The Influence of Watershed Management Activities Operated by the Royal Forest Department on the Land Use of Local Smallholders in Northern Thailand

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Abstract

Watershed management to maintain the quality and quantity of watershed services has been regarded as an important issue for the Royal Forest Department (RFD). Meanwhile, these upland areas have been inhabited by many people represented by hill tribes. Watershed management activities restrict the land-use of local smallholders. To operate watershed management and to secure the livelihood of local residents in the upland area represent urgent issues for Thailand.

The objective of this study was to clarify the influence of watershed management activities, the establishment of protected watershed forests and tree planted areas operated by the RFD on the land-use of local residents between 1990 and 2005. Two households were sampled and the history of their field use clarified by GPS mapping. A GIS analysis of village land-use was conducted. Interviews were also carried out with all householders about the number of field locations they had lost. The survey was carried out in the Mi'en (Yao) hillside village in northern Thailand in 2005. The RFD started watershed management around this village in 1991.

The results showed that two households had lost their usufruct areas of 11.2 and 10.7 ha, respectively, as a result of watershed management activities. Thirteen of a total of 20 households lost from to sixteen locations of their fields as a result of watershed management activities. The GIS analysis of village land-use revealed that the villager's fields were not located in the protected watershed forests, excluding some on the boundary periphery. As countermeasures against watershed

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management activities, villagers switched from slash-and-burn farming to sedentary farming in the late 1990s and some villagers moved to Bangkok or foreign countries to work after 1990. Although some villagers suffered restrictions in their land-use due to watershed management, they felt that their livelihood had improved compared to before 1990. This study describes a successful case of operating a watershed area in conjunction with local residents.

Keywords: fallow area, GPS mapping, hill tribe, slash-and-burn farming, usufruct

Introduction

In Thailand, the rapid decrease of forested areas has been recognized as a national issue since the 1980s. To maintain the forest environment, the Royal Forest Department (RFD) not only manages existing conservation forests, national parks and wildlife conservation areas but also continues to establish new national parks, wildlife conservation areas and watershed management areas around the country. In addition, the RFD conducts tree planting in national forest conservation areas and watershed management areas. Local residents are prohibited from using national parks, wildlife conservation areas and particular parts of watershed management areas. They cannot practice tree-cutting or cultivation in these areas. This paper focuses on one watershed management area. Watershed management areas were established on the basis of physical and biological criteria to manage and protect forested upland areas in the mid-1980s (Forsyth and Walker, 2008).

The establishment of national parks and watershed management areas has caused incidents and conflicts between the RFD and local residents around the country. It has previously been reported that the establishment of a national park in northern Thailand caused village relocation in 1994 (Ganjanapan, 1997), and Hmong villagers living in a watershed area in northern Thailand participated in a campaign for legal recognition of customary rights to natural resources in 1997 and 1999 (Pinkaew, 2000). Roth (2008) pointed out that resistance to the parks was a significant movement throughout the region. Operating watershed management areas and securing the livelihood of local residents in upland areas are both urgent issues in Thailand.

The objectives of this study were to clarify the influence of the watershed management activities, specifically the establishment of a class I watershed area and tree plantation areas, carried out by the RFD from 1991, on agricultural land-use by local residents at the household level in the hillside village in northern Thailand. In addition, the key to successfully maintaining both local residents’ livelihood and RFD watershed management is discussed.

Materials and Methods

Study Area

Natural Environment

The study was conducted at Doi Phaamon watershed management area, hereafter referred to as the DP watershed management area. This watershed management area is located in the Phayao province of northern Thailand, near the border with the Lao People’s Democratic Republic (Figure 1). The area has a monsoon climate, with distinct rainy and dry seasons. The altitude in the management area ranges from about 500 m to about 1500 m. The vegetation is hill evergreen forest, deciduous forest and dry evergreen forest, including Castanopsis spp., Quercus glabribuloides, Schima wallichii and others. Due to wildfires and agricultural land uses, such as shifting cultivation and tree clearing for more than a century, the vegetation consists of secondary forest at several stages of succession.
Study Village

The study village was located on a hillside (950 m above sea level) about one hour's drive from Chiang Kham town. The population of the village was 20 households totalling about 130 people in 2005. Villagers belong to the Mien, one of the hill tribes of northern Thailand. At least 100 years have passed since the foundation of the village. The village was an administrative village and almost all villagers held an identification card.

