Transformation of Indigenous Society in Southwest China: a Case Study of the Dai

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ABSTRACT

China's fast pace of development since the 1978 economic reforms has had a wide range of impacts on the country' s social and natural environment. The decollectivization of agriculture, the introduction of responsibility systems in agricultural and industrial production, and a growing emphasis on regional specialization have raised living standards considerably in rural and urban areas. However, they have also generated significant disparities in wealth among counties, provinces, and other administrative areas in the country. At the same time, the pressures of modernization and economic development have had a severe impact on the country's natural resources, resulting in loss of agricultural land, increased deforestation, and global ecological damage. China's ethnic minority areas are largely distributed in the western half of the country. Their economic development has not kept pace with the rest of the country. The southwest region, which contains a high proportions of ethnic minority populations, remains the poorest region in the country. Nevertheless, increased autonomy in political, economic, and cultural affairs has encouraged the minority groups in this region to explore new paths of development.

This study focuses on the Dai of Xishuangbanna, a subtropical area in the South of Yunnan province that is characterized by a high degree of ethnic diversity. Their society is undergoing rapid changes to adjust to the forces of modernization in the market economy and to a situation of decreased agricultural and forested land base in the area. This study investigates the changes in land-use strategies and traditional social institutions adopted by the Dai in response to these pressures. It focuses on two villages that have embraced very different forms of agro-forestry practices and social arrangements. A questionnaire survey designed to gather local resident knowledge as well as informal interviews and observations have been performed in these two villages. In addition, development issues and environmental problems in various parts of Xishuangbanna were identified through informal interviews, observations, and a questionnaire survey of village leaders. The study presents the results of the empirical analysis of the data and their interpretation according to known

theories of peasant economic behaviour and peasant social organizations. It then investigates the implications of the findings for the Dai society's capacity to absorb pressures of modernization in a political environment largely controlled by the Chinese state.

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DEDICATION

This work is dedicated to the Dai nation and all other ethnic minority populations in China and Southeast Asia which have struggled to keep their cultures alive and strong.

Chapter 1

INTRODUCTION

> An important common feature of development is its incorporative nature, by which peripheral formations are drawn into the mainstream of a wider society, polity, and economy. There is a constant tension between development as a liberating force giving people more control over their own lives and access to a better standard of living, and development as a constraining influence in the sense that decisions affecting people's livelihoods are made at an even more remote level.
>
> Hirsch (1990: 1)

1.1 Nature of the Problem

China's fast pace of development since the economic reforms introduced by the Deng Xiaoping government in 1978 has taken the world by surprise. In the freer economic environment that was created by the reforms, the country's economy has grown at an average annual growth rate of 9 percent, and growth rates continue to accelerate (The Economist, 1992; Walsh, 1993; Vohra, 1994). Growth, development, and modernization have become the main issues of concern for central planning agencies as reflected in the various forms taken by the official slogan: "Socialism with Chinese Characteristics," "Socialist Market Economy," and "To be Rich is Glorious" (Smith, 1991; Kaye, 1993). The process of economic transformation has given rise to a wide range of impacts on the country's society and natural environment. The decollectivization of agriculture and the introduction of responsibility systems in agricultural and industrial production have raised living standards considerably in rural and urban areas. However, they have also generated significant inequalities in incomes throughout Chinese society. At the same time, the decentralization of decision-making, a growing emphasis on regional specialization, and the priority given to investments in the coastal provinces' economies, have also served to accentuate the wide variations in wealth among counties, provinces, and other administrative areas in the country (Prime, 1991; Kirkby and Cannon, 1989).

Two important sets of disparities—two "great divides"—are in continuous formation as a result of China's process of modernization. One is characterized by the increasing economic dominance of the rapidly industrializing eastern coastal provinces over the less-developed interior and border regions of the country, and the other by reinforced cultural and administrative supremacy of the growing Chinese cities over the countryside (Smith, 1991). These changes have been accompanied by rapid growth in industry, trade, and services, and a declining importance of agriculture in the national economy, which has received a diminished share of state investment. This has important implications for remote, mostly agricultural areas of the country, in which improvements in incomes and standards of living have not kept pace with those of the nation (Knox and Agnew, 1989; Unger and Xiong, 1990).

The pressures of modernization and economic development have had an equally severe differential impact on the country's natural resources. Two areas of particular concern are the adequacy of the agricultural land base and the status of forest resources. The country's agricultural land area has suffered from an increase in urbanization fueled by continued population growth, the construction of roads and irrigation projects, and rural industrialization, which have led to considerable losses of arable land. At the same time, environmental degradation caused by desertification, erosion, and salinization have resulted in decreased soil quality throughout the country (Taylor and Banister, 1991). He Bochuan (1991) estimates that over 1.6 million ha of agricultural land were lost annually during the last decade. China now has less than 95 million ha of agricultural land, of which only 20 percent is prime arable soil (Glaeser, 1990; China Daily 1993a). The decreases in soil quantity and quality have affected agricultural productivity. Grain production stagnated through the second half of the 1980s and in several interior provinces, it actually declined, creating pockets of poverty in areas with the poorest soils (Unger and Xiong, 1990). The deteriorating environmental conditions in agriculture are unlikely to be reversed as unsustainable farming practices such as declining organic recycling, excessive reliance on synthetic fertilizers and pesticides, disappearance of traditional complex crop rotation systems, and inefficient irrigation methods continue to spread throughout the Chinese countryside (Smil, 1993; Ouyang Kang et al., 1994).

The country's forest cover has suffered similar losses. Deforestation caused by excessive logging, fuelwood collection, and land reclamation projects has not been offset by the government's reforestation programmes. The annual consumption of raw wood in the early 1990s has been 300 million cubic meters, far more than the annual growth rate of 230 million cubic meters. In the past three decades, China lost a quarter of its original forest. The forested portion of the country, at 12 percent, was well below the world average of 22 percent (He Bochuan, 1991). The southwestern provinces, which supply much of the raw wood to the nation, suffered the highest rate of deforestation in the country. Sichuan's forests have declined by 30 percent since 1950; Yunnan's by 13 percent over the last decade (Glaeser, 1990). The loss of forest cover in these regions has in turn caused considerable soil erosion, contributing to losses of top soil, and a decline in agricultural production.

It is in the resource-rich provinces of the west that the country's ethnic minorities have the highest concentrations. These groups are largely distributed in autonomous administrative units at the province, district, and county level, covering about 64 percent of China's total land area (Heberer, 1989). These regions enjoy a degree of autonomy in political, economic, and cultural affairs. They can draw up production plans, administer financial institutions, and draft laws and regulations. Local development plans, however, must conform to overall regional development policy conceived by the central government, and conflicts between indigenous authorities and the state are frequent. Matters of disagreement include lack of central funds, immigration policies encouraging influx of Han Chinese into these areas, overexploitation of natural resources, ecological damage, and contempt of local customs and religious traditions by the Han immigrants (Heberer, 1989).

These regions have in the past decade experienced an upsurge in ethnic minority populations. By 1990, minority populations had increased by 36 percent over 1982 to a total of 91.2 million, and constituted 9 percent of China's population (Yuan Tien, 1992). These groups have, as a result, gained political and economic significance, and the debate over their participation in the country's development planning has intensified. In reaction to pressures caused by modernization and population increases, many indigenous peoples have taken measures to modify their traditional methods of natural resource use and

diversify their local economies. Nevertheless, their economic development has not kept pace with the rest of the nation. In particular, the southwest, which contains a high proportion of ethnic minority populations, remains the poorest region in the country (Prime, 1991; Webb, 1991).

Xishuangbanna, a border area in the south of Yunnan province, has some of the last remaining stands of tropical forest in China. It is an important source of hardwood and tropical crops—rubber, tea, fruit, spices, medicinal plants—for the rest of the country. The majority of the population in the region is formed of indigenous peoples, lowland and upland minorities, with diverse origins and distinct cultures and languages. These people share a habitat that spreads over national boundaries into neighbouring countries of Southeast Asia. Traditionally, these groups have been engaged in various forms of agro-forestry adapted to the local environment and they have developed complementary relationships of livelihood by trading their products at rural markets and fairs (Pei Sheng-ji, 1988).

In the modern socialist state, this area has been subject to development pressures of various kinds—from wholesale exploitation of natural resources during the collective era to commercialization of agriculture and forestry in recent years. These activities have had a number of impacts on the land base available to the local native populations. Planting activities by state farms, illegal wood-cutting for fuelwood and timber, and continued slash-and-burn agricultural practices have resulted in deforestation and soil erosion throughout the region. In addition, increases in local population levels due to high birth rates and continued immigration from neighbouring provinces have created a situation of scarcity of arable and forested land. This has weakened the ability of peasants in some parts of the region to provide for their subsistence needs and caused land-use conflicts between local farmers and government agencies (Smil, 1984; Leeming, 1985; Zhao Songqiao, 1994). This situation has prompted some indigenous groups to intensify their traditional methods of agricultural production, modify their forestry practices, and find other sources of livelihood in urban areas. These societies are undergoing further changes. In the hope of reversing the process of assimilation characteristic of the previous decades, they are increasingly seeking to exploit an increase in freedom of cultural expression and a recognition by the state of their potential value for tourism revenue to re-

affirm their cultural entities and integrate their local economies in a state that has made economic development its top priority (Pei Sheng-ji, 1988; Oakes, 1992; Wijeyewardene, 1990).

Although important field research has been conducted on the impacts of economic reforms on peasant society in China (e.g. Chan et al., 1992; Croll, 1994), few geographical studies have focused on the changes in land-use strategies adopted by the country's indigenous societies as result of these reforms. Fewer still have investigated the role of culture and tradition in shaping these societies' responses to modern development. Yet current regional development policy could marginalize and acculturate those groups which have settled in remote areas or are disadvantaged in terms of access to natural resources and financial assistance (Heberer, 1989; Hsieh, 1989; Cannon, 1990; Wang Zhusheng, 1991). There is, therefore, a need to investigate the capacity of these groups to modify their social institutions and adjust their methods of livelihood in response to modernization pressures imposed by the central state.

1.2 Purpose of the Study

The purpose of the study is to assess the impact of the economic and political reforms initiated by the Deng Xiaoping government in 1978 on the Dai's agricultural and forestry practices and on the related transformations in their society. The Dai of Xishuangbanna are caught up in a continuous process of adapting to the forces of modernization imposed by the Chinese state. The specific objectives of the study are:

- to describe the changes in the Dai's land-use strategies as a result of development schemes laid out by the central government;
- to examine the ecological sustainability of their agro-forestry practices;
- to investigate the impact of commercialization on their cultural practices of natural resource use and traditional social institutions;
- to examine the implications of the study's findings on the capacity of their society to respond to pressures of modernization.

Since the Dai are essentially a peasant society, there is also a need to review agricultural policy since the foundation of the People's republic of China and

examine its implications on social life in rural China. As well, the consequences of reform in national policy for the social, cultural, and economic development of ethnic minority groups in China must be examined.

1.3 Thesis Outline

This thesis has been organized into six chapters. Chapter two provides an overview of agricultural policy in China since the communist take-over in 1949. It also describes national policy affecting the development of ethnic minority areas in China. Chapter three presents the conceptual framework, the research methods, and the data collection procedures adopted for the study. Chapter four describes the study area and outlines the village selection process. Chapter five presents and discusses the results of the research. Chapter six summarizes the findings and presents implications and conclusions.

Chapter 2

AGRICULTURAL AND REGIONAL DEVELOPMENT POLICY IN SOCIALIST CHINA

This chapter reviews agricultural and regional development policy in socialist China. It also discusses the impact of agricultural and economic reforms on the development of ethnic minority areas.

2.1 The Collective Era

China has for centuries suffered from a shortage of cultivable land. Of a total area of 9.6 million square kilometers, less than 10 percent is suitable for agriculture (Zhao Songqiao, 1994). Apart from a few areas naturally suited to extensive cultivation, such as the vast North China Plain and large river basins, much of this land is on steep mountain slopes, plateaus at high elevation, or in deep river valleys, which are difficult to access and to cultivate. Traditional farming has required extensive terracing, soil stabilization techniques, construction of flood control structures, and other engineered methods of intensive cultivation to support the ever-growing population in the country. Nevertheless, agricultural output was, in the past, often unpredictable, as much of the cultivated land is periodically threatened by natural disasters, such as droughts, land slides, and flooding. Extreme variability in temperature and rainfall from one year to the next, was yet another cause of uncertainty in agricultural production, causing prolonged periods of hunger and famine for a generally impoverished population (Derbyshire, 1990; Leeming and Powell, 1990; He Bochuan, 1991). These problems in agricultural production were compounded by a land ownership system that favoured a small class of rich owners over a large mass of mostly landless peasants.

Land Reform after the Communist take-over in 1949 was primarily politically motivated, aimed at redistributing the land held by landlords and rich peasants, who made up 10 percent of the population and owned 70 percent of the

agricultural land. Thus 47 million hectares of farmland, half of the total agricultural area, were allotted to 300 million peasants. Each peasant household owned on average 0.8 hectare of farmland and had to share a draught animal and a plough with another household. However, most households had too little land and too few resources to subsist without the help of the larger community. The political leadership became concerned with the necessity to increase agricultural production (China Handbook, 1984).

Through collective efforts, land reclamation projects were performed to increase the supply of agricultural land. Ponds and marshes were dried up; forests were converted to grain fields; burial sites and sacred edifices were removed from the countryside. By 1963, agricultural land had increased to 110.6 million hectares from 94 million in 1949. These gains, however, barely matched the land losses caused by the construction activities of an ever growing rural population in the form of housing, rural factories, roads, and public facilities. By the end of the 1970s, the total amount of cultivable land had almost fallen back to its level in 1949, while the population had almost doubled to 950 million. The amount of farmland per capita had dropped to under 0.1 ha, one-third of that in Brazil or India[1] (Smith, 1991; China Handbook, 1984). China was feeding one fifth of the world's population using one thirteenth of its cultivable land (He Bochuan, 1991).

To support the growing population, agriculture had to be intensified considerably. Characteristically of the Maoist era, land in rural areas was boldly re-worked through collective investment in large irrigation projects. New terraces, dams, irrigation ditches, canals, reservoirs, and artificial lakes were built in order to boost agricultural productivity. Calls for economies of scale combined with leftist campaigns designed to combat class inequalities resulted in the formation of local administrative units of increasing size which assumed social, economic, and political functions throughout the countryside. Production teams of ten to thirty households organized production and distributed income. Brigades of village size undertook infrastructure projects, organized health-care and social activities, and provided local leadership in administrative and economic affairs. Communes, based on market towns, and the grouping of

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1 In 1990, the total farmland area was estimated at 95.7 million hectares for a population of 1.14 billion, resulting in an area of 0.08 hectare per capita (Zhao Songqiao, 1994).

thousands of households, were the highest level of spatial organization in the countryside, directly responsible to the state[2]. They were also vital nodes of distribution at the national level, responsible for rural credit distribution, tax collection, agricultural product purchases, and the supply of fertilizers and machinery (Smith, 1991; Leeming and Powell, 1990). China's agriculture had been reorganized into a complex hierarchy of administrative units, with local units required to produce fixed grain quota annually for official procurement.

Incomes were distributed according to socialist principles: peasants were paid from a collective fund according to work points gained in agricultural production. But incentives to work hard were insufficient, and agricultural productivity was characteristically low. Increases in grain harvest were mostly due to China's "Green Revolution," with the use of fertilizers, pesticides, and high-yield strains. Between 1949 and 1980, while the total grain output increased 2.8 times, from 113 million tons to 318 million tons, the consumption of chemical fertilizers increased 170-fold, from 0.75 kg per ha to 128 kg per ha (China Handbook, 1984). The increase in productivity barely surpassed the increase in population during the same period, and peasants' incomes remained depressingly low. Rural per capita incomes barely doubled between 1954 and 1978, from 64 yuan to 134 yuan (Zhu Ling, 1991).

Rural incomes were in fact considerably lower than those in the cities. Against officially proclaimed goals of egalitarianism, the state had, on the whole, favoured the development of cities over the countryside and kept prices of agricultural products consistently low in the urban markets. In the 1960s, average urban incomes were 2.5 times higher than in the countryside; in the 1970s, they were 2.6 times higher. In addition, city-dwellers had better access to services such as education, health-care, transportation, and subsidized housing. These conditions created a situation of inequality between residents in cities and in rural areas (Smith, 1991). Not surprisingly, feelings of discontent among peasants ran strong, and numerous ideological campaigns were felt necessary by the central government to prevent "capitalist roaders" to alter the course of

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2 In the administrative hierarchy in the collective era, a natural village (*zhai*) was a team (*xiao dui*), a brigade (*da dui*) grouped several natural villages, and a commune (*gongshe*) contained several brigades. This system was formally abolished in 1982, and their administrative and political functions returned to the townships and the villages.

socialist transformation. Political struggles led to frequent reversals in agricultural policy with negative consequences on agricultural productivity (Dietrich, 1986; Chan et al., 1992).

Environmental consequences of collectivization of agriculture. The collective era left a lasting imprint on the rural landscape. New lands had been reclaimed for cultivation, and there had been noticeable improvements in the infrastructure over the pre-liberation era. On the whole, however, the quality of agricultural land had irreversibly suffered. Between 1957 and 1977, one third of the best arable soil was lost as a result of natural hazards, environmental damage, and construction activities, while land reclaimed for agricultural use was generally of poor quality. Much of the remaining land consisted of low-grade clay-soils, sands, or soils waterlogged by careless irrigation. Only 20 percent of the agricultural land was prime arable soil. In addition, excessive use of chemical fertilizers had replaced application of green manure as well as nitrogen-fixing legumes and many long-time proven traditional practices of agricultural diversification and continuous crop rotation (Glaeser, 1990; Smil, 1984).

Generally, the collectivization of agriculture had a negative impact on the natural environment. Natural resources made scarce by increasing population densities, such as forests, pasture lands, and fresh-water supplies, had been consistently mismanaged. The policy of local self-sufficiency in grain production, "take grain as the key link," led to numerous agricultural land reclamation projects which contributed to degradation of natural resources throughout the country (Sun Jingzhi, 1988; Ross, 1988). Pressure to convert fishponds, lakes, and drainage channels into land for crop production reduced drinking water supplies and affected fisheries so that there was a serious decline in fresh-water fish production (Pannell and Ma, 1983). Pastures in populated areas were reduced considerably in favour of expanded grain-sown areas. This resulted in overgrazing, soil compaction, and soil erosion on slopes in watersheds, which detrimentally affected water quality. The conversion of forests to grain fields accelerated the process of deforestation in the country. Between 1949 and 1980, 24 percent of China's forest was lost mainly by reclamation for agriculture, state-run logging, and illegal cutting (Smil, 1984). In Yunnan, forest cover decreased from 50 percent to 24 percent; in Sichuan, from

20 percent to 13 percent (Sun Jingzhi, 1988). In the southwest, much deforestation occurred through the large-scale practice of slash-and-burn agriculture in mountainous areas, which, often, caused forest fires (Smil, 1984). At the same time, orchards, tea-gardens, and other tree-crop plantations were converted to rice fields. In the 1970s alone, thousands of square km of woodland were cleared annually to create new arable land (Leeming, 1985). Deforestation led to soil erosion, siltation, and a decrease in land productivity in general. It also had a significant effect on the local climate, as areas normally subject to mild winds and regular rain falls became afflicted by sporadic storms and prolonged droughts (He Bochuan, 1991).

2.2 The Agricultural Reforms

The economic reforms initiated by the Central Committee's Third Plenum in 1978, two years after Mao's death, were to usher in a new era in China's agricultural and economic development. The Deng Xiaoping government's decision to increase official prices of grain and other agricultural products, to encourage diversification into cash crops and 'sideline' products (animal husbandry, fisheries, non-agricultural activities), and to introduce new regulations for democratic management of communes and for public accounting, marked a turnaround in the political situation in China. After decades of political instability, the Communist Party was finally responding to the peasant masses (Gittings, 1989).

The introduction of the Household Responsibility System (*bao gan dao hu*) was to revolutionize agricultural production in China. With this system, the individual farm was re-instated as the basic agricultural production unit, solely responsible for its own profit and loss. Every household in the village was allocated a portion of the village land, draught animals, and farming equipment. Village land was subdivided on a per capita or per labourer basis according to soil quality, land use, and types of crops cultivated. Thus households might have received an allocation of land for growing "food grain," one for cash cropping, and, in addition, "fodder, forest, orchard, or waste lands for exclusive use by each household" (Croll, 1994). Each farm paid an agricultural land tax (*gongliang*) to the state and a community tax to the village, and was contracted to sell a proportion of its crop output (*yunliang*) to the state. Importantly, it was entitled

to keep the production surplus and decide on whether to use it for consumption or re-investment in agriculture (Zhu Ling, 1991). In this context the socialist slogan "to each according to his work" would enable peasants to raise their productivity and to accumulate surplus. By the end of 1984, almost 95 percent of the rural households had adopted the contract system. This resulted in a significant increase in productivity and a sharp rise in family income (Wen, 1994). Between 1978 and 1984, the value of agricultural output rose annually by over 12 percent. During the same period, grain yields rose from 2,335 kg per hectare to 3,615 kg, an increase of 42 percent. The harvest of 1984 was the first to exceed 400 million tons (Leeming, 1993). At the same time, the total labour force in agricultural production declined from 75 to 62 percent (Watson, 1989).

Success led to further reforms, which soon acquired a momentum of their own. First, to alleviate peasant uncertainties about returns on their investments, new legislation was introduced in 1984 allowing households to contract land for at least 15, 30, or even 50 years (Smith 1991; Webb, 1991). Second, in order to encourage concentration of land in the hands of those most able to farm it efficiently, contracted land could legally be transferred from one household to another. The central committee had decided to set free the rural economy and to progressively replace state planning by market demand. Prices of most agricultural products—except grain and cotton—were allowed to float on the free market. Peasants could hire labour, buy vehicles and machinery from the state, and transport produce for sale across county and provincial boundaries. New family enterprises, known as "specialized households," began to emerge, earning incomes considerably higher than other families. These households concentrated their activities on fast growing branches of agriculture, such as cash crops, poultry farming, pig raising, and fish hatching. In 1983, there were already 25 million specialized households, amounting to 13.6 percent of all rural households (Gittings, 1989).

The net effect of the reforms was that the composition of agriculture changed considerably. There was a large increase in the areas sown with cash crops, mostly at the expense of grain. In the Southwest, grain-sown areas decreased by 7.2 percent from 1979 to 1988, while areas devoted to cash crops (cotton, peanuts, soybeans, sugarcane) increased by 77 percent. During the same period, animal husbandry increased by 19 percent annually to 35 percent of the

total agricultural gross value of output, surpassed only by fisheries, which recorded an annual growth of 39 percent (Webb, 1991). Investments in forestry, a branch of farming in China, increased at a slower rate as a result of long growing periods and insecurity over the state's commitment to honour long-term land leases (Zhu Ling, 1991).

As some households specialized in farming activities, others left agriculture to enter the service and manufacturing sectors. The rapid rise of rural industry in the 1980s was made possible by the availability of a large surplus of rural labour which had been forced out of agriculture by the increases in agricultural labour productivity (Wen, 1994). By 1985, independent rural enterprises, 'township enterprises,' employed 17 million people, or 19 percent of the rural labour force (Gittings, 1989). This additional source of employment contributed to the rise in rural incomes, which doubled between 1979 and 1984, allowing a 51 percent increase in per capita consumption. This resulted in a more varied diet, with more protein and fat for every person in the country (Smith, 1991).

The government's decision to promote sharp increases in rural incomes had achieved one of the important goals of socialist society. The traditional discrepancy between urban and rural living standards, which had actually increased during the Maoist era, had finally changed in favour of the countryside[3], The development of rural enterprises and the growth of small towns avoided the urbanization problems found in the too fast growing cities of other developing countries. "Industrialization could now follow a different path from the West, where modern industry had grown at the expense of the countryside, with farmers driven to bankruptcy and forced to swarm into the cities to become the tools of capitalism" (Gittings, 1989, p.142).

2.3 The Costs of The Reforms

At first, the successes of the reforms were undeniable. There had been remarkable growth in agricultural productivity in most rural areas. Between 1979 and 1984, the total grain production in the country rose from 304 to 407

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3 Between 1978 and 1987, for example, annual urban retail sales per capita increased only by 13 percent, from 433 to 490 yuan. By comparison, rural sales increased almost sixfold, from 102 to 580 yuan (Smith, 1991).

million tonnes, an increase of 33 percent[4] (Leeming and Powell, 1990). The rise in agricultural productivity was largely caused by gains in productivity of inputs to agriculture. Thus, while there were significant increases in labour, machinery, and chemical fertilizers, the value of agricultural output per unit of input grew at an average annual rate of 5.7 percent after 1979. Reforms had "boosted peasant initiatives, enhanced savings for investments, expanded lucrative sideline activities," and promoted regional crop specialization (Smith, 1991). Consequently, living standards had been considerably improved, and consumer spending on food had been reduced in both rural and urban areas. Peasant and city dwellers could now afford investing in better housing and purchasing amenities that come with modernization[5]. Nevertheless, several problems created by the reforms became noticeable in the second half of the 1980s as increases in agricultural production were coming to a halt.

Decrease in grain production. In 1985, after six years of uninterrupted growth, grain production fell by 7 percent. The replacement of the grain quota system by household contracts had resulted in a general shift to more profitable cash crops and a sharp reduction in size of grain-sown areas (Gittings, 1989). The fear of loosing self-sufficiency in grain production caused the government to re-impose controls on household production. As a result, grain production was soon re-established at the 1984 level. However, inconsistencies in the agricultural pricing system have discouraged peasants to invest further in grain agriculture[6]. While cash crop production continued to increase at a fast pace, grain yields remained stagnant at 3.6 tons per hectare during the entire second half of the 1980s (Leeming and Powell, 1990). This caused China to increase grain imports to feed

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4 Agricultural productivity increased consistently in all the country's regions. In the Southwest, the rice yield increased from 4.4 tons per ha in 1979 to 5.7 tonnes per ha in 1988, corresponding to an annual increase of 2.8 percent since 1978. During the same period, soybean production per unit of land increased by 40 percent. Similar increases were reported throughout the country (Webb, 1991).

5 According to government statistics, average per-capita incomes in rural areas rose by 13.4 percent annually during the first 14 years of reform. In 1992, Chinese country-dwellers earned, on average, 784 yuan (US $ 137), six times as much as in 1978 (China Daily, 1993b).

6 Although prices of agricultural inputs, such as seed and fertilizers, rose considerably during the 1980s, the Chinese leadership intentionally kept purchasing prices for grain low. With this policy, they hoped to keep inflation under control and avoid a "Polish problem" of urban unrest (Gittings, 1989).

its growing population. By 1993, China had become the world's biggest importer of wheat (The Economist, 1993).

Incomplete price reform. An important deterrent to private investment in agriculture has been the lack of thorough price reform. A leftover from the central-planning economy of the Maoist era, the government's pricing policies have been such that prices not only do not reflect the relative scarcity of resources, but also fail to stimulate peasants to increase spending in agriculture. The so-called 'scissors' effect' caused by the imposition of low prices for agricultural outputs and high prices for essential inputs (crop seeds, chemical fertilizers, diesel fuel, electricity) continues to decrease incentives for farmers to improve land productivity and to practice environmentally sound land management (Gittings, 1989; Webb, 1991; Omara-Ojungu, 1992). For example, in 1993, grain prices were essentially the same as in 1990, while the cost of fertilizer and equipment more than doubled over the same period[7] (Hornik, 1993). Pricing policies have affected all aspects of agricultural production, including household specialization. Thus the production of pork (usually the most lucrative specialization in the Chinese countryside) has been upset by price fluctuations in meat and fodder. Although the state monopoly of pork purchase was given up in 1985, a variety of subsidies by local official units, such as provinces and cities, has affected both the price of pork and the cost of rearing pigs. By the end of the 1980s, the cost of rearing pigs was close to their market value. As a result, growth in household production of pork has been sluggish throughout the country (Leeming, 1993).

The system of controlled prices has proved to be difficult to dismantle (Lin Ling, 1993). Efforts to decontrol prices of agricultural products invariably resulted in sharp increases in food prices and ran into opposition in urban areas. A major price reform in 1988 left the prices of most food items be entirely determined by the market forces. This led to a immediate surge in inflation, and the government was forced to reinstall price controls nationwide (Smith, 1991; Ross 1992). Nevertheless, agricultural prices had to be raised to appease an increasingly restive rural population. At the same time, however, food prices in

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7 Fertilizer is not only expensive. In most rural areas of China, it is also found to be in short supply and of poor quality (Croll, 1993).

cities were kept at previous levels by a government faithful to its urban constituencies. These urban subsidies imposed a financial burden on the government which became another source of inflation in the late 1980s and contributed to the subsistence of income inequality between rural and urban areas. In 1988, the average income per capita in the countryside was only half the one in cities, and the gross value of output per agricultural worker was only 1/10 of the one per industrial worker (Webb, 1991). In the 1990s, after a brief period of price stability in 1990, inflation has been dangerously revived, and the income gap between city and countryside has been growing wider (Hornik, 1993).

Land fragmentation. The process of land fragmentation inherent in the land distribution programme of agricultural reform put severe constraints on agricultural productivity. Farming land had been allocated to households in small parcels spread over the countryside. According to a survey conducted at the end of 1984, the average family allocation was 8.35 *mu* held in 9.7 plots with an average size of 0.86 *mu* (1 *mu* = 1/15 ha) (Watson, 1989). The principle that had driven the land distribution process was that each family was to receive a similar share of soils of given attributes—soil quality, land configuration, irrigation facilities, road access, village proximity, and so on. This process, however, led to excessive dispersal of farmland holdings, land wasted in the construction of ditches and furrows between plots, and time wasted travelling between the plots[8].

It also proved to be a serious obstacle to collective management of ploughing, irrigation, and pest control, which had been beneficial to agricultural production during the collective era (Pannell and Ma, 1983). Large-scale ploughing as well as efficient irrigation techniques are incompatible with the existing land tenure system of scattered, small agricultural plots. As a result, individualized farming and inefficient use of furrow irrigation continue to

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8 Dispersing agricultural plots in various locations is also an effective way to minimize the risks of failure in agricultural production under unreliable conditions. In wet years, low-lying land may be inundated and unplantable or subject to extensive crop loss. Similarly, in dry years, high land can not be planted without severe crop damage caused by drought. In addition, growing crops in plots of different soil types at different locations normally results in peaks of labour requirements that are less sharp than would be the case with a single homogeneous holding. Consequently, peasants have traditionally preferred to hold land in several locations (Dixon, 1990).

dominate heavily in China's agriculture (Smil, 1993). In addition, the practice of Integrated Pest Management, widely used in the final years of the collective era, has become largely ineffective. The product of decades of research and experimentation, it combined biological, chemical, and physical techniques with traditional farming techniques. However, it can only be effectively applied over large areas (Glaeser, 1990). Thus land fragmentation had a negative effect on crop productivity. According to the survey, given the level of technology at the time, the optimum size of agricultural plots would have been 15 *mu* per labourer, twice the average family allocation (Watson, 1989).

