatives were established throughout the country in the 1960's, and then dismantled some twenty years later, returning the land to individual family farms. During the cooperative period, all ethnic groups contributed to the intensification of paddyland productivity, thereby limiting agricultural pressure on the uplands. Nonetheless, rice production was not sufficient to cover food needs because of management problems in the cooperatives. Therefore, upland rice production became indispensable to meet the deficit in paddyland production. In the 1990s, the allocation first of paddyfields and later of uplands helped to slow the deterioration of the mountain ecosystem. However, the local reinterpretations of national land polities resulted in further inequalities, placing certain ethnic groups into extreme poverty and food insecurity. *Tày* farmers who could reclaim ancestral paddy lands were often privileged over the *Dao*, who traditionally had been shifting cultivators and thus were forced to return to slash-and-burn cultivation systems that were no longer sustainable under higher population pressure and a new institutional environment.

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Ethnicity was a major determinant of livelihood strategy in the past, and contributed greatly to the household differentiation that exists at present. However, distinctions among livelihood strategies can no longer be drawn along ethnic lines. Farmers of all ethnicities share the goal of attaining food security through paddyland rice production. Farmers who lack paddyland fields, whether *Tày* or *Dao*, are turning to shifting cultivation on the hillsides.

Keywords: mountain agriculture, farming-systems typology, land use changes, crop-livestock interactions, household differentiation, northern *Viet Nam*

1. Introduction

The unsustainable use of forest resources in combination with rising population pressure endangers the ecological and economic sustainability of traditional upland agrarian systems (Bal et al., 1997). High population pressure has made access to land that is suitable for agriculture a vital issue for subsistence farming households (Castella and Erout, 2002).

Vietnam Government authorities have long blamed northern *Viet Nam*'s reduction in forest cover on ethnic minority groups, such as the *Dao* and the *H'mong*, that practice slash-and-burn shifting cultivation (Dang Nghiem Van, 1991; Morrison and Dubois, 1998). The *Dao* within *Ngoc Phai* Commune, despite having adopted fixed settlements since 1962, are included in the above group because they continue to use slash-and-burn practices.

The *Tày* ethnics were the first settlers in *Ngoc Phai* Commune, and now control the majority of the paddyfields there. However, it would be an oversimplification to view *Dao* agriculture as confined to the uplands and *Tày* agriculture to the lowlands. There are *Tày* who have been without paddyfields since the land reallocations of the early 1990s, and there are *Dao* who have gained access to lowland paddyfields through the recently-created land market in *Ngoc Phai*.

To assist households in developing production systems that are more environmentally sustainable, we must first understand the processes and circumstances that have led to people's current practices. We also must characterize the diversity of existing household production systems to ensure that our proposed technical and organizational innovations are adapted to the local community's objectives and constraints. Towards this end, this chapter presents two components of a monographic study of *Ngoc Phai* Commune: (i) an historical analysis of commune-level agrarian dynamics and their environmental impact, and (ii) a farm-household differentiation study.

2. Methods

2.1. Selection of Ngoc Phai Commune

Cho Don District, situated approximately 220 km north of *Ha Noi*, is one of six districts of *Bac Kan* Province. The total area of the district is approximately 92,000 ha and the population 46,800, for an average population density of 51 people / km^2. The *Tày* ethnic group makes up 76% of the population. The other ethnic groups, in order of size, are the *Dao* (10%), the *Kinh* (10%), the *Nung* (2%), and the *H'mong*.

Within *Cho Don* District, we selected *Ngoc Phai* Commune for our monographic study based on the agro-ecological zoning of *Cho Don* District (Castella et al., 2002b). The commune captures the diversity of landscapes, ethnic groups, and agronomic issues present in the district (Bal et al., 2000).

2.2. Relating farming systems to land-use changes

The overall approach was based on relating farming systems to land-use changes. There were four main steps in the study:

- The agro-ecological zoning of the district, on the basis of which the *Ngoc Phai* Commune was chosen for the study. This was based on the analysis of secondary data (maps, statistics, etc.);
- An examination of agrarian system dynamics over the last five decades, with information gained from surveying witnesses to the commune's history;
- An examination of land-use changes, with the use of a chronological series of aerial photographs (1983, 1989) and SPOT satellite images (1990, 1995 and 1998);
- Surveys of a sample of farmers (n = 250) representative of the diversity of groups present in the commune. Using a semi-structured questionnaire, we quantified the land use of individual farms and their associated options for future production systems. This allowed us both to explain the present diversity and to identify patterns of future agricultural land use evolution.

3. A tiered system of land use and access

3.1. Tày - Dao: a dual agrarian system (up to 1960)

The *Tày* and the *Dao*, historically the two dominant ethnic groups in the studied region, have traditionally occupied different tiers of the ecosystem. These two ethnic groups have distinct cultural norms and practices, and the evolution patterns of their land use systems have followed unique courses, even if shaped by the same State policies.

Until the establishment of cooperatives in 1960, the *Tày* inhabited the lowlands and the *Dao* inhabited the uplands. The *Tày* cultivated an annual irrigated rice crop, using a collective system of water and labor management based on mutual aid. The plentiful lowland area met the needs of a still-small population (density < 10 people / km^2). On the gentle slopes bordering the lowlands, *Tày* farmers cultivated maize and cassava as feed for pigs, or less commonly as a security against food shortages from poor rice harvests or natural disasters. Some families built terraces for rice production on sloping land, despite the availability of lowlands and the burden of such construction. Buffaloes were raised both for draft power and manure for fertilizing paddyfields. Social differentiation was based on land ownership; early arrivals to a village tended to gain possession of the largest and most productive paddyfields.

The *Dao*, the "people of the forest," were primarily producers of upland rice, but also cultivated maize and cassava. Their shifting cultivation system was based on swidden agriculture with long fallow periods, necessitating frequent migrations. The gathering of forest products (bamboo shoots, wild vegetables, mushrooms, etc.) and hunting of still-plentiful game played essential roles in the *Dao* system, particularly in times of food shortage. Fields were grouped together to limit crop losses to wild animals, but the typical hamlet consisted of only two to four households. Upland territory was subject neither to *Tày*-like land regulations nor to taxes levied by the French colonial administration. A plot belonged to the family that had cleared it for the duration of use, but became available for other users as soon as it was abandoned. Given the lack of permanent property, land ownership was not a criterion for social differentiation. The socially elevated in a *Dao* community were those who had water buffaloes (up to six per family), which served as a kind of savings as well as being useful for transportation when hamlets were being relocated.

Interactions between the *Dao* and the *Tày* were rare, as their respective production systems were based on very distinct landscape units. Table 1 presents the main characteristics of the pre-cooperative systems. With *Viet Nam*'s independence in 1954, the traditional system began to see growing intervention by the State.

Table 1: *Comparison of the traditional Tày and Dao cultivation systems*

Ethnic Group	*Tày*	*Dao*
System Type	Sedentary	Shifting
Location	Lowlands	Uplands
Main crop	Irrigated rice	Upland rice
Limiting factor of upland field area	Labor	Weeds
Type of upland fallow	Short (5-10 years)	Long (20 years)
Importance of forest products in diet	Medium	High
Role of buffaloes	Plowing, fertilizer	Capital, transport

3.2. Institutionalizing mutual aid

The first land reform occurred in 1954, and aimed to create equality in rural areas by confiscating land from wealthy landowners and giving it to the most impoverished. In *Ngoc Phai*, as in all of *Cho Don* District, the reform had only a minimal effect because of the low level of social differentiation (Tran Van Ha, 1993). In the lowlands, agricultural officers oversaw the creation of mutual aid groups composed of an average of five households each. At this stage, only the *Tày* participated. Thus, the mutual aid groups effectively institutionalized the traditional *Tày* system of mutual aid for water and labor management. The official mutual aid system made possible an increase in irrigable land area, which resulted in increased productivity.

