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Thomas Sikor and Dao Minh Truong

Agricultural Policy and Land Use Changes in a Black Thai Commune of Northern Vietnam, 1952–1997

Vietnamese agricultural policy has changed radically during the past 5 decades. Decollectivization in the 1980s and 1990s followed 2 decades of collective agriculture. This article examines the effects of agricultural policy on land use. It reports the results of remote image interpretation and socioeconomic field study in a Black Thai commune in Vietnam's northern mountains. It suggests that the landscape in the commune has been highly dynamic and that this dynamism was partly the result of the agricultural policy. Collectivization and decollectivization affected land use, but their influence was mediated by other factors, primarily changing technology and markets. In addition, the relationship between national policy and local land use is complicated by 2 factors: (1) changes in local institutions may predate national reforms, and (2) implementation of national policy and the resulting local institutions may differ from place to place.

Keywords: *Land use changes; GIS; agricultural policy; decollectivization; Vietnam.*

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Introduction

Black Thai villages have experienced radical changes in agricultural policy during the past 5 decades. The Vietnamese government mandated the villages to work on the land in agricultural collectives and subjected exchange to administrative controls in the 1960s and 1970s. Decollectivization shifted control over production and exchange back to households in the 1980s and early 1990s. In examining the effects of agricultural policy on land use in a Black Thai commune of northern Vietnam, we ask whether radical changes in policy caused similarly drastic transformations in land use.

This article aims to contribute to a growing number of studies on land use changes in the mountains of mainland Southeast Asia (Fox et al 1995; Long et al 1999; Xu et al. 1999; Trebuil et al 2000). Focusing on 1 commune in northern Vietnam, it examines changes in forests, vegetation cover, and land under cultivation during the past 50 years. Our analysis of remote imagery and statistical data highlights the dynamic nature of land use: forests and agricultural fields increase and decrease over time.

