



# TOURISM AND AGRICULTURAL DEVELOPMENT IN THAILAND

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**Abstract:** The adoption of tourism by agricultural communities may increase or decrease environmental degradation by affecting the frequency of cultivation or perceived value of soil conservation. Research undertaken in a prominent "hill tribe" village in northern Thailand indicated that tourism was only adopted by those with available cash and labor, and did not present a viable alternative to agriculture. However, households which did adopt tourism increased frequency of cultivation by hiring agricultural labor and dividing land within families to maximize use of land. Tourism has, therefore, been unavailable to the poorest small landowners who most need a new source of income, but it has generally increased frequency of cultivation among those who have adopted it. **Keywords:** ethnic tourism, environmental management, economic innovation.

**Résumé:** Tourisme et développement agricole en Thaïlande. L'adoption du tourisme par les communautés agricoles peut accélérer ou ralentir la dégradation de l'environnement en affectant la fréquence de cultivation et la valeur perçue de la conservation de la terre. Des recherches entreprises dans un village montagnard important du nord de la Thaïlande ont indiqué que le tourisme a été adopté par des foyers ayant suffisamment de travailleurs et d'argent, et ne présentait pas d'alternative viable au travail agricole. Mais ces foyers ont accéléré la fréquence de cultivation en embauchant plus d'employés et en distribuant la terre parmi les familles pour maximiser la cultivation. Le tourisme est donc resté inaccessible aux plus pauvres tout en augmentant la fréquence de cultivation parmi ceux qui l'ont adopté. **Mots-clés:** tourisme ethnique, gestion de l'environnement, innovations économiques.

## INTRODUCTION

Much of the debate concerning tourism's impact on the environment in developing countries has focused on direct, visual impacts such as hotel construction, pollution, or footpath erosion (Jenner and Smith 1992; Lea 1989; Mathieson and Wall 1982; Pearce 1989). However, in locations where tourism is still growing, it also has indirect impacts on the environment by acting as a substitute for traditional economic activities. Where tourism is adopted as a new occupation by agricultural communities, its indirect impact on the environment may be greater than more obvious direct ones (Cater 1991; Cohen 1978; Momsen 1986).

Tourism offers an alternative source of income to agriculture, and such non-agricultural trade flows have been claimed to reduce

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agricultural pressure on the environment (Barbier 1989; Fürer-Haimendorf 1975; Laarman and Durst 1992; Thompson, Warburton and Hatley 1986). Communities who produce and sell goods and services to tourists are theoretically less dependent on agriculture, therefore, they may reduce the frequency of cultivation or practices of agricultural expansion like deforestation. Tourism also extracts labor from agriculture and provides cash for farmers to adopt innovations like fertilizers. Such innovations may decrease environmental degradation indirectly by enabling farmers to enlarge production without increasing frequency of cultivation or clearing new land (Boserup 1965; Geertz 1966; Hutanaserani and Roumasset 1991).

Tourism may also increase agricultural pressure on the environment. The existence of an alternative source of income to agriculture may decrease the perceived opportunity cost of land and, therefore, encourage farmers to neglect soil-conservation measures, or adopt exhaustive short-term cultivation. Extraction of labor from agriculture may also remove farmers skilled in land management (Barrios and Barrios 1990). In addition, the adoption of agricultural innovations has been shown generally to be limited by household differences in farm size, land quality, or labor supply, and thus not available to all farmers within a community (Barker and Herdt 1985; Cornia 1985; Hayami and Ruttan 1985; Rigg 1985, 1986).

Evidence for impacts of tourism upon agricultural practices varies. In the Khumbu region of Nepal, for example, agricultural production declined after the growth of tourism, and tourism attracted at least one individual from each household for up to 10 months a year (Bjønness 1984:269). However, the success of tourism here has been claimed to be partly a result of the trading spirit of the local Sherpa people and the fortuitous rise of tourism after the closure of traditional trading links with Tibet after the Chinese occupation in the 1950s (Eppler 1988:252). Furthermore, the environmental impacts of tourism through agriculture also depend on the nature of agricultural practices used. Groups practicing sustainable techniques, such as crop rotation and fallow, have been classified as "ecosystem people", compared with "biosphere people" who use land exhaustively (Dasmann 1976). Hence the environmental impact of tourism is likely to vary between "ecosystem" and "biosphere" people, as well as between "adventurous traders" and "cautious cultivators" (Forsyth 1991; Thompson et al 1986:98).

In the long-term, the ability of local communities to profit from tourism may decline as control passes to large business concerns. Butler's (1980, 1991) model of Tourism Area Cycles points to a life cycle of tourism including stages of exploration, involvement, development, consolidation, and then stagnation, decline, or rejuvenation. As mass tourism develops in one location, smaller forms of tourism will locate elsewhere, and direct impacts of tourism on environment from causes like construction and pollution will increase. A similar outcome has been predicted for all trade flows (Blaikie and Brookfield 1987). The extension of national or international economic systems into previously-remote zones has been

claimed to marginalize land and people as control over the zone passes into outsiders' hands. The result is an increase in degradation as soil-conservation measures are no longer valued by the wider economic system, and as the needs and knowledge of local inhabitants are not reflected by the form of development taking place. Local communities need to maintain control of the trade flow in order to maximize positive impacts on environment and development.

Northern Thailand provides an opportunity to identify how the adoption of tourism impacts on environment. Tourism has grown rapidly in recent decades in a region characterized by forested mountains and a cultural landscape featuring "colorful" ethnic groups from Burma, China, and Laos. Upland agriculture by these groups has been blamed for deforestation, soil erosion, and damage to watershed properties. In response to this, Thai authorities have encouraged hill farmers to adopt soil-conservation measures and alternative sources of income to agriculture. This paper describes research to assess how the adoption of tourism may increase or decrease exhaustive agricultural practices. Fieldwork was based in one village in Chiang Rai province, northern Thailand, where inhabitants sold goods and services to tourists as an additional income to agriculture. Tourism was at a stage when land ownership by organizations outside the village was just beginning. Research identified the factors influencing the adoption of tourism within the village, and compared the agricultural activity of households dependent on tourism with those with no dependency on tourism.