3.3. The agricultural cooperatives

In 1960, the first cooperative, ten households in size, was in *Phieng Lieng* village, populated by the *Tày*. Its success encouraged all the other villages in *Ngoc Phai* Commune to organize themselves as cooperatives. Membership was voluntary, but with time the free-market system dwindled away, and it would have been difficult for any individual to exist separately from a village cooperative. Nonetheless, there were villages in *Bac Kan* Province that did not become cooperatives.

In 1961, a national program attempted to settle the country's ethnic minorities permanently. The goals of the program were to settle the ethnic minorities in regions where they could contribute to cooperative production, and also be more effectively observed and controlled by local authorities. This program placed eighteen *Dao* families into *Tày*-populated *Ban Cuon* village, on the terraced lower slopes. Some *Tày* families took the opportunity to leave *Ban Cuon* and join other *Tày*-dominated cooperatives, while others stayed to work alongside the *Dao* in the village. In spite of the departures of some *Tày* families from *Ban Cuon*, the arrival of *Kinh* migrants from the overpopulated Red River delta resulted in substantial net population growth in the area. Between 1964 and 1974, more than 4,000 *Kinh* passed through *Cho Don* District to build the road connecting *Bac Kan* and *Ba Be* towns, and some stayed behind after the work was finished. The result was a migration of the immigrant *Kinh* toward the interior of the commune and increased pressure on commune paddyfields (Figure 2).

In 1962, *Ngoc Phai* Commune was composed of two distinct cooperatives: the predominantly *Dao* cooperative in *Ban Cuon* village, and the *Ba Ngoc* cooperative containing the other five *Tày* villages. Though founded on prin-ciples of egalitarianism, the cooperative system resulted in a marked diffe-rentiation of villages based on per capita ricefield area. Despite low population density (Figure 1), the return per person per day on a paddyfield was fairly unequal, ranging from 0.8 kg in *Ban Cuon* Cooperative to 1.5 kg in *Ba Ngoc* Cooperative. Like the

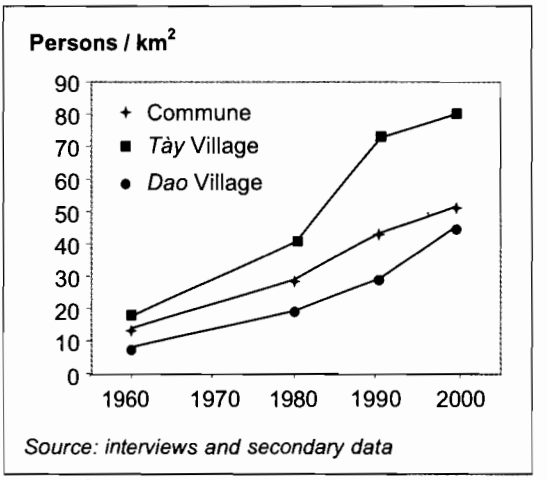


Figure 1: *Changes in population density in Ngoc Phai Commune*

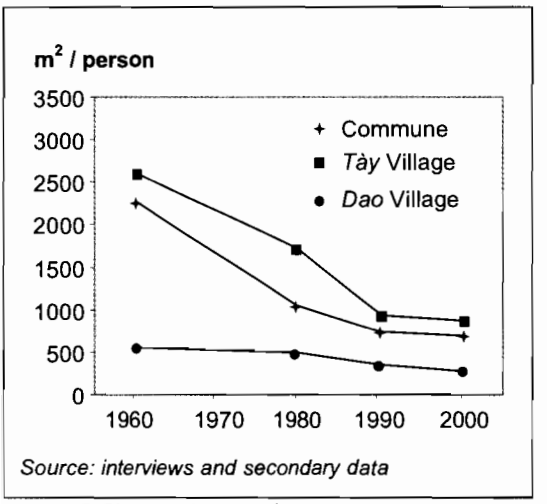


Figure 2: *Changes in paddyfield area per person in Ngoc Phai Commune.*

traditional livelihood systems, the new system was split along ethnic lines: the *Dao* cooperative farmed an average paddyfield area of 550 m² per person, compared to 2600 m² in the *Tày* cooperative (Figure 2).

As the *Tày* cooperative intensified its rice cultivation systems (by introduction of two rice crops per year, expansion of irrigated area, new photoperiod-insensitive short-cycle varieties, use of chemical inputs, plow innovations, etc.), paddy yields were stagnating and even declining in the *Dao* cooperative (1.7 t/ha compared with more than 5 t/ha in the *Tày* cooperative). Lowland paddyfield production did not meet the food requirements of *Ban Cuon* village, leading the *Dao* cooperative there to turn to the uplands. The remuneration systems differed substantially between lowland and upland cultivation: a large proportion (30%) of lowland production went to the State, whereas the full production of the uplands was shared among cooperative members. Further, swidden fields cleared from primary forests offered higher rice yields: 4 t/ha in swidden fields compared to lowland yields of 1.7 t/ha/year (1 crop cycle; *Dao*) and 5.0 t/ha/year (2 crop cycles; *Tày*), and higher labor productivity: 32,000 VND/day in swidden versus 20,000 VND/day in lowland paddyfields, both in 1999 VN Dongs. With work on swiddens considerably more profitable than on paddyfields, it is not surprising that the *Dao* did not invest in intensifying paddyfield productivity.

As disparities between the cooperatives progressively deepened, new disparities arose among individual households within the *Dao* cooperative. Some households in the *Dao* cooperative developed private swidden fields alongside the collective

swidden fields. The blurred borders between collective and private sloping lands made it easy for households with large labor forces to engage in more-profitable private activities (upland rice, pig raising, forest product extraction, etc.) once they had completed their required collective work.

In contrast, the *Tày* cooperative did not develop private production. They achieved food security through ricefield intensification, and their demanding ricefield work schedules did not leave enough time for the cultivation of swidden crops. In summary, a double process of differentiation occurred: (i) between collectives, based on per capita paddyfield area; and (ii) among households within the *Dao* cooperative, based on the ratio between a household's labor force and number of mouths to feed (Sadoulet et al., 2002).

3.4. Crisis in the 1970s

In 1970, the two village cooperatives were merged into one large commune-level cooperative. The new level of management brought bureaucratization and reduced flexibility, leading to a growing lassitude on the part of cooperative members. Chemical input allocations were poorly organized, and yields dropped as low as 2t/ha/cycle in spite of the cooperatives' successes with Green Revolution technologies before they merged.

Exacerbating the situation, the commune population had doubled in the preceding twenty years (Figure 1). Population growth exceeded the rate of new paddyfield construction, causing paddyfield area per person to drop by approximately 40% (Figure 2). The return on labor used in paddy production was steadily declining, and cooperative work could no longer meet households' needs. Therefore, farmers of all ethnicities turned to the hillsides, in spite of bans imposed (but not yet enforced) by authorities. Specifically, a 1975 forest-protection law restricted the right to harvest wood to State forestry enterprises, and launched the first forest plantation programs, but was received with general disinterest by the *Ngoc Phai* population. Slash-and-burn practices were made punishable by severe fines, resulting in a food crisis between 1977 and 1980, bringing *Ngoc Phai* to the edge of famine.