The problem of land fragmentation has been accentuated by traditional inheritance laws and conventions for the division of family resources at marriage in Han society. In socialist China, the Chinese tradition of "patrilocal exogamous" marriage customs in which girls move into their husbands' households has been preserved (Hsu Mei-Ling, 1992). Thus every son who marries receives his share of family-owned agricultural land with which to support his future family. The new system of peasant small holdings does not re-adjust land allocations to account for changes in family size. The division of family property remains a serious obstacle to long-term investment planning, adding to peasants' uncertainties concerning the government's commitment to honour land tenure agreements (Unger and Xiong, 1990).

Loss of arable land. Serious concerns have been raised about the loss of arable land, as rising rural incomes were accompanied by a flurry of construction activities in housing, transportation, urbanization, and local industry. At the same time losses of top soil caused by land slides, floods, and high winds have been increasingly frequent as the result of deforestation and changes in weather patterns. Between 1979 and 1984, the country's loss of arable land averaged 1.5 million hectares annually. After 1985, the loss intensified to 1.65 million hectares while the population increased at an annual rate of over 2 percent (He Bochuan, 1991; Yuan Tien, 1992). In 1988, China had 95.72 million hectares of arable land for a population of 1.096 billion, that is a mean of 0.0875 hectare per capita[9]. At

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9 Loss of agricultural land has continued since 1988. In 1992, the total agricultural area was estimated at 93 million hectares (China Daily, 1993a). That would correspond to approximately 0.08 hectare per capita

the present rate of agricultural loss, this amount would decline by another 15 percent to 0.075 hectare per capita in the year 2000. Of all poor populous nations in the world, only Bangladesh and Egypt would have a lower ratio (Smil, 1993).

This trend is not likely to be reversed in the near future. With the freeing of the market economy, peasants prefer to invest in rural industry and commerce, which are more profitable sectors than agriculture. As a result, additional land is continuously taken out of agricultural use for further industrial expansion and urbanization (Vohra, 1994). At the same time, the importance of the rural industrial sector has increased steadily at the expense of agriculture. In 1987 the output value of rural enterprises exceeded that of agriculture for the first time since the introduction of the economic reforms. Excluding direct intervention by the state, the importance of the agricultural sector is likely to continue to decline (Smith, 1991). The loss of agricultural land, however, represents a worrisome decline in China's food producing capability. It has been increasingly recognized as a source of growth in severe poverty in some rural areas (Smil, 1993).

Weakening of infrastructure. The losses of arable loss have been accompanied by a deterioration in soil quality. As investments are increasingly diverted from agriculture into more lucrative enterprises the ability of the collectives to maintain and improve irrigation and drainage facilities is progressively weakened. Many dykes and reservoirs built during the collective era have entered a 'dangerous state' of disrepair (Gittings, 1989). Yet peasants have been characteristically unwilling to invest beyond chemical inputs, fuel, and electricity because of uncertainties over long-term land ownership and a lack of incentives resulting from low returns on sales of agricultural products. The use of chemical fertilizers, however, already high during the collective era, has continued to increase. China's application rate is now much higher than that of many industrialized countries. In 1990, an average of 220 kg of fertilizer was applied per hectare of sown area, compared to 50 kg in the USA. The environmental consequences of such intensive use of chemical inputs, as well as its effects on the health of the farmers, has become a matter of serious concern (Webb, 1991). The weakening of irrigation management combined with the high application of chemical inputs has resulted in widespread salinization and contamination of

surface and ground water. Nevertheless, rural environmental regulation is still largely inexistant (Ross, 1992).

Decline in state investment. There is a growing concern that new investment in agriculture will be needed in order for increases in agricultural production to match the expected increase in population. Yet state investment in agricultural fixed assets has been consistently declining since the economic reforms (from 12 percent in 1978 to 3.1 percent in 1990) (Watson, 1989; Leeming, 1993). Most agricultural investments today come from within agriculture itself, in the form of peasant deposits at the Agricultural Bank and rural credit organizations. Since peasants tend to deposit only a portion of their incomes, preferring to keep cash in hand or to invest their surpluses in other endeavours, there is a strong demand for credit, which the banks and co-operatives can not match. The future of additional investments in agriculture will in part depend on the state's ability to mobilize resources privately held by households (Watson, 1989). It will also depend on the state's commitment to pay off its mounting debt to farmers. Having, more recently, substantially increased spending in non-agricultural projects, the government has become unable to supply the money needed to redeem debt certificates issued for the purchase of agricultural products. This situation has caused riots among the farming population in different parts of the country, and it is likely to continue to undermine the peasants' trust in the central government's agricultural policy (Hornik, 1993).

Rise of unemployment. The increase in agricultural productivity generated by the economic reforms, and the modernization of farming methods, combined with a surge in rural population to create a vast pool of surplus agricultural labour (Pannell and Ferguson, 1991; Leeming, 1993). In the late 1980s, approximately 100 million people, 30 percent of the total rural labour force, were either unemployed or underemployed, seeking a new opportunities in the fast growing non-agricultural economy—services, commerce, and rural industry (Taylor and Banister, 1991). This situation, exacerbated by decades of policy restricting migration to cities, has not improved with greater freedom of movement in the 1990s. Although millions of peasants migrate every year to cities, the number of underemployed rural workers is projected to reach 200 million by the end of the

century (Hornik, 1993). This situation has increasingly worried the central government which perceives unemployment as a source of crime and instability. Labour mobility and unemployment are today among the most pressing social issues in China (Businessweek, 1993; Solinger, 1993).

Spread of Corruption. As a consequence of the economic reforms and the marketization of the economy, the network of *guanxi* ('connections') traditionally used for social advancement, has taken on renewed significance. Cadres and officials have been increasingly willing to use their positions of power to exploit new opportunities, to make profits on legal and semi-legal business operations, and to retain revenues from various levies (Vohra, 1994). In the newly emerged underground economy, these cadres often behave like black-marketeers rather than true capitalists (Smith, 1991). The wave of economic crime led to the establishment of "corruption report centres" all over China in 1988. Since then, thousands of charges of bribery and embezzlement have been reported every month, resulting in the recovery of large sums of money for the state treasury (Smith, 1991).

Corruption is inherent to the separation of China's economic and administrative hierarchies, characteristic of Deng Xiaoping's society model of economic liberalization tied to centralization of political power (Prime, 1991; BusinessWeek, 1993). To its credit, the central government is now intent on reducing the size of its bloated bureaucracy (Kaye, 1993c). Nevertheless, given the present lack of political reform to make cadres, who often enjoy lifelong tenure, more accountable to their constituencies, the problem of widespread corruption is unlikely to disappear in the near future.

2.4 Prospects of Rural Reform in the 1990s

Aware of the growing problems generated by the rural economic reforms, the government has re-emphasized the role of agricultural development in its modernization programme for the 1990s. The eighth Five-Year Plan has set a production target of 500 million tons of grain by the year 2,000. It has become increasingly clear, however, that this goal will not be achieved without the contribution of the state as an active participant.

In the second half of the 1980s, obvious failures of market direction became a matter of concern and prompted the state to look for a new set of directions. In early 1987, a joint investigation by the State Council and Communist Party recommended a series of measures to make agriculture more productive. The commission specifically recommended to raise the purchase prices of agricultural products; spread high-yield technologies; curb the use of land for non-agricultural purposes; encourage large-scale farming by merging individual farms; increase mobility of rural workers; increase period of land-leases; make property rights inheritable (Gittings, 1989). Given the narrow scope for political maneuver in China, none of these proposed changes could easily be implemented without political struggle against hard-line conservatives committed to the ideals of the Maoist era. Nevertheless, progress came, if not with entire predictability, at least with growing vocal support for the proposed amendments. In 1988, sales of land-use rights were officially authorized, but most of the reforms were put on hold following the June 1989 Tiananmen incident (Leeming and Powell, 1991).

Greater state involvement in agricultural investment. The year 1990 marked a turnaround in agricultural production. After stagnating for five years, grain production jumped from 400 million tons in the previous year to 435 million tons, an increase of 6.7 percent, caused mainly by an upsurge in state investment. These gains, however, stemmed more from extensive growth in the form of increased sown-area than from a rise in productivity, which remained close to the level in previous years. There are even indications that productivity of capital in 1990 was once again declining: for every 1 percent of growth in grain production, capital stock had to be raised by 2 to 4 percent (You-ji, 1991). Given the reluctance of peasants to invest large sums of money in farming as long as property rights and other political issues remain unresolved, the state will have to supply the investments necessary to reach its production targets. It may have to do so by introducing unpopular measures such as raising new taxes and suppressing spending in other areas of the economy.

Independent farmers and new co-operatives. Direct investment by the state alone is unlikely to raise agricultural productivity to a level high enough to meet the food

demand by the growing population. Increasingly, planning authorities have identified farmland fragmentation as a serious obstacle to improving agricultural productivity: peasants have too little land to farm, and the lack of cohesion in rural communities has had a detrimental effect on global investment. Calls for economies of scale have recently led to a two-tiered operation structure in agriculture with the establishment of economic associations and cooperatives to help households in agricultural production. These offer financial administrative functions for collective farming as well as opportunities for income redistribution in face of growing disparity in living standards among peasants (You-ji, 1991; Croll, 1994). These collective arrangements have proved especially popular in areas traditionally supportive of government policies. Thus, in the Beijing area, 64 percent of the agricultural land was farmed under collective farming in 1990 (You-ji, 1991). In many parts of China, new cooperatives and economic associations, combining private initiatives and collectively organized production emerged spontaneously. Thus service companies were formed to provide services in irrigation, public works, and agricultural machinery, and supply and marketing companies to make various inputs—such as chemical fertilizers and seeds—easily available to households. New trends in agricultural management were noticeable throughout the Chinese countryside, with a decline in household responsibility for production and "new shifts to village cooperation and unified management and to a commodity economy" (Croll, 1994).

Changing patterns of spatial interaction in the countryside. The new production arrangements generated by the rural economic reforms are dramatically altering the pattern of spatial interaction among peasants. These have implications of both geographical and political nature. At the spatial level, an emerging class of powerful merchants and rich producers is changing the nature of linkages between towns and rural areas. With the global establishment of trading mechanisms, the countryside has ceased to be simply a source of resource extraction for the central government, which had historically favoured cities in its development plans. Instead, the rational, economic decisions made by peasants in rural areas have increasingly come to bear on the living-standards and well-being of people in cities. At the same time, the emergence of free markets in both city and countryside is changing patterns of interaction throughout the country.

Rural retail markets, criticized during the Cultural Revolution as instruments of capitalism now serve as nuclei for urban growth, and the new wholesale markets in urban areas have changed the role of cities to increasingly act as central places for much larger areas than in previous decades (Smith, 1991; Leeming, 1985). The expansion of cities' reach in consumer product distribution coincides with increased responsibility in administrative affairs. Mainly recipients of resources from rural areas during the collective era, cities are now expected to administer rural counties and towns as well as provide leadership to promote economic development of the areas under their administration (Wu Chung-Tong, 1987).

At the political level, the main implications of the rural reforms have been the decentralization of decision-making and the attribution of greater freedoms to individuals in economic matters. Peasant households decide on agricultural investments; cooperative ventures are formed by social contract and negotiations based on rational considerations. In both cases, profits are kept by the farming households and re-invested locally. At the same time, villages have been made self-governing and more democratic, with village officials directly elected by popular vote (White, 1992). New political constituencies and centres of power are emerging, based on economic wealth, increasingly able to challenge the administrative hierarchy imposed by the central government (Smith, 1991).

Recent legislation. Political reforms in the 1990s, although still the exclusive privilege of the ruling Communist Party, are increasingly reflecting the economic and social trends in the country. Although the political battle between pro-market reformists and conservatives faithful to central planning policy is far from being over, new sets of reforms are emerging, which emphasize the importance of market forces and allow local authorities greater autonomy. There are official plans to abolish price controls on most agricultural commodities within the next few years, overhaul the grain-purchasing system, and end the practice of making peasants sell a fixed proportion of their grain to the state at low fixes price (Tai Ming Cheung, 1992; Ross, 1992). Even conservative politicians have been calling for an increased role of the state as a regulatory body rather than as a direct agent of intervention in the market economy. Proposed changes include conversion of state agricultural subsidies into a "relief fund for natural disasters," the creation of "price regulation funds" or

"commodity reserves" to replace price controls, and the formation of an "overall insurance fund" for unemployment, old age, and industrial injury. The same voices point to the necessity of relaxing controls on labour mobility and decreasing urban subsidies (Kaye, 1993b).

The growth of tribunals. In 1993, the National People's Congress proceeded to complete the process initiated by the 1992's fourteenth Party Congress, ensuring the continuity of Deng Xiaoping's line of economic liberalization under tight political control. The new legislation addressed the need for mechanisms to implement the current constitution, to correct violations, and to enhance citizens' awareness. The scope of civil rights remained circumscribed by a freshly drafted National Security Act granting police wide ranging powers. As with most legislation in China, the act contains a degree of ambiguity. It encourages the use of national security powers by security forces, but, at the same time, it cautions against infringement on the lawful rights of individuals and organizations (Kaye, 1993a).

To be sure, the National Security Act is designed to limit, rather than expand, civil rights. Nevertheless, institutions may be evolving to offer citizens greater legal recourse. A multitude of arbitration mechanisms are emerging from new economic laws on joint ventures, securities, companies, property, and trade, set up in agreement with international norms. The rising number of private law firms countrywide testifies to the popularity of these commercial tribunals. Importantly, these mechanisms have been applied to the country's civil courts, so that litigation is becoming increasingly accepted by the people as impartial recourse to justice on both business and private matters (Kaye, 1993a).

The popularity of courts in the countryside is bringing a much needed measure of political stability. It represents the peaceful expression of newly-found common ground between the Chinese people and their government. The recognition by the state of the rights of its citizens and their private organizations, however narrowly defined at the present, is an important step toward the process of expanding these rights. It is likely to lead to an expanding body of legislation designed to this end.

2.5 **Regional Disparities**

The legacy of the Maoist era. The policies designed to reduce spatial inequalities in China during the Maoist era accomplished few of the intended goals. There had been a certain dispersal of industrial growth throughout the country, and the provinces in the intermediate and interior regions had experienced faster industrial growth than the coastal provinces (Wu Chung-Tong, 1987). But investment policies favouring the heavy industrial sector had resulted in a generally impoverished agricultural sector and a widening gap between rural and urbanized regions. Thus the gap in agricultural income between the richest and poorest provinces increased from 87 yuan in 1957 to 128 yuan in 1979 (Smith, 1991). As in previous decades, the richest agricultural areas in the country were found in the suburbs of Shanghai, areas favoured by the availability of rich agricultural soil, a well-developed transportation network to markets, and a steady supply of fertilizers and other chemical inputs.

With the exception of a few, heavily subsidized agricultural development projects, of which Dazhai village in eastern Shanxi was the most advertised, there had been no overall effort to develop agriculture in the poorest areas. Poverty among peasants was severe in remote and topographically disadvantaged parts of the country. Between 1977 and 1979, 221 counties (*'xian'*), or 9 percent of the total, representing 88 million people, were reported below the official poverty line. In these countries, annual per capita incomes were less than 50 yuan, corresponding to an annual grain ration of less than 200 kg (Wu Chung-Tong, 1987; Smith, 1991; Wang Zhusheng, 1991; Cotterell, 1989). These poverty-stricken areas were clustered mostly in three parts of the country: the low-lying salty or sandy areas of the north China plain, the infertile loess plateau, and the hilly Yunnan-Guizhou plateau of the southwest (Smith, 1991). The situation was primarily caused by obvious physical conditions—lack of access to fertile land and unavailability of water, and geographical factors—remoteness from urban markets and sources of fertilizers. Other factors, however, were inherent to the centrally planned economy of the Maoist era: lack of labour movement caused by restrictions of rural-to-urban migrations; emphasis on local self-reliance in agricultural and industrial production at the expense of local special conditions; lack of investment in transportation networks, which remained under-developed

in most of the countryside; and lack of technical, managerial, and administrative skills in undeveloped areas.

The impact of economic reforms. The Deng Xiaoping government's development policies have resulted in improved economic conditions in most areas of the country, and reduced the incidence of severe poverty (Prime, 1991; Smith, 1991). Nevertheless, progress across the countryside has been uneven, and variations in levels of development between regions have increased considerably. Regional development schemes, the core-city policy, and promotion of Special Economic Zones have reinforced the coastal region's dominance, which already enjoyed relatively high incomes and well-developed industries and agriculture[10] (Xu Changming, 1993). These areas registered the highest growth in lucrative, non-agricultural employment in the country. As a result, differences in income between coastal and inland provinces widened considerably (Wu Chung-Tong, 1987; Taylor and Barrister, 1991). In 1986, the annual per capita incomes in Beijing (4,100 yuan) and Shanghai (3,400 yuan) were almost ten times higher than in Yunnan (450 yuan) (Prime, 1991). The resulting pattern is one of a modern China, based on the coastal areas and large cities, characterized by rapid industrial growth, export economy, and private lending, and a hinterland formed on the interior provinces, with stagnating economies and relying on the state for investment funds (Smith, 1991).

The development gap between eastern provinces and the interior areas are not the only form of regional disparity in China. These core/periphery contrasts are overlain by large gaps between urban and rural incomes throughout the

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10 Official development policy fostered regional specialization according to *regional comparative advantage*. Thus, in the seventh Five-Year Plan (1986-1990), the coastal regions, sites of already technologically advanced industries were left to develop at their own speed, by focusing on growth of high-technology in Special Economic Zones (SEZ) designed to bring in foreign investment. The availability of access to deep-sea harbours made industrial production in these zones naturally appropriate for exports. At the same time, the more remote inland regions were to concentrate on energy development, raw material extraction, and local specialization.

More precisely, the seventh Five-Year Plan divided China into three zones, to which were assigned distinct roles in the global modernization effort of the country. The eastern region was to focus on technological modernization and the production of high-quality consumer goods; the central region was to develop its energy resources (especially oil and electricity) and foster mineral extraction; the western region was to expand agriculture, forestry, animal husbandry, energy, and natural resources, as well as develop consumer goods for local needs and ethnic minority tastes (Kirkby and Cannon, 1989).

country and by substantial variations of incomes within rural areas (Knox and Agnew, 1989). Thus, in the 1980s, per capita incomes in urban areas were consistently double those in the countryside. These disparities were mainly the result of imposition of price ceilings on agricultural products and the control of movement from rural to urban areas throughout the 1980s (Smith, 1991).

In terms of variations between rural areas, the differences in income levels have been even more pronounced. Thus, in Gansu, a mostly agricultural interior province, the average per capita income in 1983 was 228 yuan. Yet, according to World Bank estimates, 41 percent of its population lived in a state of poverty with annual incomes per capita under 140 yuan (Knox and Agnew, 1989; Wu Chung-Tong, 1987). These differences were mainly caused by differences in quality and quantity of agricultural land and by distances between cultivated areas and core-cities. Given the bottlenecks in transportation caused by decades of neglect during the Maoist era and the difficulties in access to fertilizers and agricultural technology faced by rural areas distant from industrial centres, the incomes in agricultural suburban areas have been consistently higher than in those in remote rural areas (Wu Chung-Tong, 1987).

Backward Areas and Poverty

Two decades of Maoist policies intended to reduce inequalities among peasants and fifteen years of economic reforms designed to increase agricultural productivity have not achieved the socialist goal of eradicating poverty from the Chinese countryside[11]. Peasants in many rural areas, especially in the hill regions of China, still live in precarious conditions which continue to deteriorate (Jiang Dehua, 1989; Unger and Xiong, 1990; Smil, 1993).

The existence of poverty areas had been recognized by the Deng Xiaoping government soon after the introduction of the economic reforms, and the 1980 national budget contained a special fund to help the economies of less-developed areas. This fund, however, was too limited to improve on even the most basic resource and environmental problems which hamper the development of agriculture in the disadvantaged areas. Nine areas also became officially

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11 According to World Food Program statistics for the beginning of 1985, one-tenth of China's population was below the poverty line and lacked basic food and clothing (He Bochuan, 1991).

classified as 'backward' and therefore in need of special assistance by the government. Of these, five were autonomous prefectures (*'zhou'*), mostly populated by ethnic minorities—Xizang(Tibet), Nei Monggol (Inner Mongolia), Ningxia, Xinjiang, and Guangxi, and four were provinces containing significant minority populations—Qinghai, Gansu, Yunnan, and Guizhou. The gap between levels of economic development of the Han people and ethnic minorities was acknowledged to be wide, and backward areas began to receive special attention in developmental policy (Wu Chung-Tong, 1987).

Nevertheless, the government's recognition of backward areas has been largely ineffective in preventing extreme disparities in economic development to grow throughout the countryside, and reports of severe poverty in many parts of rural China have been increasingly frequent (Smith, 1991; Unger and Xiong, 1990; Zou Gang, 1994). In 1993, 80 million people lived below the poverty line in China (Wong, 1994). The reasons for this poverty can be linked to some of the problems specific to Chinese agriculture. People living in areas of poverty are subject to sharp increases in population density, losses of agricultural land, neglect of irrigation facilities, decrease in governmental assistance, and environmental problems such as soil degradation and increases periods of drought and flooding. Living in remote areas, far from towns and markets, they have no other source of employment than subsistence agriculture and lack of access to public facilities such as health-care, education, and technical assistance (Smith, 1991; Wu Chung-Tong, 1987; Smil, 1993).

Increasingly, however, poverty in those areas has been associated with combined aspects of agricultural policy and regional economic development policy. Unger and Xiong (1990) in a study of economic conditions in the hinterlands of Yunnan province identified recent government policies and specific aspects of peasant societies as important factors contributing to the persistence of pockets of poverty in rural China.

Bet on the strong. The "bet on the strong" bias in the Deng Xiaoping government's economic policy has had adverse effects on destitute households and impoverished areas in the Chinese countryside. Under the Household Responsibility System, peasant households are required to sell predetermined amounts of their harvest to the state at prices considerably lower than the free-

market prices. Poor households unable to keep enough grain to feed themselves after their sales of grain quota often enter a state of malnutrition and enduring poverty which can end in starvation. Most impoverished villages and counties have been exempted from paying taxes or supplying grain quota to the state. But destitute families in less afflicted areas have no other alternative than seeking short-term credit from local credit associations to buy commercial fertilizers. Their requests are rarely granted as their ratings are judged to be too low to guarantee such loans. These families are thus either forced to sell their agricultural land, often at a low price, or risk confiscation.

Credit crisis. Peasants in Yunnan have scant access to loans in agriculture. Most of the credit to households is available though local credit associations, which are controlled by the provincial Agricultural Bank. Such credit association loans are small (rarely more than 1,000 yuan) and short-term (three to twelve months). The Agricultural Bank is increasingly contributing to the credit crisis in rural areas. It has become a vehicle through which money has been extracted from peasant communities for non-agricultural investments. Thus, in 1988, half of Yunnan's Agricultural Bank deposits came from village credit associations. In other words, peasants, through the credit associations, were subsidizing the bank. These funds, however, have been increasingly used to finance the development of rural industry. As a result, the situation of credit crisis has worsened in China's rural areas (Hornik, 1993).

Special credit programs exist for relief of poverty in destitute areas. In 1988, Yunnan received from the central government 80 million yuan for its Old-Minority-Border-Poor fund (*Lao shao bian qing kuan*) created to subsidize poor, border, minority counties. The province also received 76 million yuan to be distributed in the context of an Aid-the-Poor fund (*fu pin kuan*). A large part of these funds was diverted to ends other than poverty relief. Some of this money was invested by the village communities in rural industry, reflecting a bias in rural policy towards rural industry rather than agriculture. Another part was appropriated to prosperous households by nepotism, using connections (*guanxi*) to officials. The rest of the money was directly invested by the government agencies responsible for the distribution of the fund into their own enterprises.

Lack of leadership and decrease in community cohesion. In face of a situation of increasing adversity in farming conditions, peasants have often been unwilling to cooperate in pooling their meager resources in order to improve their agricultural production. Reluctance to cooperate on behalf of community goals is no doubt partially caused by frustrations experienced during the collective era. The problem is compounded by a state of weakened leadership, as local leaders have not directly profited from the rural economic reforms. Thus village leaders, who are also responsible for their own agricultural production, are seldom motivated to undertake the supplementary task of organizing collective operations in agriculture (Latham, 1985). At the same time, families are reluctant to cooperate in developing private assets, in the form of farmland, draught animals, and agricultural machinery. Peasants are more willing to give away their labour in exchange of services and remuneration, and they prefer to cooperate on more profitable projects—requiring sizable loans—than in farming. The trend toward renewed individualism in farming, increasingly detectable since the introduction of the rural economic reforms, may have further severe implications for China's impoverished peasants.

2.6 Ethnic Minority Areas

Far from being a culturally homogeneous entity, China's population is marked by a high degree of diversity. Out of a total population of 1.13 billion recorded in the 1990 census, 91.2 million (9 percent of the total) were members of the 55 ethnic minorities (*xiaoshu minzu*) officially recognized by the government, eighteen of these groups exceeding one million[12]. These numbers represented a surge of 36 percent in ethnic minority population since the 1982 census, compared to 11 percent for the Han (Tien et al., 1992).

The high rates of population growth in the ethnic minority populations were in part the result of decreased infant mortality due to overall improvements

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12 The process of assigning membership to ethnic groups was officially started in the early 1950s. At that time, claims were made to over 400 ethnic categories, based mostly on subjective criteria. Of these, the government recognized 56, including the dominant Han. These categories were established as the result of national politics, scholar and official research and interpretation, minority groups' self-awareness, and contesting of ethnic identity. While, in traditional China, (and Southeast Asia), ethnic identities had often been subjective, flexible, and situational, in modern China, they had become fixed and immutable (Wu, 1990; Hsieh Shih-Chung, 1989).

in food production, health, and welfare in the country that followed the introduction of economic reforms in the late 1970s (Ma Yin, 1985). Above all, they were the product of change in national policy and increased liberalism towards minority nationalities after the end of the Cultural Revolution in 1976. After decades of cultural repression and forced assimilation into mainstream Han society, new legislation came into effect that not only recognized the rights of these groups but also gave them preferential treatment in some areas (Heberer 1989; Wu 1990; Oakes 1992). Thus exemption of the one-child-per-family policy and enhanced prospects of labour recruitment, school admission, and professional advancement caused many inhabitants of ethnic minority areas to claim or reclaim ethnic minority status.

The new policies on ethnic matters have led to a renewed sense of pride among minority groups (Wu, 1990). Some of these groups are experiencing a cultural revival that helps build a sense of consciousness, cultural continuity, and resistance to assimilation within the larger, dominant Han society (Oakes, 1992). Yet these groups are subjected to considerable pressures by the state's programme of modernization and fast economic development agenda. These pressures, combined with a situation of reduced resource base due to overexploitation and fast population growth, have had an impact on the minority groups' traditional methods of livelihood and natural resource use. Their societies are in a state of flux owing to their efforts to adjust to the reality of a socio-political system in profound transformation.

Autonomous areas. Since 1949, an autonomous area system has been established to represent the areas of the country that contain significant ethnic minority populations. This system is composed of four levels—regions, prefectures, municipalities, and counties, representing areas with different levels of government and power in the state's administrative hierarchy. The number and sizes of these areas have been in flux since their creation. In 1990, there were 5 autonomous regions, 62 autonomous prefectures, 71 autonomous municipalities, and 589 autonomous counties, representing a total area of over 60 percent of China's total land area. Each of these counties may have one or several leading minority groups, but these may not form the majority of the county's population. In fact, in many of these counties, the Han are in majority (Zhao Songqiao, 1994).

Since the early 1980s, autonomous areas have been granted special privileges over other administrative units. First, the use of local languages was promoted in schools and local government; laws were passed to advocate hiring functionaries from the minority populations; and the areas gained greater control on their economic and cultural development. In 1984, the Law of Regional Autonomy of the Nationalities of the People's Republic of China officially gave autonomous areas extensive rights in matters of regional planning, resource management, foreign trade, financial and tax administration, education, health, marriage and inheritance laws . Since then, new rights and liberties have been added to the constitution in favour of ethnic minorities living in autonomous areas (Heberer, 1989; Ma Yin, 1989).

In education, Nationality Schools and Nationality Institutes have been established providing education, free of charges, in the language of local nationalities. At the same time, Universities offer special programmes to help prepare minority applicants and many schools lower their passing scores in high-school and college entrance examinations (Wu, 1990). Yet the rate of illiteracy remains considerably higher than in the Han population. In 1987, the rate of illiteracy was 44 percent compared to the national average of 20 percent. In some counties, it was as high as 80 percent (Heberer, 1989).

In family planning, the state has favoured leniency in its application of the one-child-per-family policy[13]. Thus minority couples are usually allowed two children, and in certain circumstances, and specific areas, three[14] (Tien et al., 1992). In practice, minorities in remote areas are casual in their observance of official regulations, and their fertility rates are considerably higher than those in the eastern provinces. In the early 1980s, the natural population growth rates in border regions (Guangxi, Tibet, Xinjiang) ranged from 2.0 to 2.4 percent each year. These are double those in most of the coastal provinces (Jowett, 1990). In 1989, nearly 16 percent of all births in remote areas were fourth or higher parity

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13 Note that the one-child-per-family is not strictly enforced in the Chinese countryside, not even in areas mostly populated by Han. Thus, since 1989, all rural couples whose first child is a daughter have been normally allowed to have a second child. This represents a major retreat form the "one-child" policy (Cooney, 1994).

14 In Xinjiang, urban dwellers are eligible for two children; in the countryside, peasants are allowed three of four. In Tibet, no restriction theoretically applies to the rural population, and decisions on family size are mainly a household responsibility (Heberer, 1989).

births (Tien et al., 1992). The fast population increases in the autonomous areas have posed intractable development dilemmas as education and health facilities, urban services, housing, and infrastructure have not kept up with the population growth (Heberer, 1989; Jiang Dehua et al., 1989).

In terms of economic development, several policies in the 1980s came to bear effect on the economies of ethnic minority areas[15]. First, from the beginning of the decade, the "east-west dialogue" was promoted to encourage enterprises from the east to participate in joint ventures or direct investment in the west in areas such as cash crop plantations, food processing, and textile industry. The emphasis was on promoting horizontal linkages among the country's regions against the verticalism of central planning. Second, "continued grants of intellectual, material, financial assistance" were provided by the state to expand the capacity of the minority regions to exploit local mineral and agricultural resources. These policies were especially intended to slow the exodus of skilled people to the prosperous coastal provinces. Third, trade contacts were encouraged between minority areas and the nations bordering them. Cross-border contacts boosted the morale and stimulated cultural revival among ethnic groups that were spread on both sides of the border[16] (Cannon, 1990).