## TOURISM AND AGRICULTURE IN NORTHERN THAILAND

Northern Thailand is located approximately from 17° and 21° North and 97° and 101° East between Burma and Laos (Figure 1). The census definition of northern Thailand comprises some 16 provinces, although most research features the so-called "Upper North" of provinces, Chiang Mai, Chiang Rai, Mae Hong Son, Nan, Lamphun, Lampang, Phrae, and Uttaradit. The regional capital is Chiang Mai. Historically, northern Thailand was the site of the first Tai kingdoms in intermontane basins at Chiang Saen, and notably at Chiang Rai in 1262 and Chiang Mai in 1292. However, the early dominance of the north was gradually lost to larger kingdoms further south, contemporaneously at Sukothai, and later at Ayuthaya, Thonburi, and Bangkok. Northern Thailand, or Lan Na Thai, became known as a remote, unsettled region, and was only fully integrated into the new Thai state in 1939 (Wyatt 1984).

Ethnically, northern Thailand is commonly divided between the lowland intermontane basins inhabited by the Tai, and the surrounding mountains inhabited by ethnic minorities (Leach 1954; McKinnon and Bhuksasri 1983; Van Roy 1971). The minorities may be divided into those that predate the Tai, such as the Lawa, Khamu, and Karen, and those who have migrated into Thailand since the last century, such as the Akha and Lisu from Tibet and Burma, or the Yao and Hmong from Central China. In total, there are about

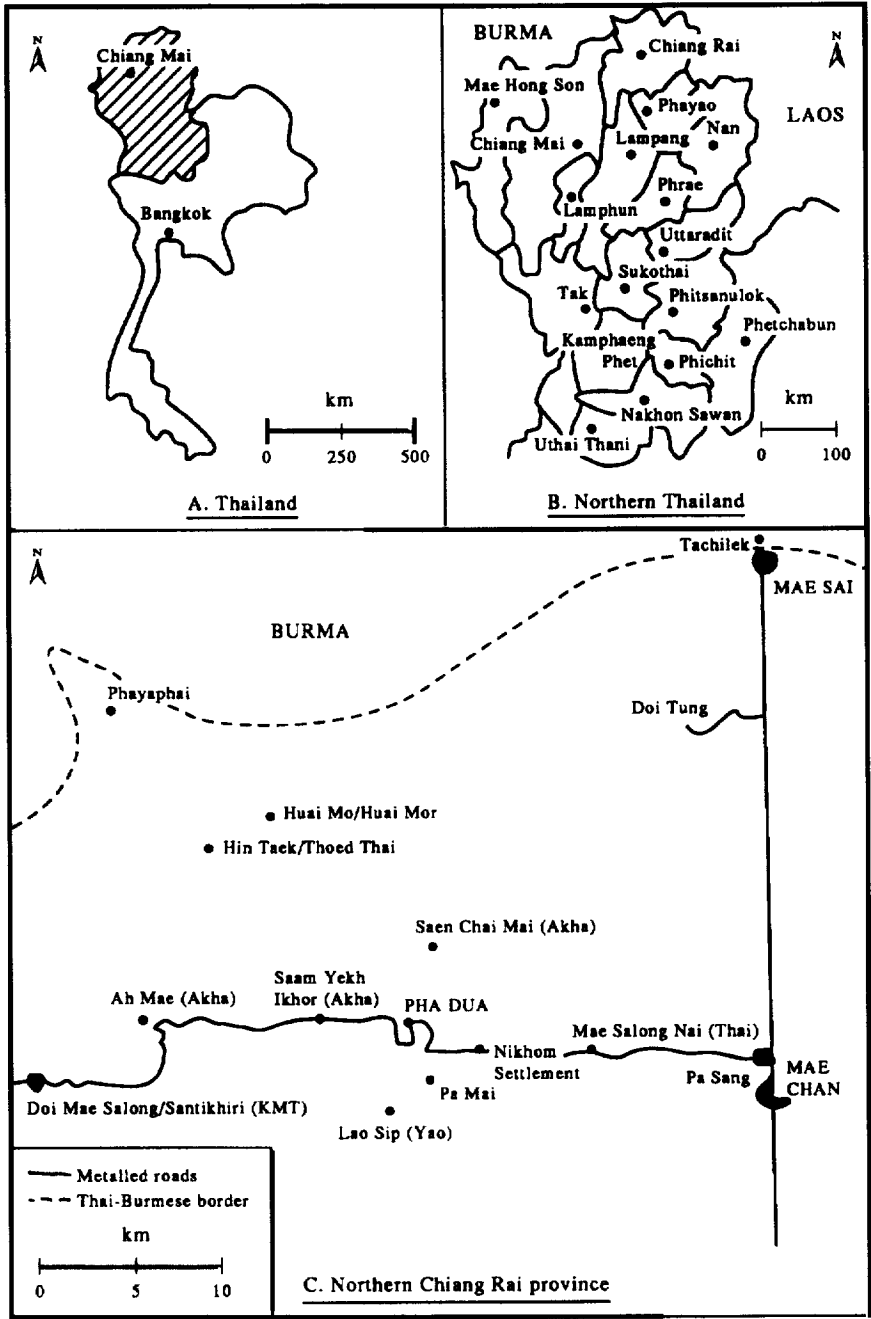


Figure 1. Location of Research

0.6 million members of ethnic minorities in northern Thailand, compared with some 13 million Thai (McKinnon and Vienne 1989:425). There has been a history of resentment of hill people by the lowland Tai for centuries (McKinnon 1983; Kesmanee and McKinnon 1986). However, conflict reached a peak during the Vietnam War when hill people were feared to be communist, or using profits from opium cultivation to buy guns (Brimmel 1959; Crooker 1988; Kerdphol 1986; McCoy 1972; Walker 1991; Wilson 1960). Sporadic fighting throughout northern Thailand between 1968 and 1973 became known as the "Hmong War" (Tapp 1986, 1989). Even today, the strategic control of land near the Burmese and Lao borders is seen as a major concern of the authorities.