3.5. Decree 100, the first step toward decollectivization

In response to similar food crises throughout the country, the State passed Decree 100 in 1981, allocating paddy fields for 4-5 years to households based on the number of family members. Households owed a fixed amount of their production to the cooperative, based on the size and quality of their fields, but were free to retain any surplus for themselves. Families that had not owned cattle before the collective period could now sell some rice and use the income to take advantage of low prices (50% of animals' cooperative-period value).

In *Ngoc Phai*, the new regulations had effects opposite from what was intended. Paddyfield productivity did not increase substantially because of continued problems with cooperative management, for example with allocations of chemical inputs. Labor continued to be more profitable on swiddens than on paddy fields, and hillside cultivation dominated, to the detriment of paddyfield intensification. In 1983, the high profitability of swiddens led to an uncontrolled rush by *Tày* farmers to claim as much forestland as possible. Within five years, swidden cultivation had claimed all of the commune's clearable land. Plots were often so far from the villages that farmers had to live in temporary bamboo shelters during the cultivation season.

The *Tày* and *Dao* villages again turned to divergent land uses. In the *Dao* villages, sloping lands were used primarily for upland rice. Production exceeded consumption needs, and farmers stored upland rice surpluses in granaries for future security, but sold surplus irrigated rice. *Tày* farmers likewise used some uplands to grow sticky rice, but treated their upland rice as a cash crop. The *Tày* did not stockpile their rice surpluses; both upland and lowland surpluses were sold. In addition, *Tày* farmers used some swidden fields to grow maize for pig raising, which was rapidly developing thanks to the introduction of faster-growing hybrid breeds. Hybrid pigs required considerably richer diets than their traditional cousins, hence the increase in land area devoted to maize.

The period following Decree 100 led to significant household differentiation within villages in *Ngoc Phai* Commune (Sadoulet et al., 2002). Paddyfields had been distributed based on the total number of individuals in a household, whether productive (laborers) or non-productive (children, elderly, or invalids). Households with greater proportions of laborers could more quickly complete their mandatory lowland work and engage in more profitable activities such as swidden cultivation. In contrast, households with small proportions of laborers had to struggle to meet their work obligations, and faced penalties when quotas were not achieved. Table 2 summarizes the differences in relative land and labor endowment, and resulting strategies, between the two household types that developed during this period.

Table 2: *Land use strategies (types A and B) developed by households after Decree 100*

Household type	A	B
Ratio of laborers to number of mouths to feed per household	+	-
Ricefield area per laborer	-	+
Swidden area per laborer	+	-
Production strategy		
- Cash crops	+	-
- Maize and livestock	+	-
- Land accumulation	+	-
Capital accumulation	+	-

N.B.: The (+) sign represents an increased value and the (-) sign a decreased value of an indicator.

During the Decree 100 period, increasing private production (mostly extensive slash-and-burn agriculture) resulted in (i) better nutrition for farmers, (ii) the beginning of capital accumulation, (iii) a notable deterioration of forest resources, and (iv) differentiation among households.

3.6. Resolution 10, the second step toward decollectivization

The disparities caused by Decree 100 prompted the State to pass Resolution 10 in 1988, bringing about the dismantling of the cooperatives. Farmers gained control of all cropping activities, chemical input allocation, and irrigation. They regained all of the means of production except the land, for which they were granted usage rights by the State. Specifically, paddyfields were redistributed in proportion to the number of laborers in each household. Each household was free to use all the production from their land however they chose. The family farm became the elemental unit of production and a free, private market developed including purchase/sale of rice, fertilizer, equipment such as huskers, and buffalo meat targeted at *Ha Noi* consumers.

The latest in a long series of policy changes, Resolution 10 finally was able to stimulate increased paddyfield production, helped by the declining profitability of slash-and-burn production. Farmers began to invest more time and capital in paddyfields, and yields per crop increased. In addition, a substantial proportion of paddy fields passed from one crop per year to two.

At this time, a group of *Tày* founding families (i.e. historically the first settlers in the area) in neighboring *Cao Bang* Province began a movement to reclaim ancestral lands, a movement that quickly spread through all of *Bac Thai*[1]. Farmers who had not been members of the pre-1954 *Tày* mutual-aid groups were divested of almost all of the lowland plots that they had been farming since the creation of the first cooperatives in 1960. The ownership of ricefields that had been built during the cooperative period was settled in negotiations. Land conflicts occasionally arose but the reallocation process was irreversible, and households in *Ngoc Phai* soon differentiated based on access to paddyfields. After the founding families reclaimed their ancestral lands a dual agrarian system emerged again based on the following two household types:

The *Tày* founding families. By 1991, the founding *Tày* families had claimed almost all paddyfields in *Ngoc Phai*. Most were growing two crops per year, and the increasing availability of chemical inputs along with the use of organic fertilizers (pig and buffalo manure) contributed to a further increase in yields (up to 2.8 t/ha/cycle). For these well-endowed households, the period was marked by the intensification of irrigated cultivation in the lowlands and the progressive

[1] *Bac Kan* Province was created in 1997 from the joining of two districts in *Cao Bang* Province and a part of *Bac Thai* Province.

abandoning of upland rice. Labor productivity on sloping land (8,000 VND/day) had become considerably lower than on the paddyfields (20,000 VND/day).

The landless. Regardless of their ethnic heritage, families who were living outside of their native villages were deprived of their paddyfields. In *Ban Cuon*, the *Dao* community retained only one hectare of their paddyfields, a field that had been built during the cooperative period. The combination of increased demographic pressure and the loss of paddyfields forced the *Dao* to expand their swidden areas, and the search for fertile forestland led them well beyond the borders of the village. But with population density now near 29 people/km², forests old enough to provide swidden yields comparable to pre-cooperative times (2t/ha) were difficult to come by (Husson et al., 2001). Farmers increased the number of successive years of cultivation and decreased the length of fallow periods (Castella et al., 2002).

Some families chose at this time to migrate to southern *Viet Nam*, drawn by the intensive development of coffee crops on pioneer lands (De Koning, 1999; Alther et al., 2002). Others, mostly of *Kinh* origin, opened small shops along the roads. Poor households turned to the extraction of forest resources, which provided a necessary complement to their income.

3.7. The 1993 land law

The 1993 land law ratified the land redistribution process that had already begun. Use rights both for flatlands with annual crops (paddyfields) and for aquaculture ponds (fish farms) were allocated for periods of 20 years, whereas use rights for forestland were allocated for periods of 50 years, though all land was still officially owned by the State. Farmers could now transfer, sell, buy, rent, and inherit land-use rights.

After almost 10 years of changing land-access rules, clearly defined use rights and access to paddyfields and forests caused new production strategies to develop (cf. Section 4). The new rules and the production strategies that they engendered both have remained stable to the present day.