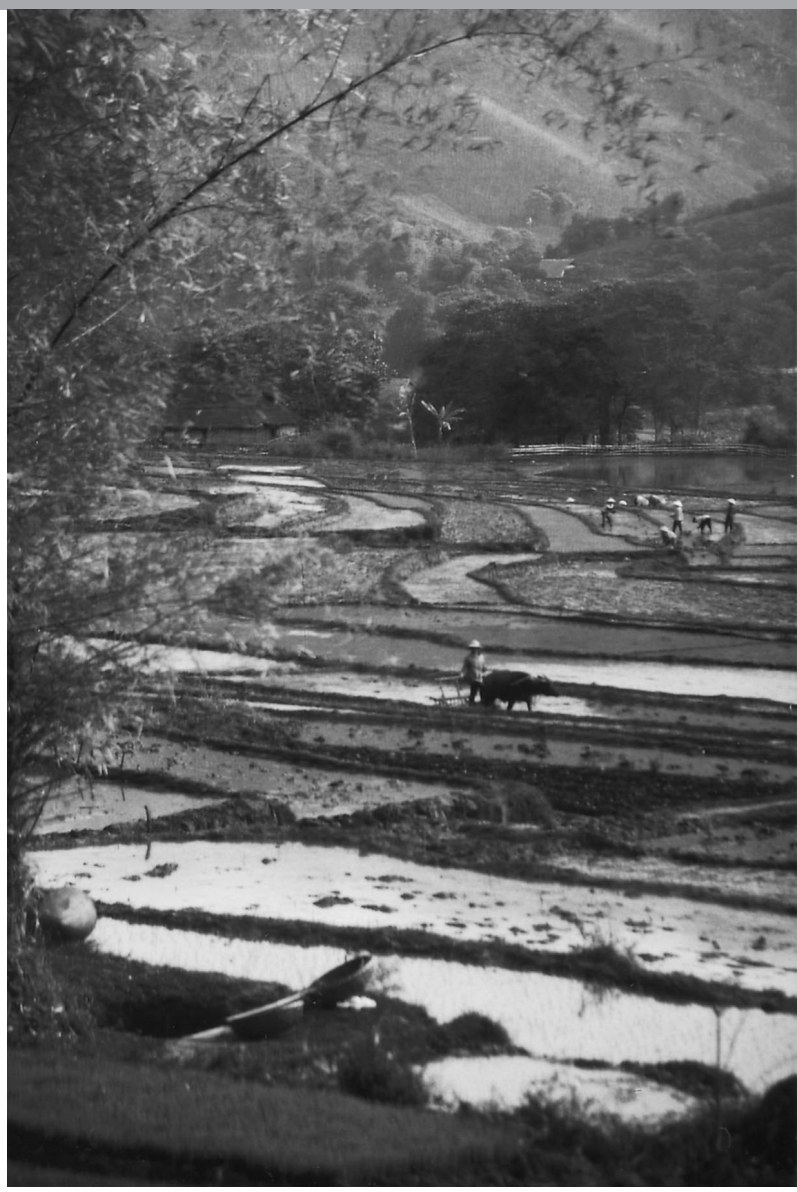


FIGURE 1 Paddy fields in the valley being prepared for the spring crop. (Photo by Thomas Sikor)

We also seek to enhance understanding of the socioeconomic forces shaping land use in the mountains of mainland Southeast Asia. In particular, we examine the effects of collectivization and decollectivization on land use. One may hypothesize that collectivization and decollectivization led to significant changes in land use because they implied comprehensive and radical changes in agricultural institutions. Our findings not only suggest linkages between policy and land use changes, but they also indicate that interactions between policy and practice go both ways. In addition, we find that other factors, especially techno-

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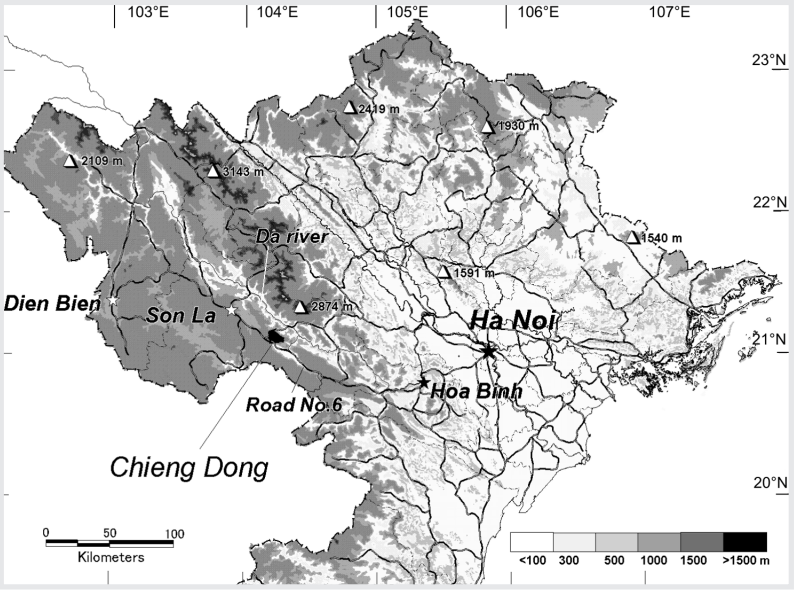


FIGURE 2 Chieng Dong study site in northern Vietnam. (Map by authors)

logical change and marketization, also exert a significant influence on land use.

Brief introductions of background and methods are presented, followed by a description of changes in agricultural policy and land use, and an examination of the effects of agricultural policy on land use in the Black Thai commune. We conclude by discussing the linkages between agricultural policy and land use in the postcollective countries of Southeast Asia as well as in a broader context.