Other state programmes have been created and special budgets earmarked to assist minorities in their social, economic, and cultural development. Under the "Three Allowances" programme, minority groups are entitled to low-interest state loans and guaranteed state price subsidies for both purchases and sales of various agricultural and industrial outputs. In addition, local enterprise ventures are allowed to retain at least half of the profits (Oakes, 1992). Development funds have been established, in part by taxation levied within the autonomous areas, and in part by transfer of central funds raised in

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15 The development of autonomous areas has been a national priority since 1949. From 1949 to 1979, their total agricultural and industrial output increased eight-fold, largely the result of state investments (Sun Jingzhi, 1988).

16 Border trade is quickly becoming the main source of hard currency for the western provinces and autonomous areas. Thus, in 1993, the Southwest China Economic Community, which includes eight provinces and autonomous regions (Guizhou, Yunnan, Qinghai, Guangxi, Ningxia, Xinjiang, Inner Mongolia, and Tibet), and involve 30 minority groups, achieved nearly half their foreign trade volume through border trade. In the first half of 1993, the total output value of gross domestic product of the whole region was 108.8 billion yuan (US $ 19.1 billion), up by 12.4 percent from the year before. Meanwhile, the central government continues to add new economic zones in those regions (China Daily, 1993c).

the eastern provinces. In the 1980s, these funds received an annual 10 percent increase in subsidies from the state. At the same time, special investments were allocated by the central government to finance infrastructural projects such as irrigation and transport. These funds and subsidies have become the object of resentment in the eastern provinces, which supply most of the money. As a result, these funds are now the target of reform, and low-interest loans have replaced grants as the most popular source of financing (Cannon, 1989).

The privileges granted by the state to ethnic minorities in autonomous areas have generated much envy in the Han population living in rural areas. There has been many attempts by Han families to register children in minority regions and by counties, townships, and villages to obtain officially recognized ethnic status. As a result, the demarcation of ethnic boundaries and identities continues in the peripheral region of the country (Oakes, 1992; Pannell and Ferguson, 1991).

Impact of development policy. China's pursuit of modernization has placed demands on the autonomous areas, and the fast pace of economic growth has inevitably led to conflicts between local populations and developers. Although ethnic minorities have, in recent years, gained some authority in the development of their local economies, national development planning is still largely a responsibility of the Han majority. Their aim is to integrate the autonomous areas into China's global economy[17]. Yet economic development has often been disruptive to the existing minorities' livelihood. The intensification of traditional agricultural methods and forestry practices has led to ecological damage. In addition, immigration of Han people has put additional pressures on local natural resources, that are already under stress from high rates of local population growth (Leeming, 1985; Heberer, 1989).

Current government development policy, based on regional comparative advantage, emphasizes the development of the coastal region as the strategy for national development. In this scheme, border areas, especially southwestern provinces are to supply raw materials and energy resources (Li Shihua, 1989;

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17 Ethnic minorities have not only had little input in the planning of their local economies; They were entirely left out of the process of defining autonomous areas. The boundaries of these areas were essentially drawn by the Han-dominated central government (Cannon, 1989).

Smith 1991). Ethnic minority areas have been subjected to several main patterns of exploitation by the Han: extraction of raw materials and energy resources; practice of intensive farming and forestry; nuclear testing and establishment of labour camps; setting up of industrial enterprises and dumping of industrial wastes; tourism development and commercialization of local economies; and other national programmes (Cannon 1989; Oakes, 1992; Gladney, 1994). The often reckless exploitation of ethnic minority areas has been largely motivated by the sense of superiority held by Han rulers towards the minority nationalities[18]. Derided during the Cultural Revolution for lacking revolutionary history and inherently possessing counter-revolutionary customs, ethnic minorities are now often criticized for having backward forms of economic organization (Cannon, 1989; Ma Yin, 1985).

The response of the minority nationalities in western provinces has often been to express resentment over the imposition of Han developmental strategy on their local economies. Western leaders are displeased with the limited role of supplying food, raw materials, and energy assigned to their regions. They have often responded to the official bias in regional development policy by enforcing stiff protectionist measures to stimulate local economic growth (Li Shihua, 1993; Lin Ling, 1993). They see much of the effect of reform policies as intensifying Han exploitation of their areas (Cannon, 1990). Yet official policy is likely to continue to give priority to the development of the Eastern Coastal Region in order to improve economic conditions in the whole country[19]. This attitude of the central government is shaped by the ethnic dimension—the perception that much of the Western Region is held by non-Han peoples—and the political perception of an "East-West divide" in levels of socio-economic development (Cannon, 1989).

Without greater contribution of the less developed provinces, continued emphasis on development according to regional comparative advantage is likely to result in larger polarization in the distribution of wealth among regions,

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18 Feelings of disdain and contempt for ethnic minorities are deeply rooted among the Han Chinese, who, in much of China's history, regarded—and treated—these groups as inferior (Eberhard, 1982; Hsieh Shih-Chung, 1989).

19 The general principle underlying economic development in China is that, eventually, prosperity will "trickle down" from the coastal regions to the less developed areas of the interior (Smith, 1991).

increased rural poverty in remote areas, and further resource depletion and ecological damage in ethnic minority areas. To reverse this trend, it is necessary to reconcile the two diverging views of economic development and balance out the economic powers of governments at regional and national levels (He Bochuan, 1991). While the fast modernizing provinces in the eastern half of China indisputably needs access to raw materials and natural resources, it is imperative for the local populations to gain increased control over the exploitation of their resources. Healthy socio-economic development will largely depend on the ability of ethnic minorities to exercise real power in decisions over regional development policy and local immigration policy.

The 1980s have seen important legislative steps taken to improve the rights and socio-economic standing of China's ethnic minorities. But the national and cultural identity of these groups is still undermined by bureaucratism and the political conservatism of low-level officials, who often show reluctance to implement new policies; Han chauvinism and contempt for local customs and ethnic minority cultures; and threats of assimilation, especially among the smallest minorities, caused by the development of minority areas without sensitivity to local economies and cultural practices (Heberer, 1989). Local minorities, so far, have had virtually no influence on Han migration into their areas, and they still yield too little power on matters of self-administration and socio-economic development. Further legislation will be required to decentralize political power as well as economic decision-making. Regional development policy will best reflect local views and local reality. The ability of the cultures of many small minorities to survive may well depend on continued political liberalization in China (Heberer, 1989). There is a need to obtain further insight into the capacity of ethnic minority groups in China to modify their local economies and social institutions in response to regional development plans devised by the central government. The purpose of this study is to investigate the changes in methods of livelihood employed by the Dai of Southwest China and the transformation of their society caused by pressures of modernization.

2.7 Summary

This chapter has reviewed agricultural and regional development policy in China since the Communist take-over in 1949. Under the aegis of socialist government, agricultural policy went through important changes which directly affected agricultural productivity and the living standards of both rural and urban populations. These were to have a profound influence on Chinese society as a whole by transforming the cultural landscape of the country and prompting political reforms reaching deeply into people's lives. The ethnic minorities living in the country's remote areas were especially affected by the changes in regional development policy. After decades of poverty and cultural repression during the collective era, these groups have regained a measure of autonomy in cultural and economic affairs. Nevertheless, progress of their local economies is still hampered by policies that favour dominance of China's coastal region. The following chapter describes the conceptual framework and the research methods adopted for the study.

Chapter 3

CONCEPTUAL FRAMEWORK AND RESEARCH DESIGN PROCEDURES

This chapter discusses the conceptual framework adopted for the study and outlines the research design procedures.

3.1 Human Ecology

This study pertains to the field of human ecology, the study of human interactions with the environment (Goodall, 1987). The theoretical model of human ecology adopted here is largely based on the *actor-based* model, in which individual peasants make rational agricultural decisions according to profit-maximizing or subsistence security considerations within the institutionalized contexts (economic, social, political) to which they belong[20] (see section 3.2). This is a valuable approach for understanding the processes of change which occur in social systems in response to environmental perturbations. The model is especially useful to explain why traditional farmers accept or reject agricultural innovations[21] (Rambo, 1983).

The actor-based model is useful to understand the choices made by members of a peasant society. To describe the ranges and types of choices available to the society, however, one must turn to another theoretical model of human ecology—the *systems* model. This model is derived from the perspective that dynamic relationships exist between human societies and the natural

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20 The *actor-based* model was developed by Orlov (1980). With this approach, environmental adaptation of a social system is seen as the result of the outcome of decisions made individually by the members of the system. Over time, the most successful adaptive strategies will become institutionalized as cultural norms. A thorough discussion of the actor-based model and other models employed in human ecology is presented in Rambo (1983).

21 The actor-based model has been convincingly applied to explain why peasants in northern Thailand have adopted tractors in some circumstances and retained water-buffaloes in others. Similarly, it has been used to show how decisions by Thai farmers to plant improved rice varieties have been based on rational consideration of environmental forces affecting crop yield (Rambo, 1983).

environment (SUAN, 1990). It assumes that two integral systems, the human social system and the ecological system, interact with one another by exchanging energy, materials, and information. During exchange, both systems change their internal configurations according to their internal dynamics. This approach, often too complex to be used as an operational research model, nevertheless offers specific guidelines for the design of research procedures by enabling the researcher to focus attention on the significant areas of interactions between human social systems and ecological systems (Rambo, 1983).

This study focuses on the components of the human society and the natural environment which have a direct effect on the nature of these interactions: the changes in ethnic composition in the area; a state of reduced land base due to recent immigration; the modernization of technology in agriculture and forestry; the traditional knowledge, beliefs, and values that shape the cultural practices natural resource use by the Dai; and the political and administrative institutions that control the land tenure system, exact taxes, and exercise constraints on village life. The changes in land use by the Dai and the associated changes in their society reflect these phenomena. These people have devised unique ways to adjust to the changing environmental conditions and political situation in contemporary China. An analysis of the components of the local human ecology and their interactions is needed to understand the changes in modern Dai society.

3.2 Peasant Economic Behaviour

> Forest degradation and rural poverty are neither isolated nor self perpetuating conditions. They are rather symptoms of resource scarcity, outcomes of agrarian change, and indicators of complex social conflict.
>
> (Peluso, 1992)

The theoretical concepts presented here deal with the issue of peasant economic behaviour. The central question is "how do peasants make agricultural decisions under economic conditions approaching those of a free market, while subjected, at the same time, to the constraints of a reduced, non-expandable land-base, a limited credit situation, and incomplete mechanisms of diffusion of knowledge and technical innovation?" This section presents concepts which

both clarify the nature of the problem and prepare the ground for an analysis of peasants' potential responses.

Most of the theoretical concepts presented here are derived from the works of the following authors. In *Peasant Economics* (1988), Frank Ellis gives an overview of the theoretical concepts put forward to describe peasant economics. In *The Moral Economy of the Peasant* (1976), James C. Scott describes traditional values and institutions of peasant societies in Southeast Asia and how these became corrupted during the colonial era. In *Weapons of the Weak* (1985), Scott analyses in depth the forms of resistance in peasant societies subject to external constraints. In *Understanding Peasant China* (1989), Daniel Little discusses the validity of various theoretical frameworks in explaining agrarian change within Asian society. These works provide considerable insight into the mechanisms of change in peasant societies.

First, the characteristics and the dilemmas of the peasant economy are described. The goal is to understand the unique position of peasant households in developing countries and to highlight the differences with the farm enterprises found in societies with established markets. Second, several theoretical models of peasant economic behaviour are presented. The *profit-maximizing* theory is, at best, a coarse approximation of decision-making behaviour of peasants. This model resembles the "free-market" model of neo-classical economics[22]. Its practical outcome is to highlight the rational aspect of the decision-making processes in peasant society and the constraints on peasant households' attempts to make economically efficient decisions[23]. The *risk-aversion* hypothesis shows the effect of uncertainties on economic decisions made by peasant households. It provides a powerful reminder of the importance of subsistence activities for households that live close to the poverty line. In the *moral economy* framework,

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22 Modern economists have largely abandoned the free-market model for reasons such as imperfections of consumer knowledge and deliberate manipulations of the market by monopolistic corporate bodies (Rambo, 1983).

23 While traditional farmers often have accurate knowledge of their natural environments, which can allow them to make rational decisions concerning natural resource use, there is no guarantee that such an end will result. Thus in the "tragedy of the commons," individual decisions to seek personal maximum gains from access to communal resources (such as communal pastures or forests) are rational from the perspective of each actor. However, the summed effect of the individual decisions is to destroy the carrying capacity of the environment, thus lowering the welfare of the whole community (Rambo, 1983).

the "norm of reciprocity," and the "right to subsistence" are the two main principles of the subsistence ethic that characterizes the peasant economy. In this view, traditional social institutions (such as land redistribution mechanisms) are shaped to protect villagers from the effects of subsistence crisis. However, these have become weakened by the creation of the modern state and the commercialized economy. "The subsistence ethic is cross-cultural because it derives from structural features of peasant life rather than cultural traditions or religious values" (Little, 1989:31). The moral economy framework does not contradict the theoretical model of rational, profit-maximizing, risk-evaluating peasant behaviour. "It is possible to regard peasants as rational decision-makers and still regard the traditional village as a social context in which cooperation, collective actions, and communitarian practices occur relatively readily" (Little, 1989:39).

3.2.1 **The Nature of Peasant Society.**

Peasant society may have been an isolated community in the distant past, in which households derived a livelihood by practicing *subsistence* or traditional agriculture. In modern days, in the majority of developing countries, peasants are undergoing a continuous process of adaptation to the changing larger economic and political systems of which they now are part. Two factors had a profound, disruptive effect on traditional agricultural structures: the commercialization of agriculture and the integration of the local economies into the wider national and international economies. These have led to wholesale adoption of intensive methods of agriculture and new technology as well as changes in cropping patterns and social institutions (Dixon, 1990; Rigg, 1991; Ngo Vinh Long, 1988).

From its onset in the mid-1960s to the present, the *Green Revolution*, and the *new rice technology* associated with it, has not only changed dramatically the agricultural production methods traditionally used by the rural populations, but in many parts of South and Southeast Asia, it has equally affected the agricultural motivation of the peasantry. The introduction of modified rice varieties, new chemical fertilizers and herbicides, combined with greater mechanization and improvements in irrigation, credit facilities, and work extension has made double-cropping possible in areas in which subsistence

needs by peasant households could hardly be met in the past, leading to widespread cultivation of cash crops and increasing commercialization of agriculture[24]. As a result, peasant production has been in varying degrees exposed to *market forces*, to which the peasantry's response has been ambivalent. Markets provide both opportunities and risks for peasants. By engaging in markets, peasants may hope to improve standards of living or diversify their means of consumption. At the same time, they may become exposed to the possibility of failure either from adverse price trends or from the exercise of unequal market power by competitors. Thus the "relationship of peasants to the market contains a tension between the risky advantages of market participation and the preservation of a non-market basis for survival" (Ellis, 1988:6).

An important aspect of modern peasant farming is the *dual* economic nature of peasant production. The *household*, the peasant unit of production, is both a farm and enterprise, and it simultaneously engages in *consumption* (or subsistence) and *production*. The subsistence basis of peasants' livelihoods is a distinguishing feature of peasant economy. As a result, the integration of peasants into the market economy is only partial. At the same time, the operation of market principles is limited by the existence of *non-market factors* in peasant society. For example, significant non-market criteria affect the allocation of land. In many peasant societies, families have complex traditional rights of

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24 The precise impact of the Green Revolution on peasant society has been on the whole difficult to evaluate. Research in the 1970s criticized the dissemination of the new rice technology for promoting the growth of inequalities of income in rural areas and to give incentives to large farmers to accumulate land at the expense of small-holders, who lost access to their family plots. Since the 1980s, however, there has been a reappraisal of the technology. Rigg (1989) points out that the new research has shown that the new rice technology has become increasingly 'small-holder friendly' and that this technology is being adopted by the poor as well as by rich farmers.

> "Many of the changes currently under way in rural areas--growing inequalities, rising, landlessness, the breakdown of traditional society--are best understood as part of the wider process of agrarian change and agricultural commercialization. The role of the green revolution has often been to ameliorate the negative consequences of these developments, not to promote them."
> (p. 393)

Rigg, in addition, sees a real danger of growing inequality in rural communities, not because of the new rice technology, but "because of insufficient progress in the technology under the strong pressure of land." (Rigg, 1989: 393). However, he emphasizes very rightly the need to take greater note of the ecological implications of modern farming methods and to learn from indigenous technologies and knowledge to build in long-term sustainability into the new agricultural system.

access to land which interfere with the operation of freehold land markets. In the same vein, labour markets are affected by reliance of households on family labour. Although this feature does not rule out the use of hired labour in special circumstances, as during peak periods of harvesting, the predominance of family labour has a distorting effect on classical labour markets caused mainly by peasants' various subjective criteria relating to decisions in the use of their labour. Another example concerns the use of capital. Given the dual production and consumption nature of peasant agriculture, there is no well-defined category of profit for household production, and profit can not be easily distinguished from returns to family labour. At the same time, purchase of capital inputs by the household may have both production and consumption aspects (Ellis, 1988).

Thus peasant societies are characterized in part by their varying rather than total commitment to the market, and in part by the incomplete character of the markets in which they participate. There are additional characteristics of peasant societies that further distort the markets in which they operate. To varying degrees, peasant society features non-market, or reciprocal transactions between households. *Reciprocity* is a cultural phenomenon. It refers to exchanges which involve unlike goods and services. One peasant will help his neighbour in the construction of a house; in return, the neighbour will provide his services during harvest. There is an economic content in such exchanges, but they are not valued by market prices. Reciprocity may involve social norms of sharing and redistribution designed to make survival of community members easier in times of adversity. When these norms predominate over individual gains in the market, the peasant economy can be described as a *moral economy* (Scott, 1976). Another element contributing to market imperfection confronting peasant societies is the low and uneven development of economic infrastructure. In this condition, markets are spatially fragmented due to poor transportation and communication. As a direct consequence, peasants are afflicted by inadequate information of market conditions.

To summarize, peasant households are farm households "with access to their means of livelihood in land, utilizing mainly family labour in farm production, always located in a larger economic system, but fundamentally characterized by partial engagement in markets which tend to function with a high degree of imperfection" (Ellis, 1988:12).

3.2.2 **The Profit Maximizing Peasant Household**.

The model of the economically efficient, profit-maximizing peasant household is based on Schultz's celebrated hypothesis that farming households in developing countries are "efficient but poor" and that "there are comparatively few significant inefficiencies in the allocation of the factors of production in traditional agriculture" (Schultz, 1964, in Ellis, 1988:63). This model has had a lasting influence on rural development programmes and policy making processes in the third world. In reality, the nature of peasant economy inhibits the attainment of economic efficiency in a strict neoclassical sense, which would require the existence of a purely competitive market. Peasant household decisions can not be considered as essentially based on pure motivation of profit maximization. Nevertheless, a strong element of economic calculation exists in the context of the multiple goals and constraints of the farm household. This is supported by a great deal of indirect evidence that shows peasants' responsiveness to changes in market prices of farm outputs and inputs.

Closer to the realities of peasant economy, however, is the notion of partial, or constrained, profit maximization. This concept affirms that peasants seek profit maximization in an economic environment distorted by *constraints* of various kinds. First, the existence of uncertainty in the peasant economy creates a very different situation from the protected market in which farms operate as capitalist enterprises in developed countries (see section 3.2.3). Second, unlike the capitalist mode of production, peasant economy contains both production and consumption components. Thus there exists trade-offs between profit maximization and other household goals, such as increased time spent in activities other than farm work. Finally, pervasive imperfections exist in credit, labour, output, and input markets, as well as in the diffusion mechanisms. These effectively restrict the scope for profit maximization endeavours by peasant households.

These considerations of economic efficiency and profit maximization in farming methods have had important implications for rural development policies. The recognition of profit maximization as a behavioural trait of farming households has led to policies which seek to increase the output of the peasant sector by rising farm output prices or by lowering the cost of variable inputs,

such as fertilizers, pesticides, and new seed[25]. Increasingly, however, small farm economic policies are being designed to remove constraints and to improve efficiency. Such policies are ambitious. They aim at nothing else than transforming the economic system in peasant society, at converting peasant households into farm enterprises in a competitive market system (Ellis, 1988).

3.2.3 Uncertainty and the Peasant Household.

Agriculture for peasant households in developing countries is linked to a high level of uncertainties which have a considerable impact on peasants' economic decisions. These uncertainties can take many forms. *Natural hazards*—floods, droughts, volcanic eruptions, pests and diseases, and other natural calamities, add a considerable element of uncertainty on predictions of agricultural productivity. The response of households to such an element of danger is not necessarily uniform among households[26]. As an example, the capacity to combat pests and diseases may depend on the ability to purchase relevant cash inputs, and this can vary widely between different households

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25 Such policies were implemented with success in China after the introduction of agricultural reforms in 1978. These resulted in an annual increase in agricultural output of 6.7 percent during the period 1978-1985 (Selden, 1993).

26 The economic unit used in the theoretical models presented here is the *peasant household*. These models ignore the gaps with respect to the internal relations of the households. Thus the distribution of tasks and gains between *genders*, however unequal, is assumed to be directed at maximizing the overall welfare of the household. At the same time, the differences between men and women with regard to risk evaluation in agricultural decisions are ignored.

Yet decision-making processes in agriculture have been shown to differ sharply among genders. Thus men are more likely to base their decisions on market considerations than women, who show a preference for subsistence crops over cash crops. At the same time, men are favoured by a bias in agricultural policy which gives them access to new technology (new seeds, improved fertilizers and pesticides, mechanization, and so on) and special credit facilities. On the whole peasant societies are characterized by the social subordination of women in spite of their essential subsistence and reproductive function (Ellis, 1988).

A rigorous study of intra-household economics would require a systematic evaluation of the contributions of both sexes, and this would be the object of an entire study of its own. This research is limited to issues of *gender-specific* and *gender-sequential* farm work. In particular, it investigates task-specific and seasonal division of labour in rice agriculture, winter-cropping, rubber growing, and fuelwood collection. The focus of the study, however, remains essentially the economic status of the household. It does not attempt to compare systematically the contributions of women to those of men in farming. This would represent a move away from the objectives of the study, which concern the changes in Dai society caused by modernization and economic reforms in China and the integration of the Dai community within the greater Chinese society.

within a peasant community. *Market fluctuations* are an other form of uncertainty. These are unavoidable consequences of the time-lag between decisions to plant a crop and the achievement of an output. The result is that market prices at point of sale are unknown at the time decisions are made. The problem is especially severe where information is lacking and markets are imperfect. *State policies* often add an element of uncertainty to the economic environment in peasant society. Peasant economies are susceptible to the vagaries of decisions by agencies of the state which may change greatly from one moment to the next. Present policies may contradict some made in the past or they may soon be invalidated by others made in the near future. The situation of poverty dramatizes the importance of uncertainty for the majority of peasant households in developing countries. The sheer poverty of many peasant families means that the outcome of certain events can often make the difference between survival or starvation (Ellis, 1988).

The Safety-first Principle. Extensive research into peasant risk behaviour has brought to light an important aspect of the peasant economic decision-making process—*risk aversion*. According to Scott (1976), peasant economics can only be understood from the small-holder point of view, that is from the premise that "struggle for a subsistence minimum is carried out in the context of a shortage of land, capital, and outside employment opportunities" (p. 13). In such an environment, *safety-first* is the ground principle of the economics of subsistence, likely to guide peasants in their decisions concerning new agricultural investments. Peasants evaluate the risks associated with increasing investments of cash for fertilizer, hiring non-family labour at transplanting time, and growing cash crops. New farming undertakings will normally not threaten the subsistence security required by the household. The goal of secure subsistence is expressed in a wide array of choices in the production process: a preference for crops that can be consumed over crops that must be sold, an inclination to employ several seed varieties in order to spread risks, a preference for varieties with stable if modest yields. Cultivators near the subsistence margin follow essentially the same line of reasoning in decisions concerning the growth of cash crops. There is almost always an element of risk in shifting from subsistence production to cash cropping. While a successful subsistence crop normally

guarantees the family food supply, the value of a cash crop depends invariably on its market price and on the price of consumer necessities. As a result, peasants will switch to cash crops when these do not compete with their subsistence crops and when the new labour requirements are low enough not to compete directly with the labour needs required by subsistence agriculture. The bulk of the research in Southeast Asia has shown convincingly the overall priority of subsistence concerns over profitability[27].

Ellis (1988) points to other consequences of risk-aversion behaviour on peasant household farming. First, it often results in economically inefficient resource use at the farm level. The more risk associated with the output of a given resource, the more efficient the use of the resource. Second, it may lead to cultivation practices, like mixed-cropping (that is, the intermingling of a variety of crops in a single field), which achieve security at the expense of lower returns than could be achieved by mono-cropping[28]. Third, peasant risk aversion inhibits the diffusion and adoption of innovations which could improve the

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27 In severely overpopulated areas of the Southeast Asian countryside, the pursuit of subsistence by the peasant households often translate into a desperate attempt to combat starvation by farming more and more intensively the small family agricultural plots. In this instance, the methods and arrangements of farming become more and more elaborate. Peasants work harder and longer hours on crop patterns more diverse and more strictly reflective of the household's subsistence needs; the tenure system grow more intricate, tenancy relationships more complicated, cooperative arrangements more complex. The net result is one of an agricultural system in which the productivity of land continues to increase, albeit in a slower fashion. The productivity of labour, on another hand, takes a slow downturn. Ultimately this is a self-defeating process, and the growing household needs are not matched by the new agricultural gains. When this pattern becomes characteristic of a whole agrarian order, it represents what Clifford Geertz has called *agricultural involution* (Geertz, 1963).

28 Mixed-cropping is an agricultural practice prevalent in most tropical areas of the world. It refers to the intermingling of a variety of crops, commonly between two and five, and sometimes up to eight or nine, in a single field. The advantages of this agricultural practice are numerous. Mixed-cropping allows:

(a) security through diversification;
(b) superior use of light, water, and nutrients, due to different spacing, height, and nutrient requirements of the different crops;
(c) beneficial effects of the growth of some other plants;
(d) reduction of susceptibility to pests and diseases;
(e) protection of soil from leaching and drying out;
(f) evening out of labour requirements of weeding and harvesting over the year;
(g) ensuring the variety and nutritional balance in the food supply;
(h) security of food supply in face of adverse weather or market prices.

(Ellis, 1988, p.95)

output and incomes of peasant farm families. This is related to imperfect knowledge of innovations and improvements in agronomic practices. Also important are other constraints to adoption such as high cost or lack of credit. Finally, risk aversion declines as wealth or income rises. Wealthier farmers are better able to withstand the losses which may result from taking risks in agricultural decisions. "It follows that households with higher incomes might be expected to be more able to make efficient economic decisions, more prepared to specialize in cash crops, and more willing to innovate. They are also likely to be better informed and have greater access to credit" (p. 94).

Government Interventions. The theory of the risk-averse peasant "is associated with government interventions designed to remedy the adverse impact of risk aversion on agricultural productivity and growth" (p. 96). In order to minimize the impact of natural hazards on peasant agriculture, irrigation projects have been financed by the state as an answer to rainfall variability. (However, irrigation is not simply a risk strategy. Together with double-cropping, increased fertilizer use, and improved seeds, it is an essential component of intensive agriculture.) At the same time, new plant varieties have been designed for resistance to pests, diseases, droughts, and stability of yields. Market risks have also been lessened by a series of state interventions. A common policy response to price instability has been price stabilization. This may take many forms, from minimum floor prices for key strategic staples to fixed producer prices across a wide variety of crops. Information provision, through extension work, training programmes, farm education in schools, and so on, has been attempted to remedy the situation of insufficient knowledge of markets. Credit subsidies have made peasants more likely to adopt higher production technologies (new seeds) and the variable inputs (chemical fertilizers) that go with them.

Such government intervention programmes are often necessary to help peasants adjust their livelihoods to a commercialized economy. "The spread of market relations inevitably exposes peasants to new risks because it erodes non-market social interactions, reduces the subsistence basis of peasant agriculture, and increases competitive pressures. At the same time, these processes increase the efficiency of peasant production due to the discipline of the market" (p. 99). Nevertheless, what characterizes a peasant household as opposed to a family

enterprise is the continued prevalence of non-market forms of economic interactions between households within peasant communities. Some of these transactions are measures for coping with situations of adversity and disaster, which prevail over situations of self-interest and thus may be part of the peasant society's moral economy.

3.2.4 The Moral Economy Framework

In the *Moral Economy of the Peasant* (1976), Scott holds that the desire for subsistence security, which grew out the needs of cultivators living on the margin of subsistence, was "socially experienced as a pattern of moral rights or expectations", a "subsistence ethic" (p. 6). As a moral principle, the subsistence ethic has a normative or moral dimension, which is expressed in the form of social guarantees, in preferred systems of tenancy, and in attitudes towards taxes. Most village studies of Southeast Asia stress the importance of informal social controls, which act to provide for the minimal needs of the village poor and tend to redistribute the wealth among the villagers. These controls can take the form of village rights over agricultural rights. Thus, in many rural areas of Southeast Asia, communal land is traditionally allotted on the basis of the need to poor villagers. This pattern embodies the "minimal moral requirements of village mutuality" (p. 43). It guarantees, in normal times, the "survival of the weakest" (p. 43). In terms of tenancy, peasants under most circumstances, have naturally preferred systems that provide subsistence crisis insurance. This preference is most strongly present where "plots are small, yields highly variable, peasants are poor, and where few alternative subsistence opportunities exist" (p. 44). Fixed rents—in cash or in kind—are, in safety terms, the most burdensome because they seriously weaken the peasants' ability to feed themselves in bad years. The peasant would "minimally ask of the state what he asked of the patron—that it adjust its claim on his yield to his capacity to pay" (p. 52).

In *Understanding Peasant China* (1989), Little provides support for important elements of Scott's moral economy[29]. Traditional peasant societies

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[29] The moral economy framework has been opposed by the political economy framework advanced by Popkin (1976). In this framework (which draws many concepts from economic theory), Popkin argues that peasants are "primarily concerned with the welfare and security of self and family" rather than that of the collective group (p.31). Peasant will favour personal investment in future welfare "—through children and savings—" over relying on reciprocity and

invariably embrace several kinds of collective practices: "labour and draught-animal sharing, crisis insurance among rough equals, agricultural development projects that benefit all villagers, and redistributive schemes to preserve the subsistence needs of poor villagers" (pp. 48-49). The collective actions are facilitated by the coordinating role of informal, non-state organizations existing in the village. Thus an informal village council, dominated by prominent local figures, often performs recurring functions, such as distributing the tax burden among villagers. In addition, it provides an "institutionalized context to consider village interests and problems" (p. 48). Villages also typically incorporate a range of nonpolitical organizations to which villagers belong—kinship groups, temple organizations, trade associations, burial societies, and so on. "These provide loyalties and commitments that influence individual motivations, as well as organizational and motivational resources to village leaders who attempt collective action" (p. 48).