3.8. Agrarian dynamics, landscape transformation, and environmental impact

Figure 3 summarizes the main phases in the evolution of the agrarian systems of the *Dao* village of *Ban Cuon* and the *Tày* village of *Ban Dieu*, in terms of both agrarian dynamics and related socioeconomic transformations. The land use maps in Figure 4 reveal the environmental impact of those agrarian dynamics. Between 1983 and 1989, swidden fields were extended, beginning with the area around the commune's paddyfields, dwellings, and roads. Hillside cultivation was much more important in the *Tày* villages than in the *Dao* village of *Ban Cuon* (Figure 5, north-west of the map). The *Dao* had already been cultivating the hillsides for

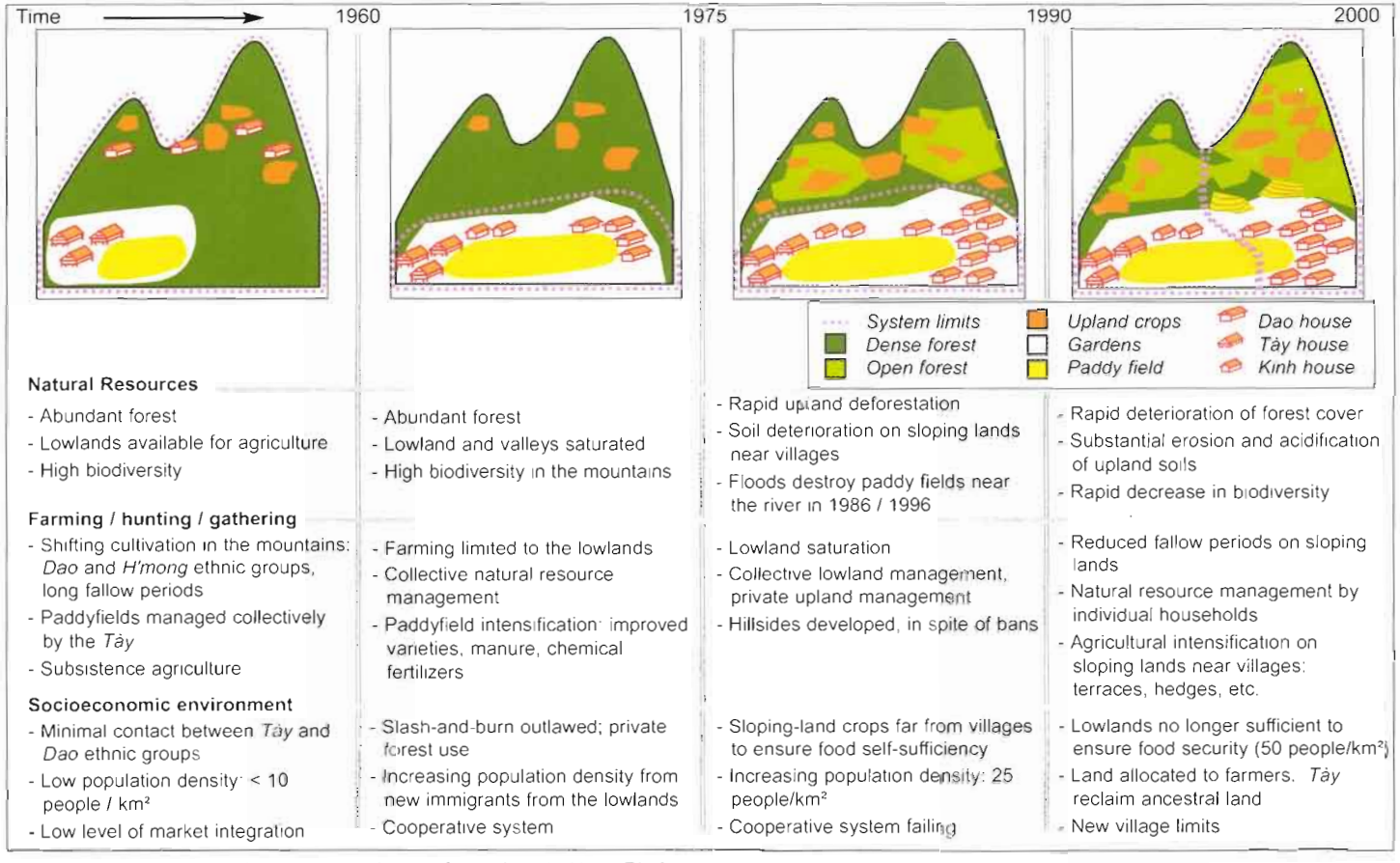


Figure 3: *Agricultural and socioeconomic transformations in Ngoc Phai*

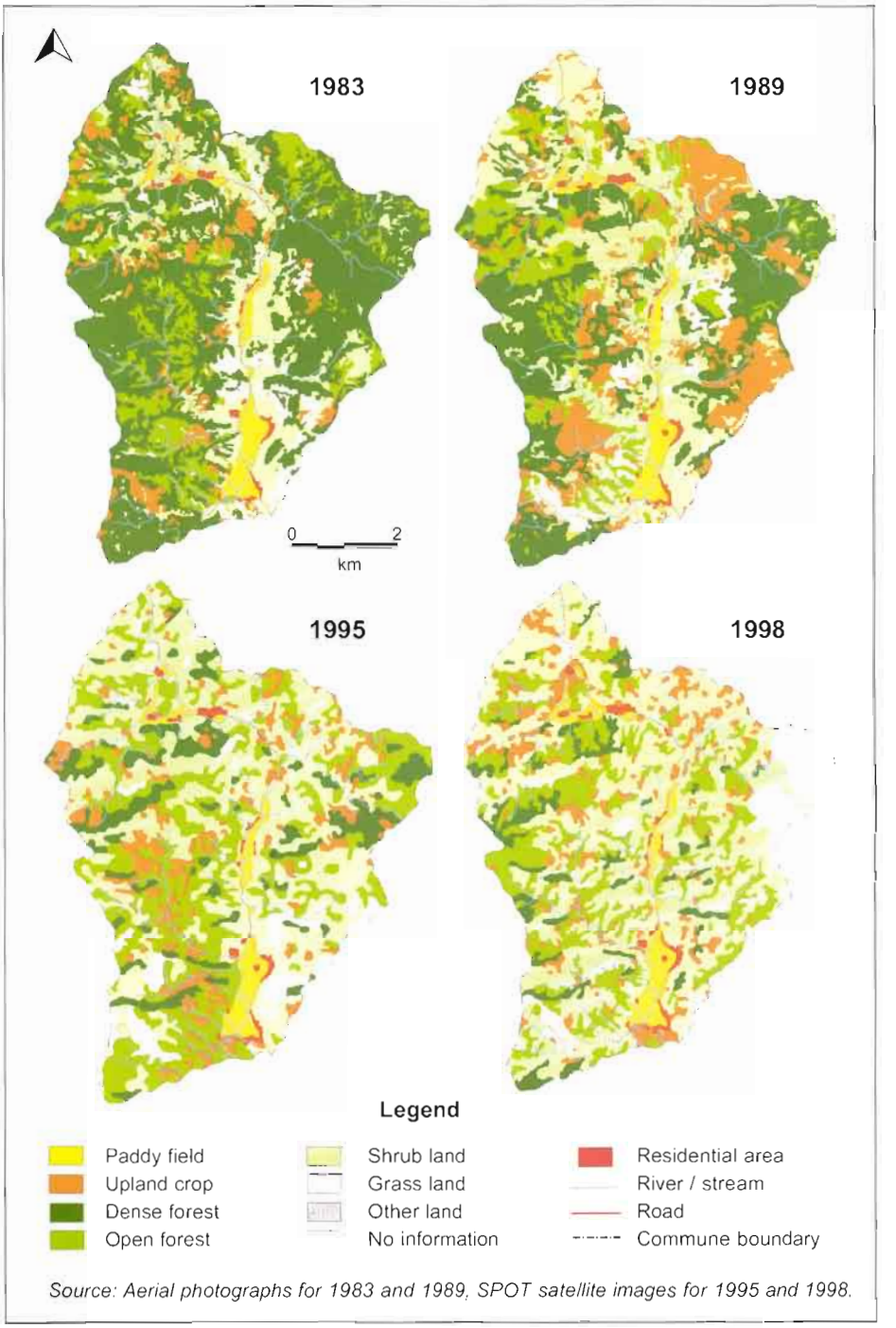


Figure 4: *Land use maps of Ngoc Phai Commune for 1983, 1989, 1995, and 1998.*

years, and cultural norms opposed the clearing of any more land than was necessary. Thus, their practices on the hillsides did not substantially change during the Decree 100 period (1982-1988). Instead, in *Ban Cuon* there was substantial expansion of paddyfield area and a relative regeneration of forestland, characteristic of a slash-and-burn system with a long fallow period. The *Tày* villages, in contrast, had been concentrating on lowland fields for years, so for them the availability and profitability of the hillsides was new - they rushed to clear and claim as much land as possible.

By the end of the 1980s, *Tày* households were cultivating all accessible arable sloping lands in their villages (Figure 6). Natural forest cover (forest and shrub land from Figure 6-A) reached its lowest level in the history of *Ngoc Phai*. The upland rush naturally ended with the exhaustion of upland forest areas, and was soon followed by the *Tày* movement to reclaim ancestral paddylands, which effectively reversed the *Tày/Dao* agrarian dynamics of the 1980s. As the *Tày* in the south of the commune focused on their newly-acquired paddy fields, the forest regenerated. Meanwhile, deprived of their paddyland fields, the *Dao* resorted to increased sloping-land cultivation (Figure 6-B) with shortening fallow periods and more land being cropped continuously.