The setting

Black Thai people moved into the mountains of what is today northwestern Vietnam in the first centuries AD (Wyatt 1982). The valleys and lower mountain ranges provided good conditions for wet rice agriculture and upland cultivation (Figure 1). Black Thai villages remained fairly autonomous over the centuries. The rugged topography and lack of infrastructure protected them against outside influences. After 1954, however, Black Thai villages were integrated into the Democratic Republic of Vietnam. Today, there are approximately 400,000 Black Thai living in northwestern Vietnam. Virtually all Black Thai continue to be engaged in agriculture, which has remained the major source of livelihood (Nguyen and van der Poel 1993).

Chieng Dong commune, our study site, includes 10 Black Thai villages (Figure 2). The villages are located in the valley of a small river that flows into the Da River, one of the major rivers in northern Vietnam. Villagers work in paddy fields in the valley and in upland fields far up the surrounding slopes (Figure 3). The population in the villages has grown steadily at around 2.6%



FIGURE 3 Corn fields and new rice terraces have expanded all over the uplands. (Photo by Thomas Sikor)

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annually during the past 5 decades, from less than 2000 in 1950 to more than 6000 in 1997. These villages can be considered fairly representative of Black Thai villages, with one exception: road improvements have put them at a distance of only 7 hours from the lowlands.

Methodology

Our research used data from 3 primary sources. First, we acquired SPOT satellite imagery for 1989, 1993, and 1997, and aerial photographs for 1952 and 1968. We interpreted the aerial photographs and satellite images manually and transferred the results to a 1:25,000 base map. The land cover maps were digitized and entered into a geographic information system (GIS) database. We checked the accuracy of the land cover classifications on the basis of knowledge gained during numerous walks through the terrain.

Second, we collected government statistics on agricultural production to complement the remotely sensed data. Local authorities had collected statistical data on population and agricultural output since 1958.

Third, data on land use practices, implementation of state policy, and other factors with the potential to influence land use stem from 1 year of in-depth research in 3 villages of Chieng Dong. Research included semistructured interviews with a randomly chosen set of 65 households, direct observation, key informant interviews with elders, village leaders, merchants, and local government officials, and review of government documents.

Results

Changes in agricultural policy and local implementation

The central government expanded the collectivization drive into the mountains in 1959 (Ban 1994). By 1961, almost all households in the valleys of the northwest, including those in Chieng Dong, had joined agricultural producer cooperatives. Control over wet rice and buffalo production and distribution shifted toward collectives. Corn and cassava cultivation as well as pig and poultry raising remained with individual households.

Collectivization came in combination with an ambitious program for mountain development (Chu 1962; Ban 1994). Local authorities constructed irrigation projects, distributed new seed varieties and chemical fertilizer, and provided technical advice to promote the intensification of wet rice production. They also designated large upland areas as "forestry land," that is, land for forestry. The villages had to seek official approval annually for their upland fields.

Collective agriculture remained an unstable project in Chieng Dong, as in many other Black Thai villages. Collective control over production eroded after 1975, when the war against the South Vietnamese regime came to an end, removing a major motivation for collective production. People increasingly preferred working in fields and raising animals outside the collective. The labor they contributed to the collective declined significantly, as did the share of land worked in common.

Decree 100, promulgated in January 1981, responded to the widespread erosion of collective control across northern Vietnam through a partial devolution of management authority to households (Kerkvliet 1995). The decree legalized the "end-product contract," under which cooperative leaders concluded annual contracts with members concerning the management of collective fields. Henceforth, members were to assume all basic production tasks and to be allowed to keep output in excess of a predetermined quota.

Implementation of the end-product contract in the cooperatives of Chieng Dong halted the erosion of collective control. Cooperative leaders concluded contracts with households in which the latter were requested to work in specific wet rice fields and in a certain area of upland rice fields. Households were required to meet output quotas for each plot. If they harvested more than the quota, they were allowed to keep the surplus. If production fell short of the quota, they had to make up the deficit from production outside the collective.

