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Tourism: An Alternative to Development?

Reconsidering Farming, Tourism, and Conservation Incentives in Northwest Yunnan Mountain Communities

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In the last decade, tourism has developed rapidly in the mountainous areas of northwest Yunnan. This growth has led to substantial economic and social changes, with resulting environmental consequences. This

article uses a case study to illustrate how local farmers involved in tourism changed their agricultural practices as a result of the transformations that took place in the area. The aim was to examine tourism's expected benefits of poverty alleviation and conservation incentives. Tourism investments were found to have been adopted only by households with available cash and labor, whereas they remained inaccessible

for the poor, small landowners who most needed a new source of income and used their land more exhaustively. Relatively rich, large landowners did not take the opportunity to reduce their agricultural activities. Instead, they used supplementary incomes earned from tourism to hire external labor to cultivate their land more intensely. Tourism development failed to generate real incentives for mountain farmers to adopt more conservation measures and prevent soil erosion and nonpoint source agricultural water pollution, which currently constitute serious environmental problems for mountain environments in Yunnan. This article presents recommendations based on the conclusions of the study.

Keywords: Mountain communities; tourism adoption; agricultural practices; conservation incentives; Yunnan; China.

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Introduction

For many years governments have promoted local economic growth in the mountainous area of Northwest Yunnan, a formerly peripheral area in China inhabited by ethnic minorities. The lifestyles and livelihoods of these minorities have traditionally depended on subsistence agriculture (Guo and Padoch 1995; Wilkes 2006). More recently, the region has suffered from generally depressed development; an increasing number of areas have been designated as protected land to maintain ecological functions (Yang et al 2008). Mountain farmers are therefore under pressure to provide more efficient economic and environmental services to both local and regional populations. Since the late 1990s, tourism has been regarded as an alternative form of development to address these challenges. This has shaped the position of the local authorities, who have set up a tourism-oriented community development strategy to alleviate poverty and reduce agricultural pressure on the local environment (Krongkaew 2004; Walsh and Swain 2004; Nyaupane et al 2006).

In previous studies around the world, tourism has been shown to be an additional source of income for local households (Torres 2003; Fleischer and Tchetchik 2005);

as a nonagricultural activity, it is said to reduce agricultural pressure on the environment (Kurek 1996; McGehee et al 2007). Communities that produce and sell goods and services to tourists are theoretically less dependent on agriculture (Hjalager 1996; Goodwin 2002; Stone and Wall 2004). As a result, they may divert labor from agriculture (Garcia-Ramon et al 1995; Simmons and Supri 1997; Fuller et al 2005), reduce the frequency of cultivation, or reduce their farm size (Sharpley and Vass 2006). Tourism has been shown to provide cash for farmers to adopt soil conservation measures (Marenya and Barrett 2007). These measures can directly reduce runoff, pesticides, and loss of nutrients, thus increasing soil fertility and sustaining the quality of farmland. They may also indirectly decrease environmental degradation by enabling farmers to enlarge production without cultivating or clearing new land (Forsyth 1995).

However, it is unclear what factors influence tourism adoption and to what extent tourism modifies farming practices in agricultural areas. Furthermore, the real incentives for conservation expected from tourism development have seldom been examined in the literature. Therefore, the aim of this article is to examine changes in agricultural practices induced by newly developed tourism in mountain communities in

northwest Yunnan. Using a survey at the farm household level, we first identified the factors influencing the adoption of tourism among households. We then analyzed how and to what extent tourism affected agricultural practices. The real incentives for environmentally friendly agricultural practices were also assessed by comparing the households involved in tourism with those that were not.