There has also been resentment of hill people for environmental reasons. Environmental degradation in northern Thailand may be divided broadly between problems of declining soil fertility in the uplands, and of sedimentation and water shortage in the lowlands (Kunstadter, Chapman and Sabhasri 1978; Ives, Sabhasri and Voraauri 1980). Both sets of problems have traditionally been blamed on upland shifting cultivations (Kaye 1990; Moerman 1968; Oughton 1971; Pendleton 1939; Warrington Smyth 1895), although recent research suggests that both sedimentation and water shortages may in fact be naturally occurring or related to road construction (Alford 1992; Forsyth 1994; Hamilton and Pearce 1988; Ives and Messerli 1989:81; McKinnon 1986).

Shifting cultivation in northern Thailand has been classified into "rotational" and "pioneer" techniques (Grandstaff 1980). Rotational cultivators, such as the Karen, generally use long fallow periods to maintain soil fertility around villages that remain located at the same site on a semi-permanent basis. Pioneer cultivators, such as the Hmong, have tended to use land repeatedly for 10–20 years before relocating villages to a new site (Cooper 1984; Geddes 1976). The two groups may be described respectively as northern Thailand's "ecosystem" and "biosphere" people (Dasmann 1976; Grandstaff 1979). However, in recent decades, a shortage of land has resulted from rapid population growth and the rise of new intended land uses for mountainous areas (Table 1). New land uses include industrialized agriculture producing export crops like strawberries or flowers, or non-agricultural activities such as international or domestic tourism, often featuring the construction of second homes in the mountains by wealthy Bangkok Thais. Such new demands on land have affected traditional agriculture by reducing the the supply of land, and by offering a new, higher rate of return possible from plots. Fallow periods have decreased in length, and pioneer shifting cultivation has effectively ceased because there is no new land for relocating villages. Many historic pioneer cultivators are now forced to farm the same land permanently, and are thus experiencing long-term problems of declining soil fertility for the first time.

Environmental policy in northern Thailand has aimed to replace opium with high-value export crops like cabbages and strawberries, and to maintain soil fertility by introducing grass strips or nitrogen-fixing plants (Kaye 1990; Tangtham 1991). In extreme cases,

**Table 1. Growth of Population and Non-agricultural Employment in Chiang Mai and Chiang Rai Provinces (1960 to 1990)**

| Year | Chiang Mai Province     |  | Chiang Rai Province      |                             |
|------|-------------------------|--|--------------------------|-----------------------------|
|      | Population <sup>c</sup> | Non-agricultural Employment <sup>a</sup> | Population <sup>bc</sup> | Non-agricultural Employment |
| 1960 | 0.80                    | 21%                                      | 0.60                     | 10%                         |
| 1970 | 1.03                    | 23                                       | 0.75                     | 9.5                         |
| 1980 | 1.15                    | 34                                       | 0.90                     | 14                          |
| 1990 | 1.37                    | 41                                       | 1.05                     | 20                          |

<sup>a</sup> Non-agricultural activities are classified as all activities outside agriculture, forestry, fishing, hunting, and mining. Figures are based on working population over the age of 11 years (13 years for 1990).

<sup>b</sup> Chiang Rai population statistics do not include the area separated to form Phayao province in 1977. All figures are for Thai citizens only, and do not include ethnic minorities.

<sup>c</sup> In millions.

Source: National Statistical Office censuses.

villages have been resettled from zones identified as susceptible watersheds (RFD 1993; Tangtham 1988), although critics claim the classification of watersheds to be scientifically inaccurate and focusing only on areas of historic insurgency (Bo Gua 1975; Cohen 1981; Forsyth 1992; Hearn 1974; Maathuis 1990). An alternative form of environmental management has been the encouragement of non-agricultural income like tourism.

Tourism has grown rapidly in northern Thailand during the last 20 years, particularly after *Visit Thailand Year* in 1987 (Table 2). At first, tourists came to trek between mountain villages and see the so-called "hill tribes". Advertising presents the "tribes" as "primitive and remote", because many still wear traditional dress and live in villages without electricity or piped water (Cohen 1983, 1989). Treks offer an all-round adventure experience also including river rafting, elephant rides, and, unofficially, the chance to smoke opium and even heroin (Dearden 1994). Most recently, however, tourism has developed to a stage of mass consumption featuring luxury hotels, resorts, and golf courses. Domestic tourism and the construction of second homes in northern Thailand has boomed as a result of Thailand's recent prosperity, plus the combination of cool air and cheap land in the mountains. Perhaps most representative of this change towards internationalization and luxury is the construction of the Golden Triangle Paradise Resort at the exact meeting place of Burma, Laos, and Thailand on the River Mekong. The resort, which is rumored to be also a casino, is being built on Burmese territory with financial backing from Thailand and Japan.

The rapid growth of tourism has raised fears of cultural damage among the hill people (Cohen 1979, 1983, 1989; Dearden 1988, 1991, 1994; Dearden and Harron 1992; Ekichai 1990; Michaud 1993; Seewuthiwong 1989). However, the environmental impact is also far

**Table 2. Tourist Arrivals in Chiang Mai City, Northern Thailand  
(in millions)**

| Year | Domestic Tourists | Foreign Tourists | Total |
|------|-------------------|------------------|-------|
| 1983 | 0.389             | 0.145            | 0.534 |
| 1987 | 0.475             | 0.352            | 0.827 |
| 1991 | 1.320             | 0.414            | 1.734 |

*Source:* Tourism Authority of Thailand.

from clear (Brockelman and Dearden 1990; Elliott 1993; Parnwell 1993). Between 1970 and 1980, the Thai population of northern Thailand grew by 21%. During the same period, the proportions employed in non-agricultural manufacturing and services rose by 44% and 65%, respectively (National Statistical Office 1970, 1980). Real estate prices are poorly regulated (Hirsch 1990), but as an indication of the boom in land speculation, government income from stamp duty on land transactions in Chiang Mai and Chiang Rai provinces rose by 72% and 55%, respectively, between 1988 and 1989 (Bangkok Bank Monthly Review 1990 February: 73). These changes in land pricing and the size of the non-agricultural sector are likely to have indirect environmental impacts.