The main subsistence and economic activity was agriculture. Villagers grew upland rice for subsistence and hybrid maize for cash income. Both crops were grown once a year during the rainy season. The average cultivated area was 7.5 ha per household in 2005. Upland rice and hybrid maize accounted for 9% and 88% of the total cultivation area of the village, respectively. All households used herbicide and chemical fertilizer for upland rice and hybrid maize cultivation in 2005.

The villagers had practiced shifting cultivation for many years. In the case of upland rice, they cultivated a field one year and moved to another field the next. The former cultivated fields were left fallow to restore the vegetation. It can therefore be said that one characteristic of shifting cultivation was the existence of fallow areas. However, farmers in the study village switched from shifting cultivation to permanent farming in the 1990s (Masuno and Ikeya, 2008).

The economic situation of the study village has improved in the past decade. In 2008, almost all households owned a motorbike, the number of households that owned a pickup track was increasing, and the construction of new houses was continuing in the village.

Activities of the Royal Forest Department

The RFD divided the watershed management area into five classes based on land characteristics such as elevation and topographical gradient (Forsyth and Walker, 2008). The land characteristics of a class I watershed area are a very high elevation and very steep slopes. This area should be maintained as forest. The villagers were strictly prohibited from deforestation and cultivation in this area. In addition to these activities, the RFD conducted road maintenance, seedling cultivation, and contracted small sediment-control dams.

In this paper, both class I watershed management areas and tree plantation areas are included in the general category of 'protected forest areas'. Protected forest areas are zones where RFD planning is in effect, and are not necessarily forested in reality. Areas that actually had forest vegetation in 2005 are designated in this paper as 'forested areas'.

\[^1\] The Mien originated from southern China and reached northern Thailand in the 19th century (Yoshino, 2005). It has been pointed out that movement owing to shifting cultivation played an important role in their migration (Yoshino, 1998)
Land Tenure in Thailand

Legal and Traditional Land Tenure Management

The land law passed in 1954 adheres in its essentials to the ideas of the 1936 law, recognizing three different stages in acquiring land: occupancy, utilization and legal possession (Yano, 1968). This basic idea remains unchanged. Although there are several means of obtaining legal land possession, one of the most common is to obtain certification of land occupancy (soo koo) as the first step, followed by obtaining certification of land utilization (noo soo) or certification of legal land ownership (chanoot thii din).

Rural areas of Thailand, however, such as hillside areas, have made little progress in the application of legal land tenure. Local residents in rural areas often manage their land tenure by customary law in the community. For example, Miles (1990) reported on the basis of research in a Yao village in northern Thailand in 1968 that the farmers maintained their land tenure only during cultivation and the fallow fields were managed by the community. On the other hand, Hakari (1978) reported that land tenure, including fallow areas, was managed at the household level in Yao villages in northern Thailand from research carried out during 1970 and 1971. The Karen people, another of the hill tribes of northern Thailand, however, managed their land at the community level (Nakano, 1978; Hayami, 1997).

These previous reports suggest that there were many varieties of land tenure management. These systems were not always the same, even within the same ethnic group. It should be noted that according to these reports, fallow fields were inevitably managed.

Land Tenure Management in the Study Village

The villagers in the study village did not hold land tenure or land ownership in law in 2008, meaning that they did not possess official certification of land occupancy, land utilization and land ownership. Land tenure was managed by their customary law. The customary law was the same as that reported by Hakari (1978) in another Yao village. Specifically, in the study village, the farmer who initially cleared an area of woodland was customarily qualified to hold land tenure to use the newly cultivated field and this tenure did not expire even during the fallow period. This tenure was recognized within other village communities, including the neighbouring village. Moreover, agricultural land tenures were regarded as being like property. According to local custom, if villagers continue to clear new fields, they could accumulate areas to which they held land tenure year by year. This land tenure management system had existed at least since the 1970s in the study village, and was therefore not the outcome of the forest policies instigated by the RFD around the village.