But the success of cooperative reform was short-lived. Households rapidly gained full control over labor allocation after a few years. The collectives gave up control over land preparation and sold most of their water buffaloes to households, which increasingly raised their own buffaloes. Similarly, collective control over output weakened. Much of the crop production in the uplands took place outside the collective distribution system. Only paddy output from wet rice cultivation remained under collective control to a significant extent.

Resolution 10, passed by the Communist Party in April 1988, called for virtually full-fledged decollectivization. Problems with the end-product contract had become widespread throughout the country and not just in Chieng Dong (Ban 1987). But the implementation of Resolution 10 had little effect on institutions in Chieng Dong concerned with agricultural production. Households had already gained extensive control over production in previous years. In addition, the villages failed to implement a key element of Resolution 10: they did not allocate the collective wet rice fields to households under the long-term lease arrangements mandated by the new policy. Instead, they continued to reallocate collective wet rice fields among households every few years.

Lowland traders began to pass through Chieng Dong in greater numbers in 1989, when central policy

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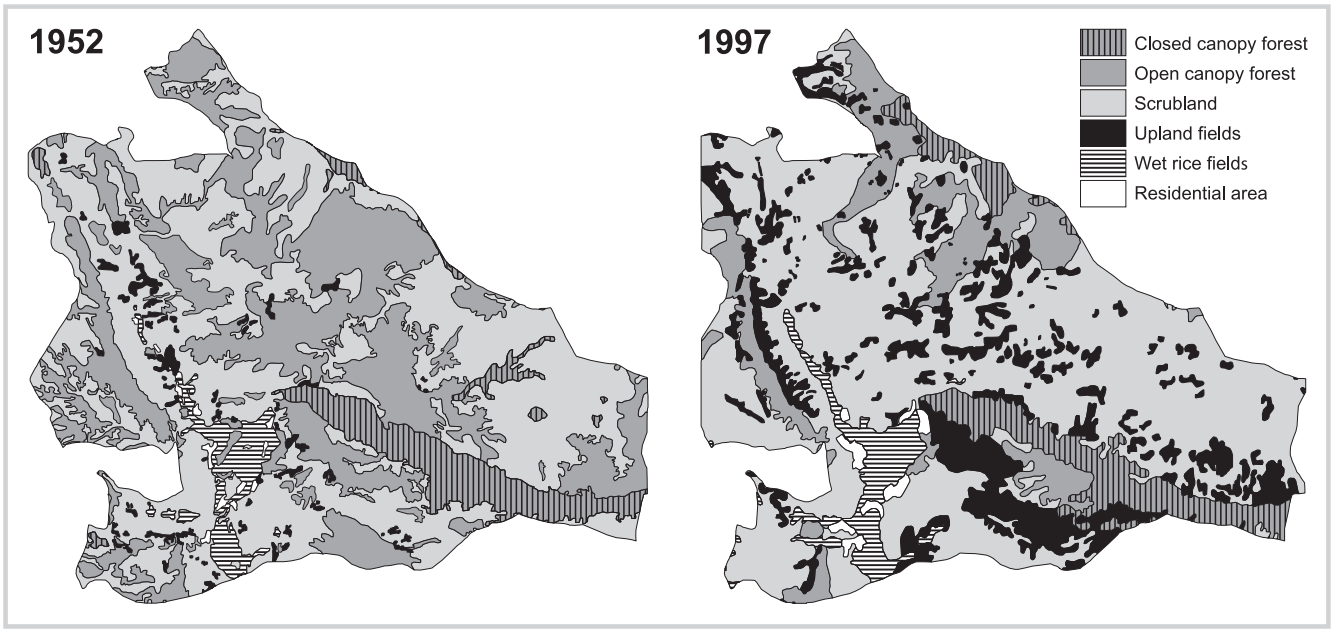


FIGURE 4 Land use in 1952 and 1997. (Maps by authors)

mandated the lifting of barriers on interprovincial trade. The private traders brought consumer goods, which had been notoriously scarce in previous years. They also purchased cassava and corn to meet the rapidly growing demand from feed mills in the lowlands. Market expansion also gave villagers access to new seed varieties of rice and corn. Chemical fertilizer became available in greater amounts at decreasing prices.