#### *Pha Dua and the Yao*

Research was conducted in the Yao village of Pha Dua, in the Mae Chan district of Chiang Rai province, at 20° 10' North and 99° and 45° East. Pha Dua was selected after reconnaissance to find a village where there was evidence of exhaustive agricultural practices, and where the villagers were clearly involved in selling goods and services to tourists. Chiang Rai is the most northern province in Thailand, and has been subject to influxes of pioneer shifting cultivators in recent decades, particularly Akha and Yao. Chiang Rai is also a major growth area for tourism. The years 1990 and 1992 were named as *Visit Chiang Rai Years* by the Thai Tourist Authority. An international airport at Chiang Rai was completed in mid-1992.

The Yao of Thailand, or Lu Mien, are historically pioneer cultivators who relocate villagers every 10–20 years (Miles 1972; Lemoine 1982; Hu Qiwang 1991). They number about 36,000 in Thailand, or about 7% of northern ethnic minorities (McKinnon and Vienne 1989:425). In general, the Yao are known as “adventurous traders,” showing commercial skills in opium trading, and attaching much symbolism to the ownership of silver (Kandre 1967; Miles 1972). Pha Dua (or Phalae) was founded in 1947 by a small groups of Yao from Muang Meung in Huai Sai province of northern Laos. They migrated to Thailand to avoid taxes and persecution by Communist Pathet Lao forces. The settlement grew quickly from 10 households (110 people) in 1947 to approximately 118 households (900 people) in 1991 (Chamlong 1987; Forsyth 1992, 1993; Kandre 1967; Kandre

and Leh 1965; Shiratori et al 1973). "Household" is taken to mean a discrete family unit, although in some large houses two or three households lived under the same roof when closely related.

At first, the Yao intended Pha Dua to be a settlement for no more than 20 years. However, relocation was made difficult by the shortage of land elsewhere, and by commercial advantages to the existing site that developed from its location close to the lowlands and following road construction in 1968–69 and 1982–83. During the 60s, Pha Dua became a trading post for opium following the establishment of Chinese Kuomintang (KMT) forces at Doi Mae Salong and Huai Mo (Figure 1). These forces were allowed to trade opium in return for resisting infiltration by Communism (Bo Yang 1987; Forbes 1987; Grandstaff 1979; Hill 1983; McCoy 1972:315; Walker 1991). However, the dominance of the KMT ended following the completion of a road from Mae Chan to Doi Mae Salong in 1972–73, and the enforcement of the 1959 ban on opium production in Thailand (McCoy 1972:316). Pha Dua was no longer allowed to grow opium. But the existence of the road increased the opportunity to trade agricultural goods, and also introduced tourists. Now, Yao women from Pha Dua, wearing traditional crimson and indigo robes and turbans, are featured on postcards of northern Thailand, and the village is a popular staging post for coach trips to Mae Sai, Chiang Saen, or Doi Mae Salong. Villagers sell cheap souvenirs at stalls, or transport tourists in pick-up trucks (Forsyth 1993).

During the peak in the tourism season of December and January, up to 300 tourists may visit Pha Dua every day. However, this falls to less than 50 during June and July (Figure 3 below). During 1990 to 1991, the annual volume of tourists to this village of 900 people was estimated at 40,000 (Forsyth 1992:172), although this has fallen since then because of the impact on tourism caused by the 1991 Gulf War and the May 1992 massacre of demonstrators in Bangkok. The nature of tourism in Pha Dua is gradually changing to high value resorts outside the control of the local people as predicted by Butler's (1980, 1991) model of tourism area cycles. Trekking tourism, featuring long walks through hill country, ended in the early 1980s. In mid-1994, the first luxury resort on agricultural land once partly owned by Pha Dua was constructed for Thai tourists, although just offering about 20 rooms. Other offers by Taiwanese resort developers to buy land at Pha Dua have been turned down.

Today, the village is still largely dominated by the original founding families, who have more power and respect in the village than families arriving more recently. One such powerful family has already provided three village headmen since 1947, and is likely to provide more as sons grow older. The older families live in the center of the village close to the historic location of the village market and central roadway. They live in large wooden houses and sometimes operate a small shop selling drinks to tourists or food and toiletries to neighbors. Other villagers tend to live further from the center of the village and in houses made of mud and bamboo. Such households are the young sons and daughters of old families now living on their own, or are recent immigrants to Pha Dua from Laos. Many



recent arrivals cannot speak Thai and are still not familiar with Thai culture or business opportunities available in Thailand. Since the late 80s, immigration into Thailand has been restricted, and a small proportion of Pha Dua's newest arrivals are likely to be illegal immigrants less willing to become integrated with Thai society.

The older families tended to own more land than newer arrivals. However, they did not always own the best agricultural land. Some heads of families complained that new arrivals to Pha Dua in the early 70s effectively stole land from the older families by identifying the most productive land and staking a claim to it. This began the demarcation of land between households, and now all land farmed by Pha Dua is clearly defined between different households. Before the 70s, land was not perceived as being in short supply, and families shared farm plots on a rotational basis (Forsyth 1994). Farm sizes in Pha Dua varied between 5 and 100 rai (1 rai = 1,600 m<sup>2</sup> = 0.16 ha) for individual households, although the most typical sizes were between 20 and 50 rai. Households with the largest farms were typically older men with no sons to whom they could pass the land. Yao culture forbids women to own land, but women were obviously involved in the commercial management of households, and almost always operated tourism stalls while men worked in the fields or drove pick-up trucks.