Recently, farming landscapes in *Tày* villages have reached a sustainable balance, while the environmental degradation around the *Dao* village has been aggravated by a large-scale return to slash-and-burn systems. Such systems, driven by the lack of access to paddylands, are steadily destroying the resource base on which they draw, and local farmers are looking for alternatives (Castella et al., 2002).

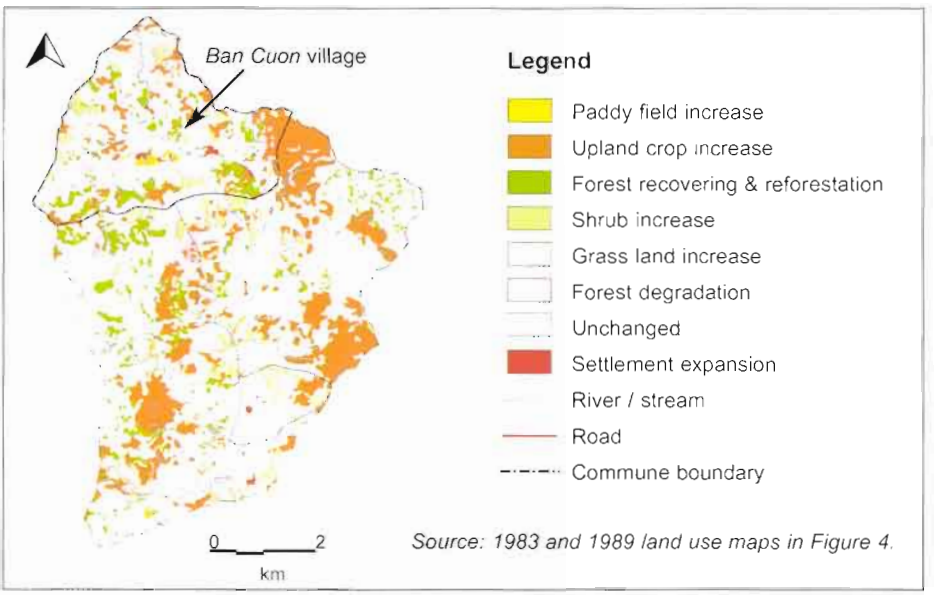


Figure 5: *Land use changes in Ngoc Phai Commune between 1983 and 1989.*

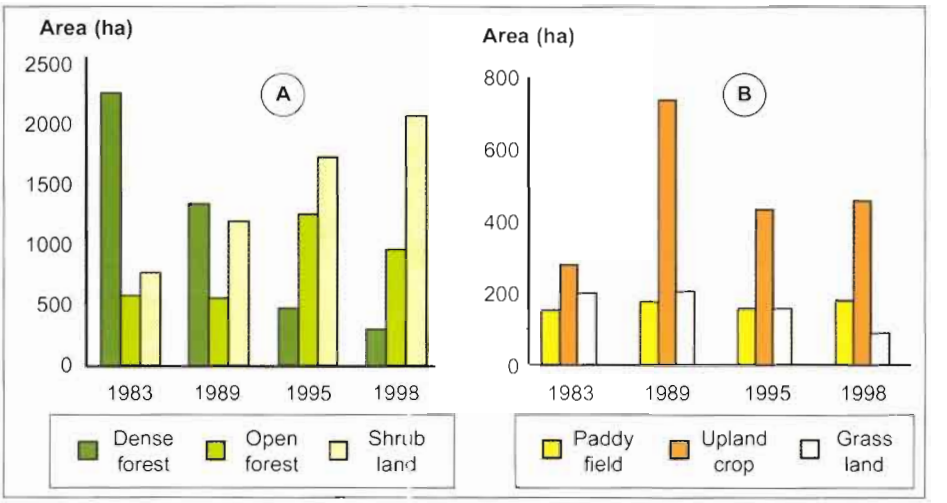


Figure 6: *Land use changes. A: Forest and natural vegetation, B: Farmland*

3.9. The evolution of animal husbandry practices

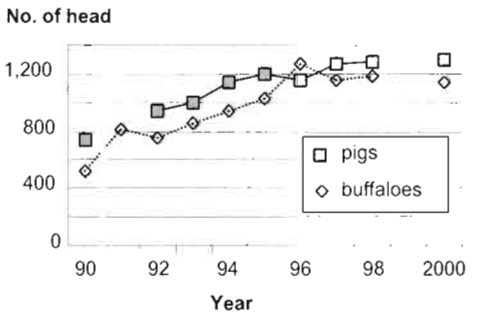
Animal husbandry in the commune expanded both as a means of storing capital for farmers and as a response to the recent development of the meat market for the delta zones (Figure 7). The steep increase in numbers of large ruminants (buffalo and cattle) has created a threat to sloping lands and forests. The transition from collective herd management to management by individual households has led to free-grazing practices in both the lowlands and hillsides, resulting in an increased number of disputes between farmers (Eguienta et al., 2002). Livestock owners returned to this traditional practice because individual households did not have enough labor force to tend a few head of livestock all year round.

Farmers have developed a number of solutions to the problems caused by roaming animals:

- Building fences (of wood or bamboo) for the short term and then planting hedges and digging trenches around cultivated plots;
- Temporarily (during the crop cycle) establishing shelters close to agricultural plots to better survey crops;
- Growing crops in areas inaccessible to animals.