Methodology

Study area

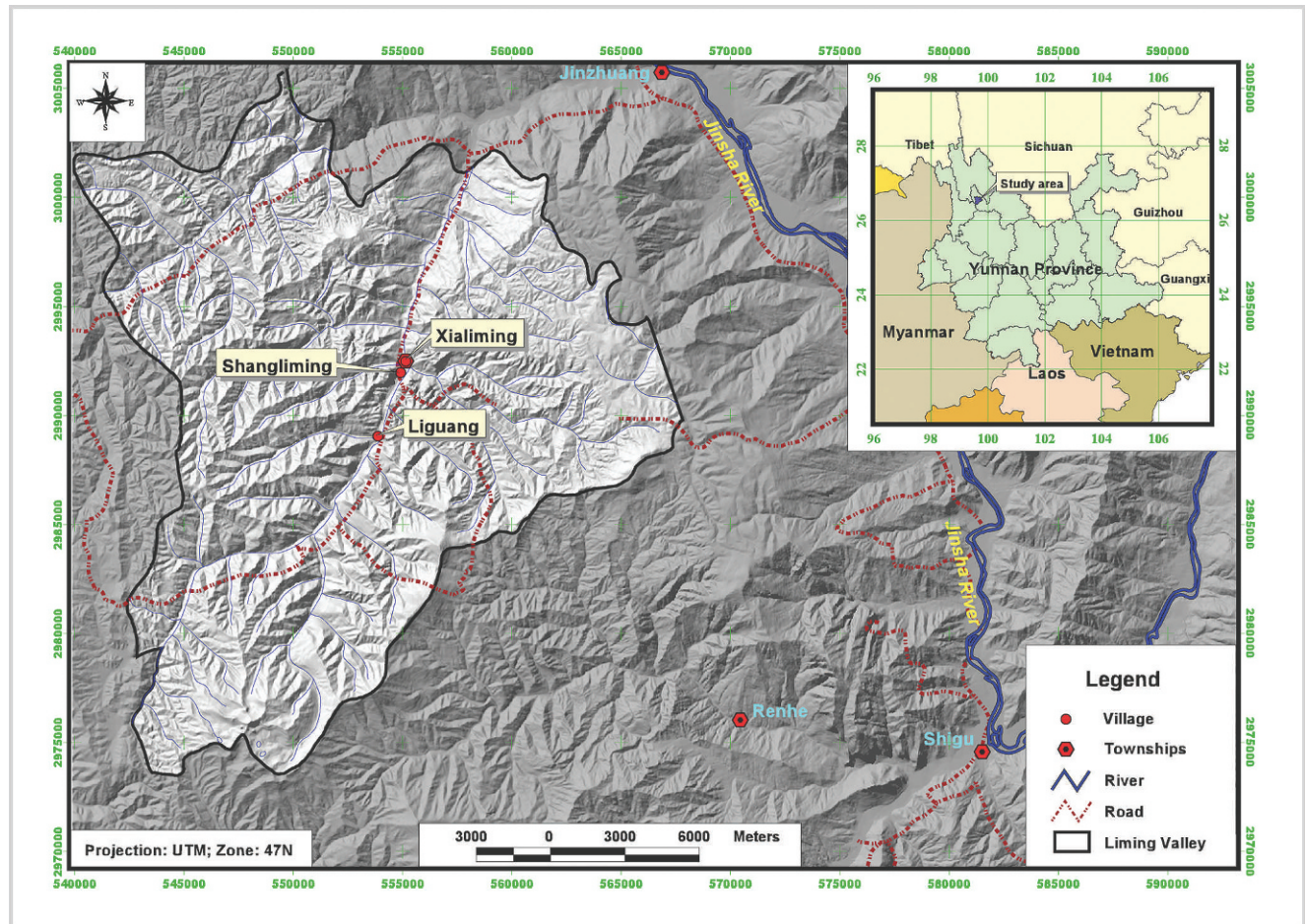
The study area is the Liming Valley ($26^{\circ}52' - 27^{\circ}08'N$; $99^{\circ}32' - 99^{\circ}43'E$), located in the Lijiang Prefecture, Northwest Yunnan (Figure 1). The valley covers 316.93 km^2 of mostly steeply sloped land. It contains 3 administrative villages and 12 functional community centers. The altitude ranges from 2145–3816 m. The average annual temperature is $8.6\text{--}13^{\circ}\text{C}$, and average annual precipitation is 900–1000 mm.

The Lisu and Naxi ethnic minorities make up 96% of the local population. Most of the residents have limited formal education and little or no experience with service sector businesses. Tourists in the valley usually stay in accommodation facilities near the valley entrance. Shangliming, Xialiming, and Liguang—3 communities near the entrance of the valley—were selected for the study (Figure 1). Households in these communities have more opportunities to be involved in tourism activities than those living deeper in the valley.

The complex topography of the valley provides opportunities for a variety of land management techniques. Farmers grow paddy rice in the lower areas near the river and corn, potatoes, and beans higher up the slopes. However, large areas of farmland are located on marginal, highly erosive land with low yields due to soil infertility or the cold climate. Crops are usually grown for household subsistence.