At the time of research, farmers at Pha Dua grew rice, maize, and soya, sometimes supplemented by ginger, peanuts, coffee, and citrus fruits, but very few cattle. Land was said to be in short supply, especially after the establishment of a village woodlot in the early 70s. Fallow periods had declined from a claimed 7–10 years then to an average 3.5 years in 1991. However, only 39% of farmers questioned used fallow, and this was for just 20% of land, after an average cultivation period of 4 years.

### *Research Aims and Methods*

Research aimed to identify the factors affecting the adoption of tourism, and how tourism then impacted on agricultural practices in a way to affect soil fertility. The research was part of a Ph.D. project and visits were made to Pha Dua between March 1990 and September 1991. Follow-up visits were made in 1993 and 1994. The researcher immersed himself in the village by living with three families in one large house belonging to an ex-headman and religious leader. Altogether about six months were spent living in Pha Dua, with the maximum length of one stay being a month. Thai language was studied for a year before the start of field research.

Research combined qualitative and quantitative techniques of social research. Qualitative participant observation and discussions with villagers were considered the most important source of information (Chambers, Pacey and Thrupp 1989; Geertz 1973; Walker 1985). An introduction was sought to the village with the help of a local developmental organization for hill people (MPCDEP, Chiang Mai), which identified key informants and a house to stay in. Further key informants were identified and all questioned at length during each stay. Agricultural and touristic activities were observed, and

group discussions on tourism and agriculture prompted. All discussions were conducted by the researcher in Thai, with the occasional help of an interpreter between Thai and Yao language (*Iu Mien wa*). The researcher made his presence known in the village for some weeks before attempting to question more than key informants. Villagers were assured that research did not aim to assess illegal activities such as logging or drugs.

In addition, quantitative semi-structured questionnaires were carried out on tourism-stall operators and household heads (Bulmer and Warwick 1983; Casley and Lurey 1987; Dixon and Leach 1984). Questionnaires were intended to provide empirical measurements of economic behavior and also to enable the testing of relationships between physical environment and economic behavior which were not obvious to informants. One of the assumptions of research was that some impacts of economy on environment may not have been immediately obvious to the Yao because of the newness of the concept of land ownership, and their historic status as "biosphere" people and pioneer shifting cultivators.

Households answering questionnaires were classified according to farm size, frequency of cultivation, and dependency on tourism. Information was also sought on household wealth and labor supply. The index used to measure frequency of cultivation was whether households used fallow on a regular basis or not. Dependency on tourism was classified into three groups: 0%, less than 50%, and more than 50% of household income. Household income was considered to be the total of money from tourism, cash crops, and the calculated value of non-cash food crops. Information on household labor supply was also sought. A random sample of 63 out of 118 household heads were questioned, and all 46 tourism-stall operators at the time of research.

Different households were then compared using statistical tests to show the probability of samples being drawn from statistically similar or different populations. It was acknowledged that questionnaires, especially concerning figures of income or expenditure, are notoriously inaccurate in assessing cultures such as the Yao. However, it was hoped that this technique would supplement the qualitative information from informants and observation rather than replace this. Questionnaires were designed with the help of informants, and provided several chances for villagers to speak freely on the key topics of research. Quantitative figures of money were checked (anonymously) with key informants for general accuracy.

The chi-square and *t*-test statistical tests were used to determine the probability of random samples being drawn from same or different populations. The chi-square is a non-parametric test to judge how closely a set of observed frequencies corresponds to a given set of expected frequencies, assuming no relationship between the samples. The chi-square test was used on indexes such as dependency on non-agricultural income which were divided into categories (Norcliffe 1982:98–102). The *t*-test is a parametric test measuring differences or similarities between samples by assessing differences in the means of each sample. The *t*-test also uses interval-scale data

with precise numerical values, which are assumed to be normally distributed. In Pha Dua, the *t*-test was used on farm size data, assuming that farm sizes were normally distributed. Commonly, the probability level of 95% is used with both tests to indicate when an observed difference between samples is statistically significant (Norcliffe 1982:131–156).

### *Study Findings*

Tourism was by far the most important source of non-agricultural income at Pha Dua. Approximately 70% of households sold goods at tourist stalls, and 15% owned pick-up trucks used to transport tourists as well as agricultural produce. There were also three small shops selling cold drinks to tourists and one selling Yao silver goods imported from Yao villages in Nan province. Women from Pha Dua travel to Tachilek in Burma between one and five times a month to buy souvenirs to sell, and to a market in Laos once or twice a month. Some women sell traditional embroidered fabrics or hats for children which they make themselves. Occasionally, valuable antiques are bought from relatives in Laos to be sold at Pha Dua.

Questioning of stall holders and information revealed that claimed monthly cost of buying goods for stalls (in 1991) varied between 1,000 baht (\$40) and 3,500 baht (\$140), with an average of approximately 2,200 baht (\$88). This figure was, therefore, the average cost of entry to the tourism market, and later questioning revealed that this provided a barrier to some households who were short of money. Monthly profits from stalls were claimed to be an average 840 baht (\$34). Profits varied according to proximity to the main gate, and diligence of individual stall holders: claimed profits varied between 2,000 baht (\$80) and 2500 baht (\$10) a month. Average monthly profits from pick-up trucks was claimed to be an average 4,200 baht (\$168), but this could double once instalments on the purchase price were fully paid, typically after four years. Ownership of trucks had risen markedly after the completion of a metalled road to Pha Dua in 1982–83.

Although Pha Dua appears to most visitors as a village totally dependent on tourism, this activity was not evenly distributed within the village. Only 15% of all households earned more than 50% of their total income from tourism, and these were virtually all truck owners. The largest group of households were in the second category of dependency on tourism, earning less than 50% of household income this way. Some 30% of households questioned earned nothing from tourism. Household income grew rapidly with dependency on tourism. Average cash incomes per year from pick-up trucks were 50,000 baht (\$2,000) compared with about 17,000 baht (\$680) from operating tourism stalls. All households questioned sold cash crops, which also earned an average 17,000 baht (\$680) a year.