In *Ban Cuon*, the existing upland crop systems determined the methods of buffalo management. The animals were monitored during the day and stabled in the evenings throughout the whole upland rice-growing season. Given that a specific plot could be planted to upland rice for no more than 4 successive years, and that their areas were often large, *Dao* farmers were not willing to invest in hedges and trenches. In contrast, terraced paddyfields can be cropped permanently. Thus the users often built barriers around their terraced paddyfields.

In the *Tày* villages, swidden crops were systematically protected with hedges and trenches. Animals were rarely monitored, even during the growing season. Sloping land cultivation thus required an increased investment (fence building or planting hedges) if crops were to be protected from roaming animals. *Tày* farmers often chose simply not to cultivate those areas where buffaloes were present in large numbers.



Source: Cho Don District's Office of Agriculture and Rural Development

Figure 7: *Pig and buffalo numbers in Ngoc Phai Commune*

The free-grazing practices of *Tày* farmers have not soothed relations between ethnic groups in the region. *Tày* previously had abruptly removed the *Dao* from their paddyfields by the ancestral land reclamation movement, and now *Tày* livestock are causing a major problem for the *Dao*'s upland harvests. Researchers are looking for solutions that will undoubtedly require new spatial arrangements to reconcile crop with livestock management on the hillsides (Castella et al., 2002a).

4. Farm diversity and access to the means of production

The previous section demonstrates that historically, ethnicity has been a major determinant of paddyland access and household differentiation. But in present-day *Bac Kan*, the existing diversity in land use and access cannot be attributed exclusively to ethnicity. At present, the comparative advantage of paddyland rice relative to upland rice has made it the priority for farmers of all ethnicities. Where the possibility has existed, *Dao* farmers have established permanent settlements and purchased paddy fields. Conversely, many *Tày* farmers have been forced to turn to shifting cultivation as a means of survival when their paddyland access was restricted (e.g. sons inheriting from their parents paddy area not sufficient to feed their family). Production systems today are no longer divided along ethnic lines.

4.1. Means of access to paddyfields

The disputes caused by the unequal distribution of the paddylands dissipated toward the end of the 1990s, as land-deprived farmers took stock of the finality of the 1993 land law. That they did not seek to overturn the law indicates that access to paddyfields had been defined relatively clearly and accepted by this time. There remained several means of access to paddyfields.

Purchase of paddyland

In *Ngoc Phai* Commune, the first land sales took place in 1992. The *Tày* who were relocated to the interior of the commune in the 1962 resettlement were the first to sell off their land, either in part or in its entirety. The first paddyfields sold were of low quality: either terraced or in places with poor soil, insufficient water, or insufficient solar radiation (e.g., deep narrow valleys). In *Ban Cuon*, the majority of the *Tày* chose to sell their ricefields to *Dao* farmers for the following reasons:

- The desire to unite separated families: while parents often continued to live in neighboring *Ban Dieu* village, their children were managing lands in *Ban Cuon*.
- Crop dispersion: farmers owned paddyfields in *Ban Cuon*, and maize fields at *Ban Dieu*. By consolidating all their holdings in a single area, their production could become more efficient (less time wasted travelling between sites).
- Yields at *Ban Cuon* were poor in comparison with the rest of the commune (resulting from the recent development of the paddyfields).

The *Tày* founders, after reclaiming their ancestral land, were not interested in reselling it. But between paddyfields and sloping-land swidden crops, they soon found that they had more land than they could make use of with their labor force. Their most practical option was a single annual rice crop on paddy land. In terms of efficiency and production per se, it would have made sense to sell off the upland and focus on paddy intensification. Nonetheless, they did not take that option because by continuing to produce swidden crops, farmers could maintain property rights on the cleared land. Nor did they want to divest themselves of any paddyland. Paddylands were the most important component of the production system, and were held to keep land security for future descendants. Therefore, land sales by descendants of founding families have begun to take place only very recently. The sellers tend to be families with insufficient labor to maintain their paddyfields, and a small number of descendants. The profits from sales of paddyland are generally reinvested in new equipment (huskers, hand tractors), livestock (cattle), and cement houses.

By the year 2000, it had become very difficult to find land to purchase in the *Tày* villages, though land transactions continued to take place in *Ban Cuon*. Between 1992 and 2000, the price of paddyfields rose by a factor of four (Figure 8).

Inheritance of paddy fields

A young married couple could gain access to a paddyfield by inheriting a portion of a parent's land. In the *Tày* communities, land traditionally was passed from father to son, keeping the land in the line of male descent and preventing an outsider from gaining access to land through marriage. The *Dao* only recently adopted this principle, having never before been landowners. With the growing shortage of paddyfields and the *Dao*'s difficulties in obtaining them, they have become very attached to patriarchal land inheritance.

Borrowing and lending of paddy fields

Lending most often takes place within a family, between brothers or between father and son. However, a farmer occasionally will lend land to a farmer in another family, if the lender owned more than he was able to cultivate. The lender generally does not receive any compensation for the loan.

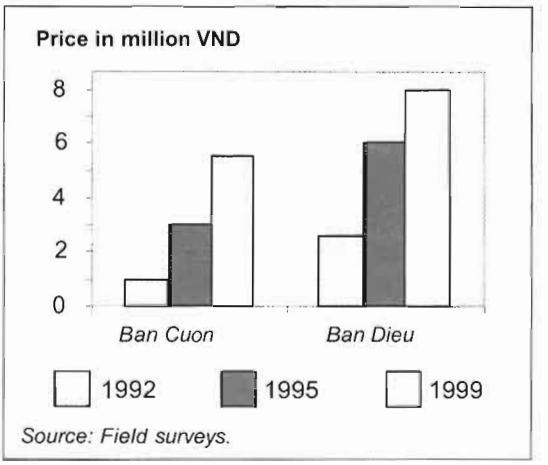


Figure 8: *Paddyfield price changes in two villages in Ngoc Phai.*

N.B.: Average price of a 1000 m² paddyfield plot adapted for double-cropping in 1999 VND.

Tenant farming

Rarely practiced in the commune, but recent examples illustrate the growing interaction between ethnic communities. At *Ban Cuon*, some *Dao* farmers benefited in 1999 from the temporary use of a paddyfield belonging to *Tày* farmers. The *Dao* farmers were allowed to work the land during the spring and reap the harvest. In exchange, they prepared the soil (plowing, harrowing) and provided buffalo manure for the second crop, which was cultivated by the *Tày* landowners.

Renting

We did not observe land renting over the course of our survey, but it existed in the commune between 1993 and 1995. Tenants had to give landowners a sum of money or portion of the harvest in return for the use of the land. According to the former tenants interviewed, this practice did not last long, as landowners preferred to sell their land.

Building new paddyfields

The only households who could engage in the task, particularly in *Ban Cuon*, were those with both many laborers (or enough capital to hire help), and land suitable for development (close enough to a water source for irrigation, few stumps and stones, etc.).

4.2. Means of access to sloping lands

In the early 1990s, forestlands were allocated to households in such a way that most farmers received the rights for whatever lands they were cultivating at the time (Castella et al., 2002). In the swidden expansion of the 1980s, the founding *Tày* families, like the *Dao*, had cleared the sloping lands nearest their settlements.