As of 2002, a national project, the Sloping Land Conversion Program (also translated as “Grain for

FIGURE 1 Location of the Liming Valley in the province of Yunnan, China. (Map by Zhiming Zhang)



Green”), was implemented in the valley to encourage afforestation. By providing grain or cash subsidies to farmers who plant trees in designated cropland areas, the policy aims to convert vast amounts of steeply sloping agricultural land to forest or grassland (Feng et al 2005; Weyerhaeuser et al 2005). One year later, the valley was designated as a World Natural Heritage Site owing to its biological importance as well as to geological features of high conservation value. There is a substantially limited amount of arable land available to mountain farmers, who have to bear high opportunity costs for traditional agriculture activities.

No official statistics on the number of tourists visiting the valley are available before 2003. It is assumed that several hundred tourists visited the valley each year. After recognition of the valley as a World Natural Heritage Site, a commission for tourism management was established. In 2003—the first year that statistics are available based on entrance fees—5212 people visited the valley. This is a considerable increase as compared to the several hundred estimated visitors during the previous years. In 2004, a 40% increase was noted, with 8691 arrivals despite the Severe Acute Respiratory Syndrome (SARS) epidemic in China. With 12,290 arrivals, 2005 was a watershed year for the Liming Valley; this was a 29.3% increase as compared to the previous year. It is predicted that this growth will continue during the next decade.

Data collection

The study combined qualitative and quantitative survey techniques. Agricultural and tourism-related activities were observed. Semistructured group interviews were carried out with villagers, tourism operators, and the local authorities during the period of September–October 2004, and follow-up visits were conducted in October 2005. These surveys made it possible to obtain general information on tourism-related activities and changes in the households’ agricultural practices in the valley.

In addition, structured questionnaires were completed by the heads of the households in 3 communities between October 2005 and May 2006. The questionnaire covered 6 topics (Table 1). The first addressed information on household labor structure. Household members between the ages of 16 and 60 were automatically classified as a labor force unit in the family. The second topic was household income. Income from agriculture was calculated as the total sum earned from noncash food crops, cash crops, and livestock. The third topic was information on farm size, cropping intensity, frequency of cultivation, and other agricultural practices. Cropping intensity was estimated by dividing the gross annual cropped area by net harvest multiplied by 100. The frequency of cultivation was deduced from the yearly percentage of cropland set aside for fallow. The fourth topic identified the tourism-related activities of household members if tourism had been adopted. Labor

reallocation was then measured by 2 indicators in each household: the ratio of labor to the land and of labor to tourism. The final question was related to ecological farming practices: 2 items, biofertilizer and terrace-related soil conservation measures, were surveyed.

A total of 38 households were surveyed. They represent 75% of the population in the 3 communities; a higher percentage was impossible to achieve because of some farmers’ involvement in agricultural practices far away from their farm when the interviews took place the second time. Demographic information for 3 communities was provided by the Liming township authority.

Results

Income from tourism

The main sources of income for the households surveyed were agricultural activities, collection of nontimber forest products, tourism-related activities, subsidies from the “Grain for Green” program, and external employment. On average, tourism contributed 34% of the total income of the surveyed households, making it by far the most important source of nonagricultural income. However, results also showed that income from tourism was unevenly distributed among the households (Table 2). This enabled classification of the households according to the share of tourism income. Three groups were distinguished: no income from tourism, less than 50% income from tourism, and more than 50% income from tourism (Table 3).

Only 37% of the households earned more than 50% of their income from tourism. The main activity was to rent part of the house to accommodation providers, whereas rooms were seldom rented directly to tourists. The largest group of households earned less than 50% of their income from tourism. Members of these households were most directly employed as local guides or souvenir makers, or they provided food or did cleaning work in the accommodations. Approximately 23% of the households had no income at all from tourism.

Farm size

Households involved in tourism had larger farms than households that earned no income from tourism. The average farm size per capita for those engaged in tourism was 1.06–1.08 *mu* (0.071–0.072 ha). Households not involved only had farms of 0.94 *mu* (0.063 ha) per person. This implies that adoption of tourism activities is more likely in households with initially more important land resources. Interviews also revealed that small landowners complained that they had no cash to start their own business, such as building a new house to rent or buying a horse in order to offer horseback-riding.

TABLE 1 Questionnaire structure and indicators applied for the survey.

Aspects	Indicators
Structure of household labor	◇ Age
	◇ Member's sex
	◇ Ethnic group
	◇ Educational qualification
Source of household income	◇ Cash crops/noncash crops/livestock ^{a)}
	◇ Nontimber forest products (NTFPs)
	◇ Subsidies from "Grain for Green"
	◇ Tourism-related ^{b)}
	◇ External employment (find temporal and seasonal jobs in urban/township areas)
Agriculture-related activities in household	◇ Farm size per capita
	◇ Cropland intensification
	◇ Fallow practices and frequency (summer/winter crops)
Tourism-related activities if adopted by household	◇ Accommodation and related
	◇ Local guide service
	◇ Product supplier (vegetables, fruits, souvenir, etc)
Reallocation of labor	◇ Labor-to-land
	◇ Labor-to-tourism
Adoption of environment-friendly agro-innovation	◇ Biofertilizer
	◇ Terrace-related soil conservation practice

^{a)} Calculation of cash equivalent of crops based on pricing information from *Agriculture Yearbook*.