In total, tourism only contributed an average of 25% to total household income throughout Pha Dua (Table 3). Informants confirmed that this was insufficient to challenge the role of agriculture in household income. This was even true of households who

**Table 3. Income Received Per Sector at Pha Dua (summary of information from sample of 62 households)**

| Sector:   | Non-cash Crops | Cash Crops | Non-agricultural Income |
|---|----------------|------------|-------------------------|
| <b>A. Total Income in Baht:</b>                       |                |            |                         |
| Households  | 61             | 62         | 43                      |
| Minimum   | 2,000          | 2,500      | 2,000                   |
| Maximum   | 61,400         | 55,000     | 135,000                 |
| Std.deviation   | 11,430         | 10,100     | 27,700                  |
| Mean  | 16,300         | 17,100     | 23,300                  |
| <b>B. Average Percentage Contribution of Sectors:</b> |                |            |                         |
| Households ( <i>n</i> )                               | 62             | 62         | 62                      |
| Minimum   | 0              | 6          | 0                       |
| Maximum   | 82             | 91         | 83                      |
| Std.deviation   | 17.5           | 20.4       | 24.5                    |
| Mean contribution                                     | 35.5           | 40.2       | 24.3                    |

*Sources:* Questioning of farmers, Pha Dua, 1991; calculation of cash equivalent of food crops based on pricing information in Department of Agriculture yearbooks; non-agricultural income is defined as the sum of individual household earnings from stalls, pick-up trucks and shops.

earned more than 50% of income from tourism. All but two of these said that they could not survive without the income from agriculture, while the two who suggested they could said the standard of living would be unacceptably poor. These households tended to be from the oldest families in the village who had helped found Pha Dua. The majority of the group with no dependency on tourism were recent immigrants to Pha Dua who lived some minutes walk away from main street where tourists came, and who were poorer than the older families.

Most importantly, however, farmers admitted that the stalls were only adopted when they did not extract labor from agriculture. Contrary to expectations, as discussed later, agriculture was more likely to extract labor from tourism than vice versa. The main limitations on adopting stalls were shortages of cash to buy goods (48% of those questioned) and labor which was free from agricultural work (33%). Previous questioning had revealed that the average monthly costs of running a tourism stall were 2,200 baht (\$88) a month. Some other farmers (14% of those questioned) also believed that stalls offered too low a rate of economic return, or that they had no need for stalls (5%). Further insights were provided by statistical tests. A *t*-test conducted on average farm sizes showed that households involved in tourism were more likely (to a confidence level of 99%) to have larger farms than households with no tourism. The average farm size for those with tourism was 44 rai (7 ha), compared with 27 rai for those without (4.3 ha). This implies that the adoption of

non-agricultural income is more likely in houses with initial resources for creating wealth.

A separate study in northeastern Thailand of Thai farmers, however, reached a different conclusion (Rigg 1987). Analysis of economic innovation among lowland Thai farmers showed that non-agricultural innovation was encouraged by a shortage of land. Farmers without a guaranteed agricultural income adopted non-agricultural activities because there was no other means of making money. But farmers in Pha Dua explained that a shortage of land meant that they had no cash income to buy souvenirs to sell or pick-up trucks. The different conclusions show that cash incomes are much easier to come by and to adopt for Thai farmers in northeastern Thailand than for farmers of an ethnic minority in the northern mountains.

In addition, information was sought on the importance of labor supply. The Yao have a highly developed culture of sharing labor between households to create so-called *peo* units (Miles 1972). Furthermore, they have a tradition of buying children from other ethnic groups in order to supplement household labor (Kandre 1971). At Pha Dua, 77% of households hired seasonal labor from within the village or from neighboring Akha villages to tend fields. Some households adopted Akha or Thai children to do menial work while their own Yao children attended school. Predictably, the largest farm owners hired the most labor (confirmed by a *t*-test of confidence level 99.9%).

The results indicate that poorer farmers do not adopt tourism because they do not have sufficient cash to buy goods or hire labor to allow them to operate stalls. However, there was evidence to suggest that these farmers also cultivated land most frequently. Research from different locations has concluded that small landowners tend to use land more frequently than larger landowners because they have less land to leave fallow each year, and also have a higher labor-to-land ratio (Cornia 1985; Chalamwong 1986; Feder *et al* 1988; Hirsch 1990:227). This was supported at Pha Dua by comments of farmers who said smaller landowners preferred to work hard at agriculture in order to become rich. A *t*-test on farm size and use of fallow generally indicated that smaller farm sizes tended to use less fallow (confidence level 80%). Therefore, generally in Pha Dua, tourism is unavailable to poor households with small farms, who also need to cultivate land most frequently.

In the introduction it was stated that tourism could affect agricultural practices by reducing the need for frequent cultivation; by altering perceived opportunity cost of land; by extracting labor; or by providing funds to adopt agricultural innovations. Results indicated that tourism did not reduce the need for agriculture because it contributed just an average 25% to household income (Table 3). About 15% of households earned more than 50% of total household income from tourism, but even these said that they could not survive without agriculture. Statistical tests between indexes of dependency on tourism and frequency of cultivation also showed a lack of relationship, confirming that the adoption of tourism in Pha

Dua has not reduced agricultural activity. However, there was also evidence that the adoption of tourism increased frequency of cultivation. There was no evidence to suggest that tourism had led to a reduction in fallow of large landholders. But an analysis of small landowners showed that farmers with both small farms and tourism tended not to use fallow.