This forced families arriving later in the collectivization to go farther away (beyond village limits) to find fertile land. Many such households did not claim these lands when forestlands were being allocated in the early 1990s. Some who had the option chose not to act on it, as the land was too far from their residences. There was little benefit in becoming the owner of land that was either unusable or impossible to monitor. Still others were dissuaded by the fear that a tax would be imposed on the new allotments.

Unsanctioned use of common land

In the early 1990', local authorities categorized uplands and specified their uses (Mellac, 1997; Castella et al., 2002). However, farmers mostly ignored these specified categories. Many farmers continued to cultivate commons supposedly reserved for pastures, protected forests, or zones at the bases of hillsides. Farmers concentrated first on common land because (i) they each had signed agreements to protect their allocated upland, whereas the protection of common land was less clearly defined; and (ii) by clearing common land, they hoped that it might one day become theirs. Many farmers realized this hope, as a second allocation in 1997 indeed gave to farmers the common lands that they were cultivating.

Although common land played a relatively small role in *Tày* production, it was essential for the struggling *Dao* households, who relied on upland cultivation. Avoiding cultivation on their allocated lands wherever possible because they had signed protection agreements, *Dao* farmers turned to:

(i) *Communal pasture lands*. In *Ban Cuon*, hillside crops were cultivated intensively in zones initially set aside for animal pasture. In 1999, approximately 60% of households were cultivating upland rice on land officially designated as pasturelands. Local authorities temporarily authorized swidden crops in order to expand the pastureland area. Access to these lands seemed to follow no particular rule: the land could be cultivated even without authorization from the village headman.

(ii) *Land in other villages or communes*. In 1999, ten *Dao* families from *Ban Cuon* farmed *Tày*-owned land outside of *Ngoc Phai*. Authorities of the neighboring communes eventually put an end to these slash-and-burn practices after several disputes between the *Tày* owners and *Dao* occupants.

Borrowing and purchase

A few isolated land transactions did take place between *Ban Cuon* farmers and neighboring villages. One *Dao* farmer "borrowed" a plot of land that had been used in the previous year by another *Dao* farmer from a neighboring village who had decided to abandon it. We came across only one case of an upland purchase over the course of our research in *Ngoc Phai*. A *Dao* farmer purchased a swidden plot of some 3,000 m² for 800,000 VND from a *Tày* farmer of a neighboring commune who had been using the land. This kind of transaction is more

developed in other communes of *Bac Kan* with more severe land scarcity (Alther et al., 2002). Renting and tenant farming do not exist in the uplands.

Allocated lands covered by forest-protection contracts

Several farming approaches were observed on allocated lands:

(i) A farmer burns a single plot, out of sight from forest wardens (not visible from the road).

(ii) Under the authority of a forest and fruit tree plantation program (e.g., national reforestation program 327, or international development projects), some plots are cleared completely, then planted with seedlings of the desired tree species. This allows several years of planting annual crops between the young trees. Annual cropping ends when the trees grow big enough to block the sunlight.

(iii) A farmer burns wherever he determines that the soil is well adapted to his crop choice, without regard to the forest wardens. In the interest of supporting agriculture, forest wardens keep fines relatively low (Zingerli et al., 2002).

(iv) Since 1999, several poor *Ban Cuon* farmers requested special permission to engage in slash-and-burn practices on their allocated land, as a last resort to feed their households. The commune's forest wardens either granted or denied the farmer this right, based on the quantity and quality of land that he possessed. If the request was granted, the forest wardens then regulated the practice, specifying the area and location of the burn.

4.3. Household typology and livelihood strategies

Based on the access mechanisms described above, several different household types have developed in *Ngoc Phai*, each with its own particular production strategy. Figure 9 shows the differentiation trajectory that gave rise to each household type. Table 3 identifies the characteristics of the resulting household types and Figure 10 graphically demonstrates their associated production systems. The classification of households permitted us to better understand farmers' current situations and the reasons behind their current livelihood strategies. In this section, we will describe the various production alternatives employed by the various household types

The products of crop and livestock production

At the level of the commune, the main commercial products from crop production were rice, soybeans, and maize. The owners of the largest paddyfields (households in Types I and II) often sold upland rice surpluses. Naturally, *Ban Cuon* farmers without paddyfields (Type VI) did not sell any upland rice, because they used any upland production for family consumption. All households possessed at least some pigs. Crops with harvests spread across the year, like cassava, were generally grown to feed pigs (all Types) and the sale of animals was

often a significant income source. Depending on the particular husbandry strategy (breeder-fattener or fattener), revenue from pig husbandry could be either immediate or spread out across the year.

In *Ban Cuon*, some *Dao* farmers (Type IV) were able to raise funds to repurchase paddyfields from founding *Tày* families by selling their buffaloes. Ownership of a substantial number of livestock (5 head or more) at the time when the first paddyfields were being sold by the *Tày* was the major determinant of differentiation in *Ban Cuon*.

The raising of large ruminants (buffaloes and cattle) was an important means of capitalization and long-term saving, whereas pig farming was a medium-term source of income for timely investment needs (expenses related to festivals, chemical input purchases, etc.).