The nationwide program of land allocation reached Chieng Dong in 1994. The National Assembly had passed a new Land Law in 1993 that mandated the state to allocate land to households under long-term lease arrangements. Despite its importance at the national level, the new Land Law had virtually no effect on land tenure relations in Chieng Dong (Sikor 2001). Villagers openly protested the long-term allocation of collective wet rice fields, which motivated the local state authorities to exclude collective wet rice land from allocation. They continued to expand upland fields far up the slopes, ignoring formal demarcations of forestry land. They also maintained the practice of flexible adjustment of upland boundaries between neighbors from year to year, although these boundaries had been fixed on paper.

In sum, national policy on rural areas and people has changed radically during the past 5 decades. Yet as radical as the changes looked in policy texts, they turned out to be much more moderate in practice. People reacted directly to policy changes and adapted them to their own conditions and interests. In addition, decollectivization policy was in large part a reaction to changes in local practices that predated national-level reforms.

Changes in land use

Analysis of aerial photographs and satellite images demonstrates that land use in Chieng Dong has been highly dynamic during the last 5 decades (Figure 4; Table 1). Forest cover shrank and then increased. The area covered with scrubland expanded, remained stable, and finally decreased. The only constant trend was the increase in area under cultivation: the later the year, the larger the area under cultivation.

The statistical data support the dynamic picture portrayed in remote imagery. Wet rice outputs grew over the whole period, yet annual growth rates fluctuated widely (Figure 5). Upland rice output fluctuated, typically increasing when wet rice output declined, and

TABLE 1 Land use in the Chieng Dong area, 1952–1997. Source: interpretation of aerial photographs and SPOT imagery.

Year	Closed canopy forest (ha)	Open canopy forest (ha)	Scrubland (ha)	Upland fields (ha)
1952	534	2438	3601	133
1968	568	1258	4511	317
1989	517	224	4571	553
1993	544	687	4548	800
1997	551	885	3988	1115

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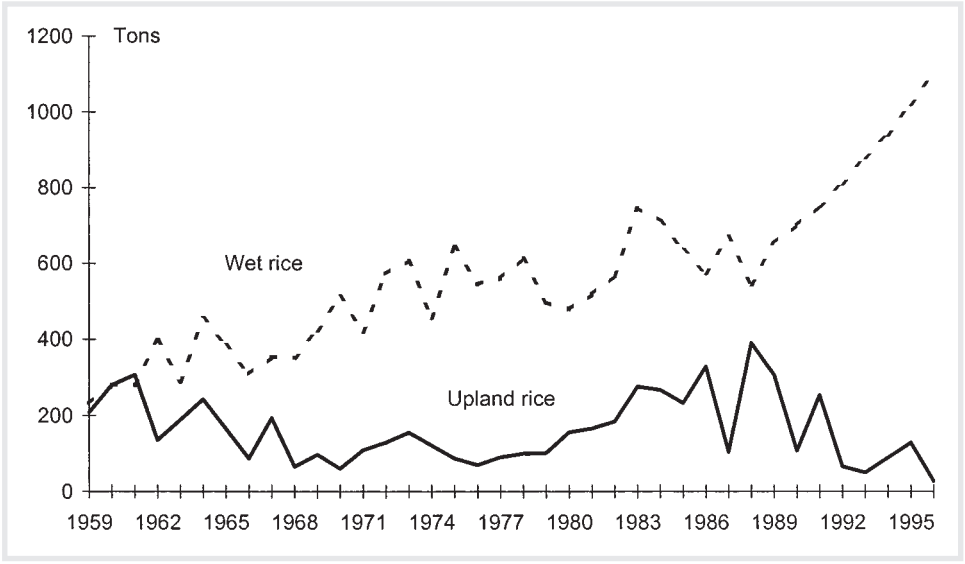