A group of 25 landowners with farm sizes of 30 rai or less were selected for questioning. Thirty rai was chosen because the average farm size of households without tourism was previously shown to be 27 rai. A chi-square test comparing dependency on tourism with frequency of cultivation was impossible because too few households in this group used fallow to make the test operable. However, of the 25 in the group, four who owned pick-up trucks all hired agricultural labor and used no fallow periods. Of 11 farmers identified as the poorest in the group, seven did use fallow. These findings show that small landowners with tourism use land more frequently than those without tourism. They indicate that farmers with an alternative source of income to agriculture do not take the opportunity to relax frequency of cultivation by introducing fallow periods. Therefore, it appears that tourism has reduced the perceived opportunity cost of land to those farmers with income from both agriculture and tourism.

This group of small landowners with tourism were the sons of the large, old families that helped establish Pha Dua. Such farmers were generally innovators and well-adapted to trading in Thailand. The families also tended to divide land between different sons according to their personal ambitions to be specialized in tourism or agriculture. Sons choosing tourism received only small farm sizes and then used their land totally every year. The possibility for tourism to impact on environment was thus greatest among this group of small landowners.

The adoption of tourism over time by Pha Dua's largest families has led to a new group of small landowners who have deliberately chosen to have small farms but greater involvement in tourism. This has not decreased frequency of cultivation as might have been thought. Research elsewhere suggests that hiring of labor by these rich small landowners may also increase frequency of cultivation by reducing the "drudgery" associated with agriculture when conducted by household members who feel they have no choice but to do such work (Chayanov 1966; Durrenberger and Tannenbaum 1992). Figure 2 indicates observed relationships in the form of a flow diagram. Tourism stalls were only adopted when they did not interfere with agriculture. Some stallholders admitted that they only set up shops as an occupation for aged parents. Furthermore, the low point in the tourism season coincided with the main planting season of June and July (Figure 3). To date, there has been no seasonal migration of labor from Pha Dua, and hence no physical removal of skilled agricultural labor from the fields.

The impact of tourism on agricultural innovations was less clear; however, Weedkiller had been used since the early 80s and by 1994 was used by an estimated 90% of households. Fertilizer had only been used since 1990, but by 1994 was used by an estimated 75% of

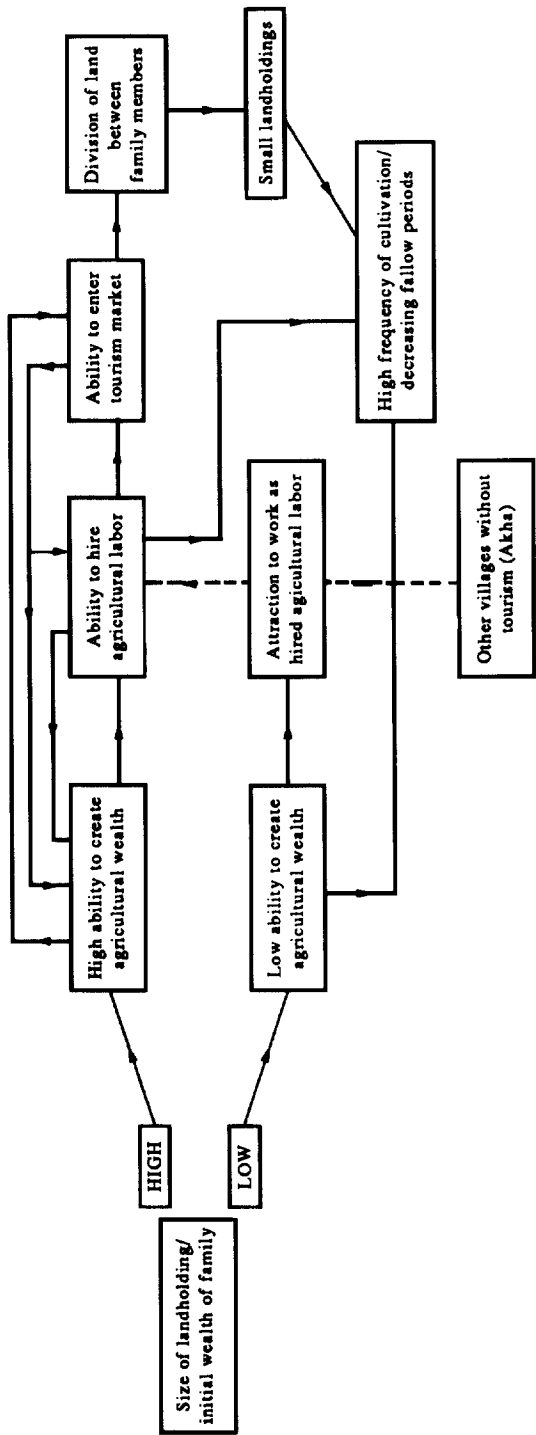
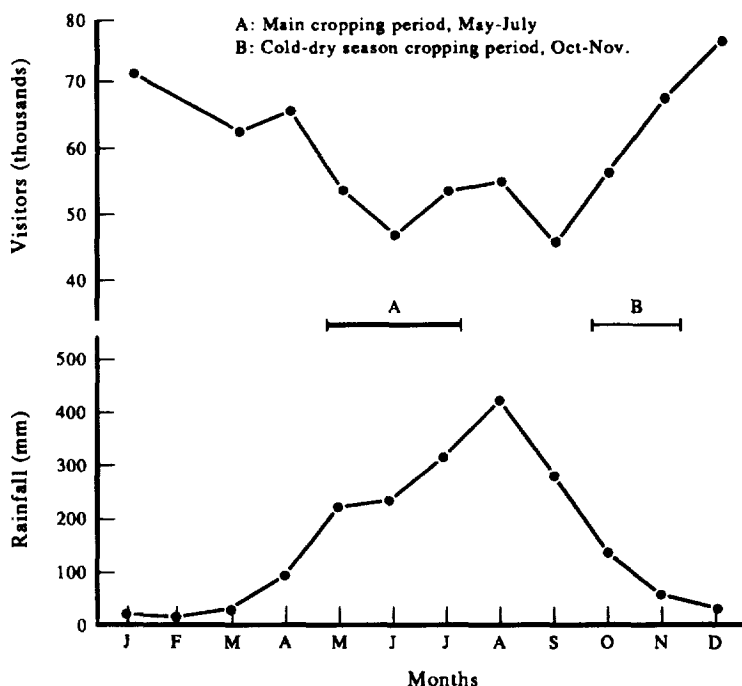