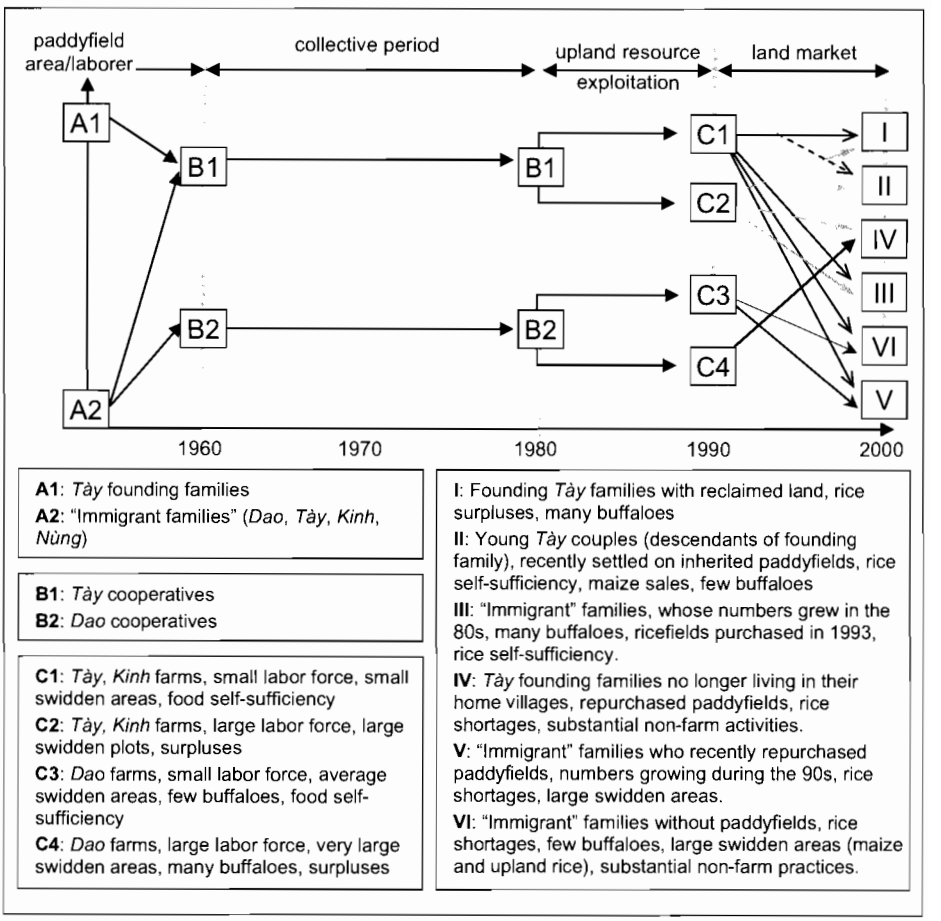


Figure 9: *Household differentiation patterns in Ngoc Phai Commune*

Table 3: *Main characteristics of household types identified in Ngoc Phai*

Farm type	***I***	***II***	***III***	***IV***	***V***	***VI***
Arrival date	founding families	descendants of founding families	founding families	at the beginning of and during the cooperative period		
Family composition	6 to 7 members 3 laborers	4 to 5 members 2 laborers	6 to 7 members 3 laborers	6 to 7 members 3 laborers	4 to 7 members 2 to 3 laborers	5 members 3 laborers
Means of access to paddyfields	reclamation	inheritance	reclamation and purchase	purchase in 1993	no paddyfields	recent purchase
Paddy area / laborer (m^2)	2000-2400	1500-2000	500-700	700-1200	0	500-700
Allocated forest area	3-5 ha	1.5-3 ha	1.5 ha	10-12 ha	*Dao* (Va): 5-10 ha *Tày* (Vb): 1 ha	1.5-3 ha
Rice self-sufficiency	self-sufficient/ surpluses	self-sufficient	shortages	self-sufficient	shortages	shortages
Sale of swidden production	no	maize	no	upland rice	no	maize, upland rice
Annual buffalo sale (no. of heads owned)	yes (6)	no (2)	no (2)	yes (5 – 7)	no (0 - 3)	no (2)
Type of pig raising (no. of heads)	intensive (3 – 6)	intensive (2)	intensive (4)	semi-intensive (8 –12)	light (Va, 1-6) intensive (Vb, 4-6)	intensive (3)
Size of perennial plantations	large	medium	small	large	small	medium
Importance of non-farming activities	unimportant	important	important	important	unimportant (Va) important (Vb)	unimportant
Net revenue / laborer / year (x 1000 VND) (% agric. revenue)	4,820 (100)	4,270 (80)	3,020 (60)	4,050 (75)	2,240 (Va=85, Vb=45)	2,590 (90)

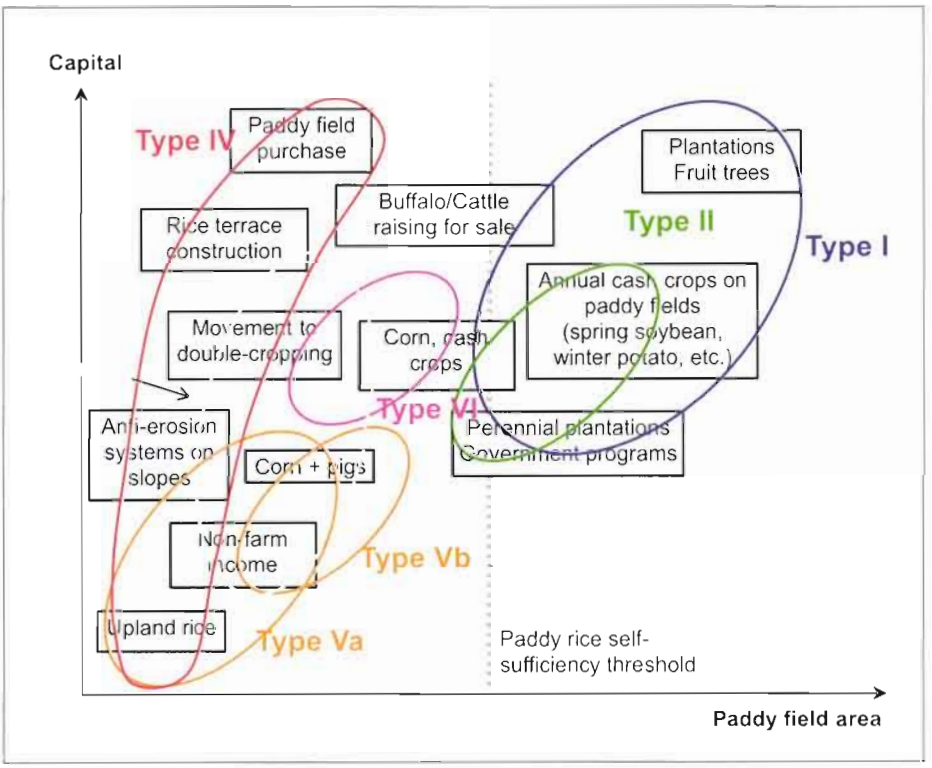


Figure 10: *Options for income generation based on paddyfield area and capital accumulation.*

Non-farm income

In *Ngoc Phai*, the majority of farmers engaged in non-farm activities. The time given to these activities depended on the household type. The households that made substantial investments (in time and labor) in non-farm activities were:

(i) households with little or no paddyfield area (Types V and VI),

(ii) households with a high laborer/cultivated area ratio (Types III, IV, V and VI), and

(iii) households with access to forest resources for commercial exploitation.

Principal non-farm activities included:

- *Forest resource use.* The primary non-agricultural activity was the gathering of forest products (Types II, III and IV), including sales of firewood, bamboo, bamboo shoots, rattan, and some kinds of wild animals (snakes, turtles, and rodents).
- *Commerce.* Village shops fell into two categories: (i) households without paddyfields, able to dedicate a large part of their time to commerce (Type Vb); and (ii) households with surplus labor force and sufficient capital to open a shop

while concurrently pursuing their farming activities (Type III). It is often the elderly women who take care of the shop.

- *Other activities.* Non-agricultural revenue also was generated from service provision, such as house construction, brick-making, or motorcycle taxi.

5. Conclusions: strategies based on access to production means, not ethnicity

Historically, the two major ethnic groups populating *Bac Kan* Province inhabited separate tiers of the ecosystem. The sedentary *Tày* cultivated paddy rice in the valley-bottoms, while the nomadic *Dao* harvested rainfed rice on swidden fields in the uplands. The two groups rarely mixed. Historically, the *Tày* received the majority access to lowland fields by privilege of their ancestral rights, and the *Dao* were left to find their livelihoods in the forest.

Since the beginning of Vietnamese independence, several State policies have altered the institutional environment in which mountain people live, and have caused various levels of social differentiation between and within the ethnic groups. At present, both groups follow similar livelihood strategies, basing production decisions on the relative profitability of land and labor dedicated to various activities. These strategies hinge on one crucial factor: access to paddy fields (Castella and Erout, 2002). Where land purchases are possible, we see traditionally-migratory *Dao* farmers willingly taking up sedentary living, to take advantage of the stability of irrigated rice production. Conversely, where traditionally-sedentary *Tày* farmers do not have access to lowland fields, *Tày* farmers have turned to the shifting cultivation systems traditionally practiced by the *Dao*. It is now becoming difficult to draw clear lines between the agricultural practices and lifestyles of these two major ethnic groups in *Bac Kan* Province. Instead of using the traditional criterion of ethnicity, researchers should use households' endowments of land, labor, and natural resources as the key factors for analyzing current circumstances and future rural development actions.

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