FIGURE 5 Rice output, 1959–1996. (Source: Government statistics)

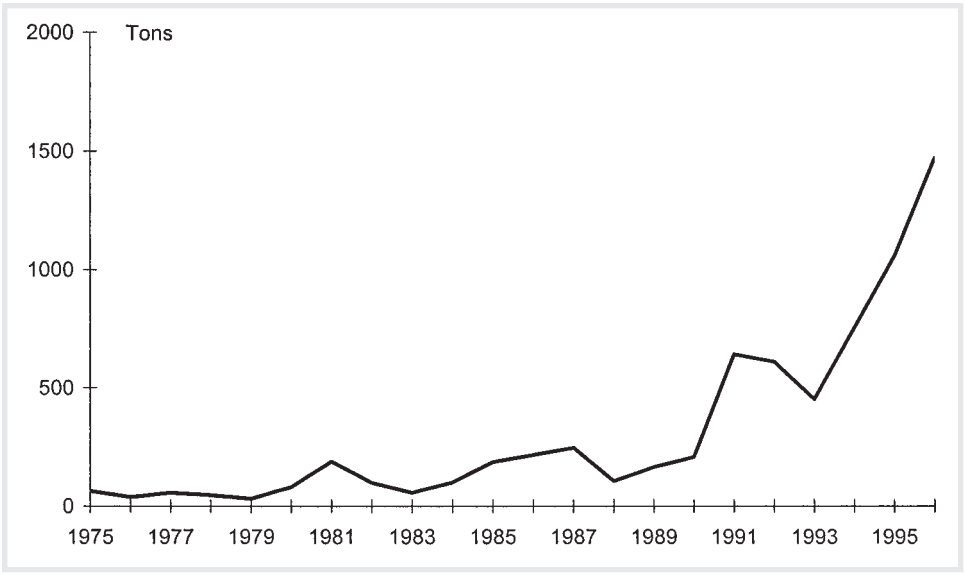


FIGURE 6 Corn output, 1975–1996. (Source: Government statistics)

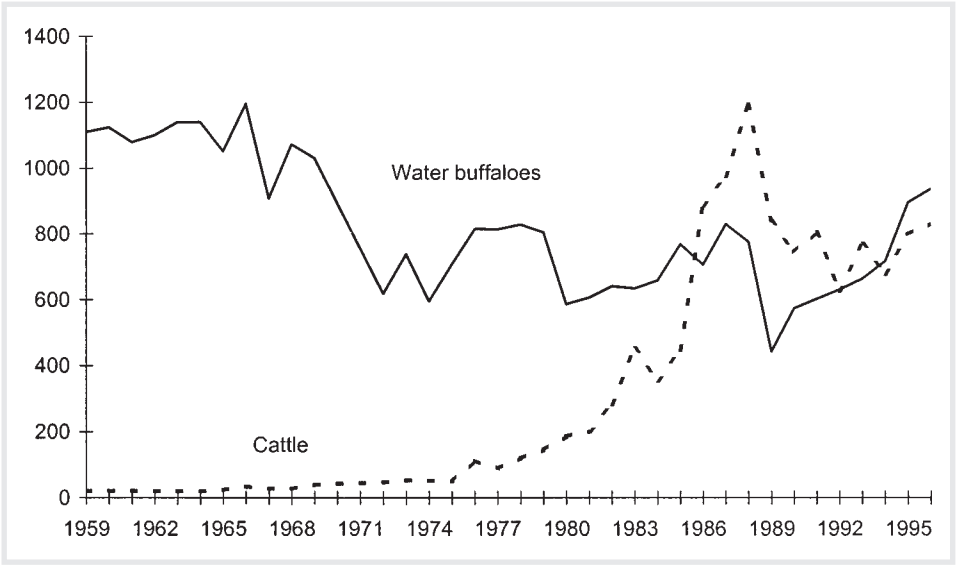


FIGURE 7 Water buffalo and cattle, 1959–1996. (Source: Government statistics)

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vice versa. Cassava output was initially insignificant, then experienced strong growth, and finally gave way to skyrocketing corn output (Figure 6).