Little emphasizes the circumstances that are likely to undermine voluntary cooperation and collective action in village society. Market forces or extra-village politics (such as a more intrusive state) can disrupt trade organizations of the village and undermine cooperation by lessening incentives for individuals to deal with other villagers. As individuals develop primary economic and political relations to outsiders (through trade, day labour in the city, political affiliation with national political parties), interdependence among villagers is greatly diminished. At the same time, exposure to national economy and culture may reduce shared values and motivations for collective action in the village society. Little holds that "incentives toward conditional reciprocity disappear as group size grows larger and social relations become atomized" (p.

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insurance from the village (p.23). The "moral economy predictions about collective security, based on assumptions of collective rationality," are invalidated by the realities of "individual self-interest" at all strata of village society, including leadership (p.38). Peasant economic and social behaviour is only rational from the point of view of the individual. However, the "actions of individually rational peasants in both market and nonmarket situations" rarely "aggregate to a rational village" (p.31).

The position taken here is that both views are complementary rather than contradictory. As Little (1989) suggests, Popkin offers a model of economic and social behaviour based on individual action. He describes village practices as the "aggregate of the rational activity of many rational, welfare-maximizing villagers" (p.53). Scott adds to the model "the assumption that individuals are motivated not only by the rational self-interest but also by a set of culturally established constraints" (p.66).

51). In the case of China's countryside, this statement was dramatically demonstrated by the failure of collectivized agriculture to reliably provide for subsistence needs of the vast majority of the peasants in times of crisis.

3.2.5 Peasants and the State

> The revolution, when and if it does come, may eliminate many of the worst evils of the ancient regimes, but it is rarely, if ever, the end of peasant resistance.
>
> (Scott, 1985)

An important issue of investigation concerns the state of the relationship between Dai farmers and the state. For the longest time since the Communist take-over, and especially during the years of collectivization, the situation in China has been one of a powerful, centralized state that has not had the material basis to survive without extracting large surpluses from its rural population. In the freer economic and political climate of the 1980s and 1990s, the Chinese state has retained complete control of the institutions that affect the welfare of Dai society—land tenure, taxation, population control, rural credit, agricultural inputs, and planning of the country infrastructure. The effectiveness of the economic and political reforms on the development of Dai community and its integration within the greater Chinese society will depend largely on the relationship between the Dai and these institutions themselves.

From a phenomenological perspective, the issue can be examined by focusing on the experiences and perceptions of the weaker participant in the power play—the Dai. Is the state perceived by the Dai as cooperative in their efforts to adjust to the changing ecological conditions in China, or is it felt to be principally extractive, bent on exacting fixed taxes from households in a precarious state of economic insecurity? Is the new political climate conducive to the strengthening of ethnic identity or are new government policies aimed at ethnic assimilation? To keep in line with James Scott's argument (1976), peasant societies living close to the subsistence margin have two main moral principles, two primary criteria of justice: the norm of *reciprocity* (or *equal exchange*) and the *right to subsistence*. These are genuine components of the subsistence ethic, rooted in the economic practices and social exchanges of peasant society.

Together they form the standard against which claims by landlords and the state to the agricultural surplus are evaluated.

The Norm of Reciprocity. It is based on the principle that a landlord-tenant relationship, like any other human relationship, will be judged to be exploitative or not depending whether it satisfies the norm of reciprocity[30]. The moral idea is that favours should be returned out of gratitude and that, consequently, equal exchange defines a fair relationship. On another hand, a situation of unequal exchange will be associated with sentiments of exploitation. In this context, one would expect that any major shift in the ratio of goods and services that peasants provide to elites and the goods and services that they receive in return "would be accompanied by a corresponding shift in the perceived legitimacy of the relationship" (p. 171).

The concept of balance in the terms of exchange employed here is not directly quantifiable. No definable exchange rate applies to convert subsistence insurance and protection provided by the state into a number of bags of grain handed over in lieu of taxes by peasants. At the same time, services provided by elites (public works, schools, village festivals, etc.) are not unambiguously divisible into exchange between individuals. Nevertheless, both the direction and approximate magnitude in terms of trade can often be ascertained. "If elites discontinue a service and the services of peasants remain unchanged, we know the balance has become less favourable for peasants. If elites demand more without providing more, we know that peasants are in a less advantageous position" (p. 172). Thus in rural class relations, "the crucial question is whether the relationship of dependence is seen by clients as primarily collaborative and legitimate or as primarily exploitative" (p. 170).

The Right to Subsistence. Along with reciprocity, the right to subsistence is an active moral principle in the tradition of the village. This right is inherent in the preference for social arrangements that minimize the danger of failure in a situation of hardship. A system of tenancy in which the landlord protects his

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30 Since in the Chinese countryside the role of the landlord is almost exclusively assumed by the *state*, the relationship in consideration in this study is the one between the Dai households and the Chinese state.

tenants against ruin in bad years; an officialdom which makes allowances on taxes levied in periods of scarcity; a system of village rights over land in which communal land is allowed to the poorest members of the community; social pressures on the richest families within the village to be generous toward their less fortunate neighbours; these are expressions of the same moral right to subsistence which kept hold in the precapitalist agrarian order. The assumption of this right is that all members of a community have a presumptive right to a living so far as local resources will allow. When a worsening of balance of exchange threatens crucial elements of subsistence routines, when it results in a situation in which the peasant household subsistence requirements are hardly met, we may expect outcry and vehement protest against the established agrarian order and state policy.

The central question for the researcher to ask bears on the essential concern of the peasants themselves. It is "not only how much elites extract from them but what effects their claims have on the constituent elements of their lives" (p. 178). As one might expect, the social meaning of the right to subsistence and the obligations of the elite varies considerably according to the cultural and historical context. In feudal systems of strong personal patronage, elites had the duty to intervene to subsidize and assist peasants whose subsistence was in jeopardy. In the peasant's historical relationship to the state, the right to subsistence asserts that the state's claims to produce or labour must not jeopardize the peasant's right to subsistence. The actual content of the moral claim has a direct relation to the claimant's sources of subsistence. For smallholding peasants, the claim may include "continued access to land, assistance from state agencies during hard times, remissions of taxes following a bad harvest" (p. 179).

The "peasant's idea of justice and legitimacy" according to this analysis "is provided by the norm of reciprocity and the consequent elite obligation to guarantee—or at least not to infringe upon—the subsistence claims and arrangements of the peasantry" (p. 188). If the state, in its political and economic reforms, fails to recognize the peasantry's social rights as its obligation, it is likely to meet with reforms of peasant defiance, which, from the vantage point of the

peasant, are morally justified[31]. By neglecting to fulfill its moral obligations towards the peasantry, the state will, in effect, have dissolved the normative basis for continued peasant deference; it will have relinquished any moral rights to peasant production.

Forms of everyday Resistance. One "barometer of shifting class relations" includes the means devised by peasants "for clandestinely improving their terms of exchange with landlords" or state authorities "while avoiding open confrontations" (p. 231). Peasants may secretly harvest and sell a portion of their crop before the formal division of the harvest. They may pilfer from the landowner's granary when the occasion presents itself. The landlord, or the state agency collecting taxes, may receive baskets of rice filled with as much chaff as grain. "All of these devices are a violation of the tenancy or the labour contract. As such, they suggest that labourers or tenants consider the imposed terms unjust and will do whatever is in their power to circumvent them" (p. 231).

Another area of peasant life in which we may expect to find strong indications of feelings of exploitation is the peasant culture. Much of the *folk culture* in peasant society amounts to a legitimation, or even a celebration, of various kinds of evasive and cunning forms of everyday peasant resistance (Scott, 1985). Tales of "tricksters," bandits, and peasant thieves; accounts of religious mythological figures and past heroes; spread of gossip and character assassination are forms of peasant subcultures designed to underwrite

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31 This is especially relevant to the situation in China. Until 1978, the Chinese state had unquestioned power to enforce any law or motion decreed by the central government. Of course law-making in that era was backed by the exercise of a great deal of coercive power. It was also justified by intensive campaigns of propaganda which would in most forms extol the virtues of peasant work . Since 1978, successive governments in China have introduced economic and political reforms which have restored a certain amount of decision power to local populations. At the same time, however, the state has retained some of the old regime's rigid claims to peasant production, expressed in the form of the imposition of fixed taxes on household production, the right to determine prices of agricultural inputs and outputs, and firm control on the supply of credit. There are indications that peasants in the Chinese countryside are increasingly considering the reciprocal side of this exchange relationship between the state and the peasantry. Unrest in parts of the country, as occurred several times in Sichuan, in 1993 are evidence of increased resistance to some of the state's claims, such as the sale of production quota at prices determined by the state. This resistance is likely to have been perceived to be based on *moral grounds*, not only by the peasants themselves, but also by the state, which has proceeded to revise its stand on a whole range of agricultural issues.

dissimulation, poaching, theft, tax evasion, avoidance of conscription, and so on. Folk culture in this sense often achieves a climate of opinion favourable to unorganized forms of resistance. At the same time, it prepares the ground for an understanding of a whole range of complex activities, which, although made up of individual actions, together will form a collective expression of protest and defiance (Scott, 1985). Proverbs, folksongs, oral history, legends, jokes, language, ritual, and religion can help us gauge the symbolic distance between the elite and the peasantry. "Since the freedom of peasants to elaborate and define their own culture is almost greater than their capacity to remake society, it is into their culture that we must look to discover how much their moral universe diverges from that of the elite" (Scott, 1976:239).

3.3 Research Design

3.3.1 Interpretive Approach

The objective of this study is to investigate the Dais' responses in farming practices and social arrangements to economic and political reforms in China. The methodological approach adopted here is essentially *behavioural*. Decisions are made on a rational basis but in relation to the social and natural environments as they are perceived by decision-makers. In other words, choices are made on the basis of knowledge, which, in most cases, is incomplete, and the perception of which varies according to individuals (Johnston, 1987). An important aspect of behavioural research in geography and resource management is that behaviour be investigated *inductively*. It is believed that a positivistic approach based on deriving hypotheses from general models built on assumptions about behaviour would have only limited usefulness in understanding social reality. As experience has shown, the use of mathematical models and structural analysis has often been found inadequate to describe the complexity of human experience (Eyles and Smith, 1988). In contrast, an inductive investigation of behaviour will 'provide inputs to a superior range of models' (Johnston, 1987:127).

As Eyles (1988) affirms, a qualitative or *interpretive* approach is especially well suited to understand and explain the nature of social reality. This approach is grounded in the intersubjective nature of the world: the observer and observed

share an experience of everyday life and use the same phenomena to identify meanings. An investigation of this experience and social world requires methods 'which allow the acquisition of insider knowledge through interaction, observation, participation, and informal interviewing.' (p. 2). Social reality can be reconstructed through induction—'generalizations are developed from information presented in *case studies* using refinement, abstraction, typification, and categorization' (p. 4). Interpretive approaches in case studies have been convincingly employed in various parts of the Southeast Asian region, such as Burma (e.g. Leech, 1964), rural Indonesia (e.g. Geertz, 1963; Peluso, 1992), and Thailand (e.g. Hirsch, 1990). They stress the importance of cross-cultural comparisons and interdisciplinary cooperation in human geographical studies (Jackson, 1989).

The possible range of qualitative methods is vast, and the interpretive geographer is, by need, a 'methodological eclectic' (Eyles, 1988: 6). To represent the complexity of the social world, it is appropriate and often necessary to adopt a '*multiple research strategy*' (p. 4). First, multiple investigators can be used to design the research procedures and collect the data. These may come from different disciplines, be men or women, or have different ethnic origins. Second, multiple theories may be used, even if they seem contradictory or inadequate, provided the relative explanatory merits of these theories are carefully assessed. Research design must, above all, be '*theory-informed*' in order 'to avoid the error of empiricism' (p. 5). The researcher may then discover empirical relationships and 'select those relationships where data are theory related' (p. 5). Third, there may be multiple sets of data, requiring different methods of investigation. Thus there may be a need for statistical coverage, observation, and ethnographic description (based on conversation and interview). Ley (1988) lends weight to this position. He holds that the geographer's task to interpret the complex relations of people and place requires a 'methodology of engagement not detachment, of informal dialogue as well as formal documentation' (p. 127). The qualitative material forms the basis of the interpretation, but it can be 'usefully supplemented and confirmed by more formal methods' (p. 131).

3.3.2 Local Knowledge

Importantly, the study focuses on local knowledge—the Dais' perceptions on the matter of interest. As recent development in human geography has shown, gathering local knowledge has acquired increased significance in cultural studies (Jackson, 1989). The philosophy underlying the methodological approach is that the problems facing local populations are best identified by the local people themselves. Van Maanen(1988) points out that an ethnographic text, in order to present an accurate description, has to be a co-authored production involving the natives and the fieldworker—"the heart of ethnography is discourse" (p. 137). The critical task is then to *interpret* the data transmitted orally. According to Geertz (1973:20):

> "The main characteristic of ethnographic description is to be interpretive, and it is interpretive of the flow of social discourse."

The process of interpretation is inherent to and undissociable of ethnographic description. Its importance is felt at every stage of the process, not only during data analysis and production of the final written account, but also during fieldwork. As Marcus (1986: 264) states:

> "In an important sense, fieldwork is synonymous with the activity of inscribing diverse contexts or oral discourse through field notes and recordings."

Thus the process of collection of indigenous knowledge is itself an act of interpretation. It is made difficult by the differences between the belief systems of the natives and those of the researchers. Beliefs in supernatural causes, good, and bad spirits can not be translated into scientific knowledge, and the peasants' notion of causality is not readily understandable from a scientific perspective (SUAN, 1990). The process of interpretation thus plays an important role at the stage of data analysis. Without interpretation by the fieldworker, the recorded knowledge would appear as a set of incoherent and unintelligible data to the reader. Without further interpretation by the analyst, the final written product would likely be perceived as dull and on the whole rather uninteresting. The

aim of ethnography is to produce a "thick description," "to draw large conclusions from small, but very densely textured facts[32]" (Geertz, 1973:28).

Semi-structured Questionnaire.

The principal method chosen to survey the natives' perceptions was to design a semi-structured questionnaire which focused the interviews on the issues of investigation while giving the respondents the opportunity to define their issues of concern (a copy of the questionnaire is included in Appendix A). This method allowed new, as yet unthought-of, issues to be identified. It also revealed systemic linkages among the different areas of inquiry[33]. The household questionnaire is divided into four sections. The first section focuses on household characteristics: family size, generations, living and land-tenure arrangements. The second section is designed to elicit information on agricultural practices and agricultural production. The third section concerns rubber cultivation and fuelwood provision. This section is designed in a way to make clear the linkages between the two issues. The last section considers questions of economic nature and labour-cooperative arrangements. It leads to problem definition by the correspondents. In order to obtain a sample of data representative of the peasant communities, the questions were addressed to a broad cross section of the population surveyed: farmers of different generations, males and females, people with and without families, educated people, members of the village council, and elders.

Also targeted were the village leaders (*cunzhang*), who were assumed to be particularly knowledgeable about the problems facing their communities. A special questionnaire was designed to sample the leaders' perceptions concerning the problems facing their communities. This questionnaire is also divided into

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32 In "Local Knowledge" (1983), Geertz makes the point that it is not possible for ethnographers to perceive what the informants perceive. They can only perceive *experience-near concepts*--natural expressions through language or actions. Ethnography is then the task of interpreting these concepts and integrating them into a coherent text using concepts of social discourse.

33 The use of a semi-structured questionnaire had two additional advantages. First it was designed by myself in cooperation with researchers at Yunnan University who thus had their input in the process. Second, it became possible this way for separate interviewers to focus on the same issues while giving the respondents leeway for expressing their personal opinions. A number of interviews were performed by my fieldwork assistant and myself separately.

four sections. In the first section, the leader is asked to describe the village's characteristics (population, agricultural land, and forested land). The second section contains questions relating to the land tenure arrangements in the village. The third section concerns the relationship between the Dai community and the neighbouring state farm; it contains questions on the nature of possible land-use conflicts. The fourth section is designed to elicit information on the problems facing the Dai community (this questionnaire is presented in appendix B).

The questionnaires were designed on the basis of thorough literature review on agricultural and regional development policy in China. They are theory-informed in that they reflect the conceptual models developed earlier in this chapter (see sections 3.1 and 3.2). The questionnaires were developed in consultation with academics in the departments of history and anthropology at Yunnan University in Kunming, who also formulated the questions into Mandarin Chinese. Special care was given to the phrasing of questions. Thus these were expressed as clearly and simply as possible in order to be easily understood by all potential respondents. At the same time, many questions were carefully structured to elicit information concerning the issues of interest to the researchers; others were open-ended to allow respondents to identify issues which they found to be problematic. The purpose of the interpretive approach adopted here is to reconstruct social reality as the result of interactions among Dai peasants, Chinese researchers, local officials, and the writer alike.

The household survey was conducted in Mansha and Mandahuo, the two villages selected for in-depth study, between September 15 and November 15, 1993. (Section 4.6 describes the physical setting and the socio-cultural and economic characteristics of these two villages.) Households were selected from various neighbourhoods in each of the two villages in order to cover the range of economic conditions existing in the village. The questions were addressed to both male and female members of the different generations of adults in the households, and the sex, age, and marital status of each respondent were carefully recorded. Most issues investigated in this study concerned the household as a unit, and, for these issues, the sex of the persons interviewed was unimportant. Nevertheless, a few important matters such as division of labour and family inheritance rules had to be addressed specifically to members of both

sexes. On the whole, however, in this study, households rather than individuals are the units of measurement.

The interviews were normally conducted in Mandarin Chinese (*putong hua*), which is spoken by the majority of the Dai people. Questions were asked by an interpreter from Yunnan University who accompanied me to Xishuangbanna to perform the survey. The use of interpreting gave me the time to write down the answers in situ and think of the implications of the information provided for further questioning. A few older people had to be addressed in their native tongue. This could be done with the help of younger household members, who were speakers of both Dai and Chinese. The Dai proved to be, in general, cooperative in the execution of the interviews, and the refusal rate was relatively low (less than 15 percent). In the two study villages, approximately one-third of the households (35 in Mansha and 30 in Mandahuo) were successfully interviewed. Timing turned out to be crucial to the success of the interviews. The Dai work in the fields on a daily basis, and interviews were performed in the late afternoons, after they had returned to their homes. At some special occasions, it became extremely difficult to collect information. Thus, when a festival drew near, the villages became the sites of frenzied activities. During this period, virtually no one was prepared to lend us their attentions for very long, and every effort to perform an interview proved to be futile in the end. A similar situation was encountered at harvest time. In those days, it was more productive to limit activities to visual observations. Flexibility in scheduling research activities proved to be an important quality for the success of the interviews.

The village-leader survey was conducted in ten villages of the region—four in the Jinghong area (including Mansha), three in the Daluo area (including Mandahuo), and three in the Menghun area. All village leaders visited proved to be hospitable and showed enthusiasm in taking part in the interviews. The information which they provided turned out to be essential to understand the development processes occurring in the region. In particular, the leader of Manjinhan, a village directly adjacent to Jinghong, described the processes of social transformation and the problems associated with rapid urbanization in Xishuangbanna.

Informal Interviews

Informal interviews were a valuable additional source of information. Conversing with peasants in the agricultural fields, tree plantations, and along the country roads allowed information to be exchanged on issues directly identifiable—crop patterns, plot sizes, land-use conflicts, deforestation, and so on. Apart from the two in-depth study villages, informal interviewing was the method predominantly employed to sample local knowledge in most of Xishuangbanna. Used in conjunction with direct observation, the method allowed to determine the patterns of land-use and to assess the environmental situation in the areas visited.

Informal interviews also made the checking of information collected in household interviews possible. Many data obtained during household and village-leader interviews could be cross-checked where local documentation existed, such as land contracts, taxes, and local welfare levies. More informally, data such as those concerning items of consumption, housing, grain stores, and fuelwood stocks could be checked by pointing out items in the houses, on property grounds, and in the fields, and discussing the observations made at some length.

3.3.3 Methods of Observations

Direct observation was an essential component of the methods employed for data collection. Observations of the cultural landscape and human activities in villages visited provided reliable information on agricultural and environmental conditions—agricultural crop pattern, tree plantations, state of irrigation, deforestation—and on social and labour arrangements—cooperation at harvest time and during house construction, rubber collection, public information sessions, and so on. Observations were useful at two levels. First, it allowed researchers to draw a *mental map* of the whole region according to topography, ethnic composition, cropping practices, forest availability, and other criteria[34]. In my first, exploratory trip to Xishuangbanna in October and November 1992, I became able this way to identify the areas in which rubber plantations had displaced other forest uses in terms of economic importance,

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34 For a discussion of the 'mental map' concept, see Johnston (1987:134-135).

those in which agricultural cash crops had become an important part of the local economy, and those in which traditional subsistence agriculture had remained of primary concern to the local population. Many more observations allowed for further categorizations. The resulting mental representation of the area led me to focus the design of the study on specific areas of interest, which I would revisit the following year. Second, local observations provided checks on the data collected during interviewing sessions. They also provided material for questions and conversations. Observation and interviewing were necessary complementary components of the process of local data collection.

Based on observations, effective *indicators* of economic situation and environmental conditions could be designed to improve data collection. A household economic indicator can be defined according to housing characteristics. The quality and age of a house is a good indicator of the economic status and stage in the demographic cycle of the household (SUAN, 1990). I used this indicator during the interviewing sessions to check the accuracy of answers to questions concerning the financial standing of the household. A fuelwood indicator has been implemented in this study to determine the availability of fuelwood to households (Lovelace et al., 1988). This indicator is presented in Appendix C. With this indicator it was possible to determine whether the area of investigation was under severe pressure caused by a strong demand for wood products. It was also possible to determine whether the area was undergoing changes in land use—changes in fuelwood and rubber plantation patterns—or progressively entering a state of deforestation.

3.4 Summary

This chapter has presented the conceptual framework adopted in this study. It has shown several important aspects of peasant economic behaviour. First, peasants make economic decisions in an market that is subjected to constraints. Second, when peasants operate at near-subsistence levels, their priorities in agricultural investment are likely to attempt to minimize the risks of failure of crop production. Third, the vulnerability of peasant household economy to subsistence crises has given rise to a subsistence ethic that is expressed in informal, collective social institutions designed to protect the village poor and redistribute wealth among villagers. However, these mechanisms are

weakened by commercialization of agriculture and extra-village politics. Finally, as a result of this subsistence ethic, peasants expect from their landlords, or the state a system of land tenure, taxation, and financial aid that is fair and generous.

This chapter has also outlined the research design and data collection procedures. Because the study focuses on obtaining insight into local knowledge and perceptions, an interpretive approach has been adopted. Methods include semi-structured questionnaires, informal interviews, and observations. The following chapter describes the study area.

Chapter 4

THE XISHUANGBANNA DAI NATIONALITY AUTONOMOUS PREFECTURE

This chapter describes the physical and socio-economic characteristics of the study area. It then outlines the village selection process for the study.

4.1 Regional Setting

Xishuangbanna is the southernmost autonomous prefecture in Yunan province. The area borders Laos and Myanmar, between the longitudes 99 degrees 56' and 101 degrees 50' East and the latitudes 21 degrees 8 ' and 22 degrees 36' North (see Figure 4.1). It is made up of complex and varied land forms with mountains and high plateaus separated by large valleys and basins[35]. Although much of the area lies between 500 and 1,000 meters above sea level, several mountain peaks range between 2,300 meters and 2,400 meters of altitude (Pei Sheng-ji, 1985). The region owes its land forms to the Mekong (*lancang*) river system and its tributaries. The Mekong flows from north to south, dividing the region in two areas of a similar size, forming numerous incised valleys.

The region is sheltered in the north by the Hengduan mountains, a southeastward extension of the Tibetan plateau, which keep out cold currents from moving southward. The valleys in the south are so shaped that the entire region is subject to two monsoons, one from the southeast and one from the southwest. These cause abundant rainfalls and give the area its tropical monsoon climate characterized by a hot rainy season (May to October) and a dry season (November to April) with a prolonged Spring drought. The rain distribution pattern varies throughout the area according to location and

35 Approximately 94 percent of Xishuangbanna's total area of 19,220 square km is mountainous terrain. The remaining 6 percent are made up of river valleys (Pei Sheng-ji, 1985).

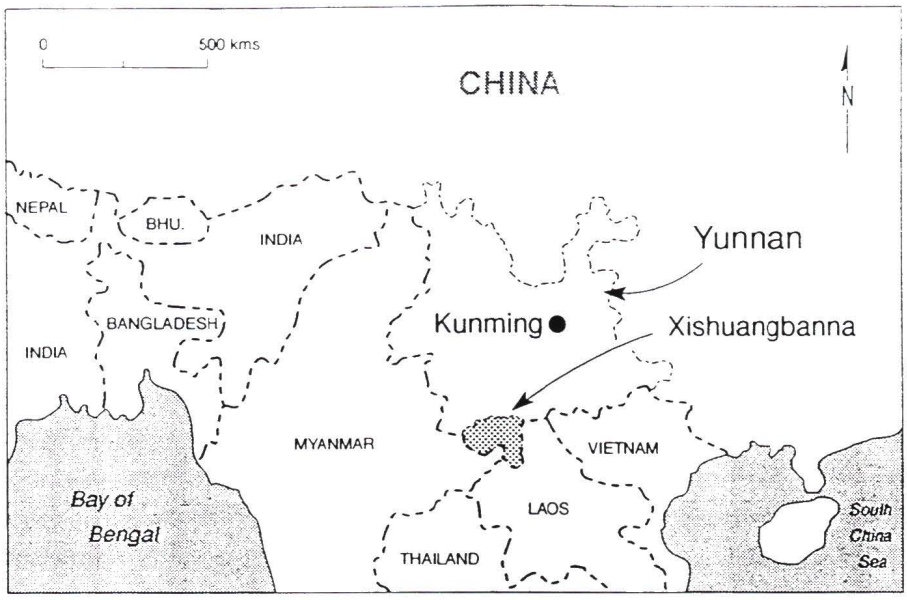

Figure 4.1 Regional Setting of Xishuangbanna

altitude, and the annual rainfall normally ranges between 1,200 and 1,600 millimeters.

Xishuangbanna is home to the richest and most diverse flora and fauna in China: between 4,000 and 5,000 species of high-order plants and over 500 species of vertebrates live in the area (Zhao Songqiao, 1994). The great differences in elevation have generated distinct vertical climatic and vegetative zones. The valleys with an elevation under 800 meters above sea-level are covered with evergreen tropical monsoon forest of tall, broad-leaved trees (which include dipterocarps), and perennial flowers. The range 500 to 1000 meters contains, in addition, deciduous monsoon rain forest, in which trees lose their leaves during a short period of the dry season. Between 1000 and 1800 meters, grows mostly evergreen, subtropical broad-leaved forest, the largest of all forest forms, occupying 80 percent of the total original forest area. Above 1800 meters, is the moss evergreen broad-leaved forest (Yunnan Society of Ecological Economics et al., 1992). Most of these forests have been, for centuries, subjected to burning and cutting for shifting agriculture. As a result, many parts of the region are now dominated by secondary growth, such as bush and grasslands. Less than a third of the original forest cover remains (Zhao Songqiao, 1994).

4.2 Ethnic Composition

As in much of mainland northern Southeast Asia, the different ecological zones of Xishuangbanna became over the centuries the sites of settlement for various ethnic groups that migrated into the area. The region is now home to minorities with distinct histories and cultural backgrounds, sharing a mountainous habitat that extends well into the neighbouring Southeast Asian countries (Eberhard, 1982; Alting von Gensau, 1988).

The Dai with a population of over 270,000, are the largest native group[36] (Photographers' Association of Xishuangbanna, 1992). They speak a language of the Zhuang-Dai branch (related to northern Thai), and they have their own written language, culture, practices of agroforestry, and traditions of plant use. They live in lowland villages, cultivate paddy rice, practice home gardening, and raise livestock (pigs, buffaloes, oxen). They possess a traditional pattern of

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36 In 1990, the total Dai population in China was approximately 1.025 million, an increase of 22 percent since 1982 (Pannell and Terguson, 1991).

planting fuelwood trees (Casia Siamea Lam.)[37]. This tree grows fast , and its cultivation offers substantial economic advantages. It is easy to cultivate and manage, and its burning produces considerable heat, factors which make it a very good source of energy (Pei Sheng-ji, 1985). Their conceptions of "holy hills", cultural beliefs derived from an ancient polytheistic religion that was heavily bound to the natural world, helped preserve large areas of original forest cover throughout the centuries. These forested areas provided a reliable supplement to their agricultural system. In addition, with the acceptance of Hinayana Buddhism, the Dai have introduced a variety of non-endemic plants in the local environment—ritual plants, ornamental plants, and fruit trees.

They are over ten mountain minorities ('hill tribes') in the region, scattered in specific mountain ranges, often at different altitudes, and with their own histories, traditions, and spoken languages. Of these groups, the Hani (population: 154,000), the Lahu (46,700), the Bulang (33,000), the Jinuo (17,700), and the Yao (15,000) have the largest populations in the area (Photographers' Association of Xishuangbanna, 1992). They traditionally derive their means of subsistence from cultivating upland rice by slash-and-burn techniques. In addition, they grow tea, raise shellac, and collect bamboo, rattan, edible fungi, natural drugs, and other products of the forest (Pei Sheng-ji, 1988).

4.3 Administrative Divisions

The Xishuangbanna Autonomous Dai Prefecture (*zhou*) is one of eight autonomous prefectures (*zhou*) in Yunnan province (*sheng*). In this administrative area, the Dai and other ethnic minorities enjoy a degree of autonomy in cultural and economic matters. A number of officials are drawn from the local ethnic populations, and policies are designed with local conditions in mind to preserve and enhance the indigenous cultures. Thus Dai, the language of the majority group in the area, is taught in schools and the practice of Buddhism is tolerated by the local authorities.

The prefecture is divided into three counties (*xian*), units endowed with a certain amount of administrative power and accountable to the prefecture for the implementation of population control, output agricultural quota, and legislation

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37 This fuelwood tree is commonly called *gemaxili* in Dai and *heixinshu* in Mandarin Chinese.

designed by higher levels of government. The central county contains Jinghong, the main city in Xishuangbanna and administrative seat of the prefecture. West of Jinghong, bordering Myanmar, is the county of Menghai, and in the east, bordering Laos, is the county of Mengla (see Figure 4.2). Each county has a number of townships (*xiang*), sites of government facilities, such as a bank, a hospital, and police. The township contains the government agency responsible for collecting grain quota from each peasant household. Further down the administrative ladder, is the administrative village (*cun*), the government organ for a number of natural villages (*zhai*) (see Figure 4.3). The government of the administrative village is filled with a number of officials, including a village leader (*cunzhang*), a Communist Party Branch secretary (*zhishu*) in charge of ideological control and propaganda, an accountant (*kuaiji*), who records land contracted by households and the taxes due, and an adviser on birth control (*funüzuchang*). Life in the natural villages themselves is overseen by a villagers' committee composed of five members—a village leader (*cunzhang*), a vice-leader (*fucunzhang*), an accountant, a cadre responsible for the local militia (*minbingduizhang*), and a birth-control adviser (*funüduizhang*), a local woman in charge of enforcing the official population control policies.