Figure 2. Flow Diagram of Observed Relationships between Farm Size, Adoption of Tourism, and Frequency of Cultivation



**Figure 3. Seasonality of Tourism, Rainfall, and Cultivation in Northern Thailand.** Sources: Monthly Tourist Arrivals in Chiang Mai City, Average 1974–1989 (Tourism Authority of Thailand); Monthly Rainfall at Chiang Rai Bridge, Average 1951–1988 (Royal Irrigation Department); and Seasons of Cultivation. A (Wet Season): May–July; B (Cold, Dry Season): October–November (Personal Observation, Pha Dua, 1990–1994)

farmers. Claimed expenditure on agrochemicals varied from 200 baht (\$8) to 3,500 baht (\$140) per year in 1991, and so could easily be paid for by profits from tourism. However, informants explained that the use of agrochemicals was more related to perceived problems of soil fertility than available cash. Statistical tests also showed no relationship of agrochemical use to involvement in tourism. Further, there was no claimed or statistical relationship between involvement in tourism and cultivation of new crop varieties. Rice terraces had been adopted by a small number of farmers during the 60s as a way to improve agricultural production. But more recently, gifts of terraces had been made to Pha Dua by the local agricultural extension office. The ownership of rice terraces in this village seems unrelated to the adoption of tourism.

## CONCLUSIONS

This study researched one prominent “hill tribe” village of northern Thailand to identify how the adoption of tourism has impacted



upon environmental degradation by changing agricultural practices. Tourism has grown rapidly in the village during the last 20 years, and now three quarters of households supplement agricultural income by selling goods and services to passing tourists. The study sought to identify which households were able to adopt tourism, and how it challenged their traditional reliance on agriculture. Attitudes to soil conservation were also identified, and compared between households with and without involvement in tourism.

Perhaps most fundamentally, it was found that tourism did not challenge the traditional dependency on agriculture. Although, Pha Dua is an example of a village in northern Thailand with a high involvement in tourism. Up to 300 visitors arrive each day, and the villagers sell souvenirs enthusiastically at stalls and transport tourists in pick-up trucks. However, even here tourism only contributes an average of 25% to total household income, and is only adopted when it does not withdraw labor from agriculture. The adoption of tourism by different households was shown to be controlled by the availability of cash and spare labor. This meant that many families who are not connected to Pha Dua's oldest and wealthiest families are unable to adopt tourism because they have farms too small to create sufficient income to buy souvenirs or hire agricultural labor. Yet, arguably, it is these households who most need to adopt tourism as an alternative to agriculture because it is they who use land most frequently.

In addition, it was found that households highly dependent on tourism did not use this as an opportunity to reduce frequency of agricultural cultivation. The adoption of tourism reduced perceived opportunity cost of land. This means that households with tourism are less likely to introduce soil conservation measures such as fallow periods or grass strips to control erosion. Tourism also provided cash for many farmers to hire agricultural labor. Extra labor gives the opportunity to cultivate more land more frequently, may improve marginal productivity of labor compared with household members, and increase the degree of cultivation. However, this also gave a non-agricultural benefit to the Yao by allowing many Yao children to attend school, instead of working in the fields. Operating tourism stalls gave Yao women the ability to become involved in commercial management, while under Yao culture this is usually discouraged because they are not allowed to own land.

Tourism has been encouraged among hill communities in northern Thailand as a way to reduce environmental degradation by resolving the need for exhaustive, or over-frequent agriculture which results from land shortage in the mountains. Evidence from Pha Dua shows tourism is unavailable to poor, small landowners who cultivate land most frequently, and that tourism allows rich, large landowners to increase exhaustive agriculture. The Yao at Pha Dua are good examples of "adventurous traders" who historically have also been "biosphere people" by using pioneer shifting cultivation. The failure of tourism to reduce agricultural pressure even among proven traders suggests that environmental management may be better achieved by continuing education in sustainable agriculture and soil conservation.

Such agricultural extension work has been active in Thailand for years, but has met resistance from farmers who often dislike donating land to grass strips or trees, because it means a loss of land to plant crops (Kaye 1990; Kunstadter et al 1978; Renard 1986). Another obstacle is reassuring farmers that the land they are conserving today will continue to be their land in the future. In Pha Dua, farmers fear that agricultural land will be reforested during the next five years as part of a local land-use development project aiming to reforest a strategic mountain on the Burmese border (Chettamart and Kuladilok 1991; Srisawas, Intrachandre and Pattaratuma 1991). Under this project, local Akha and Lahu villages have had land repossessed and inhabitants put to work in plantations for waged labor. Rumors of land being reforested in this way encouraged two Akha villages near Pha Dua to sell land to a resort developer on the understanding that they were going to lose their land to forest anyway. Such transactions are officially illegal yet continue under the eyes of local authorities. They do not encourage a long-term commitment to soil conservation, and form the transition point for tourism to change from the stage where it is in the hands of local people, to the stage where it is controlled by outside organizations (Blaikie and Brookfield 1987; Butler 1980).

Land-use policy in northern Thailand cannot achieve the best form of environmental management if it still aims to gain military control over areas of historic insurgency or attempts to provide new trade opportunities for outsiders instead of local inhabitants. However, evidence from this study suggests that this is the case. Thai authorities will have to take the unpopular steps of guaranteeing land tenure to villages to make farmers adopt long-term soil-conservation, and ensure new trade flows remain controlled by locals in order to reduce the damaging impacts of agriculture on environment. Despite its promise of reducing environmental degradation, tourism has not decreased agricultural pressure on forest and soil resources, and has been the medium to accelerate economic and political changes in land ownership that encourage further degradation. □ □

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