The water buffalo and cattle populations exhibited different trends (Figure 7). The water buffalo population dropped in the 1970s and never reached its initial level again. On the other hand, farmers began to raise cattle in significant numbers only in the 1970s. Cattle husbandry boomed quickly and stabilized at a high level thereafter.

Remote imagery and statistical data suggest 3 periods of land use in Chieng Dong:

- Agricultural production shifted from extensive upland cultivation to valley-based wet rice fields in the 1960s and the first half of the 1970s. Production had been very extensive in the 1950s, as indicated by the predominance of scrubland and open canopy forest in 1952 (Figure 4; Table 1).
- Agricultural fields and cattle husbandry rapidly expanded up the slopes in the second half of the 1970s and 1980s, whereas wet rice cultivation stagnated. The land under cultivation almost doubled. By 1989, scrubland covered about three-quarters of the land.
- Agricultural intensification set in around 1990. Intensive use of land grew rapidly, especially for cultivation of wet rice and corn, whereas extensive use in the form of upland rice and cassava farming declined. Agricultural intensification allowed forests to regenerate, although agricultural fields continued to grow (Figure 4; Table 1).

In sum, land use has been very dynamic during the past 5 decades. Villagers intensified production in the 1960s and early 1970s, drastically expanding the land under cultivation in the late 1970s and 1980s and then shifting to more intensive uses again in the 1990s. The forests of Chieng Dong reflected changing trends in land use. They regenerated in the 1960s and early 1970s and then disappeared rapidly in the late 1970s and 1980s, regenerating once again in the 1990s.

Discussion

Our results indicate that agricultural policy and land use have undergone radical changes during the last 5 decades and that these major changes roughly coincided. Can we thus conclude that collectivization and decollectivization policies caused the changes in land use? This conclusion would be premature. Associations between changes in policy and land use do not necessarily imply that policy changes transformed land use. Causation may take the opposite direction, with policy reforms responding to land use changes. Or, changes in land use may be due to other factors such as markets, technology, population, or climate. Analysis of the relationship between state policy and land use requires further discussion.

How did collectivization affect land use in Chieng Dong? The lack of hard data—on weather and taxation, for example—prohibits conclusive explanations. Our findings allow us to infer, however, that collectivization contributed to intensification. Collective organization of production facilitated the cooperation required for investments in water control and changes in paddy management practices. Besides collectivization, direct state intervention appeared to have a strong influence on land use. The demarcation of large upland areas as forestland generated disincentives for upland rice farming because villagers were confined to small areas and risked fines if they expanded beyond these areas. State support for new seed varieties, chemical fertilizer, and technical extension increased labor productivity in wet rice.

How did decollectivization influence land use? Here we need to differentiate between national reforms and the local-level erosion of collective control. Our material suggests that local-level erosion of collective control over production drove the expansion of land under cultivation in the late 1970s and 1980s. The loss of collective control "pulled" household production into the uplands because new opportunities opened up there. Continuing collective control over wet rice also "pushed" villagers into the uplands. Upland rice fields provided twice the yield on household labor that wet rice cultivation provided (6 versus 3 kg paddy rice per day of labor), and households also retained a larger share of output.