Research Methods

The distribution of agricultural fields and forested area in 2005 was researched by GPS mapping. A hand held GPS was used in conjunction with traversing the boundary of each field in the study village and the boundary between fields and forested areas. The owner of land tenure for each field was identified by interview research. An interview survey of all households in the village was conducted and their understanding of the effects of RFD activities on their agricultural field utilization was clarified. Three households (households A, B and C) were selected from within the village and their land use history and conflict or incidents in relation to RFD activities were clarified. An interview with the officer of the DP watershed management area was conducted in March 2007. Intensive research was conducted from January 2005 to April 2006 and supplementary short-term research was carried out in 2007 and 2008.

Results

Distribution of Class I Watershed and Tree Plantation Areas

The RFD started to establish a class I watershed area in the DP watershed management area in 1991 (Figure 2). The RFD branch office in the DP watershed management area did not have a map showing the planning zone of the five classes of watershed management area until the mid-1990s. In some places, the RFD officers and local villagers therefore negotiated over setting up practical boundaries. In addition, the RFD established tree plantation areas in the DP watershed management area. They set up a new tree plantation area every year and planted trees such as Pinus merkusii. Around the village, RFD established tree plantation areas from 1991 to 1997 (Figure 2). The RFD has continued to set up tree plantation areas distant from
the study village since 1998. Once trees have been planted, the villagers are prohibited from practicing cultivation in the area, in order to restore the forest.

Figure 2  Distribution of Class I watershed area and tree plantation areas and years of establishment in Doi Phaamon watershed management area, Phayao Province.
Source: Information from RFD office

Volume 3: GIS/GPS/RS

Distribution of Agricultural Fields and Forested Area

In terms of village-level distribution, the agricultural fields of the study village were located north and northeast of the village, with none lying south of the village in 2005 (Figure 3). Many fields were clustered in particular areas, but some were scattered in areas where the fields of other villages were clustered, such as those lying 4 km north of the village.

In terms of household-level distribution, the agricultural fields of household A were located in four areas and those of household B in five areas (Figure 3). Eight of the total nine areas were cleared for cultivation before 1990, when the RFD’s activities did not affect the villagers’ land use. The fields of other households were also scattered over several areas.

With the exception of part of the area to the north the study village was surrounded by forested areas (Figure 3). It was obvious that the high altitude area of Mt. Nan, located south of the village, was a forested area. Forested and cultivated areas were clearly demarcated (Figure 7). There were few fields located within forested areas. The local residents maintained the protected forest areas because the distribution of forested areas (Figure 3) coincided with the locations of the class I watershed management area and tree plantation areas (Figure 2).

Number of Field Locations where Cultivation is Prohibited

Thirteen out of 20 households recognized that they were prohibited from practicing cultivation due to the establishment of the class I watershed area and tree plantation areas. The number of fields they were prohibited to use ranged from one to 16 locations per household (Figure 4). The average number of prohibited fields was 7.1 locations per household, with at least 92 in total. The seven remaining households were established after the mid-1990s. Thus, although the number of locations differed according to household, all the households established before the RFD started watershed management were affected by the establishment of protected forest areas.
Household A recognized that they had forfeited nine field locations (11.2 ha in total, measured by the study) due to the establishment of protected forest areas (Figure 5). Six of the nine locations were fallow fields. Fields (i), (ii) and (iii) were cultivated by household A (Figure 6). These three fields were located inside the tree plantation area. Field (i) should have had cultivation prohibited in 1991 due to the establishment of a tree plantation area. In practice, however, the RFD set the boundary along the stream. The householders could therefore continue to use field (i). Although field (ii) had its cultivation prohibited in 1991, it was cultivated by household A in that year. They believed that field (ii) was located outside the tree plantation area.