This hierarchical system is repeated in the whole of rural China except that the prefecture level of administration is absent outside ethnic minority autonomous areas. The verticality of the administrative structure in China is underscored by the fact that every level in the hierarchy contains a representation of the important components of the central government. This system ensures that, however far political and economic reforms go towards increasing local autonomy and empowering the local populations, the state retains the ultimate level of political control in the country.

4.4 State farms

As in most of southwestern China, until recently, Xishuangbanna's population remained relatively low. The area, remote and rugged, was never subjected to large-scale immigration by the Han, who had, over the centuries,

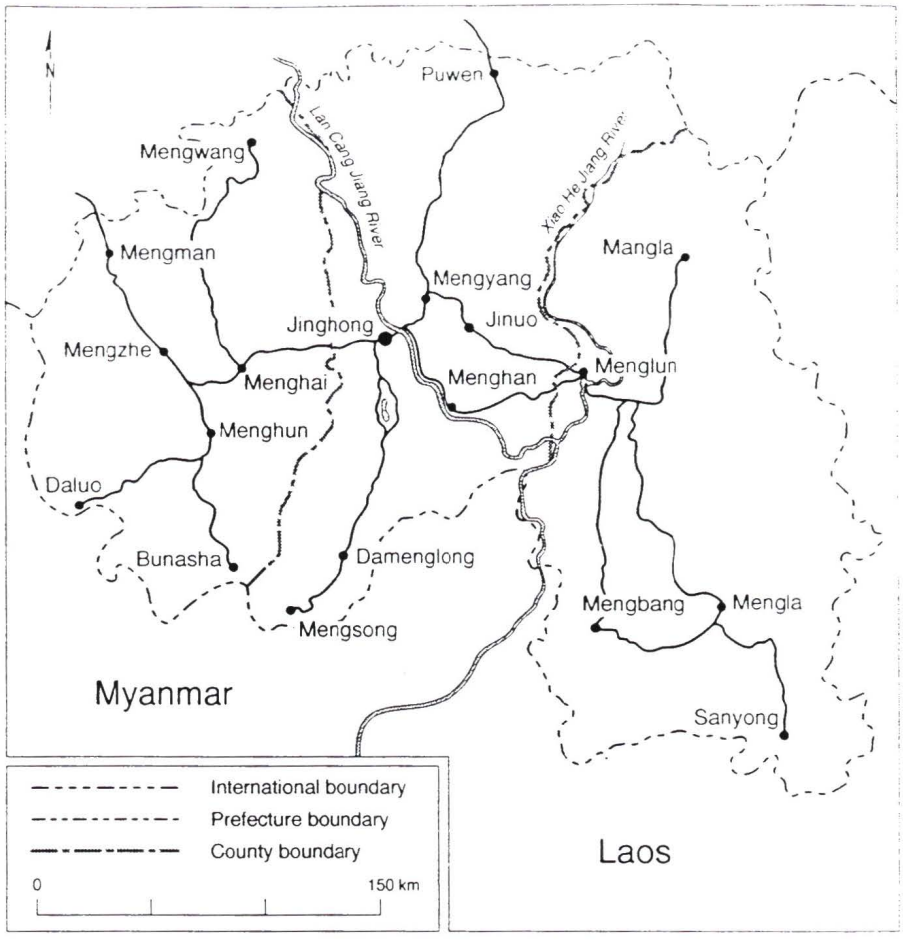

Figure 4.2 The Xishuangbanna Dai Autonomous Prefecture

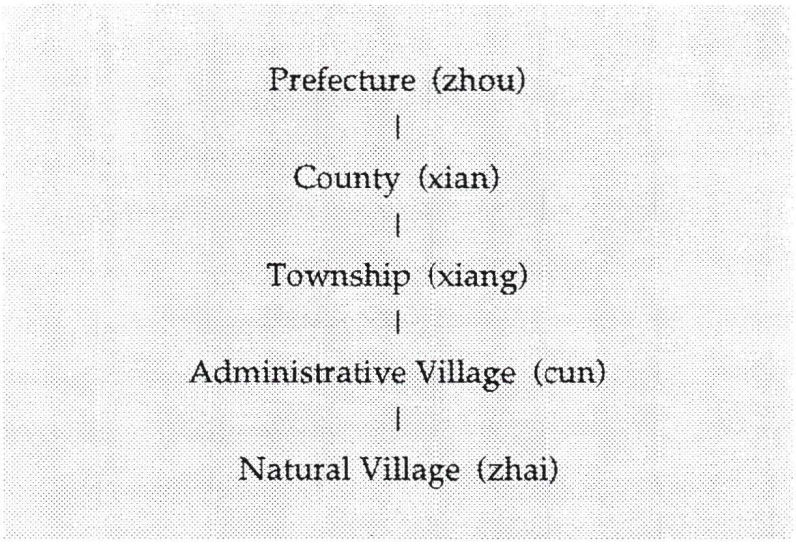

Figure 4.3 Administrative Divisions Within a Prefecture

settled in the valleys and river basins in the eastern part of the country as sedentary grain cultivators. The indigenous peoples in this region, the Dai and mountain minority groups, were thus able to maintain their traditional methods of natural resource use: wet-rice cultivation in the valleys, shifting cultivation in the mountains, and various forms of forestry.

This situation changed drastically with the rise to power of the Communist Party in 1949. As in other parts of China, Xishuangbanna was submitted to increasing immigration by the Han, who imposed their political ideology and methods of agricultural and forestry development on the local population. The key factor that altered irreversibly the region's natural and social environments was the government policy to establish state farms in the region. Thus, in the 1950s and 1960s, the area became the target of a continuous inflow of government cadres and Han settlers from other parts of China, officially entrusted to convert large portions of the region's agricultural and forested lands into state farms specialized in the production of grain and commercial crops (Hsieh, 1989). The influx of Han altered the ethnic composition of the region considerably, and the Dai population fell from about half of Xishuangbanna's population at the end of World War II to about a third (Wijeyewardene, 1993).

While state farms were created, the region's agriculture, as in other parts of China, was quickly falling to collectivism. The national imperative of achieving local self-sufficiency in grain production called for maximum expansion of rice fields and abandonment of traditional structures. As a result, not only was all agricultural land in the prefecture switched over to grain production, but vast forested areas were cleared and cultivated by slash-and-burn agriculture (Heberer, 1989; Hsieh, 1989). At the same time, large rubber (*hevea*) plantations were created on hills and mountain slopes. The environmental consequences of these policies, however, soon became widely felt. First, much agricultural soil created on mountainous slopes became quickly depleted due to excessive shortening of fallow periods. Second, the practice of rice monoculture encouraged the spreading of crop diseases. Third, deforestation became widespread throughout the whole region, causing soil erosion and local climate changes, such as irregular rain patterns and rain

droughts. In 1950, 69 percent of Xishuangbanna's total area was still forested. In 1981, only 31 percent of the forest cover remained (Heberer, 1989).

As a result of economic reforms and reversals in agricultural policy, some of the arable land created during the collective era was returned to its original use, and the pace of deforestation has considerably slowed down. Nevertheless, local environmental conditions and the original resource bases have been considerably altered. By 1985, the total agricultural land area had increased to 92,700 hectares, from 36,700 hectares in 1949. In addition, 30,000 hectares of rubber plantations had been created. Meanwhile, deforestation and soil erosion have continued to increase (Zhao Songqiao, 1994). As to local immigration, the flow of immigrants was officially stopped in the early 1980s, when new government policy, fashioned to preserve the ecological balance and the ethnic diversity in the area came, into effect. As a result, the total state-farm population in the region is currently only slightly higher than in 1982, when it was estimated at 130,000 (Deng Yongjin, 1990). A large majority of these are Han, but the farms also employ a number of indigenous people, including Dai farmers.

They are, at the present, ten state farms in Xishuangbanna of approximately ten divisions each[38] (Deng Yongjin, 1990). These farms tend to specialize in the production of a few selected crops. of the three counties in Xishuangbanna, Menghai county has only one state farm, Liming state farm, the oldest and largest in the prefecture. The farm specializes in the cultivation of rice, sugar, tea, and rubber. It is the only state farm in Xishuangbanna which emphasizes rice production. Jinghong county has five state farms: Jinghong, Dengfeng, Galanba, Daduga, and Mengyang. Jinghong state farm is Xishuangbanna's second largest. It specializes in rubber production. Other crops are: tea, fruit trees, sugar, and rice. The four state farms in Mengla county, Mengpeng, Mengman, Mengxin, and Mengla all grow rubber as well as sugar, tea, rice, and other crops[39]. The state farms fall under the jurisdiction of the

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38 I am grateful to Deng Yongjin for his clear presentation of the state-farm situation in Xishuangbanna. Deng Yongjin is a researcher in social sciences at Yunnan University, Kunming. He wrote a Master's thesis on state-farm policies in Xishuangbanna.

39 Mengla county was open to immigration by Chinese authorities later than the other counties. Since the original ethnic population (Dai, Yao, Hani, Yi) was considerably lower than in the other two counties, the road network and the public infrastructure in general was less developed and thus less favourable to encourage immediate immigration.

Xishuangbanna government (Dai autonomous prefecture) which makes the important decisions concerning planning and investment.

4.5 Prospects for the 1990s

Xishuangbanna is exposed to many of the problems that plague China's countryside. Much of the arable land is cultivated according to methods of unsustainable farming, such as extensive monocropping with excessive use of chemical fertilizer, sharply reduced organic matter recycling, and too few crop rotations. In addition, it is subjected to extensive agricultural land losses due to land fragmentation, house and road building, growth of rural industry, and so on (Smil, 1993). Especially serious are chronic rural energy shortages, which have worsened the deforestation problem inherited from previous agricultural and rural development policies. As on Hainan island, nine-tenths of all household energy needs in Xishuangbanna have been supplied by forest fuels (Smil, 1993). By the mid-1980s, the local cutting of fuelwood exceeded one million cubic meters per year, equivalent to an annual loss of 100,000 mu of forest. The destruction of woodland (caused by gathering fuelwood, clearance for new arable land, forest fires, and timber cutting) was almost twice the rate of regeneration (Leeming, 1985). The increased deforestation has had a crippling effect on the species diversity and caused severe soil erosion throughout the region (Jiang Dehua et al., 1989; Smil, 1993; Zhao Songqiao, 1994).

The growing scarcity of agricultural and forested land in the area has been the cause of increasingly frequent conflicts over land use. The relations between the Agricultural Department, which has sought to increase the size of the commercial plantations, and the Forestry Department, which has increased its commitment to the conservation of forest resources, are often strained (Leeming, 1985). At the same time, conflicts between the Forestry Department and local farmers have become familiar as the result of increased illegal cutting of firewood in recent years and continued practice of slash-and-burn agriculture by mountain minority groups. Antagonism is, by no means, limited to access to forested land. Conflicts between state farms and local farmers over "farmland, grazing land, potential rubber land, and water supplies" are frequent (Leeming, 1985).

The land-use development plans for the 1990s emphasize the need to achieve a more balanced and sustainable use of natural resources. There are calls to practice intensive farming exclusively in flat plains; balance the plantation of rubber and other tropical crops with soil conservation measures on slopes and hills below 900 meters in elevation; and reserve mountain areas above 900 meters for industrial forestry and forest protection (Zhao Songqiao, 1994). The local government has undertaken to control the planting activities by the state farms and not to allow rubber plantations to expand beyond the already cultivated areas. This decision was motivated by several factors. First, the locally produced rubber has come under severe competition from Malaysian rubber. There are indications that the annual precipitation levels are not high enough for sustained production of high-quality rubber[40]. Second, the government has recognized the need to protect the remaining natural forests and the ecological balance in the area. Finally, the native groups, especially the Dai, who live in the valleys, have seen their agricultural and forested land base seriously reduced as a result of the establishment of state farms in the area. As a result, the Dai have become sensitive about land issues. Any further expansion by the state farm could cause tensions in the relationships between the Dai communities and the Han settlers.

4.6 Village Selection

The area to be surveyed in Xishuangbanna was selected in the Fall of 1992. At the time, large sections of the region were not accessible to foreign travellers, such as Mengla county and the area bordering Myanmar. The field research was thus conducted principally in the counties of Jinghong and Menghai. In those counties, the Dai villages are fairly uniformly spread through the valleys, in concentration increasing slightly in areas adjacent to the major towns. They are easily accessible by means of bus, truck, and bicycle, as they are generally located within 10 kilometers from one another. These communities are almost exclusively composed of Dai people. Traditionally, physical remoteness, culture, and language have acted as barriers to ethnic mixing. Today intermarriages are

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40 This is the opinion of several agricultural specialists with whom I spoke during my stay in Xishuangbanna. In particular, Aik Daw Mwe, deputy advisor to the Border Area Development project of the Myanmar Agricultural Service provided me with invaluable information concerning rubber plantation in this part of the world.

increasingly frequent as Han Chinese praise Dai women for their charm and beauty. However, many of the new families so formed live on state farms and in the towns so that villages remain, for the most part, ethnically and culturally, mostly Dai.

A total of approximately forty villages were visited during the months of October and November 1992 and September to December 1993. These were mostly spread around the towns of Jinghong, Mengyang, Menghan, Damenlong, Menghai, Menghun, and Daluo (see Figure 4.2). These areas represent the range of physical characteristics in Xishuangbanna. Jinghong, Damenlong, Menghan, and Daluo lie in low-elevation valleys (between 600 and 700 meters), suitable to double-cropping in wet-rice agriculture and growing rubber and fuelwood trees in forested areas. These patterns of agriculture and forestry are widespread in low-elevation-valleys, where the majority of Dai villages are located. Villages for in-depth study were thus chosen in these areas. The Menghai-Menghun plateau, at an elevation above 1000 meters, has cooler temperatures and few reliable sources of water, conditions unfavourable to both intensive rice agriculture and cultivation of rubber and fuelwood trees. As a result, the Dai practice cropping methods adapted to local conditions, such as alternating crops of sugarcane and rice in paddy fields and growing tea on the village hillsides. In addition, the area is the site of extensive deforestation, and Dai villages are afflicted with severe fuelwood shortages. The data collected in those villages were almost exclusively the result of observations and informal interviews. In some of the villages, however, the leaders were interviewed with formal questionnaires. These sessions provided valuable information on the problems faced by the Dai communities in those areas.

Comparative Studies

Two villages were selected for in-depth study: Mansha, in the Jinghong area, and Mandahuo, near Daluo, a town on the border with Myanmar (see Figure 4.2). In these villages, data were collected using information and formal and informal interviewing methods. These villages were selected in order to provide comparisons between two main trends in agricultural development in Xishuangbanna, one based on intensive wet-rice agriculture and cultivation of rubber as a cash crop, and the other on traditional methods of agriculture and

forestry. These villages were found to exemplify these two trends as the result of observations and informal conversations with Dai farmers while travelling throughout the region[41]. The selection was also conditional on the willingness of the village-leaders to cooperate in the survey. The leaders of these two villages authorized the conduct of the study and offered to provide personal assistance.

Mansha

Mansha is approximately ten kilometers northwest from Jinghong. The village lies in a small valley extending northward from the Jinghong city area into a mountain range. In the center of the valley runs a stream down from the mountains. Two dirt roads, one on each side of the valley, connect a number of Dai villages, including Mansha, and state-farm settlements to the Jinghong-Menghai highway. At the junction of the road to Mansha lies Gadong, a small Chinese settlement serving as the local township administrative centre. The terrain in the valley is relatively flat, and it is thus suited to wet-rice agriculture with only a minimum of terracing necessary. On the mountain slopes on both sides of the valley grow mostly rubber trees. The original forest cover was cleared three decades ago by the Jinghong state farm, which now controls most of the forested land in the area.

Mansha's size is slightly above average. According to the village leader, in 1993 it had 103 households and a total population over 540. As all Dai villages, it has followed an organic pattern of growth, and streets have been laid out with few symmetry considerations. The core of the village is relatively dense, with narrow, winding streets separating blocks of relatively high two-storied houses built on stilts. The small yards at the back of the houses form a contiguous space used for gardens and fruit-trees inside the blocks. In the central part of the village is a square, in which stands the *zaixin* (or *zaiban)*, a shrine to the village spirits and the symbolic heart of the community. The zaixin attests to the Dais' ancient tradition of animistic beliefs. These beliefs have remained an essential component of the Dais' belief system in spite of growth in importance of

41 The differences between the economic systems of the two villages were easy to discern. Mansha was surrounded by large tracts of rubber plantations, and tractors, instead of water-buffaloes, could be seen in the paddies—an unmistakable sign of modernization. In Mandahuo, on the other hand, only small plots of land near the villages had been planted with rubber, and large numbers of buffaloes were grazing in fields and along the rivers.

Buddhism in recent history, and their importance is still reflected in many aspects of village life. The northern gate to the village has a *daliao*, a star-like charm made of woven bamboo strips, intended to keep the bad spirits away from the village[42]. Daliaos can also be found inside most individual houses as they are believed to have the power to protect the houses and their inhabitants from bad luck and evil.

At the southern edge of the village is a Hinayana Buddhist temple, an imposing wooden structure opening on a large yard. The temple is the focus of all ritual and community life in the village. Its importance for spiritual and social life is reflected by its physical prominence in the village layout. All streets lead to the temple, and houses and the ridges of the individual houses are aligned according to the orientation of the village temple. The result is an effect of order and harmony in a pattern of growth essentially disorganized. There is a small school outside the village, built by the government, which provides education to children until the age of twelve. Older children can further their education in a secondary school in Gadong. The village teacher, a Dai, is designated by the government, and he or she resides in the village. There is no health facility in the village. However, a village doctor (*moyadai*), trained in a hospital in Jinghong, provides consultations and dispenses drugs in her home.

In the northern part of the village is a large grey building, the local government seat of Mansha administrative village. Mansha serves as administrative centre for eleven natural villages, scattered in the surrounding area. Mansha is under the authority of the township of Gadong, which administers a total of five administrative villages and 49 natural villages. The ethnic diversity in the area controlled by Gadong is high. Out of a total population of 12,668 in 1993, 56 percent were Dai, 20 percent were Hani, 12.5 percent were Lahu, and only 6 percent were Han[43]. Nevertheless, most of the villages inhabited by indigenous people are in proximity of Han Chinese settlements established by the Second Division of Jinghong state farm (*Jinghong*

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42 Traditionally, a Dai village could be accessed through four gateways. These were typically connected in pairs by the main village streets which intersected more or less at a right angle in proximity of the zaixin (Zhu Liangwen, 1992).

43 These statistics were collected from the government office in Gadong.

nongchang er fengchang), which manages large rubber plantations and controls much of the forested land in the area.

The methods of agricultural use in Mansha, as in the other Dai villages in the valley, reflect the intensive farming practices introduced into the area by the state farm. In the paddies, the Dai now grow double crops of rice with high inputs of fertilizers and the use of mechanization, and, in the village wooded lands, they practice monoculture of rubber as cash crop. These crops have in Mansha, as in other parts of Xishuangbanna, become the hallmark of Dai agricultural and forestry practices in an era of market reforms and modernization. As a result, Mansha is an ideal site for studying the growth of the cash-crop economy in Dai society.

Mandahuo

Mandahuo is located near Daluo, a town on the Chinese side of the border between China and Myanmar in the south of Menghai county. Until recently the area had been relatively isolated from the rest of the country as a result of its geographical remoteness and political factors which had kept the border closed to traffic for long periods of time since 1949. Consequently, immigration into the area from other parts of China has been relatively low, and the population is still almost entirely composed of indigenous groups, especially hill tribes. The township of Daluo administers 45 natural villages. Of these, 17 are in valleys and populated by Dai people and 28 are in mountains (18 Hani and 10 Bulang). In 1992, out of a total population of 16100, 45.8 percent were Dai, 29 percent were Hani, 22.9 percent were Bulang, and only 1.7 percent were Han[44]. In the mountains, villagers plant dry rice, maize, tea trees, fruit-trees, and other crops adapted to mountainous environments. They also obtain fuelwood and lumber from village-owned forests, which they use for their own consumption or sell to the Dai in the valleys. Although deforestation has been severe in recent years due to increased trade in wood products and continued practice of slash-and-burn agriculture, extensive forests remain in mountainous areas. Thus, in 1992, the township of Daluo encompassed almost 3000 hectares of collective forests,

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44 The statistics presented in this section were collected from government agencies in Daluo.

owned and managed by villages, and an additional 17000 hectares of protected state-forest.

Mandahuo has approximately the same size as Mansha. According to the village leader, the total population in the Fall of 1993 was 487, making up 102 households. The village is directly adjacent to the town of Daluo and it is entirely built on the west bank of the Daluo river, which runs approximately from south to north in this area. Like Mansha, Mandahuo has had an organic pattern of growth without grid pattern or other type of symmetry. The village has a central square with a zaiban and a Buddhist temple at the northern end of the village, where most of the village's agricultural fields are located.

Ploughing and harrowing in Mandahuo are done using water-buffaloes rather than tractors, and many of these animals are seen grazing in the fields and along the river. The villagers grow only one crop of rice annually, which they alternate with other crops, such as watermelons and winter vegetables. They make relatively little use of chemical fertilizer, preferring to employ manure and other forms of organic fertilizer. Ecological sustainability, rather than maximum agricultural output, is a concern in Mandahuo. In this village, farmer opted to return to the practice of traditional methods of farming after the end of the collective era, and the contribution of agriculture to the village economy is largely one of subsistence. The villagers do plant cash crops in the form of a variety of agricultural plants—fruit, legumes, and other vegetables—and tree crops—tea, rubber, and fruit trees. However, diversification, rather than monoculture, is the principle underlying the land-use strategies adopted by Dai farmers in Mandahuo. A comparison of the agroforestry practices in Mandahuo with those in Mansha will provide a representation of the range of agricultural economies existing in Xishuangbanna. Mandahuo was chosen as a site of study on these grounds.

4.7 Summary

This chapter has provided an overview of the study area in its regional context and has outlined the environmental and agricultural problems and land-use conflicts encountered by Dai farmers. The chapter has also described the characteristics of the two Dai villages selected for in-depth study. The land-use strategies and agroforestry practices adopted in these villages are essentially

quite different. The following chapter presents a comparison of the resulting land-use strategies in an attempt to understand the range of possibilities for adaptation to modernization and economic reform in contemporary China.

Chapter 5

RESULTS

This chapter presents and discusses the results obtained from the full investigation of the data obtained through the application of the research procedures described in chapter three. The investigation process has included empirical analysis of the data collected in the field through interviews and observations. It has also entailed an interpretation of these data as well as those collected from formal sources, such as official local statistics and literature, in the light of the conceptual frameworks discussed in chapter three. All data presented in tables in this chapter were collected in the study survey.

5.1 Rice Agriculture

The three decades of collective agriculture which followed the advent of socialism in China destroyed the traditional system of subsistence rice agriculture in Dai villages. Rice production became a large-scale collective operation in which the peasant households' contribution was largely limited to passive provision of labour. Since the introduction of economic reforms in the late 1970s, households have regained a considerable amount of autonomy in agricultural matters. Two trends are now discernible in Dai agriculture. In many valleys of Xishuangbanna, Dai farmers practice intensive agriculture based on monoculture and double-cropping of rice combined with large amounts of chemical inputs and mechanization. In others, villages are experiencing a partial return to traditional agriculture characterized by diversification of agricultural crops and use of organic fertilizers and water-buffaloes on small plots. The two study villages, Mansha and Mandahuo exemplify these trends.

5.1.1 Mansha

When the household responsibility system first came into effect in 1978, families in Mansha became responsible for their own agricultural production.

After three decades of central planning, these were now able to decide which crops to plant and which methods would be best to achieve their production goals. Under three-year contracts, households were assigned agricultural plots that would provide for their subsistence needs and would enable them to earn cash income by selling crops on free markets.

In 1984, in order to encourage long-term investment by cultivators, paddy land was officially distributed to households for a duration of 20 years. The village agricultural land (783 mu) was then partitioned and allocated to households according to their size. Thus every adult member, as well as the two oldest children in the household, received 1.8 mu (0.12 hectare) of the village land, amount determined by the village leader according to the village population size at the time (see section 5.3 for a discussion of the land tenure system in the Dai village). Today, the total amount of agricultural land currently available to households reflects the stage in the family cycle. Households with young children own substantially less paddy land per capita than those with children in their teens or those with no children at all. Thus for the households surveyed, the average size of paddy land is now 8.16 mu (0.54 hectare) or 1.43 mu per capita (0.095 hectare) (see Table 5.1). In general, this land is distributed in many small scattered plots, originally designed for ploughing with water-buffaloes. The average number of plots owned by the households surveyed is 22.6, more than twice the national average, with some plots smaller than 0.1 mu. Some of these plots have now been made larger for the use of tractors[45].

On their small, scattered agricultural plots, the families plant a number of rice varieties. Traditionally, glutinous rice has been the main element of the diet and it still occupies a significant proportion of the cultivated land. Over half of the land, however, is planted today with high-yield varieties of nonglutinous rice. Nonglutinous rice is the rice category required by the government in lieu of land tax and to fulfill crop sale contracts. The exclusive element of the Han Chinese diet, it is also readily sellable on the national market. Households plant a number of varieties (usually one to four) of both glutinous and nonglutinous rice. This practice reflects a certain sense of ecological awareness as multiple species are more resistant to pests and diseases. It is, above all, motivated by

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45 In 1985 per capita farmland in China averaged 1.38 mu (0.092 hectare) with an average of approximately 10 scattered plots per households (Selden, 1993).

strongly pragmatic concerns. Modern varieties of nonglutinous rice that grow fast and produce high yields are planted to honour dues to the state as well as feed the livestock. Others, slower growing species produce better quality rice and are better suited for marketing.

Ecological sustainability is not the primary principle shaping household agricultural strategies in Mansha. The use of chemical fertilizers is, in general, very high, averaging annually over 600 kg per hectare and reaching in some cases an amount almost twice as high[46] (see Table 5.2). Nevertheless, farmers, to an extent, continue to practice traditional methods of cultivation. Most are well aware of the need to use organic fertilizers to guarantee a healthy soil condition. Virtually every household interviewed reported using at least some manure (two to six tractor loads) produced by the farm's domestic animals or bought from other peasant families. They are also aware of the benefits incurred to the soil by practicing crop rotations. Thus most households rotate the location of rice varieties in the agricultural plots from a harvest to another[47]. Nevertheless, they rarely practice other forms of crop rotation, although a few have recently experimented with substituting a crop of watermelons to replenish the nutrients lost in the practice of intensive rice cultivation[48]. On the whole, present agricultural methods in Mansha are based on monoculture of rice with emphasis on fast growth and high yields at the expense of agricultural diversity characteristic of traditional systems. This situation is reflected in the widespread use of chemical inputs and relatively modest use of organic fertilizers. Mechanization is contributing to this trend, and tractors have almost entirely replaced water-buffaloes for harrowing and ploughing fields[49].

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46 Many brands of fertilizers used in China have low Nitrogen content, such as ammonium bicarbonate. Nevertheless, the overall application rate of nitrogen is high by world standards. In 1990, it averaged almost 200 kg per hectare of cultivated land, one of the highest rates in Asia. In comparison, the average annual rates per hectare were 35 kg for India and 70 kg for Indonesia (Smil, 1993, p. 167).

47 Out of 30 households interviewed, only two reported not to rotate rice varieties. The reasons given were that they had too many plots scattered in several locations.

48 One family reported having rented out most of their land to another family for one crop of watermelons in the winter 1992-1993. As a result, the amount of chemical fertilizers needed for growing rice in the summer 1993 had been less than in previous years.

49 Of thirty households surveyed, only five owned at least one water-buffalo. In contrast, seven households owned a tractor. Others were saving a portion of their incomes to purchase mechanical equipment (tractor, threshing machine, and so forth).

Table 5.1

Household Characteristics in Mansha

	Range		Average
Household size	3	10	5.7
Agricultural land area (mu)	1.7	12.8	8.16
Number of plots	3	60	22.6
land area per capita (mu)	0.7	2.56	1.43

Table 5.2

Annual Chemical Fertilizer Inputs and Rice Yields in Mansha

	per household			per hectare		
	Average	Range		Average	Range	
Fertilizer (kg)	249	120	480	615	250	1100
Rice yield (kg)	5468	3000	9850	10170	3000	15300

	per capita		
	Average	Range	
Rice yield (kg)	1000	429	1970

As a result, the individual rice yields produced by households are high. The average annual yield reported in the survey was over 10,000 kg per hectare, and one household achieved over 15,000 kg per hectare (see Table 5.2). The yields per capita, however, vary sharply among households. Thus in the survey, they ranged from 429 kg to 1970 kg, with an average of approximately 1000 kg. These differences can be explained in part by the amount of land available per household member, the quality of agricultural land, and the stage in the family life cycle (which determines the number of working members in the household). Some families produce rice yields considerably higher than their subsistence needs. Others are in a precarious situation. In a bad year, they must purchase rice on the free market to fulfill their basic subsistence needs and supply the quota due to the state[50].

Regardless of these disparities, rice cultivation is the mainstay of the household economy. For most households, it is the main source of subsistence and, indirectly, of cash income. Households must first hand over a portion of their annual rice production to the state in lieu of land tax (*gongliang*) and in the form of grain sale quota contracted under the household responsibility system (*yunliang*). Thus for the households surveyed, the total amount of grain handed over to the state averaged 27 percent of the annual output (see Table 5.3). Nevertheless, households retain approximately three quarters of their annual rice production for direct consumption or to invest in family enterprises. Most families sell a small portion of their rice output on the free market to generate directly cash income (4 percent in the survey), but they reserve the largest part of their surplus to feed pigs. Pig raising is a lucrative operation in Mansha, and it is practiced by virtually every household in the village. Pigs (or their meat) are then sold either on the market in Jinghong or directly to an itinerant merchant in the village. Households derive the largest part of their cash income by selling pigs (see Table 5.3). Of course, the cash generated by the sales is not all profit.

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50 One nine-member household, including three young children, had a total agricultural land of 7.2 mu, that is 0.8 mu per member (0.05 hectare). With an annual rice yield of 4,000 kg and an amount of 1,160 kg owed annually to the government, this household had, in a normal year, less than 3,000 kg to feed 9 people (less than 335 kg per person).

Table 5.3

Annual Land Taxes, Rice Quota, and Household Incomes in Mansha

	Average		Range	
Land tax + output quota (kg)	1490		1000	1450
Rice sale on free market (kg)	218		0	2000
Number of pigs sold	5.36		0	15
Income from rice sales (yuan)	207	(6%)	0	1900
Income from pig sales (yuan)	2580	(74%)	500	7500
Total income (yuan)	3495	(100%)	800	10000

Piglets must be bought as well as food additives and sometimes grain[51]. In general, however, pig raising, an activity made possible by the individual production of rice surpluses, represents the best opportunity for households to generate income[52].