^{b)} Refers to the sum of individual household earnings from all tourism-related activities.

Labor reallocation

Small landowners showed the highest labor-to-agriculture ratio (Figure 2). This was supported by the interviews, which showed that smaller landowners worked more and

relied on lands for their food and income. They did not have sufficient resources to hire seasonal laborers to cultivate their land, which might have enabled them to engage in tourism. The results also indicated that

TABLE 2 Income by source of origin in the surveyed households (Yuan/year).

Source	Min	Max	Standard deviation	Mean
Agriculture-related	200	18,600	3294	3810
Nontimber forest products	0	10,000	1244	2595
Subsidies from "Grain for Green"	0	7020	817	1254
External employment	0	21,000	3025	5351
Tourism-related	0	48,000	6484	9330
Total	200	50,100	14,867	11,390

Min, minimum; Max, maximum.

TABLE 3 Household category according to tourism dependency.

Category	Percentage of income from tourism	Number of households surveyed	Percentage (%)	Average total income (Yuan/year)	Average tourism-related income (Yuan/year)
H1	≥50%	13	37	17,418	12,507
H2	<50%	14	40	16,867	4597
H3	0%	8	23	7221	0

households that earned more than 50% of their income from tourism had a lower labor-to-tourism ratio than households that earned less from tourism. People in families in the latter category were often directly employed in tourism activities. On the contrary, households that earned more income from tourism were only involved in renting rooms or houses. Furthermore, they had larger farms where more labor was required.

Cropping intensity and fallow frequency

Because of the “Grain for Green” program and protection status, most of the households surveyed had experienced cropland conversion and subsequent reduction in food supply since 2002. As a result, local farmers were motivated to undertake perennial cultivation and more intensive use of their available land. But the survey showed that they had different cropping intensities and fallow frequency.

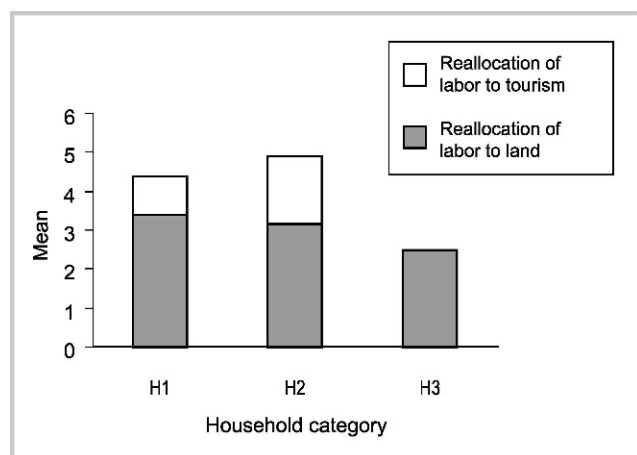
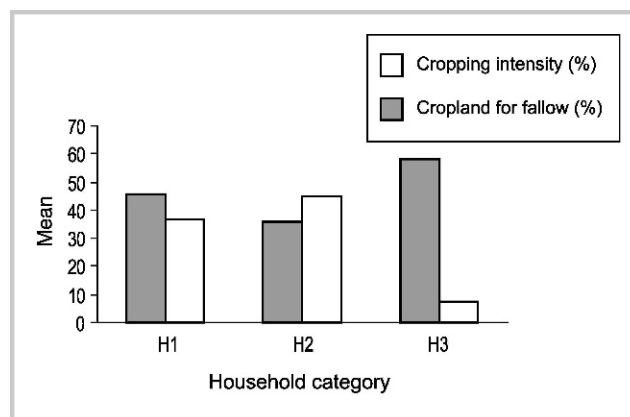
In 2005, small landowners were automatically forced to intensify agriculture on 58% of their cropland compared with 2002 (Figure 3). Households with less than 50% of their income from tourism, not surprisingly, intensified only 36% of their cropland. Respondents explained in the interviews that tourism directly required a certain amount of household labor; meanwhile, the tourism season in the valley coincided with the main agricultural season from May to October. This caused a

shortage of labor and limited the capacity for intensive land use. Responses also indicated that households that earned more than 50% of their income from tourism intensified 46% of their croplands, which was much higher than expected. This is related to the finding that their pattern of involvement in tourism was not related to labor. Moreover, additional income from tourism enabled them to hire seasonal labor from neighboring communities for agricultural activities.