Note: + shows at least

**Figure 4** Numbers of field locations which each household forfeited as a result of watershed management activities by Royal Forest Department.

Source: Interviews with householders

**Household Response against Establishment of Protected Forest Area**

The establishment of protected forest areas restricted the villagers' land use. Here the response to the establishment of protected forest areas was clarified through three household-level case studies. In a previous study, the field use history of households A and B from 1980 to 2005 was clarified (Masuno and Ikeya, 2008).

**Case 1: Household A**

Household A recognized that they had forfeited nine field locations (11.2 ha in total, measured by the study) due to the establishment of protected forest areas (Figure 5). Six of the nine locations were fallow fields. Fields (i), (ii) and (iii) were cultivated by household A (Figure 6). These three fields were located inside the tree plantation area. Field (i) should have had cultivation prohibited in 1991 due to the establishment of a tree plantation area. In practice, however, the RFD set the boundary along the stream. The householders could therefore continue to use field (i). Although field (ii) had its cultivation prohibited in 1991, it was cultivated by household A in that year. They believed that field (ii) was located outside the tree plantation area.
The RFD intervened, however, and household A was prohibited from using field (ii) from 1992. Field (iii) was prohibited from cultivation in 1991. The area of field (iii) became bamboo forest. This area was burned by a forest fire in March 2004. Household A asked an RFD officer to give them permission for cultivation because their fields were in that area before the establishment of protected forest areas. The RFD officer gave household A permission as an exception to cultivate field (iii) for one year.

Figure 5: Distribution of the fields which households A and B forfeited as a result of watershed management activities by the Royal Forest Department.

Source: GPS mapping and interview as part of the study

Firstly, Case 1 shows that household A recognized that it forfeited nine field locations to the RFD. The total area of these nine fields was 11.2 ha. Six out of the nine locations were fallow fields. Household A cultivated 4.5 ha in total in 2005. The area which they forfeited was more than double the area they cultivated in 2005.

Secondly, the case of field (i) shows that differences existed between planned tree plantation areas and actual forested areas. This difference was due to RFD officers using actual features of the landscape as boundaries for tree plantation areas. The case of field (ii) illustrates differences between the RFD and a local resident in their understanding of the boundary of a tree plantation area. In this case, the understanding of the RFD took priority over that of the local resident. The case of field (iii) shows that awareness of customary land tenure still remained after the establishment of protected forest areas. Local residents waited for the opportunity to use their fields in protected forest areas.

Case 2: Household B

Household B recognized that it had forfeited 13 field locations (10.7 ha in total, measured by the study) due to the establishment of protected forest areas (Figure 5). Eleven of the 13 locations were fallow fields. Household B did not have particular incidents or conflict with the RFD.

Case 2 shows that household B recognized that it had forfeited 13 locations of fields to the RFD. The total area of these 13 fields was 10.7 ha. The area that household B forfeited was smaller than that of household A. Eleven out of the 13 locations were fallow fields. Household B cultivated 10.2 ha in total in 2005. The area they were forfeited was nearly the same as the area they cultivated in 2005. Household B did not have any particular incidents and conflict with the RFD. Although all households forfeited some field locations, not all households experienced incidents or conflict with the RFD. Household B has obeyed the RFD’s decisions.

Case 3: Household C

Household C recognized that they were prohibited from cultivating six field locations due to the establishment of protected forest areas. The specific locations of fields and their surrounding areas were not surveyed. Field (iv),
cultivated by household C (Figure 6), was surrounded by and located inside a protected forest area. The householder of household C said that as field (iv) was used as terraced paddy fields, he had an official document showing his occupancy of the field. After negotiating with the RFD officer, household C avoided forfeiting the field (iv). The householder also said that if other villagers did not insist on the occupancy of their fields to the RFD, they lost their fields.

Figure 6 Fields located inside Class I watershed and tree plantation areas.