The distribution of household incomes in Mansha reflect their agricultural productivity. The disparities in annual incomes (which varied from 800 to 10,000 yuan in the survey) depend mostly on conditions which affect household agricultural production—stage in the family life-cycle, number of adult workers in the household, soil quality, initial capital, and access to tractors and other mechanized equipment. They also reflect a situation of scarce rural credit, fixed annual tax system, and limited access to new technology and market information. Increasingly, they have come to depend on the state's willingness to incorporate household needs in designing agricultural policy.

51 Cheap pig fodder is in relatively large supply in Mansha. Pigs are usually fed by mixing low quality rice produced by fast growing species with dried fruit from rubber trees and chaff. In addition, food additives are often employed to make pigs grow faster and fatter.

52 Of the households surveyed, only one did not raise pigs. This household had abnormally low rice yields as the result of poor soil quality.

Problems

The disparity in rice yields and household incomes is naturally causing unhappiness among households on the low end of the productivity scale. These have raised concerns about the state of agriculture in the village.

Land Scarcity. Land scarcity is, as expected, often blamed by households for subsistence difficulties. Young families with one or two young children are usually in the most precarious situation. Those who left both parental houses to live on their own have few opportunities other than to farm the land that was allocated to them at the time of the economic reforms. The situation is especially severe when either the husband or the wife comes from another village. In this case the total land available to the young family is only the portion received by the spouse who was a village member in 1984 (1.8 mu), a portion too small to feed two adults and children, let alone hand in the fixed annual land tax and grain quota to the state. Unless they receive help from the villager's relatives, the young family is unlikely to obtain more land until the year 2004, when, according to current Land Management Law, the village agricultural land will be redistributed to households[53]. A temporary solution would be to lease additional land from either the village or another family. This is, however, rarely possible as little unused land remains in the community.

The situation is not necessarily better for the young families that stay in one of the parental houses to take care of aging parents. In this case, the total land available to the household is shared by all members. Nevertheless, the household may also face a situation of land shortage. Land which, when distributed in 1984, may have been sufficient to provide for the needs of the household at the time, is now often inadequate for feeding the growing families. This situation is frequently encountered when, as a result of Dai tradition, the newly weds spent the first years of their marriage in the woman's parents' family home. When one of the woman's sisters has also brought in her husband into the family home, the resulting situation is temporarily one of serious shortage

53 In 1984, Document 1 issued by the Central Committee prescribed contractual terms of 'more than fifteen years' and 'sanctioned inheritance of the land for the duration of the contract' (Selden, 1993: 193). In Xishuangbanna, contractual terms were extended until the year 2004.

agricultural land, which will not be resolved until the new families' permanent residences and agricultural plots have been established (see section 5.3).

Availability of Chemical Fertilizers. The use of chemical inputs is an issue of contention between farmers and the government. Many households in Mansha have pinned their hopes for increased agricultural production on a steady supply of cheap fertilizers by the state. But supplies hardly meet the demand, and households must often turn to the free market to supplement their needs in chemical fertilizers. One 40-kg bag of fertilizers supplied by the government normally costs 45 yuan. The same amount sells for between 55 and 65 yuan on the free market. Farmers, especially the poor ones, resent paying higher prices to purchase fertilizers, the production of which they consider to be essentially the responsibility of the state. Complaints do not only focus on cost and availability of chemical fertilizers. Farmers, in general, maintain that the quality of fertilizers supplied by the state has sharply decreased in recent years[54]. As a result, they are now eager to purchase foreign-made fertilizers. Especially valued is the Philippine-made fertilizer stocked by the state farm and enriched for use in rubber plantations. In fact, an illegal market has started to flourish. Through connections (*guanxi*), a few farmers have obtained access to fertilizer stocks in the state farms. Bags of enriched fertilizers can be purchased in the village at 35 yuan a piece—less than the official price of 45 yuan for Chinese fertilizer.

The heavy use of chemical inputs in Mansha is not solely motivated by hopes for increased profit from high agricultural production. In some agricultural plots, the soil quality is too low to produce sufficient crop yields without intensive use of chemical fertilizers. In addition, alternative methods of cultivation are not well known in the village, and farmers occasionally complain about the lack of technical advice and information on new technology. A few households, for example, are aware of the benefits gained by growing alternate crops of watermelons and rice. Yet, lacking the technical knowledge necessary to grow crops of watermelons successfully and, unwilling to risk crop failures, they

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54 It is conceivable, that, given the increased production of chemical fertilizers in China in recent years, the quality of these products would have suffered in the production process. However, the heavy use of fertilizers may have affected the soils' chemical balance in such a way that the returns on agricultural output do not match the increases in chemical inputs.

resort to employing increased amounts of fertilizers. Instructional assistance provided by the government has been, so far, mostly limited to the use of chemicals. In 1993, for example, the agricultural plots farmed by several households were affected by a plant disease, a situation to which the government swiftly responded by sending experts to demonstrate the use of pesticides. The problem of ecological sustainability of rice cultivation, however, is fundamentally ignored by agricultural authorities. Fortunately, a long agricultural tradition is preventing farmers from relying exclusively on chemical inputs to improve yields. There is a Dai saying that the use of too much fertilizer "makes the soil acidic (*suan*)" and the majority of farmers mix manure with chemical fertilizers before application. Most farmers also rotate rice varieties planted from a season to another because they know that it is "good for the soil."

Irrigation. There is a growing feeling in the community that the irrigation system has, in general, deteriorated in recent years. The large number of small agricultural plots created by the land distribution process has caused canals, ditches, and gates in mud walls separating plots to multiply, severely straining the water supply available to the community. According to some farmers, there is a need to make plots larger. This would not only make water distribution to the individual plots more even and reduce water losses in the numerous conduits but also make agriculture more suitable to the use of tractors. Others point to the growing competition between the village and the neighbouring state farm for water. An increased consumption of water by the state farm communities has sharply reduced the water supply available to the village. The government, however, has no plan to build new reservoirs or improve the canal network bringing water to the area from the surrounding mountains. To be sure, competition for water has increased among the villagers themselves. In their efforts to increase agricultural yields in the newly commercialized agricultural economy, farmers have been found increasingly frequently guilty of tapping off water from neighbouring plots. These acts have had a somewhat souring effect on, otherwise essentially peaceful, working relationships among the villagers[55].

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55 The harmonious state of personal and working relationships among Dai farmers contrasts sharply with the often belligerent interactions found in much of the Chinese

Government Policies. Much criticism of government policies today, is directed at the fixed agricultural land tax and grain sales quota specified in household contracts. Fears of not being able to hand over their annual dues to the state have led farmers to rely excessively on intensive methods of rice cultivation. These fears are serious enough to keep farmers from experimenting with other crops and diversifying their cropping patterns. Instead, they increasingly rely on the use of expanded labour and additional purchases of chemical fertilizers. Nevertheless, even intensive rice agriculture often fails to boost production of land-poor households enough to meet their quota. In dry years, these often have to purchase rice at high price on the free market to fulfill their obligations to the state.

Another complaint concerns the lack of credit and financial assistance. There are few established mechanisms for peasants to borrow money. No state institution provides funds directly for agricultural investment and local banks are reluctant to provide credit in situations which involve financial risks. Thus destitute households have often no other recourse than attempt to borrow money privately from friends, family, or other villagers. Households rarely obtain this way loans large enough to finance needed agricultural investment, and the chances to improve their economic status remain low.

Finally, unpredictability of agricultural policy as a result of incomplete agricultural reform tends to create a climate of insecurity that can affect planning and decision-making by households in agricultural matters. Thus the purchasing prices determined by the government for rice sales quota established in the household contracts have been alternately rising and declining. This has periodically led to worsening terms of trade for Dai farmers with the state. In the same way, while the state, until recently, guaranteed purchases of surplus rice (quantity above sales quota) at premium prices, the practice is now increasingly being discontinued. These uncertainties have caused households to rely less on sales of rice as a reliable source of cash income and to engage instead into sideline operations such as pig raising and rubber plantation.

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countryside. Conflicts over water use and land use among Chinese farmers are frequently reported to have ended in acts of violence, including murder.

5.1.2 **Mandahuo**

In Mandahuo, collective agricultural land was subject to the same distribution process as in Mansha. However, concerns for the local ecology combined with scarcity of agricultural land resulting from recent population increases has spurred cultivation practices to evolve in a different direction. The fast population growth has occurred mainly for two reasons. First, a large number of adult women, born before the enforcement of birth-control policies, are now in a child-bearing age. Second, since the early 1980s the area has been subject to an influx of Dai people who had escaped to Myanmar during the Cultural Revolution. These then returned to their homelands as the political situation in China stabilized[56]. According to the village leader, the number of households increased from 80 in 1981 to 102 in 1993. From 1988 to the end of 1993, the population grew from 440 to 487, an increase of 10 percent.

As a result of the rise in population, the amount of agricultural land available per capita has decreased considerably. At the time of the land tenure reform of 1984, the village agricultural land (480 mu) was distributed to households according to their sizes. Thus every adult and child received 1.35 mu (0.09 hectare) of paddy land for a duration of twenty years. Given the recent increases in village population, these amounts have become increasingly inadequate. On the one hand, households that have increased in size have now less land per capita than at distribution time. Thus new families have often barely enough agricultural land to satisfy their subsistence needs. On the other hand, families that have lost members have too little labour to cultivate their plots.

Aware of the problem, the village leadership in Mandahuo has attempted to improve the situation in two different ways. First, a village reserve of agricultural land (60 mu) was created, from which needy or new families can lease land annually. The rental fee, paid at the end of the year, is equivalent to a percentage of the income earned by selling the crops grown on these plots (normally 30 percent). Second, land that has become available after someone has

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56 The Dai are ethnically closely related to the *Shan*, who are the majority group in the Eastern Shan state of Myanmar. Today marriages among Dai and Shan are frequent. As a result of the population movement across the border, the population level in the village is in a constant state of fluctuation.

left the village or passed away, is automatically allocated to a land-poor family. In this fashion, the land allocation process in the village reflects somewhat the ongoing demographic changes in the village, and disparities in land ownership per households have been temporarily reduced (see section 5.3). Nevertheless, the overall amount of paddy land per capita, approximately equal to 1 mu (0.066 hectare), remains considerably low (see Table 5.4). At the same time, the total land available to households is made up of large numbers of plots, usually 40 to 50 for each household, scattered at various locations.

The use of intensive methods of cultivation on small, scattered plots is in general, impractical, and villagers have resisted the encouragement by authorities to grow two crops of rice annually. Although a new reservoir has been built to increase the water supply available for cultivation in the area, villagers have unanimously opted to grow one single crop of rice a year. When they were asked in the survey to justify this decision, households gave surprisingly consistent explanations. First, the extra amount of water provided by the reservoir is a welcome addition to the water obtained from precipitations in the rainy season, but it would be insufficient to irrigate the paddy fields in the winter. Second, for most households, a summer crop yields enough rice to satisfy subsistence needs and pay dues to the state. Third, the higher use of chemical fertilizers required by growing a second rice crop could damage the soil, and, as a result, harm agricultural production[57]. Finally, growing a winter rice crop would be unnecessary hard work. Rice cultivation is an essentially bare-foot and bare-hand activity, hard felt by most farmers in cold winter water. In addition, weeds grow fast and abundantly in the spring, and the extra amount of work involved in the weeding out operation deters many villagers from growing a second crop. Thus farmers prefer to plant winter crops or leave their fields fallow.

Crop Rotations and Intercropping. Villagers in Mandahuo have thus, so far, rejected the idea of growing a winter crop of rice. Instead, they prefer to rely on traditional methods of cultivation based on crop rotation and intercropping

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57 This indicates a degree of ecological awareness among farmers in Mandahuo. As will become increasingly apparent in this text, respect of the natural environment often plays an important role in shaping the villagers' agricultural decisions.

systems together with application of organic fertilizers and use of water-buffaloes. Thus, although they plant the same improved varieties as in Mansha, given the smaller sizes of paddy fields and the less intensive methods of cultivation, their rice yields are, in general, smaller (the average yields for the households surveyed is 2,670 kg; see Table 5.5). Nevertheless, the soil productivity is high considering the low inputs of chemical fertilizers. Thus rice yields average almost 7,500 kg per hectare for chemical inputs below 70 kg per hectare (see Table 5.5). Households achieve this high level of productivity partially by fertilizing their crops with large amounts of manure, but also mostly by planting crops according to rotation cycles.

Planting winter vegetables represent one possible stage in the agricultural cycle. About one half of the households in Mandahuo plant a crop of vegetables on part or whole of their agricultural plots in the cool and dry winter season. The winter crops—chillis, potatoes, cabbages, onions, tomatoes, beans, garlic, peanuts, muskmelons, and so forth—provide the vegetable supplement to the daily diet of rice, meat, and fish consumed by the Dai. For some households, the sales of surplus crops on the market in the neighbouring town of Daluo also bring in a welcome addition of cash income. Growing winter crops also serves an important ecological function by replenishing the soil with nutrients lost in the cultivation of rice.

The most popular crop rotation cycle in Mandahuo involves planting watermelons. At least half of the families plant watermelons in their paddy fields every three or five years. In addition, some, experts in the technology, lease additional land from other villagers to increase their harvests. The decision to plant watermelons is based on both ecological and economic grounds. Thus, in Mandahuo, farmers know that growing a crop of watermelons every three or more years has a beneficial impact on the soil quality. The watermelons' long roots reach deeply into the ground, loosening and aerating the soil considerably. In addition, when they decay, the roots supply the soil with nutrients, re-establishing the chemical balance that had been disturbed by rice cultivation. Of course, cultivating watermelons itself requires large amounts of chemical fertilizers. Thus farmers, who often rely on outside technical assistance in this operation, usually apply 80 kg of fertilizer per mu of land planted (1200 kg per

Table 5.4

Household Characteristics in Mandahuo

	Average	Range	
Household size	5.9	2	14
Agricultural land size (mu)	5.8	2.7	12
Number of plots	43	4	100
Land size per capita (mu)	1.0	0.57	1.5
Average size of watermelon plantation (mu)	5.17	0	23

Table 5.5

Annual Chemical Fertilizer Inputs and crop yields in Mandahuo

	per household			per hectare of cultivated land
	Average	Range		Average
Fertilizer for rice cultivation (kg)	25	0	93	65
Fertilizer for watermelon cultivation (kg)[1]	270	72	613	400
Rice yield (kg)	2,670	1000	3900	6,910
Watermelon yield (kg)[1]	5,275	750	15,300	8,240
Total amount of fertilizer (kg)[2]	160	0	613	405

1. Amounts are averaged over a three-year rotation. The amounts indicated refer only to households that plant watermelons.

2. For both rice and watermelon cultivation. The averages correspond to all households sampled, including those that do not cultivate watermelons. These values were calculated from the values in the first two rows in the table knowing that 50 % of the households cultivate watermelons and that 85 % of all agricultural plots are planted with watermelons.

hectare). Because plantation occurs only every three years, however, households in Mandahuo employ annually less fertilizer per unit of cultivated land than in Mansha (405 kg versus 615 kg per hectare; see Table 5.5 and Table 5.2).

Planting watermelons also makes good economic sense. Since it replenishes the soil with nutrients, households that rent out their fields for a winter crop of watermelons need to purchase little fertilizer or none at all. Those, on another hand, that engage in the cultivation normally derive a good profit from the sales. Watermelons sell for approximately 0.6 yuan per kg on the markets. With average annual yields of 5,275 kg per household, the sales could generate an additional income of over 3000 yuan annually. For households with technical expertise, the costs involved in the cultivation process are low. One household, which claimed to have annual yields of between 2,000 and 3,000 kg per mu of cultivated land, estimated the costs at 200 yuan per mu, mostly for the purchase of fertilizer and renting of equipment. This household thus derives a profit of 1,200 yuan per mu of land planted with watermelons. Many households, however, have not mastered the skills required by the technology. These usually hire itinerant experts to do the planting[58]. In addition, they may not have enough members to perform the labour-intensive operations involved in the cultivation. Fields must be ploughed, harrowed, planted, watered, fertilized, weeded out, and covered with plastic tarps during spells of cold weather. These tasks often require households to hire additional labour[59]. Nevertheless, the growth of popularity of watermelon cultivation in Mandahuo attests to its current profitability. Ultimately, the market capacity to absorb the sales of watermelons will determine the extent of the cultivation among households in the village[60].

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58 These specialists come from northern parts of the country with a long tradition in watermelon cultivation, such as Anhui province. Travelling around the country, they offer their services in areas suitable for watermelon cultivation. These activities are part of the growing underground economy in China.

59 One household in this situation had to hire several workers at 6 yuan per day for the four-month cultivation period. In addition, they hired two specialists to do the planting, who charged 260 yuan each.

60 The limits to the profitability of the watermelon market can be illustrated with the following example. In one much talked about—and derided—land extortion scheme, a highly placed official in the Gadong township government arranged, in the winter 1993, for renting 200 mu of paddy land in Manling, a few km from Mansha, for growing watermelons. With the help

The practice of crop rotations plays an important role in agriculture in Mandahuo (see Table 5.6). Together with intercropping, in which crops with complementary nutrient requirements are planted next to one another during the same season, it constitutes an efficient cropping system[61]. Thus, in the summer, farmers plant several rice varieties in adjacent plots. In the winter, they grow various vegetable crops, alternating crops row by row. The following year, they grow the same rice varieties and winter crops in different locations. In addition, some plant a winter crop of watermelons every three or five years. Others plant winter vegetables next to watermelons[62]. Farmers, in general, display creativity by combining the crops in many different ways. The result is a complex pattern of agricultural crops intended to suit the needs of individual households and to protect the overall soil quality.

Varying crop plantation patterns in time and space is an ecologically sound approach to farming. At the same time, the diversity in sales of agricultural products makes household incomes less sensitive to changes in market demands. The various crops contribute to the household economy in very specific ways. Rice is the basic subsistence crop; it is handed over to the state to pay land taxes and fulfill contractual agreements; it is used as food component for pigs and draft animals; and it is sold on the market. Winter

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of the village leader, 25 families were persuaded to rent out their fields at the price of 140 yuan per mu, an amount considerably smaller than the value of the rice that would have been grown otherwise in these plots. The harvest was good, and the business operation at first profitable, as watermelons were sold for one yuan per kg. Soon, however, the local market became saturated, and the official was forced to liquidate his stocks at 0.4 yuan per kg. In the end, the man lost 20,000 yuan in the operation, and many families that had rented out their lands were not paid. As a result, these families have refused to hand over their land tax and sales quota for 1993 to the township government.

61 Intercropping is commonly practiced in traditional agricultural systems. This practice reduces the losses of nutrients associated with plant growth and strengthens the crops' resistance to pests and diseases. As a result the needs for inputs of fertilizers and pesticides are considerably less than with monoculture (Glaeser, 1987).

62 One household, for example, combined crop rotations and intercropping in the following way. The family divides their total agricultural land (8 mu) in two equal parts. They thus plant crops according to a three-year cycle. Every summer, they plant over four rice varieties on all of their agricultural land. One winter, they plant watermelons on half of their land (4 mu) and leave the other half fallow. The next winter, they reverse the pattern by growing watermelons on the other half. The third winter, they plant vegetables on one quarter of the land (2 mu) and leaves the remaining portion (6 mu) fallow. Thus at every stage of the cycle, the soil is replenished in nutrients lost during the previous stages. At the same time, the diversity in crops planted at every stage of the cycle minimizes the crops' vulnerability to pests and diseases.

vegetables are mostly subsistence crops, although, for some households, they represent a significant additional source of income. Thus some families have reported earning over 1000 yuan annually by selling vegetables on the market. Watermelons, on another hand, are exclusively cash crops. Growing watermelons represents the most lucrative activity in Mandahuo, bringing in, on average, 3100 yuan annually to households engaged in the cultivation. Next to watermelons, sales of domestic animals—pigs, water buffaloes, and oxen—constitute important sources of cash income (see Table 5.7). Households interviewed reported other sources of income, such as sales of tea and rubber. A few households also derive supplementary incomes from sales of imported consumer products from Myanmar.

To conclude, in contrast to Mansha, households in Mandahuo favour diversification in agricultural decisions. Crop diversity ensures reliable harvests and, as a result, enhances the chances of obtaining reliable incomes. Whether households will choose to simplify and intensify their agricultural practices in the future will depend in part of government policies. Thus rises in land taxes payable in grain form and increased availability of cheap fertilizers may induce some farmers to grow two crops of rice annually. It will also depend on agricultural recommendations provided by the village leadership and extension services. For now at least, peasant rationality, ecological awareness, and tradition continue to determine the agricultural systems prevalent in Mandahuo.

Problems

Common complaints in Mandahuo refer to lack of agricultural land. As a result of lack of paddy land and insistence on growing single crops of rice annually, some households are in a precarious situation. Thus families with very little land per capita produce barely enough rice annually to meet their subsistence needs and pay their dues to the state. In bad years, these may have to purchase rice, at high prices, on the free markets. Most of these households draw relatively reliable incomes from the sales of various agricultural products, and thus are able to afford these purchases without incurring debts. Some, however, have little disposable income. Cash crop cultivation and animal husbandry require initial investments that they can ill afford. To increase their agricultural production, these will have to borrow money from friends or

Table 5.6

Crop Rotations in Mandahuo

Household activity	Proportion of households (%)
Plant winter vegetables	50
Plant watermelons	50
Rotate rice varieties	100
Plots subject to rotation: rice—watermelons[1]	85
Plots subject to rotation: rice—winter vegetables	50
Plots subject to rotation: rice—winter vegetables—watermelons[1]	38

1. The plots are either planted with watermelons by the owners or by tenants.

Table 5.7

Farming Activities Generating the Highest Incomes in Mandahuo

Activity	Annual household income[1]		
	Average	Range	
Sales of watermelons (yuan)	3,160	450	9,200
Sales of pigs (yuan)	2,130	700	4,500
Sales of buffaloes and oxen (yuan)	920	500	1,625

1. The amounts given refer to households that practice the indicated farming activity.

relatives or attempt to obtain additional land from the village agricultural reserve (see section 5.3).

It is worth emphasizing, to this effect, that the cultivation of watermelons, the most commercially profitable agricultural activity, is outside the financial reach of many households in the village. Villagers, in general, have not yet acquired the skills necessary to produce high yields of watermelons, and families engaged in the cultivation must hire experts to plant and manage the crop. Those families that try to grow watermelons without their help usually have little success in producing healthy crops. For most households, however, these expensive services are indispensable because experts are unwilling to provide instruction on the technology. As result, many families (50 percent of the households surveyed) have decided not to grow watermelons, preferring instead to rent out their fields to households experienced in the cultivation. These families either do not have the capital needed to cover the expenses associated with the cultivation or do not want to take the risk of failed production[63]. Watermelon cultivation is thus increasingly responsible for income disparities among households in Mandahuo.

Another problem caused by insufficient agricultural land in the village is the destruction of winter crops by grazing animals. The village has no special pasture for buffaloes and oxen to graze. In the summer, these animals can graze around the village, especially along the river banks, where grass is abundant. In the winter, when rain and grass are scarce, the animals are kept under watch in the paddies during the day, where they are fed stubble from the summer harvest. Nevertheless, the roaming animals often damage the family crops, hindering the planting of large areas. In response, a few farmers send their draft animals to relatives in Myanmar for the winter, where land is more plentiful. Those who do not have this opportunity, however, have no alternative than keep a tight watch on the grazing animals.

If families in Mandahuo worry about the lack of paddy land, they spare most of the criticisms voiced in Mansha. Thus farmers rarely complain about the state's inability to supply enough cheap fertilizers since, as the result of crop rotations and intercropping techniques, they need only to apply relatively small

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63 The cost of cultivating watermelons involve purchases of fertilizer, hire of labour and tractors, and purchases of equipment (tools, plastic tarps, and so forth).

amounts of chemical fertilizers. In the same way, most find the irrigation system adequate since they grow rice, the crop needing by far the most water, only during the rainy season. Villagers also rarely criticize government agricultural policies. The fixed land taxes and rice quota handed over annually to the state are currently small enough to allow most households to meet their subsistence needs [64]. At the same time, they are not overly concerned by the relatively low purchasing prices for rice set by the state since their incomes are mostly derived from sales of crops other than rice. Finally, although some households blame the lack of rural credit for their low rates of agricultural investment, most are able to finance their projects with incomes generated by activities outside agriculture, such as across-the-border trade and work in rural industries.

In Mandahuo, farmers continue to show adaptability and versatility in designing solutions to agricultural problems and, more appropriately, in preventing their occurrence. By combining traditional methods with modern methods of cultivation, they have achieved high agricultural productivity while protecting their crops against pests, diseases, and droughts, and preventing soil deterioration. At the same time, the sales of various crops and domestic animals have helped diversify their incomes and reduce their dependency on state economic policy.

5.2 Forestry Practices

Like agricultural land, forested land previously owned by the Dai village during the collective years was redistributed to the villagers as a result of the economic reforms in the late 1970s. After three decades of communal forestry, families had gained the right to own and manage woodlots. The forestry practices adopted by Dai villages after the economic reforms vary considerably throughout the region. In the two study villages, sharp inequalities in availability of land per capita and levels of ecological awareness have resulted in

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64 The average annual amount of rice handed over by the households surveyed to the state is 535 kg in Mandahuo. Since the average size of paddy land is 5.8 mu, this amount corresponds to 92 kg per mu. In contrast, in Mansha, the average amount of rice turned over to the state is 1490 kg, that is 182.6 kg per mu.

forest uses that are markedly different[65]. In Mansha, families have unanimously specialized in the monoculture of rubber trees as a source of cash and fuelwood. In Mandahuo, on another hand, they have chosen to diversify their resource base by planting rubber, tea, fuelwood, and fruit trees. In contrast to these areas, the Menghun-Menghai plateau is at a too high elevation for rubber and fuelwood trees to grow. The deforestation on the plateau is so severe that electricity has increasingly replaced fuelwood as a source of energy.

5.2.1 Mansha

When the economic reforms came into effect in 1978, the total forested area administered by the village was 1120 mu. Much of this land contained mixed lots of rubber, bamboo, and other trees, planted by village production teams during the collective era. It also included plots of fuelwood trees (*heixinshu*) and orchards which had been cultivated by past generations. These had, somehow, survived the radical land-use policies of the previous decades. As the result of the reforms, this land was distributed equally among the families, which would from then on assume the forestry operations in the village.

Rubber Cultivation

Households had thus received on average 11 mu (0.73 hectare) which they could cultivate in the manner that they wished, according to their needs and their own perceptions of market conditions. At first, they continued to practice the patterns of forestry established earlier by the production teams, by harvesting the trees in the plots already planted with rubber (*hevea*) and cultivating pineapple, fruit trees, and other crops in the other plots[66]. In the early 1980s, however, as the financial benefits derived from rubber cultivation became widely known and as the land tenure system became consolidated, families progressively increased the size of their rubber plantations. By the end of the 1980s, virtually every family in the village had devoted their entire land holdings

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65 In many parts of China, the privatization of village woodlands initially had a negative impact on the remaining forested areas as the villagers cut the trees newly received for firewood and lumber.

66 Given the temperature profile in Xishuangbanna, land areas at elevations under 900 meters are suitable for rubber cultivation (Zhao Songqiao, 1994).

to cultivating rubber. With a density of approximately 30 trees per mu, families had three to four hundreds rubber trees which they hoped to harvest soon in order to increase their cash incomes[67]. The maturation period for rubber trees, however, at eight years, is rather long. Since most of the trees were planted in the second half of the 1980s, by 1993, only a third of the trees were already producing. The average annual yield of rubber collected by households was then 650 kg (see Table 5.8). The annual amounts of rubber harvested by individual households will increase sharply in the second half of the 1990s, when the majority of trees planted will become productive.

Sales of rubber bring in regular, reliable incomes. Families collect rubber on a daily basis, which they normally sell to the government-owned rubber factory in Mansha. Liquid rubber sells for one yuan a kg; dried rubber for two yuan a kg. In 1993, families thus derived, on average, an additional income of 700 kg annually from rubber sales (see Table 5.8). Although the government has reserved a monopoly on rubber purchases, a private market has developed in the village. A few merchants are now purchasing dried rubber from families in the village to sell to the factory in Jinghong. This activity is illegal and, in theory, punishable by fines. Nevertheless, selling rubber on the private market is increasingly popular in Mansha. First, farmers can obtain higher prices by selling privately. The purchasing prices are subject to bargaining, and families usually obtain 0.2 or 0.3 yuan more per kg than by selling to the government. Second, the income is more reliable because the government pays households only once a year, and it does not always pay the entire amount due. Third, the government levies a 20-percent tax on rubber sales for reasons not entirely understood—or accepted—by most producers. Private rubber sales are not taxed and thus are very attractive to villagers. The government's response to the increased popularity of the rubber market has been mixed. As imposing fines caused resentment among the villagers, local authorities have become more tolerant, preferring instead to increase the purchasing prices of both liquid and

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67 In Xishuangbanna, rubber trees are planted in rows that are farther apart than in warmer tropical and equatorial areas. This practice enhances tree survival as better air circulation at the tree bases prevents lethal fungi, that thrive in cold and damp conditions, to reach harmful levels (Muul, 1993).

Table 5.8

Household Rubber Plantation in Mansha

	Average	Range	
Number of trees planted	329	100	500
Number of trees producing (1993)	93	30	200
Annual yield (kg)	650	200	1,000
Annual income (yuan)	700	200	1,300

dried rubber. Nevertheless, the rubber market is part of a growing underground economy in the region.

Cultivating rubber is, in any case, an increasingly attractive economic activity in Mansha. First, it is a source of regular income for families at minimal costs. Although the initial capital outlay is rather high—plots must be cleared, seedlings bought, trees fertilized, and plantations tended for at least eight years before the first harvest, once trees have started producing, however, the costs can be quickly recovered[68]. Second, it is relatively pleasant work. Cultivating rubber is less strenuous than growing rice. Trees require little care and harvesting rubber involves little more than practicing cuts on the tree trunks, emptying the bowls, and carrying the filled pails to the homes on a yoke. At the same time, the cool, shaded forests provide a welcome relief from the back-breaking daily chores in the rice paddies. Third, the rubber collection activities can be shared by all the family members—young and old, men and women. In fact, the contribution of all household members is important as rubber collection competes somewhat with the labour-intensive tasks of rice cultivation[69].

68 Most of the costs incurred in rubber cultivation can be attributed to fertilizing. Rubber trees need fertilizing once a year, at the beginning of the rainy season. Cultivators in Mansha use on average 0.25 kg of fertilizer per tree. In 1993, government-supplied fertilizer cost approximately one yuan per kilogram, and annual costs of fertilizer were approximately 0.25 yuan per tree annually. Since households owned on average 329 trees, their annual expenses to fertilize their rubber plantations was approximately 82 yuan.