In contrast to households with small farms that did not derive income from tourism, households with large farms and tourism activities tended to use fallow since 2002 (Figure 3). In 2005, only 1 of 8 of the poorest households used fallow. The survey indicates that small landowners without tourism activities used their land more frequently and had less land to set aside for fallow each year.

Adoption of ecological agricultural practices

Sloping agricultural land without any contour cultivation is quite common in the valley. This is accompanied by a high soil erosion risk. Moreover, since the “Grain for Green” program, the remaining cropland has been intensified simultaneously with increased use of chemical fertilizer for crop yield. Excesses of nitrogen and phosphorus constitute nonpoint sources of water pollution in the valley, affecting the main sources of drinking water for the lowland population. The survey

FIGURE 2 Labor allocated to agriculture and tourism in different households.**FIGURE 3** Cropping intensity and land for fallow in different household categories.

aimed to determine whether tourism development can generate incentives for local communities to adopt more ecological agricultural practices, which may mitigate these environmental problems.

The survey showed in general that the incentive for change provided by tourism was unclear. About 32% of the households increased their use of biofertilizer since 2002. Expenditure on biofertilizer varied from 100 to 800 Yuan (US\$ 12.5–100) per year in 2005. This could easily be paid for with income from tourism. However, the interviews showed that the use of biofertilizer was related more to issues of soil fertility than to available cash. Further, there was no relationship between involvement in tourism and soil conservation measures, such as terracing or other runoff management measures. Terracing was adopted by a small number of households to improve agricultural yield. Ownership of terraces was not related to the adoption of tourism.

Conclusion and recommendations

Conclusion

This study focused on 3 mountain communities in the Liming Valley in Northwest Yunnan to identify how local farmers adopted tourism, to what extent tourism changed their agricultural practices, and whether tourism development generated incentives for more ecological farming practices to mitigate local environmental problems.

Tourism increased rapidly in these mountain communities in recent years, and by 2005 more than three quarters of the households were supplementing their agricultural income by selling goods and services to tourists. Perhaps most fundamentally, tourism did not replace traditional dependency on agriculture, although tourism contributed an average of 34% of total household income. The adoption of tourism by households depends on the availability of cash and spare labor. Families with small farms and limited labor forces were unable to engage in tourism, as they did not have the necessary money to invest. Instead, they were forced to rely more on agriculture to provide for the family's livelihood. Croplands were intensified and cultivated more intensively and frequently with reduced arable land. This leads to the paradox that the households that most need to engage in tourism activities as a complement to agriculture are ruled out. Meanwhile, households that generated more than 50% of their income from tourism

did not use this as an opportunity to reduce their agricultural activities. Tourism provided complementary cash for these families to hire seasonal labor that makes it possible to cultivate more land and increases the intensity of cultivation. Tourism was less likely to stimulate local farmers to adopt more ecological cultivation measures to control soil erosion and water pollution.

Recommendations

Tourism in the Northwest Yunnan mountainous area is difficult to access for poor, small landowners who cultivate the land most intensively. At the same time, tourism development enables relatively rich, large landowners to increase their agriculture activities. The failure of tourism development to address problems of poverty and environmental problems suggests the need to reconsider the approach to use it as an alternative form of development for mountain communities. Various policy implications emerge from these results.

First, at present, if tourism is an attractive alternative option open to mountain communities, communities must be encouraged to engage more in the local tourism business and become more directly involved through labor. With comparatively advantageous effects in income and employment generation, tourism is a valid option to reduce poverty and change rural lifestyles in mountain areas.

Second, tourism is a very recent phenomenon in this area. Lack of skills and lack of education and training are the main factors affecting employment. Information and education for local residents are essential for involvement in tourism. Local residents must become an integral part of tourism and not lose control of its development in the future.

Third, local policy-makers should modify the current involvement mechanism and set up incentives that allow all community members, especially poor, small landowners, to engage in tourism. Meanwhile, they should establish opportunities to match increasing income from tourism with more ecological agriculture practices to alleviate agricultural pressure on mountain environments.

Finally, for mountain areas, the need for sustainability is more urgent than in other regions. Tourism development should be accompanied by a policy of reducing cumulative environmental impacts from traditional subsistence agriculture and newly promoted tourism development.

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