Although the householder of household C stated that he had an official document showing his occupancy of the field, this was unable to be confirmed. Case 3 shows that household C also forfeited at least six field locations. It seems that if fields could be used as paddy fields, it may have been possible for villagers to negotiate to keep them even inside protected forest areas. The statement of the householder shows that he thought he could keep his fields because he insisted to the RFD on his right of land use.

Discussions

The Effect of the Establishment of Protected Forest Areas on Land Use by Local Residents

It has previously been reported that as a result of the establishment of Doi Luang national park in northern Thailand, two Mien (Yao) villages were relocated outside the park in 1994 (Ganjapan, 1997). This previous study reported village-level incidents. The present case study has clarified the effect of the establishment of protected forest areas on land use at the household level. Although the village was not relocated, 13 of total 20 households forfeited 1-16 field locations as a result of the establishment of protected forest areas.

Roth (2007) showed that the establishment of a national park resulted in a change of land tenure management system from collective to household ownership. In the study village, however, the customary land tenure management system has been maintained.

An important characteristic of shifting cultivation is the existence of fallow areas. Households A and B forfeited nine locations (11.2 ha) and 13 locations (10.7 ha) of fields, respectively. Of the total 22 field locations, 17 were fallow fields. Suraswadi et al. (2005) pointed out that there has never been a basis for official recognition of forest fallow fields as a component of agricultural land holdings, and clearing of fields in a shifting cultivation system was officially viewed as forest destruction. The government did not recognize fallow fields as a component of agricultural land holdings. In the study village, land tenure was managed according to custom and land tenure of households was maintained not only for fields under cultivation but also for those left fallow. The customary fallow management system was divided into two systems: in one, fallow fields were managed at the community level (Nakano, 1978; Miles, 1990; Hayami, 1997); and in the other they were managed at the household level (Hakari, 1978; present study). It should be noted that there was a high possibility that fallow fields were managed by local residents. Hayami (1997) has pointed out that in Thailand, land that was not occupied or used, was categorized as forest or unused land where any form of occupation or destruction (including logging and swidden cultivation) was illegal. Roth (2007) pointed out that there were no Thai laws that recognized collective land ownership.
There is a high possibility that land management policies might have a far greater influence on the customary land tenure of local residents than had previously been thought. Roth (2008) suggested that a strengthening of social relationships between local communities and state conservation agencies was needed to carry out more flexible spatial strategies. This study suggests that land use policies such as watershed and conservation forest management must take local customary land tenure management systems into account.

Local Residents’ Responses to the Establishment of Protected Forest Areas

Watershed management activities carried out by the RFD have significantly restricted the land use of local residents. It has previously been reported that Hmong villagers living in a watershed area in northern Thailand participated in the campaign for legal recognition of customary rights over natural resources in 1997 and 1999 (Pinkaew, 2000). On the other hand, local residents of this study had not yet engaged in protests against the RFD activities.

An intensive household-level survey revealed differences in the response to the establishment of protected forest areas according to households and fields. In the case of field (i), household A was not affected by the establishment of a tree plantation area because the RFD used the actual feature of a small stream as its boundary. In the case of field (ii), there were differences between the understanding of household A and that of the RFD about the boundary of the tree plantation area and household A submitted to the RFD’s understanding. In the case of field (iii), household A succeeded in obtaining permission from the RFD to cultivate its field inside a protected forest area for one year because of a forest fire. In the case of field (iv), household C could keep its field inside the protected forest area because a member of the household possessed an official document showing occupancy of the field and insisted on his right of land use to the RFD. Household B did not experience any incidents or conflict with the RFD about their field use.

The case of field (ii) and household B suggest that local residents usually submitted to the RFD’s understanding. The case of field (iii) indicates that local residents still recognized their land tenure even though the fields were inside the protected forest area. In addition, local residents waited for the opportunity to use those fields. The case of field (iv) shows that householders have taken proactive action to keep their land tenure. These cases suggest that local residents’ attitude toward maintaining their land tenure despite the establishment of protected forest areas differed between households and fields.