69 Rubber collection contains an element of seasonality. Rubber production peaks in the rainy season, when each tree produces on average one bowl of latex a day. Production is lowest

It is easy to understand how cultivating rubber became so quickly popular in Mansha. Households received amounts of land that were large enough to make the practice profitable. In addition, the proximity of the state farm made easy access to enriched fertilizers and instructional assistance possible. When all trees planted have matured, rubber cultivation will make a considerable contribution to the household economy by bringing incomes comparable to those derived from operations based on rice agriculture. There is, however, an element of uncertainty about the profitability of rubber cultivation in the long term. As China has opened up to world trade, the locally produced rubber may become increasingly vulnerable to competition from high-grade rubber grown in equatorial areas[70]. Local authorities are currently recommending that families plant other trees, such as fuelwood and fruit trees. Fruit trees have, in general, a shorter maturing period than rubber trees and picking fruit is a more seasonal and less labour-intensive activity than tapping rubber. In addition, market opportunities are more numerous and more reliable on the long term[71].

There are indications that state farms themselves have started to reduce the extent of their rubber plantations. Most state-farm plots were planted in the 1950s and 1960s, and many trees are now too old to produce. Increasingly, these trees are now replaced by fruit and tea trees, or simply left to waste. Rubber cultivation in Mansha, however, is at an early stage. Given the extent to which households have invested in rubber as a main forest use in recent years, cultivating rubber is likely to remain a substantial economic activity for years to come.

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during the dry season as the daily production declines to one half of a bowl per tree. The production stops completely during the coolest winter months (December and January).

70 Imports of rubber from Malaysia have already made a large indent in the Chinese market. As a result, the state-farms are currently reducing investments in rubber plantations.

71 The government is also encouraging mountain minorities to plant fruit trees instead of upland rice in a bid to control slash-and-burn activities. As a result, orchards of citrus fruit, mango, and other fruit trees have become an increasingly common sight in areas surrounding mountain villages. There are signs that this policy is, at least in part, working. Instead of growing their own rice, mountain villagers have been able to purchase rice on the markets in valley towns with the incomes generated by the sales of fruit and other crops.

Fuelwood Acquisition

Traditionally, families in Mansha supplied their fuelwood needs by growing fuelwood trees (*heixinshu*) in village plots. However, following the creation of Jinghong state farm during the collective era, and, later, the commercialization of household forestry, these plots have largely disappeared, having been replaced by expansive rubber plantations. As a result, households in Mansha have adopted pruning rubber trees as a main source of fuelwood. Villagers currently obtain most of their firewood by cutting dead branches off old and mature trees on the neighbouring state-farm lands. At the same time, as the trees on household plots grow older, they are increasingly turning to trees on their own plantations. To some extent, families also purchase fuelwood from the mountain minorities. Mansha has no communal forest from which villagers can collect wood products. In contrast, mountain villages in the vicinity have woodlots for their people to use as sources of fuelwood and lumber[72]. As a result of recent population increases, the Dai villages in the valleys have increased their purchases of wood products from these minorities.

Nevertheless, state-rubber plantations remain the single most important source of fuelwood for the Mansha inhabitants. Fuelwood collection on the state-farm lands, however, is only possible because the relationship between the state-farm and the village is good. Thus not all state farms in the region allow Dai villages to collect firewood on their properties. Some state farms have restricted access of their plantations as a result of theft of equipment, illegal rubber-tapping, and destructive branch cutting. These restrictions can cause conflicts between state farms and villagers, who are often willing to risk fines imposed on trespassers to collect firewood. To avoid potential conflicts over fuelwood collection and other forest uses, the Mansha leader is actively cultivating a healthy relationship with the neighbouring state farm.

In the long term, however, rubber trees alone are unlikely to satisfy the growing demand for fuelwood in the area. The government has finally recognized the severity of the fuelwood situation. Ironically, alarmed by the

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72 Mountain-minority villages are not the only ones to have communal forests. Dai villages established at the edge of mountain forests often have forest plots that can be used to supply fuelwood and lumber. These village plots are supervised by the village leader. The leader divides plots according to use (for example, half of the plots for lumber and half for fuelwood) and controls the amount of cutting done by families.

increased fuelwood scarcity in the region, it has recently taken measures to encourage villagers to plant fuelwood trees as they did in the past. Electricity is currently not a viable alternative source of energy. Prices have risen sharply in recent years, reflecting the low supplies available to the region. According to local authorities, electricity is not even sufficient for husking, grinding, and other tasks associated with rice agriculture, especially in the winter time, when demand is usually higher. Households are thus likely to rely on fuelwood for cooking and heating in the near future. At the present, however, most households in Mansha are unwilling to forego cultivating rubber in order to plant fuelwood trees. Nevertheless, if the fuelwood situation continues to worsen, they may have no other choice than replacing part of their rubber trees by fuelwood trees.

Lumber

The rise in Mansha's population has also led to a denser housing density and an increased demand for lumber. Dai houses are mostly made of hardwood and bamboo. Hardwood is essential to traditional Dai design. It is the basic material of the house structure, the primary component of stilts, frame, and roof. Bamboo is used mostly in floors and walls. Although its importance as a construction material has decreased in recent years, it is still an essential element of modern Dai housing structures[73]. Bamboo is found in abundance on village grounds and in forested areas. As a result of increased deforestation in the past decade, however, hardwood has become noticeably scarce in the whole region.

Until recently, villagers could acquire hardwood in two ways. First, they could purchase permits issued by the Forest Service to cut trees in the state forests in the mountain areas. These permits became increasingly expensive as more stringent protection measures came into effect. Wood that could be cut free of charges in 1978, right after the introduction of economic reforms, cost 25 yuan per *fang* in 1988[74]. In 1992, the price had risen to as much as 60 yuan per fang. Second, they could buy lumber directly from the mountain minorities living in the surrounding areas. Purchasing prices were normally subject to negotiations.

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73 For a description of Dai architecture, see Zhu Liangwen (1992).

74 One *fang* equals one cubic meter.

Nevertheless, they increased at the same pace as the cutting permits. By 1993, the Forest Service had stopped issuing cutting permits and it had become illegal to purchase lumber from the mountain minorities.

The villagers' responses, so far, have been mixed. Fresh lumber can still be obtained through illegal trade and cutting, but many villagers are now re-using discarded important structural components such as stilts, columns, and beams to build their new homes. Some have also turned to bricks, a cheaper and more readily available material. As a result, new construction styles are slowly emerging in the village, affecting somewhat the visual harmony that was characteristic of traditional villages. At the same time, brick houses may be less functionally adapted to the local, hot subtropical climate of the region than the traditional wooden structures, which were designed to provide optimal ventilation and insulation against heat. As a result, many affluent villagers, reluctant to abandon the practice of building wooden houses, have proceeded to import hardwood from other parts of Xishuangbanna and more forested Myanmar.

5.2.2 **Mandahuo**

Mandahuo has considerably less land suitable for forestry than Mansha. At the time of distribution, in 1983, roughly 460 mu of forested land in the vicinity of the village were distributed to households for plantation. Of these, 70 mu contained rubber trees planted during the collective era, 30 mu had been planted with tea by village production teams at the time of the economic reforms, and 30 mu contained fuelwood trees planted long ago. The remaining portion contained mixed-use and virgin forest as well as plots of pineapple and other crops. The village had also over 1000 mu of forested land 10 or 20 km away in the mountains. Because of its remoteness, lack of easy access, and steepness of terrain, the villagers' committee decided not to distribute it to families, preferring instead to keep it under watch for the future.

Rubber and Tea Cultivation

Every family thus received a small amount of forested land (3 to 5 mu) which they could cultivate or lease to other families. These lands contained a number of rubber trees (on average 30 per family) and tea trees, which had been

divided equally among the villagers. At first, cultivating rubber was not popular in the village, and most households chose to rent out their rubber trees to a village cooperative managed by the village leader. The cooperative contracted the cultivation of the trees to families, which thus became responsible for harvesting and selling rubber. Every year, the families owning the trees received a flat fee per tree rented (5 yuan) and the incomes of the sales were distributed among the families engaged in the cultivation[75]. While the cooperative is still in operation today, villagers have now realized the potential benefits of rubber cultivation, and they have planted additional rubber trees on part of their lands. By 1985, families had, on average, cleared 3 mu of land previously containing pineapple, bamboo, and other crops, and planted rubber trees. Because of the eight-year maturing period needed by rubber trees, these trees will not be harvested before 1994. After that year, household annual incomes are expected to increase substantially as the result of rubber cultivation.

Like rubber, cultivating tea represents an increasingly important economic activity for families in Mandahuo. Tea was first planted by a village production team in 1978, at the time of the economic reforms. In 1983, villagers who had been part of the team received a portion of the plantations for their own use. Since then, households have increased the size of their plantations, some by clearing additional land to plant tea, others by interspersing tea trees with rubber trees in already established rubber plantations[76]. The size of the tea plantations varies according to households. Some, no larger than 0.1 mu, are cultivated purely for household consumption. Often, however, families grow tea on at least one mu of land as a cash crop[77] (see Table 5.9). Tea sales bring in a reliable, significant cash income. Families normally harvest 40 to 50 kg of tea leaves annually that they can sell on the market for 8 to 10 yuan per kg, generating this

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75 In 1992, the village production team realized a total sale income of 30,000 yuan. Of this amount, he families involved in the production received between 600 and 1,000 yuan.

76 Research on agroforestry in Xishuangbanna has shown that the practice of interspersing tea with rubber is *efficient* and *ecologically sound*. First, tea plants are more productive under the partial shade of rubber trees. Second, the two-species vegetation community—rubber and tea—supports a community of over one hundred species of spiders. These destroy the pest species of insects that feed on tea plants and thus eliminates the need for chemical insecticide (Muul, 1993).

77 One mu normally holds 200 to 300 trees.

Table 5.9

Tree Plantations Owned by Households in Mandahuo

	Average size (mu)	Range (mu)	
Rubber	3.0	0.5	5.0
Fuelwood	1.5	1.0	2.0
Tea	1.0	0.1	3.0
Fruit	0.6	0.3	2.0
Bamboo	data not available		

way an additional income of 300 to 500 yuan. Families that received tea trees from the village production team are bound to sell a certain amount of their harvest to the state at a fixed price set by the state (in 1993, 6 yuan per kg).

Cultivating tea, however, is hard work, and households well deserve this extra income. Weeding, pruning, and harvesting are year-round, labour-intensive activities. These tasks are often performed by women as men tend to concentrate their efforts on cultivating rice and watermelons. Not all households harvest tea on a daily basis. Some harvest every three or four days; others only twice a year, once in the period following the summer rice harvest and once after the winter crops. Some families find cultivating tea too strenuous to harvest more tea than they need for their own consumption. On the whole, the contribution of tea cultivation to the household economy is somewhat limited. Once the young rubber plantations have become productive, rubber sales normally generate considerably more income than tea sales. Nevertheless, because of a steady market demand, tea is likely to remain an important cash crop for most households in Mandahuo.

Fuelwood Acquisition

Unlike the inhabitants of Mansha, those of Mandahuo obtain fuelwood from other sources than rubber trees. Given the recent state of rubber cultivation in Mandahuo, mature trees would be too few to make a significant contribution to household fuelwood supplies. At the same time, villagers were able , from the

beginning of the economic reforms, to acquire fuelwood in various ways. First, many households derive a portion of their fuelwood needs by collecting driftwood from the Daluo river, which flows by the village. The river, especially after the rainy season, carries enough trees and shrubs uprooted as the result of soil erosion to make driftwood collection a worthwhile operation. Second, households purchase fuelwood from the hill tribes in the surrounding area. With the increased freedom of trade since the economic reforms, the Bulang and Hani living in the mountains nearby are now able to sell fuelwood collected in their village forests. One tractor load costs normally 70 to 80 yuan, and some families commonly spend 150 to 200 yuan per year to buy firewood. Until a few years ago, Dai villagers were able to collect fuelwood directly in the mountain forests. However, increased deforestation in recent years has prompted local authorities to restrict the use of these forests to mountain villages. The extent of deforestation in the area is not serious enough yet for the government to ban the trade of fuelwood altogether. Nevertheless, wood products have become considerably scarcer, and the high purchasing prices of firewood have made a third alternative increasingly popular.

Families in Mandahuo have rediscovered the traditional practice of cultivating fuelwood trees (*heixinshu*) as a reliable source of fuelwood production. Prompted in part by recollections of benefits generated by the cultivation in the past and in part by recommendations of the village leader, virtually every household in Mandahuo has now planted fuelwood trees on a portion of their lands. The cultivation of heixinshu as a fuelwood tree has been popular among the Dai for generations. Its wood has high calorific content; the tree grows fast; and the plantation is easy to manage[78]. After a short maturation period of three to four years, branches can be cut off regularly (usually every three years) then dried and stacked for use as fuelwood. Regular pruning ensures easy access to trees and efficient use of the available planting area. Thus, traditionally, Dai villages had communal plots of fuelwood trees that families could crop to provide for their fuelwood needs. During the collective years of agriculture, many of these trees were cut and the plots transformed into agricultural plots as land was reclaimed for rice cultivation. When the economic

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78 The cultivation of heixinshu is restricted to low elevation areas (under 800 meters).

reforms came into effect, households did not replant fuelwood right away. As agriculture became commercialized, some attempted to increase their cash revenues by cultivating pineapples, others by planting various species of hardwood trees[79].

Nevertheless, the popularity of fuelwood trees increased again gradually. Some families planted fuelwood trees as early as 1983. From that time on, as the benefits generated by the cultivation became progressively recognized, they planted additional trees every three or four years to increase the fuelwood production. Others planted enough trees in 1983 to satisfy their fuelwood needs today. Of the families surveyed in this study, several five-to-seven member families claimed to derive enough fuelwood from fewer than 50 mature trees. In general, one mu of fuelwood trees (100 to 150 trees) provides enough fuelwood to satisfy the needs of a six-person household indefinitely. Yet some families have now planted several mu of fuelwood trees, and the average size of fuelwood plantations in the village is now 1.5 mu (see Table 5.9).

The resurgent popularity of fuelwood-tree cultivation is easily explained. Increased fuelwood scarcity caused by deforestation, government restrictions on mountain-forest use, and long maturation period needed by rubber trees make fuelwood-tree lots an attractive investment for most families. Nevertheless, unlike in Mansha, the local government has not yet acknowledged cultivating fuelwood trees as a potential solution to deforestation problems in the area. Local land-use authorities consider this practice as uniquely part of Dai tradition and leave it entirely to Dai village leaders to advise families to plant fuelwood trees. Fortunately, most Dai villages in the area are now well engaged in the cultivation. Unlike in other parts of Xishuangbanna, Dai families have little need to scavenge firewood in mountain forests or state farms. Nevertheless, scavenging activities have not entirely disappeared. Groups of Dai farmers have been caught felling trees in forests managed by mountain minorities. Others occasionally bring tractor loads of firewood collected in the neighbouring forest in Myanmar. In general, however, Dai families in the Daluo area have been able to satisfy their daily fuelwood requirements by growing fuelwood trees on private plots.

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79 One tree often planted for its hardwood qualities by families was pear tree (*limu*).

5.2.3 Menghai-Menghun Plateau

The forestry practices adopted by Dai villages located in low-elevation areas are often similar to those observed in Mansha and Mandahuo. At higher altitudes, however, another forest-use pattern is more prevalent. The Menghai-Menghun plateau (see Figure 4.2), at an elevation of more than 1100 meters, is not warm enough to cultivate either rubber or fuelwood trees. In addition, the area has entered an advanced stage of deforestation as the result of several circumstances. First, the forest base was considerably reduced in the 1950s when the Liming state farm was established and the area partially transformed into an agricultural area. Second, the area underwent fast population growth attributable to natural increases and immigration from other parts of the country that followed the creation of the state farm. Third, slash-and-burn agriculture is still widely carried on by some of the mountain minorities. These circumstances have had a strong influence on the land-use strategies embraced by the villages in the area.

The township of Menghun administers a population of 24,000 distributed in thirty to forty villages in the surrounding area. Of these, 60 percent are Dai, 4 percent are Han, and the remaining portion is composed of mountain ethnic minorities—Hani, Lahu, Bulang, Wa, and other groups. The town is well known in China for its colourful market, to which ethnic groups from various parts of the area converge weekly to trade products. The Dai cultivate rice, sugar, maize, beans, and other crops using methods of intercropping and crop rotation. They also cultivate tea. Almost every household has planted 3 or 4 mu of tea, which they can sell to the government-owned factory in the neighbouring town of Menghai. Rubber tree plantations, so commonly seen in many parts of Xishuangbanna, and plots of fuelwood trees are conspicuously absent. Villages, on another hand, often have bamboo lots, jointly managed by families. Bamboo is in high demand, due in part to the lack of wood products in the area[80]. It is also exported to other parts of China.

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80 Bamboo is an important construction material, used for building houses, huts, fences, and other structures. It is also used for weaving baskets and making crafts.

Villages have also forest plots in which families can collect firewood[81]. The allowable cuts are regulated and determined according to availability. In some villages, families can collect one tractor load annually; in others they are allowed to cut one *pai* (8 cubic meters) every three years. These quota are strictly enforced, and forest plots are watched day and night. The amounts collected are, in general, far from enough to satisfy the individual household fuel needs. As a result, families have had to supplement their fuelwood supplies by other means. One way is to purchase fuelwood from the mountain minority groups. However, because fuelwood is in short supply even in mountain villages, these groups are often unwilling to part with their wood products. As a result, purchases must usually be arranged through relatives and friends who are members of these groups[82]. Another way is to use connections (*guanxi*) with Chinese officials to obtain special permits to collect fuelwood in the forests controlled by the state. However, the risks involved in these normally illegal activities are, high, and the costs of the necessary bribes beyond the reach of most households. Often Dai families simply turn to scavenging wood wherever they can—on village grounds, in woods along the roads, or in state farm plantations in the valleys. The fuelwood situation in the area is so serious that the Menghun police routinely performs checks of fuelwood supplies in every home. One possible long-term solution to the problem is electricity. Families in several villages near Menghun have already started cooking with electric stoves. However, electricity prices are currently so high that this form of energy is out of reach for most households. Nevertheless, the government has plans for the construction of a large hydro-electric power plant on the Mekong river near Jinghong, and electricity may well become a viable option in a not too distant future.

The lumber situation in Menghun is very similar to the one of fuelwood. As a result of deforestation, the only forests still containing tall hardwood trees are rigorously protected, and hardwood is now largely unavailable in the area.

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81 In the early 1980s, the government first distributed forest land to households. Because the private woodlots were often poorly managed and overcut, the government has now reclaimed the plots for protection.

82 Marriages among members of different ethnic groups are common in the area. As a result, many Dai households often include at least one member of a mountain group.

The Dai who still insist on using hardwood in their new constructions must then import hardwood from less deforested areas in the south of the county[83]. Hardwood acquired this way is expensive. A single beam can cost up to 200 yuan. Consequently, bricks have, for the most part, replaced hardwood as a building material in the area. In fact, houses built in villages along the main road crossing the area resemble houses in modern towns. Built of bricks, equipped with television antennae and electric wires, and more densely packed than in traditional villages, these new structures point to the urbanization process occurring through the area.

5.3 Land Tenure in the Dai Village

The changes undergone by the land tenure system since the introduction of the 1978 economic reforms in China have had a considerable impact on Dai agriculture. Under the household responsibility system, agricultural land was contracted to households, with a quantity of land determined by the number of people in the households. Families became then responsible for the utilization of the contracted land, including cultivation methods and agricultural investments. In 1984, China's first Land Management Law guaranteed land property rights to households for a period of twenty years (up to fifty years for forest and pond land), a period long enough to stimulate long-term peasant investments in agriculture. At the same time, households acquired the right, not only to use the land according to their own wisdom in agricultural matters, but also to transfer the land to other households and hire labour as they wish, under the condition to fulfill contractual responsibilities[84] (Selden, 1993).

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83 One popular area to purchase hardwood is Bulang Mountain, in the south of the county.

84 Under the current Land Management Law, land ownership in the Chinese countryside is largely defined as the product of a *tripartite relationship* between the state, the natural village (collective), and the household. The *state* has the right of eminent domain, that is the right to take possession of the land in exchange for compensation. It has also prerogatives to determine land use, cultivation patterns, and price levels. The *village* is entitled to sell land to the state and enter contracts with the state, other collectives, cooperative and individual enterprises, and peasant households. It is also responsible for allocation and utilization of all land under its administration. *Households* have usufruct, transfer, and labour rights over contracted lands. These include the rights to use and harvest the land; to transfer the land over to households; and to exchange household, cooperative, and hired labour under fulfillment of contractual responsibilities. These rights also allow households to return to the village the land that they no longer wish to cultivate, without contractual obligation. Land ownership relationships have been

Thus, in 1984, households had, in principle, received a quantity of agricultural land that reflected their sizes, and, therefore, their needs, with a quality of soil uniformly distributed among households in the village. In reality, however, the availability of land per capital is greatly affected by the dynamic nature of household composition. People leave, procreate, and die, and the resulting changes in household size and membership can have a profound effect on the household's ability to cultivate the land with optimum productivity. In some instances, households have increased too much to be comfortably sustained by the amount of land originally received. In others, they have lost too many members to cultivate the land profitably. However, in Dai society, the availability of land throughout the household's life cycle is also strongly influenced by tradition, which, to some extent, counteracts the negative effects of changes in household composition on agricultural productivity. At the same time, local autonomy in land use management has enabled village leaders to design land redistribution mechanisms to protect households from the effects of inadequate land allocation.

Dai tradition. In the Dai village, access to agricultural land is very strongly linked to residence patterns, which are themselves dictated by long-time held tradition. Thus, after marriage, a man will first live with his wife and her family for a period of time (usually two or three years) agreed upon by the two families. During this period, the man will join the workforce in his wife's household and help cultivating their family plots[85]. Afterwards, the new couple's permanent

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in a state of flux since 1978. Importantly, land ownership issues are no longer the exclusive prerogative of the state and the cooperative, and they now involve the active participation of the state, village, and households (Selden, 1993).

It is interesting to note that, in comparison, traditional land ownership in Xishuangbanna had a dual character. While all land belonged to the highest ruler in Xishuangbanna (*Chao Phaendin* in the Dai language), the land also belonged to the village. Thus village land (also called "public field of the village") was allotted to families for fixed periods of time, during which they had to "bear the burden of its cultivation." For this reason, the "public fields of the village" were also called the "fields of burden" (Qi Qingfu, 1989).

85 The reasons for this custom are not fully established. The custom may, on the one hand, serve to test the relationship between the man and his bride's family. In fact, the man sometimes moves into his fiancee's home a few months, or even a few years before marriage. The custom may also be a *bride service*—an obligation for the man to repay the woman's family for taking away their daughter by offering his labour services.

household membership will be decided by the two families. Normally the man will return to his parents' home with his wife. Often, however, the outcome of the decision will be pragmatically determined according to the labour needs and the existing gender distribution in both households. The first objective is to distribute manpower equally between both households. Thus the newly weds are more likely to become part of the household in which the amount of agricultural land (and forested land) per capita is highest. The second objective is to have at least one young man in both households. The importance of physical strength to perform heavy farming tasks, such as ploughing, harrowing, and irrigation network maintenance, has long been valued in Dai society. Third, there is a need to balance out the gender distribution in both families. The Dai have traditionally divided the tasks in rice agriculture according to gender. Thus, men build dykes and plough the fields, women plant the seeds, men transplant the seedlings, both men and women weed out and harvest the plots, and so on. Accordingly, efficient farming is, to some extent, conditional on the availability of workers of both sexes. In short, residence rules in Dai households are strongly motivated by subsistence needs and the desire to increase agricultural productivity[86].

In this regard, the man will first have had to pay a *bride price* to the woman's family. The amount to pay is negotiated between the two families. It depends on the man's family's wealth and on the woman's village of residence. In the villages visited in this study, estimates varied from 50 to 500 yuan for a bride who lives in the same village as the groom, and up to 6,000 yuan for an outsider. This is a considerable amount of money, corresponding normally to several years' worth of savings for most households in the region. Thus a Dai adage goes: "Whoever wants a Dai girl to cross the river must count his pennies first." Naturally, young men are not happy about this situation. Some have bitterly complained that the "real problem" in Dai society is that people have become "true capitalists," even in the application of their traditions. Nevertheless, this custom is adding economic value to women in Dai society. In contrast to Han peasants, Dai couples often express the desire to have at least one daughter in the family.

86 The cultural practice of choosing a residence after marriage according to labour needs on both sides of the family is well adapted to the constraints imposed by the household responsibility system. Under contractual agreement, households are required to achieve certain production quota. Thus households that have too much land per capita or not enough workers of both sexes to cultivate the agricultural plots may have to hire additional workers to perform agricultural tasks. In reality, most households will hire extra labour to perform certain tasks. Thus most families hire extra female workers (up to thirty) to plant the rice seeds, an activity that is normally performed in one or two days. Households that have a strongly skewed gender distribution, however, such as only one male worker to plough large land holdings, may have to invest considerably more money into hiring workers for a longer time period.

The choice of residence after marriage, however, is not always accompanied by adequate re-allocation of agricultural land. In particular, the custom of taking temporary residence in the woman's house in the years following the wedding can cause severe hardship in the availability of land per capita. The young woman's husband brings no land of his own to cultivate. In addition, the couple may already have had one or two children who must be then fed from the products of the woman's family plots. The situation is especially serious when more than one daughter bring in their husbands during the same period[87]. When, on another hand, the new family takes residence in the household chosen by their parents after the transitional stage in the woman's family house, the new member in the household may bring in his or her portion of agricultural land to cultivate. This, again, is a matter of negotiations between the parents on both sides of the family, and the decision is normally based on the current availability of land in both households. In most cases, a person coming from the same village will bring in his or her portion of agricultural land (and forested land). This land transfer between households is a purely private matter (without the involvement of the village leader). As a rule, it is accompanied by an agreement on the contractual obligations associated with the portion of land transferred (land tax payments).

The residence assigned after the stay in the woman's family may itself not be permanent. More than one married child may live in the parental house with his or her spouse. It is thus customary for a couple to leave the parental house and build a new home after the birth of their first child[88]. Normally only the youngest daughter (or the youngest son if the family has no daughter) will stay permanently in the parental house with her own husband and children to look after the aging parents. As a reward, they will inherit the house and the agricultural and forestry plots allocated to the parents. The families who leave the parental house will have to build a new house, usually on the periphery of

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87 One household interviewed in Mandahuo had 14 members living out of a total amount of agricultural land originally allocated for 6 people. In this case, a man had taken permanent residence in his parents' home with his wife and two children. In addition, his two newly wed sisters had brought in their husbands and had already two children each.

88 Unlike the Han family, the Dai family tends to be small and nuclear. It nowadays usually contains four or six people, overlapping two or three generations (Zhu Liangwen, 1992).

the village[89]. Because population controls were not implemented until the 1970s, most families formed in those days had at least three or four children, who are now themselves married and are bearing children of their own. As a result, many houses have been added to the village in the past decade, and a considerable amount of land suitable for forestry or even agriculture has been lost. At the same time, agricultural land has been further fragmented as the new families received plots from both parental groups. In many cases, these plots will not be sufficient to feed the growing families, whose ability to live from farming will strongly depend on the availability of additional agricultural land in the village.

Informal land redistributive mechanisms. The ability for families to acquire additional land is mostly contingent on informal land allocation mechanisms established by the village leadership. Villages in ethnic minority areas have a considerable amount of autonomy in land use management. In particular, the village leader has the power to establish land allocation processes that reflect the demographic changes in the village population. Thus villages may have an *agricultural reserve* from which land can be leased to land-poor families. This is the case of Mandahuo, where families can lease land on a yearly basis for a fee equivalent to thirty percent of the annual income generated by the sales of the extra crops harvested. For newcomers to the village, leasing land from the agricultural reserve is often the only way to acquire agricultural land. Not all villages, however, provide, a similar service. Thus, in Mansha, the entire village agricultural land was distributed to households in 1984, and the only way for families to obtain additional agricultural land is by renting privately from other villagers.

At the same time, villages may have established *land redistributive processes* that reflect the changes in household membership. Thus land that has become available after someone has died or left the village may be retaken by the village and allocated to families with children born after 1984. This is the case of Mandahuo, where newborn babies are normally entitled 0.6 mu of agricultural land, an amount considerably smaller than the 1.35 mu allocated per capita in

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89 To find suitable land for construction, a family may have to swap land with another family. The land swap will be recorded by the village leader.

1984 but large enough to make a significant contribution to family food production. In a similar way, in Manlongkun, a village located in the vicinity of Menghun, the land recovered by the village is redistributed to needy families every three years. In Mansha, however, mechanisms to redistribute agricultural land have not been established. If someone dies or leaves the village, his or her family retains the land for their own use. Since, in addition, no agricultural land reserve exists from which plots can be rented out to families, unless the village leadership realizes the potential benefits of land redistribution processes within the village, families with newborn children and newcomers to the village may have to wait until the year 2004 for a fair share of the village agricultural land.

In summary, the land tenure system currently in effect in the Dai village is the product of a complex and dynamic interaction between the household responsibility system and Dai tradition. Thus, on the one hand, village agricultural land has been divided among households subject to contractual obligations. At the same time, the availability of land per capita is affected by changes in residence patterns during the household life cycle imposed by Dai custom. In addition, land allocation mechanisms may have been established by the village leadership to soften the impact of the lack of agricultural land in China and the demographic changes in the village population on the household economy.

5.4 The Village Leader

The role of the village leader (*cunzhang*) is central to the smooth functioning and the healthy development of the village. The leader is the head of the villagers' committee elected every three (or less commonly five) years by the villagers[90]. Although this position can, in principle, be filled by a male or a female, a male is often chosen who is known to be a good skilled worker, and fair and generous to other villagers. Unlike functionaries in the local government,

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90 In socialist China, the villagers' committee is normally composed of a village leader (*cunzhang*), a vice-leader (*fucunzhang*), an accountant (*kuaiji*), a militia representative (*minbingduizhang*), and a population control officer (*funüduizhang*). In the Dai village, the population control officer is always a Dai woman. She gives advice on birth control and enforces population control policies. Thus, according to current policy, she arranges for Dai women who have had two children to be sterilized in the nearest town's hospital.

the leader does not hold an official position[91]. Nevertheless, the post carries many of the responsibilities associated with the task of managing the village's affairs, and the leader normally commands trust and respect among the villagers[92]. Some of the leader's functions are to allocate land and resources to families, organize public works, manage the village's finances, and advise farmers on agricultural policies. The leader also instructs villagers on government policies and represents the village's interests at official quarters. Above all, the leader acts as an intermediary between the villagers and the government.

