CHAPTER IV

THE VILLAGES' AND HOUSEHOLDS' PRODUCTIVE PRACTICES IN AGROFORESTRY

One of the most interesting aspects of reflecting agroforestry cultivation change is productive practice. Production system is related to resource use, labor distribution, and productive relation. Agroforestry is a land use system that relates to forests management, farmers labor distribution, and social organization on the farm respectively. Different access to land and labor may lead to different productive practices. This chapter looks at the productive practice changes and differentiation within villages, and between households with different sized land holdings doing agroforestry cultivation in Tageba community. The purpose is to identify the land use patterns and social organization changes when Miao farmers responded to market economy. It uses the realm of productive practice to illustrate how Miao farmers in Tageba respond to the market economy and development policies change.

4.1 Patterns of Adaptation and Changes in Agroforestry Practice

Forest management is the traditional way of life for the Miao people in Tageba. "*Bai dong*" (planting trees) and "*Dao dong*" (cutting trees) are the main activities of farmers in this community. Farmers often plant trees on mountains. Traditionally, there were three types of land use in Tageba: paddy fields, forestland, and vegetable gardens. In paddy fields, Miao farmers usually grew wet rice, rapeseed, wheat, and radish in different seasons. Some wet rice fields were also used to raise fish. Forestland were usually dominated by natural forestry or regenerating forestry. Vegetable gardens were located on hillsides around the village. Farmers grew various crops in the garden, such as, cabbages, radishes, corn, cucumbers, chilies, potatoes, soybeans and sesame, etc. Each household raised several livestock, such as, several pigs, a flock of chickens, and one or two cattle/buffalo. People worked and drank with each other everyday. When some families were busy, they would help each other. Most of the products were for self-consumption or exchange in the community. Farmers would only buy salt and oil from outside. The production pattern was very much a subsistence-oriented system.

Beginning in the early 1980s, rapid economic growth in China and market opening has boosted urban income and further improved the market for fresh fruit, which is income elastic.

Throughout the 1980s domestic demand for fresh fruit increased at a rate of 7% per annum (Si, 1994). As I mentioned in Chapter III, the Taijiang county government introduced chestnut and pear cultivation to the local communities in respond to market demand. Additionally, population growth, market force, and policy changes have placed new pressures on the traditional Miao farming system in Tageba. From the demand side, the increased population has forced Miao farmers to change their patterns of land use. They could use their small land to increase their production. They had to juggle the small landholdings, exotic species, and agrochemicals in their farm in order to better meet cash needs and control harvests. They have had to plant high-value fruit trees on the barren mountains, concentrating on which species benefited them. They may adjust their strategies to achieve income generation and reduce risks. In Tageba traditional farming system were gradually replaced by commercial production.

4.1.1 Change in Tree Species Diversity

Historically, the major species for forestry in Tageba were fir and pine. As a farmer in Shangten village said, "fir is important for us. We use fir poles to construct house, branches as fuel to cook, treetops to produce boards, and bark to cover the roof. Fir is used everyday and everywhere." In Tageba, there is a popular sentence: "If you family owns thousand firs, your son won't worry about his future" (*jiayouqianzusa, zishenbuyongpa*).

After market reform in the mid-1980s, the traditional timber tree management entered a period of degradation in this community. Timber forestry began to decline due to the expansion of fruit tree farms. According to data from the Forest Bureau of Taijiang County, the timber forestry in Tageba declined to 980 mu from 1990 to 1995. Even though 45% of the natural forestry areas still survived, most of these were located in the remotest mountains. Around the highway no. 210, most natural forest areas had been clear logged. And the trend was that farmers changed from timber forest cultivation to grow fruits or other cash crops in order to earn income immediately. Certainly, post-pile houses were no longer distinctly regarded as the symbol of household's rich in Miao society anymore. Modern raw materials, such as plastic and electricity, replaced fir in tools and furniture. There was an increasing use of "inferior" timbers or bricks to build houses. In Dade and Shibanqiao villages, for example, there were now 12 houses made of bricks. In short, after allocating forestland to the households in Tageba, the timber forests were seriously damaged, and most of the forestland was changed to orchards.