The farmers in the study village switched from shifting cultivation to permanent farming during the 1990s (Masuno and Ikeya, 2008). One of the important reasons for their switch of cultivation methods was that they could not keep enough fallow area to continue their shifting cultivation because the establishment of protected forest areas had restricted the amount of land that local residents could cultivate. In addition, local residents may have feared that the RFD would consider fallow fields as unused or forested land, leading them to forfeit more fields to the RFD.

Key to Successful Operation of Watershed Management Areas with Local Residents

In this case study, the RFD did not compensate the villagers for their severe restriction of villager's agricultural land use. Although villagers’ land use was restricted due to watershed management, they felt their livelihoods had improved since 1990. The successful operation of watershed areas with local residents can be explained in terms of two aspects of the village situation.

The first aspect is economic. Although villagers had suffered restrictions on their land use, the economic situation of the study village had improved in the past decade. One reason for this improvement in the villagers’ economic situation was that hybrid maize cultivation and sale had performed well in this decade. The sale of hybrid maize has become the main source of cash income in the study village. Another important reason was the popularization of off-farm work. The Mien started to leave home during the 1990s to work in Bangkok or foreign countries (Yoshino, 1999). The number of off-farm workers going outside the village had also increased in the study village since 1990 (Masuno, 2005). Such off-farm work absorbed the redundant labor of the village. This was the result of the government’s patient efforts in school education since the 1970s. The villagers were Mien, and they spoke the Mien language. Formerly they were not fluent in the Thai language, but they could now speak it well. Villagers, especially the young generations, could choose from many kinds of occupations.
The second aspect was the changes in villagers' attitudes toward forest conservation due to education and participation in Thai society. In the past, forests were the place where villagers practiced shifting cultivation and hunting and gathering. Nowadays, villagers understood the importance of forests in Thailand and felt they should conserve them. For example, the village headman said in March 2007: "An administrative officer said to me that our village maintains one of the most beautiful forests in Phayao province. I am proud of this, and I will keep our beautiful forest in the future". In addition, recently junior high school students from a lowland town visited the study village as part of their environmental education, to observe and experience village life in the forest. This kind of contact with external society also seemed to encourage the villagers to preserve the forests around the village.

It should be noted that indirect, patient support in areas such as school education has been able to cover the lack of direct compensation for land-use restrictions, and has played an important role in the maintenance of the villagers' social and economic life in this case study.

Conclusions

The objectives of this study were to clarify the influence of watershed management activities, specifically the establishment of a class I watershed area and tree plantation areas, carried out by the RFD since 1991 on the agricultural land use of local residents at the household level. The results were:

- Forested and cultivated areas were clearly demarcated. There were few fields located in the forested area. It was obvious that the local residents kept the forest area protected.
- Thirteen of a total of 20 households had lost 1–16 field locations, an average of 7.1 locations per household, as a result of the establishment of protected forest areas by the RFD.
- Two sample households in the village had forfeited nine locations (11.2 ha) and 13 locations (10.7 ha), respectively, as a result of watershed management activities. Of these 22 locations, 17 were fallow fields.
- Local residents still recognized their land tenure even though the fields were within protected forest areas. Although they usually submitted to the decision of the RFD, in some cases householders took proactive action to maintain their customary land tenure. The attitude of local residents toward maintaining land tenure despite the establishment of protected forest areas differed between households and fields.

There was a high possibility that land management policies might have a far greater influence on the customary land tenure of local residents than had previously been thought. Fallow areas should be recognized as part of agricultural areas. This study suggested that land use policies such as watershed and conservation forest management must take local customary land tenure management systems into account.

Figure 7 Landscape of the study site: protected forest areas (left side) and agricultural fields (right side) are clearly divided.

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References


Santasombat, Y. 2003. Biodiversity: Local Knowledge and Sustainable Development. Regional Center for Social Science and Sustainable Development (RCSD), Chiang Mai.