Right after the introduction of economic reforms in the late 1970s, the village leader became responsible for allocating the village's resources to families. The process of distributing agricultural, forestry, and pond land equitably to families was a laborious one. It involved allocating equal shares of land of similar soil quality to villagers, dividing up trees (tea, rubber, fruit, fuelwood) planted in the collective era equally among households, and ensuring that all families had access to village ponds. The process of land allocation has not come to an end. Every year, the leader surveys the household land holdings and keeps track of land transfers among families. He may also have created an agricultural land reserve from which land-poor families can lease additional land and established mechanisms to re-allocate the land of families that have shrunk in size as the result of death or marriage. Although the leader is not a government employee, this villager fulfills duties considered to be vital for the success of policy reform in China. Thus the leader regularly supplies the government with data on family agricultural and forestry plots. He also ensures that households pay their land taxes and grain quota (*gongliang* and *yunliang*) every year, and he collects and hands over taxes payable in cash (property, agricultural and forestry

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91 Unlike employees at the administrative village level (*cun*), the village leader is not a government official (*ganbu*), and thus does not draw a government salary.

92 Most villagers interviewed in this survey considered the village leader's work to be important, although many did not realize that it was hard work. Village leaders, however, find their tasks difficult and exhausting, and they rarely volunteer for the job. Villagers recommend them to the position, which they accept out of a sense of pride and duty. The small remuneration does not reflect the burden associated with the position. Besides managing the village's affairs, leaders work on their own farms, a far more lucrative operation. Not surprisingly, they often resign at the end of one term after having recommended a successor for the position.

land, school, medical, water, militia, and police) to the local government[93]. In addition, he reports births, deaths, marriages, and divorces, and thus he plays an important role in the implementation of population control policies.

From the villagers' perspective, the leader carries out important organizational tasks. One important function is to set up work teams to implement public works projects—irrigation network maintenance, road improvement, school, and temple repairs. Work teams are made up of volunteers, who labour for a period of up to thirty days annually for the benefit of the community. The leader may also organize a rubber production cooperative in which he pools the rubber trees belonging to households and contracts the harvesting operations to a production team. The leader then divides the incomes generated by the sales of rubber to the households involved in the operation. When the village has a communal forest plot, the leader organizes a permanent watch to ensure that no cutting occurs without permit. In the same way, he tends and manages the communal bamboo plantation. In addition, the leader implements water distribution programmes and coordinates irrigation activities during prolonged spells of dry weather. At the same time, he helps solving disputes among villagers over plot boundaries and water rights[94]. Finally, the village leader organizes wedding ceremonies, funerals, and, importantly for the cohesion of the community, religious ceremonies and temple festivals[95].

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93 Taxes are set by the villagers' committee. Thus, in Mansha, villagers paid, in 1993, 5 yuan per mu of agricultural and forested land; water-fees were 2.5 yuan per mu of irrigated paddy land, and school fees were 25 yuan per child. A good portion of the income generated by these taxes is invested in the infrastructure of the village. About 10 percent of this income is spent on the villagers' committee members' salaries.

94 In Dai villages, conflicts among farmers are generally rare. As a result of increased population pressure in recent years, however, conflicts among neighbouring villages over access to agricultural and forestry lands have become more frequent. According to government authorities, some of these conflicts have turned into fully-fledged fights among these villages.

95 The Dai celebrate three major festivals each year: the Water Festival (Songkran), the Close-Door Festival, and the Open-Door Festival. The Water Festival signals the New Year in the Dai lunar calendar (mid-April in the solar Gregorian calendar). The festival has ancient animistic roots, marking the end of an agricultural cycle and the beginning of a new one. With Buddhism now the prevalent religion, the festival has been incorporated into Buddhism in recognition of the importance of the agricultural cycle. The Close-Door Festival (beginning of July) signals the beginning of Buddhist lent. For a period of three months, the monks are locked in to pray and meditate for the benefit of the community. During this time, the lay people in the village are required to observe austerity. No wedding or house building activity can take place in the

The level of interaction between the leader and the villagers is high. The leader holds public meetings once a month where he praises good workers and gives general advice about farming and forestry practices. Although he does not interfere directly with household decisions in agricultural matters, he establishes guidelines according to market research, government expectations, and, in some villages, ecological considerations. Thus he recommends that villagers plant enough nonglutinous rice to hand in their quota to the government as well as rice varieties which are in high demand[96]. At the same time, he may urge villagers to mix organic and chemical fertilizers or practice crop rotations[97]. In forestry, the leader may advise villagers to plant rubber, tea, fuelwood, or fruit trees. He will organize public sessions to train villagers on better cultivation and harvesting techniques, and use of fertilizers and pesticides.

Importantly, the leader studies government policies and instructs villagers on their implications for village life. Thus he will notify families that they must sell rubber directly to the government; that the trade of wood products with mountain people has become illegal; and that they can collect fuelwood on state-farm grounds under the condition not to damage living trees or disrupt rubber harvesting activities. The leader thus strives to maintain a good relation to state farms. These can offer valuable advice in forestry matters and access to resources such as enriched fertilizer and fuelwood. More generally, the village leader acts as a liaison between the villagers and the local government. In good socialist tradition, he is, first of all, responsible for implementing rules and regulations; increasingly, however, he represents the villagers' views on local developmental issues.

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village. The Open-Door Festival (September 30) marks the end of the lent. For four days, people will gather on the temple grounds to rejoice and share a vegetarian banquet with the monks. During these festivals, the leader will make numerous speeches to remind the assembly of their cultural heritage and the values prevailing in Dai society.

96 Although glutinous rice is the essential element of the Dai diet, village leaders usually advise families to plant approximately half of their land holdings with nonglutinous rice varieties. In principle, families are required to hand over expensive, high-quality rice (known locally as 201 or 502). Villagers, however, rarely comply with the request and often mix low-quality, fast growing rice with the required varieties.

97 Many village leaders, however, have not, as yet, advocated an ecologically sound approach to agriculture and forestry. Thus most leaders have urged to intensify their agricultural practices and grow two crops of rice annually. At the same time, few have encouraged villagers to cultivate fuelwood trees.

As further economic reforms are implemented and competition for resource use from other groups continues to increase, the role of the village leader is likely to grow in importance, reflecting the need for active participation in local development issues. Increasingly, Dai respondents have expressed concerns that modernization plans laid out by the central government are transforming their society in a way that they can not control. One of these plans is to increase hydroelectric power supplies in order to remedy the worsening fuelwood situation in the region. The promise of cheap electricity has been recently used by the government as a strategy to compensate the Dai for land expropriation schemes in the vicinity of towns, state farms, and industrial sites. The village of Manzhan, a few km south of Jinghong, is a case in point. The village lost all its fuelwood trees twenty years ago when, following a sharp population increase caused by Maoist transmigration policies, most trees in the village were felled to satisfy the surge in demand for lumber and fuelwood. More recently, large tracts of land owned by the village were expropriated by the state to build a power plant to serve the area. In compensation for the land, the village was given electricity at greatly reduced rates so that its inhabitants today do most of their cooking on electric stoves instead of wood stoves.

The situation of Manzhan is not unique. Almost all Dai villages in the vicinity of Jinghong now use electricity as their main source of energy. Whether this trend will spread to the entire countryside depends on the development plans laid out by the central government for the region. However, this form of energy has already transformed the social structures in villages close to town. It has accelerated the processes of urbanization detectable throughout modern China, as peasants increasingly leave farming for more lucrative employment in industry and services.

A modern Dai village leader. As urbanization slowly sets in, the tasks of the village leader have become more numerous and complex. Yujiao, a female restaurant owner, is the leader of Manjinglan, a Dai village lying directly on the outskirts of the town of Jinghong, and often visited by tourists. Besides the heavy work load incurred from running a successful commercial establishment, she also shoulders the responsibilities of managing a modern Dai village well on its way to becoming a town. A large part of the work, she says, comes from living so close

to Jinghong. She spends much of her time interpreting elaborate urban regulations and negotiating with Chinese officials during frequent, often drawn out meeting sessions. She helps setting up private firms and cooperatives, and she is often involved in settling land-use conflicts. Her long-term plan is to convert the village into a town. She envisions a Mangjinglan where tourism has replaced rice-agriculture for livelihood, where people will "stop being villagers and become instead town-citizens."

Her ambitions are not limited to the village proper. After her election as village leader, she joined the Communist Party in the hope of strengthening her position as a village representative during negotiations with government officials. She aspires to become a model leader for the whole region. "In the past, only old men had the right to become leaders." Now, under socialist rule, women, according to her, have a chance to take an active part in cultural and administrative affairs. She envisions a Xishuangbanna modernized and enriched, with electricity available to the whole region. The issue of fuelwood shortage will become essentially irrelevant, and the Dai people themselves will be free to decide on whether to keep their practices of planting fuelwood trees and other traditions. She feels that the actual government respects the customs and aspirations of the Dai and that, with the right leadership, these are now in a position to improve their standard of living while maintaining a strong cultural entity.

5.5 Summary

This chapter has summarized the information collected through the implementation of the research methods described in chapter three. The agricultural and forestry methods of two villages have been compared in terms of productivity and ecological sustainability. In Mansha, villagers have adopted monoculture in agriculture and forestry. Families derive their cash revenues mainly by practicing intensive rice cultivation and growing rubber. In Mandahuo, farmers have returned to more traditional forms of agriculture. Their main land-use strategy is crop diversification. Thus they practice crop rotations and intercropping in agriculture, and plant tea, rubber, fruit, and fuelwood trees. The household economy is largely one of subsistence. This chapter has also examined the fuelwood situation in Xishuangbanna and the

land-use conflicts between villagers and state farms. It has described the Dai traditional living arrangements after marriage and the informal redistributive mechanisms at village level. Finally, it has outlined the important functions of the village leader. The following chapter summarizes the findings of the study and presents implications for development of Dai society.

Chapter 6

CONCLUSIONS

The 1978 economic reforms were a landmark in China's agricultural and land-use policies. Three decades of collectivism and excessive central planning, gave way to the household responsibility system, in which village agricultural and forestry land was allotted to families, who became then directly responsible for production and investments. For China's ethnic minorities, the reforms marked a sharp turnaround in their paths of economic and cultural development. A prolonged period of cultural repression and economic stagnation had come to an abrupt end. Decentralization of administrative power, greater freedom in economic affairs, and renewed tolerance towards cultural expression created a new set of circumstances for the minority nationalities to explore in their efforts to maintain their cultural entities and integrate their local economies in a state that has made economic development its top priority.

Traditionally, villages in ethnic minorities have derived their livelihoods from natural resource use, especially agriculture and forestry. Under the effect of new national policy that encouraged modernization and commercialization, these villages were left to make a choice in land-use strategy. One choice was to participate in the commercialized economy. By intensifying agricultural practices, planting cash crops in agriculture and forestry, raising livestock, and tending fisheries, households were determined to use their natural resource base to increase cash revenues. There were, of course, risks of financial failure. The "scissors effect" of pricing policies kept prices of agricultural output low and those of agricultural inputs high. As a result, investments in agriculture were far from guaranteed to be profitable. At the same time, uncertainties in the status of land tenure and general lack of credit for farming enterprise were not conducive to reliable investments. There were also risks of ecological damage: the practice of monoculture in agriculture and forestry made crops more vulnerable to pests and diseases; the heavy use of chemical fertilizers was accompanied with a

decrease in soil quality; and the loss of natural forest loss resulted in increased soil erosion.

The opposite approach was to return to more traditional forms of natural resource use. Concerns for "safety-first" motivated peasants to focus their investments on providing for their subsistence needs rather than increasing cash revenues. By diversifying cropping patterns, planting seeds with stable rather than high yields, and relying on collective forms of insurance against subsistence crisis, peasants could thus generally achieve self-sufficiency in food production. They could also achieve a "more natural," less degraded environment. On the negative side, their agricultural practices were likely to be less productive, and would thus generate smaller cash revenues. At the same time, they would be less open to agricultural innovations. This form of resource use would also likely result in greater disparities between local and national average standards of living.

There were, of course, many other possible choices based on variations of both schemes. Choices would depend partially on the adequacy of the land base to support local populations. Thus decisions on land use by households were likely to be affected by the sizes, number, and locations of agricultural and forestry family plots. They would also depend on the availability of government intervention programmes. Irrigation projects, road network improvements, availability of high-yield crop varieties adapted to local conditions and affordable fertilizer, and provision of technical assistance and market information were likely to influence households towards adopting cash-oriented farming activities. Choices, undoubtedly, would reflect tradition—existence of cultural practices of natural resource use, living arrangements and informal redistribution of land after marriage, economic assistance from religious associations, and so on. They would also reflect values traditionally fostered in the communities, such as ecological awareness and local knowledge of environmental conditions. Decisions in natural resource use would, above all, be conditioned by the quality of leadership offered at village level. Effective leadership would provide redistributive mechanisms to protect the poorest families, offer proper advice in agricultural and forestry practices, gather local knowledge, identify community problems, and represent the villagers' interests at government level.

This study has illustrated the choices in land-use strategies and methods of natural resource use available to ethnic minority groups and peasant societies in China's remote areas. It has focused on two villages representative of agricultural and forestry practices adopted by the Dai minority nationality in two different areas of Xishuangbanna.

Mansha.

In Mansha, Dai farmers have adopted agricultural and forestry practices typical of many low-elevation areas near towns or easily accessible by road. In agriculture, families invariably practice intensive wet-rice cultivation, with double-cropping, high-yield seeds, large chemical inputs, and mechanization. Although they rotate rice varieties (glutinous and nonglutinous) from a harvest to another, they rarely plant other cash crops. Gardens provide vegetables and fruit for consumption. Agricultural investments are essentially motivated by the prospect of increased cash incomes. Rice surpluses are sold on the free market or given as fodder to pigs. The sale of pork is the largest source of cash income, supplying, on average, 75 percent of household revenues. In forestry, families have placed their hopes to increase their cash incomes in the cultivation of rubber. Thus most forestry plots have been converted to rubber plantations. Because of the long-growing period of rubber, however, profits have only started to materialize.

Problems. The wholesale adoption of the cash economy in Mansha has created a number of social and ecological problems. First, Mansha has witnessed a rise in disparities in rice production levels and cash incomes among households. These disparities are largely caused by differences in sizes of agricultural land holdings and number of workers available to households. Both variables reflect the stage in family life-cycle, as land was distributed to families in 1984 according to family size at the time. They also reflect Dai tradition. Although, in the long term, living arrangements after marriage are decided according to household needs for land and labour, the custom of having men living with their wives' families for a number of years after marriage can cause severe temporary agricultural land shortages. Disparities are also reinforced by the absence of land redistributive mechanisms in villages. No agricultural land reserve exists, and

no mechanism exists to redistribute land that has become available after someone has died or left the village to land-poor families.

Second, in agriculture, the emphasis on rice monoculture and reliance on heavy use of chemical fertilizers are raising concerns on the ecological sustainability of the villagers' agricultural practices. The high application rates of chemical fertilizers (over 600 kg per hectare) have reached the point of diminishing returns, where the use of higher amounts does not necessarily entail higher production, and, in fact, could cause soil damage. In addition, the state of the irrigation network has deteriorated in recent years. The practice of intensive wet-rice cultivation on many small and scattered plots has strained the water supply available to the community. The competition for irrigation water among villagers and between the villagers and the state farm has grown and occasionally led to conflicts.

Third, in forestry, villagers have abandoned the traditional practice of growing fuelwood trees in favour of cultivating rubber. Villagers now obtain fuelwood by cutting off dead branches both on private plots and state-farm plantations[98]. There has also been a rise in trading activities with mountain minorities for fuelwood products, such as fuelwood for cooking and hardwood for construction. However, the deforestation in the region has become so severe that the government has now imposed a ban on wood trade. It has also stopped cutting permits in state forests. The ban has caused conflicts between farmers and the Forest Department as illegal cutting continues.

Finally, villagers have expressed complaints concerning specific state policies, especially the fixed land tax and grain sales quota specified in the household responsibility system. The requirement that households hand over fixed amounts of grain each year to the state can cause hardship in bad years, forcing them to borrow money to purchase rice at high prices on the free market to hand over their dues to the state. Villagers have also voiced criticism at the lack of credit and financial assistance from the state and expressed insecurities about pricing policy.

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[98] This practice is common in Dai villages which, like Mansha, have adopted rubber cultivation. However, in many areas of Xishuangbanna, this has become a growing source of conflicts between villagers and state farms, as these have imposed restrictions on access to their properties.

Mandahuo

Several special circumstances distinguish Mandahuo from Mansha. First, located in a more remote area of Xishuangbanna and at a further distance from state farms, Mandahuo has been less affected by modernization than Mansha. At the same time, as a result of its proximity to Myanmar, where the related Shan have been less affected by political ideology and modernization, the traditions and customs have been better preserved. In addition, because of a high population growth and a narrow agricultural land base, the ratio of land per capita is considerably smaller than in Mansha. The land distribution process at the time of the economic reforms has left families with a large number of small plots (over 40 for the average family) scattered in many locations. As a result, subsistence needs in Mandahuo have become a higher concern than in Mansha.

Thus, in agriculture, villagers have adopted more traditional forms of cultivation, based on crop diversification, crop rotations, intercropping, and a single harvest of rice each year. Most families practice complex crop rotation systems, switching locations of given rice varieties from a year to another, and growing crops of watermelons and vegetables in the winter. They also combine manure with chemical fertilizers, and continue to plough their fields with water buffaloes. They have achieved relatively high yields of rice, watermelons, and other crops with considerably smaller amounts of chemical inputs than in Mansha. In addition, diversification of cropping patterns provides both natural protection against the spread of pests and diseases and a broader base for cash revenues. Villagers have also chosen to diversify their forestry practices. Rubber, tea, and, increasingly, fruit trees have become important sources of cash incomes for most families in Mandahuo. Villagers have also rediscovered the cultural practice of planting fuelwood trees as solution to rural energy shortages in the area. The practice has helped slow down deforestation in the area.

Problems. Problems concerning the socio-economic development of the community are, in general, fewer than in Mansha. Nevertheless, a few pressing issues have been identified. Thus, disparities in family incomes have grown considerably, due mostly to the cultivation of watermelons. Cultivating watermelons is the most lucrative agricultural activity in Mandahuo. However,

it is out of reach for many families, as it requires expensive initial investments and usually also hiring itinerant experts to plant and manage the crop. In addition, the small and scattered family plots have resulted in many inefficiencies, such as time wasted in travelling from a plot to another during the planting, weeding, and harvesting phases of rice cultivation; continued use of water buffaloes instead of tractors; and land lost for the construction of ditches and mud banks. Finally, grazing water buffaloes also regularly cause crop and field damage, another misfortune caused by a general situation of land scarcity in the village.

In Mandahuo, villagers have expressed few complaints concerning the role of government. First, compared to Mansha, the villagers' diverse resource base is little affected by government policy: since they grow only one crop of rice, irrigation facilities are considered to be less important; because they use smaller amounts of chemical inputs, they are less affected by high purchasing prices and insufficient availability; and because their products are more diversified, their sales are less affected by agricultural output pricing policies. Second, although villagers face the same lack of rural credit as in Mansha, they are more able to finance their investments with incomes generated from a variety of activities, including border-trade.

Land Tenure in the Dai Village

Under the Household Responsibility System, village land in Xishuangbanna was officially allotted to families in 1984 for a period of 20 years. As a result, every family in the village received an amount of forested and agricultural land that reflected its size at the time of distribution. This amount may have become less adequate later, as new children were born and the household composition changed. However, the availability of agricultural land to families also reflects other variables. Thus, in both Mansha and Mandahuo (and in virtually all Dai villages), new families apply Dai customary rule in choosing a permanent residence after marriage. This rule evens out the land per capita distribution and labour force in the newlyweds' families. In addition, Mandahuo has also adopted informal collective schemes of land allocation. Thus, an agricultural land reserve has been created from which land-poor families can lease additional land on a yearly basis. At the same time, land

redistributive mechanisms have been established to re-allocate land which has become available after a villager has died or left the village. These schemes distribute land more fairly among the villagers and provide temporary insurance in subsistence crisis.

Village Leadership

The village leader performs important functions for the village development. This official establishes and supervises informal social institutions in the village; presides over temple festivals, wedding ceremonies, and funerals; organizes work teams to implement public works, such as irrigation maintenance, road improvements, school and temple repairs; manages community resources—communal forest plots, collective plantations, and village ponds; implements water distribution programmes; helps solving disputes among villagers over plot boundaries, water rights, and other resource uses; instructs villagers on government policies; and represents villagers' interests on local development issues at government level. The village leader acts as an important intermediary between the village and the government, and plays an increasingly important role for the socio-cultural development of the community.

Prospects

Mansha and Mandahuo exemplify two trends, two adaptations to pressures of development and commercialization in a situation of land scarcity and market environment still partially controlled by the state. However, a wide range of possibilities exists, encompassing land-use strategies adapted and tailored to specific local conditions. At the present, villages in many low-elevation areas have adopted similar agricultural and forestry practices as in Mansha, and villagers derive their main sources of income from intensive rice agriculture and rubber plantation. There are, however, limitations to this strategy, which may preclude its application in some areas of Xishuangbanna and decrease its popularity in the long term.

First, to grow two crops of rice annually is only viable where water supplies are sufficient, that is where the irrigation system is developed and sound. In addition, the heavy use of chemical fertilizers has reached a point of diminishing returns, by which additional increases could cause severe soil

damage. Crop rotations and intercropping methods could be practiced to restore soil quality and diversify the resource base. Indeed, there are indications that cultivating watermelons has grown in popularity in recent years. Second, although cultivating rubber may be an attractive activity to increase cash incomes, it may not be the most efficient way to use family forestry plots. It is relatively pleasant work; it involves the cooperation of all family members; and rubber sales are a reliable source of income. However, the region is only marginally suited to this activity. The planting of rubber is limited to elevations under 900 meters above sea level, and rubber production is affected by irregular rain patterns. As a result, local rubber has become increasingly vulnerable to competition from rubber imported from equatorial areas. At the same time, the long maturation period (eight years) leads to a long waiting period for returns on investments. Planting other tree crops, such as fruit, on part of the family plots, may be more economically profitable. In addition, planting fuelwood trees may be a more efficient way to provide for household needs in fuelwood.

As a result of this study, several recommendations could be made for more productive land-use by Dai households in Xishuangbanna. First, there is a need to diversify agricultural and forestry practices. Varying cropping patterns provides household insurance against pests and diseases, diversifies the income base, and reduces economic dependency on state policy. Second, there is a need to soften the impact of growing population in the region on the availability of agricultural land to households. Thus agricultural land loss caused by the partitioning of land holdings could be reduced by making agricultural plots larger. The large number of small plots currently held by households has also resulted in inefficiencies in labour deployment and resource use. The village leadership could also create an agricultural land reserve and implement land redistributive mechanisms to provide an adequate land base to young families and newcomers to the village. Third, there is a need to reduce deforestation and soil erosion in the region. However, unless electricity supplies to the region are increased, families are likely to step up illegal wood cutting to fulfill their daily energy needs. Planting fuelwood trees provides a reliable and significant source of fuelwood for households. Wide acceptance of the practice would slow down the deforestation process considerably. Finally, it will also be beneficial for households to diversify their economic activities. Handicraft and rural industries

may offer the best opportunities to absorb excess labour freed by a more productive agriculture. The continuing opening up of the area to border trade is likely to generate a range of additional employment opportunities. Tourism is likely to have a significant impact on income revenues mostly in villages of special interests to outsiders—sites of temples and pagodas of outstanding architectural design and colourful festivals—or villages in proximity of towns frequently visited. Nevertheless, the official promotion of tourism in the region attests to the increased recognition of Dai culture as a unique component of China's cultural heritage. It is likely to reinforce the Dai "sense of pride" and helps the Dai re-affirm the position of their nation as cultural entity.

With modernization and new policy favouring decentralization of economic development in China, the Dai are likely to play an increasingly active role in local development plans. They have shown considerable versatility and tenacity in adjusting to the realities of a changing socio-political environment. There is little doubt that their society will undergo further changes in responding to the challenges incurred from being an integral part of a powerful centralized state. It will be beneficial to the state to take note of their continuous effort to adapt and show consideration and flexibility in policy-making regarding ethnic minority affairs. Nevertheless, by granting them autonomy in cultural matters and granting them the right to participate in the decision-making processes involved in the exploitation of natural resources in Xishuangbanna, the state may have prepared the ground for more sustainable development and ethnic harmony.

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APPENDIX A

HOUSEHOLD QUESTIONNAIRE

Village _____ Date _____

Township _____

Personal Data

Sex (1) male (2) female

Age _____

Marital status (1) married (2) unmarried

Number of children (1) boys: _____ (2) girls: _____

Live with

(1) children (3) parents (5) spouse's parents
(2) grandchildren (4) grandparents

Agricultural Land

Number of plots _____

	agricultural use	plot size (mu)	distance (km)
(1)	_____	_____	_____
(2)	_____	_____	_____

(3) _____ _____ _____
(4) _____ _____ _____
(5) _____ _____ _____
(6) _____ _____ _____
(7) _____ _____ _____
(8) _____ _____ _____
(9) _____ _____ _____
(10) _____ _____ _____
(11) _____ _____ _____

Land leased to other villagers: _____ mu _____ plots

Land leased from other villagers: _____ mu _____ plots

Would you need more agricultural land? (yes / no)
For which use? Why?

_____
_____
_____
_____

Could you acquire more land? How?

_____
_____
_____
_____

Agricultural Crops

Annual yields

Crop	yield 1993 (kg)	yield 1992 (kg)	yield 1991 (kg)
Rice			

Chemical fertilizers

Crop	total 1993 (kg)	total 1992 (kg)	total 1991 (kg)
Rice			

Why have you been using more (or less) chemical fertilizers?

Do you apply organic fertilizers (manure)? Why? (Why not?)

Crop rotation (cycle):

(1) annual (2) biannual (3) other _____

rice # harvests _____
other crop: _____ # harvests _____

Do you practice other crop rotations? (Explain)

_____
_____
_____

Income

Amount of rice sold to government: _____ kg (____ yuan / kg)
Amount of rice sold on free market: _____ kg (____ yuan / kg)
Expected annual cash income (1993): _____ yuan
Last-year cash income (1992): _____ yuan

Do you expect a better income next year? Why?

_____
_____
_____
_____

Rubber Cultivation

Number of trees planted: _____
Annual yield: _____ kg
Expected annual cash income (1993): _____ yuan
Last-year cash income (1992): _____ yuan
Year of plantation: _____
Land use before plantation: _____
Why were rubber trees planted?

_____
_____
_____

Fuelwood

Sources of fuelwood:

(1) _____

(2) _____

(3) _____

Do you have a plot of fuelwood trees? (yes / no)

Plot size: _____ mu

Did you plant fuelwood trees? (yes / no)

Why? (Why not?)

_____

_____

_____

Did you clear a plot of fuelwood trees? (yes / no)

When? Year: _____

Why?

_____

_____

_____

Is it becoming more and more difficult to find enough fuelwood? (Why?)

_____

_____

_____

_____

Financing

Do you have a loan? (yes / no)

Amount of money borrowed: _____ yuan
For which purpose?

_____

_____

Do you need more financial help? (yes / no)
Explain the reasons:

_____

_____

How do you invest the profits of your agricultural sales?

_____

_____

Work Teams

Are you member of a work team? (yes / no)
Which one(s)?

_____

_____

Do you intend to join a work team? (yes / no)
Which one(s)?

_____

_____

Why?

_____

_____

_____

_____

APPENDIX B

VILLAGE-LEADER QUESTIONNAIRE

Village _____ Date: _____

Township _____

Personal Data

Sex (1) male (2) female

Age _____

Marital status (1) married (2) unmarried

Number of children (1) boys: _____ (2) girls: _____

Village Characteristics

Population _____

Number of households _____

Total agricultural land _____ mu

Total forested land _____ mu

Land Allocation Process

When was land distributed to the households? year: _____

Lease Duration _____ years

Size of land allocated

per parent	first child	second child
_____ mu	_____ mu	_____ mu

How can a household acquire new land?

_____

_____

_____

_____

Does the first son obtain land from his parents at marriage?
How much land?

_____

_____

In which house will he live?

_____

_____

How about the second son?

_____

_____

How about a daughter?

_____

_____

Is there enough land for every family?
Explain

_____

State Farm

How far is the nearest state farm? _____ km

Which crops are grown on the state farm?

Does the state farm give advise on village agricultural production (crops and trees)? Explain:

Do you encourage villagers to follow the state farm's recommendations?

Are there land-use conflicts between the village and the state farm? (explain)
(1) Agricultural land

(2) Forested land

Are Dai households allowed to collect fuelwood from the state-farm tree plantations?

Government Financial Assistance

Does the central government provide financial assistance?
(for example, Fund for Minority and Border Regions)

How about the province and the county?

Is there any credit institution?

Is the government exacting taxes from the community?

Problems facing the community

What is the state of irrigation network compared to previous years.

Is the community experiencing shortages of agricultural and forested land?

Are there shortages of fuelwood?

Does the government plan to provide electricity?

Is there any land degradation caused by intensive use of land?

What are the most serious problems facing the community?

APPENDIX C

Indicator Method for Determining the Fuelwood Situation[99]

The fuelwood situation in a village can be described by reference to four basic stages which reflect different situations of fuelwood availability and needs for adjustment: (1) abundance; (2) increased scarcity; (3) serious shortage; (4) potential recovery. This stage sequence is useful for comparing villages in different stages and for inferring temporal processes in fuelwood availability. Any given stage in the sequence is identified according to a series of *indicators* appropriate to the area.

Stage 1: abundance

Substantial sources of fuelwood exist. Extensive rubber plantations or lots of mature fuelwood-trees exist in the vicinity of the village from which families may derive their fuelwood supplies. Public, mixed forests may also be visible in the area.

Other possible indicators: numerous trees line alleys in the village and grow in private yards; fences are made of sizable, hardwood logs; wood stacks are big and contain logs of various grades; logs lie unused in the fields; quality of wood burnt is high (hardwood).

Stage 2: increased scarcity

Villagers have begun to cut trees on their fields and in their yards, and few families have fuelwood-tree plantations. In addition, they have adopted measures to save fuelwood: all logs available have a specific use; wood burnt has a relatively low quality; wood is hauled from distant areas using push carts.

---

99 The method presented here has been adapted from *Rapid Rural Appraisal in Northeast Thailand* by George Lovelace, S. Subdhira, and S. Simarah (1988).

Stage 3: serious shortage

All unprotected nearby forest have been converted into agricultural land, and few trees are left in the fields. Fuelwood collection is an organized group activity which may require the hiring of a tractor or a truck to purchase wood from faraway locations. Villages will have normally established regulations concerning property rights over wood, and fines may be imposed in case of violation. There is a strong awareness of the need to plan long-term forest use in these villages. Plans may include increased fuelwood-tree lots and plantations of new, fast-growing species.

Stage 4: recovery

Villages which have successfully implemented strategies to overcome the severe fuelwood shortages of stage 3 are in a recovery stage. Signs of fuelwood availability are everywhere to be seen. Present sources of fuelwood consist primarily of trees (fuelwood, rubber, and others) growing in the villagers' own plots. All trees are reported to be planted and managed, and people tell about their experiences of buying fuelwood ten or twenty years ago. Regulations and property rights are normally well-established at this stage.

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Title of Thesis: **Transformation of Indigenous Society in Southwest China: a Case Study of the Dai.**

Author 

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15 August 1994