What factors explain the shift toward agricultural intensification around 1990? National decollectivization policy around 1990 had virtually no effect on land use in Chieng Dong. Resolution 10 did not cause any changes in land use because the shift toward household-based production in Chieng Dong anticipated the policy reform. Land allocation did not influence land use because it did not modify land tenure institutions at the level of the villages (Sikor 2001). Agricultural intensification in the 1990s was driven by market expansion and newly available technologies. New seed varieties and increasingly available chemical fertilizer at decreasing prices facilitated significant yield increases in wet rice cultivation. In connection with the rapidly declining fertility of upland soils, changing markets and technology boosted the returns on labor for wet rice above those for upland rice (5 versus 3 kg paddy rice per day of labor). Increasingly secure food supply, improved seed, development of a stable outlet, and increasingly favorable relative product price also motivated villagers to cultivate more corn.

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One frequently cited factor is suspiciously absent from our discussion: population growth. As noted at the beginning, Chieng Dong's population grew rapidly during the past 5 decades. Population growth clearly influenced land use in the long term because it increased local food requirements. The villagers of Chieng Dong worked a much larger area of wet rice and upland fields in 1997 than in 1952. Forests receded to upper slopes and limestone rocks. Landscape transformations over the long term thus reflected the effect of population growth. Yet our findings call attention to other factors that have modified the effect of population growth on land use, in particular state policy, markets, and available technology. It is the latter factors that account for the highly dynamic nature of land use in Chieng Dong.

Conclusions

Our account of a highly dynamic landscape in Chieng Dong matches the literature on land use change in the mountains of mainland Southeast Asia (see Fox et al 1995; Long et al 1999; Xu et al 1999; Trebuil et al 2000). Agricultural land expands and contracts over time. Forests shrink and regenerate, facilitated by favorable climatic conditions. The dynamic nature of land use implies that short-term changes may differ from long-term changes in land use. Long-term trends can be hidden by short-term changes, just as one cannot assume that short-term changes follow long-term trends.

We surmise that collectivization and decollectivization shaped mountain landscapes in Vietnam and China. Although this is largely speculative, we hypothesize that collectivization provided means and opportunities for agricultural intensification. By comparison, Fox et al (1995) observed in 3 small watersheds in Thailand that land use became more extensive during the same period. Yet collectivization only led to agricultural intensification if it was accompanied by investment in wet rice cultivation. In the absence of such investment, collectivization drove expansion of upland fields through its emphasis on grain production (Xu et al 1999).

We further speculate that decollectivization caused an initial boom in production driven by the expansion of agriculture up the slopes, a reaction also observed by Xu et al (1999) in China. Subsistence needs initially remained at the core of production and growth. Thereafter, in the face of rapidly declining soil fertility, expansion was followed by more intensive forms of agricultural production. Ecological decline, new market and technological opportunities, and the lack of off-farm employment opportunities accelerated the intensification process, including the greater role of market crops (Donovan et al 1997; Long et al 1999). Decollectivization thus accelerated the transition toward more intensive agricultural practices in comparison with other parts of mountainous Southeast Asia such as Thailand (Fox et al 2000).

Our findings support the increasing attention paid to the influence of macro policy on land use (Mertens et al 2000; Sunderlin et al 2000). At the same time we suggest that the relationship between national policy and local land use is complicated by 3 factors. First, changes in local institutions may predate national policy reforms. Policy reforms may be a response to, not a cause of, changes in local practice. Second, changes in land use may be due to other socioeconomic factors. Changes in state policy often come together with changes in other factors such as technology and markets. Third, implementation of national policy and the resulting local institutions may differ from place to place. Local authorities and people may enjoy significant leeway in interpreting national policy.

This last complication, local mediation of national policy, may be particularly relevant in mountain regions. Mountains are typically characterized by physical remoteness and geographical conditions different from those found in other regions. The integration of mountain people into nation-states has mostly been a recent phenomenon. Mountain people enjoy more extensive autonomy than do their compatriots in the lowlands and have different types of social relations. In addition, the interests of local governments in the mountains frequently differ from those in other regions. If mountains, their people, and government interests are different, we may expect a relatively high degree of local mediation. National policy may thus affect land use in the mountains, yet its effects may be mediated in ways particular to mountain conditions.

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