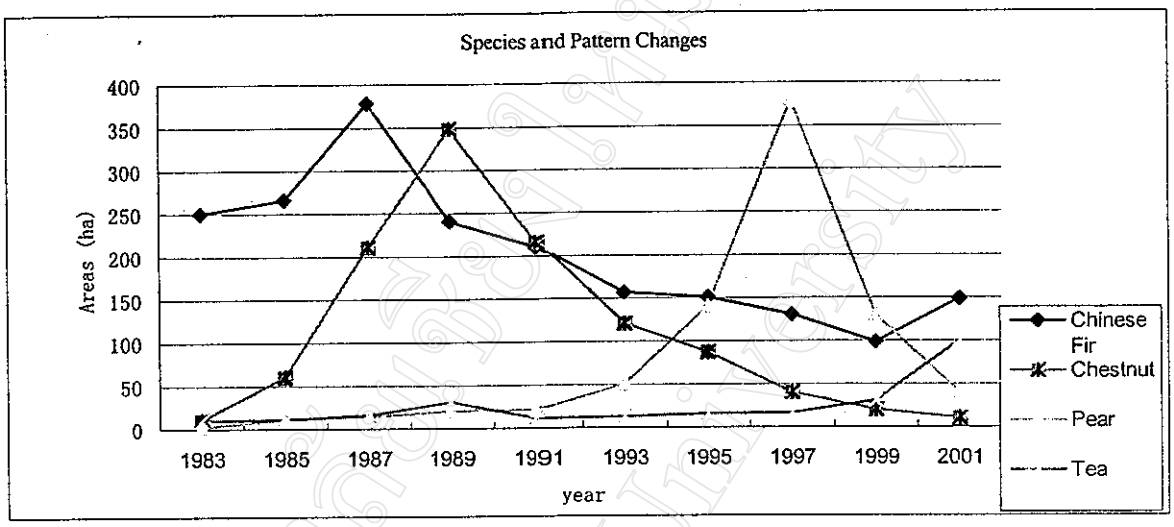
Farmers were also encouraged, through extension support, to adopt improved cropping patterns, which together with the introduction of new varieties, increased inputs (e.g. fertilizer and pesticides) and better technical information, were intended to improve the net returns from cultivation. For example, farmers were advised not to timber trees, but switch to growing higher-value crops. As a result, increased returns from terracing have been largely associated with changing crop patterns: fir production fell from 380 to 240 mu during 1987-1991, while pear production increased from 200 to 350 mu.

According the information that we obtained from Tageba community and Taijiang County, the land use patterns and main species had changed many times in Tageba during the past decades. In the early periods while the state' timber markets opened in 1985, farmers were more interested in fir cultivation, because fir timber was worth about eight hundred yuan per cubic meter. Thereby, many households planted fir on their barren mountains. At the same time, since the county government introduced the Agroforestry Expansion Project (AEP) to Tageba in the late 1980s, planting chestnuts had became popular. Farmers were interested in chestnuts planting because at that time, chestnuts sold at the price of 12 yuan per kg. Also farmers who grew chestnuts had some subsidies from the local government, such as, free seedlings, fertilizers, and technological support. However, the price of chestnuts declined from 10 to 5 yuan per kg after 1990. Farmers had to cut the chestnut trees and became more interested in pear planting in the mid-1990s. Currently, due to the price of pears declined from 10 to 4 yuan per kg as well as the rising tea price, some farmers started tea planting. Also, some farmers started to plant fir again, because fir timber prices had increased during the recent years (see **Figure** 4-1).

Despite farmers changing their land use activities several times there is an overall trend that they have pursued faster and frequent returns, or maximizing their profits for their tree planting under the market environment. Earlier change in cropping pattern from fir to chestnut was a result of market initial liberalization and timber price decline after 1984. Later changes in cultivation method, such as, cutting chestnut trees and growing pear trees reflected periods fruit price instability, in which many farmers were feeling insecure with fruit farming as a method of gaining fast cash. Finally, changing from pear to tea cultivation reflected decline in the market's demand for pears. Some of farmers have turned back to the traditional fir plantation, although it has slower returns, it generates more income and easy manage than the

fruit trees. In fact, fir planting is the pattern of tree cultivation most consistently sustained in Tageba community.

Figure 4-1. The Changes in Species and Pattern of Trees Cultivation in Tageba



Source: from communist party committee records in Tageba and Taigong Township Forest Stations.

Figure 4-1 shows the pattern of land use and species change in Tageba in the past decades. These changes consistently reflect the farmers' response to the market economy. Land use patterns changed to follow the price changes. With the advent of market intervention, farmers grew different trees in order to seek more benefit and faster returns. Now, farmers are more flexible in their selection of market outlets. This has somewhat helped farmers to offset the fluctuations in fruit prices. The strategy among the farmers now is to gauge the pattern of prices, so the produce is harvested when the price is higher. Although not one totally successful, it shows an increased sophistication in the farmer's marketing strategy.

Indeed, market intervention has been associated with change in tree species diversity in Tageba after 1985. The proportion of native species has declined, while the number of species for market uses has increased. The data from the Taijing forestry station showed that now more than 20 different kinds of commercial tree species are grown in Tageba. Of these, ten species (fir, pine, tea, bamboo, chestnut, pear, plum, peach, waxberry, and loquat) are now widely planted. Their areas accounted for over half of forestland. Meanwhile, four species (fir, pine, plum, peach) were the traditional species in Tageba while other species introduced from the outside. However, This process of species selection by farmers shows a preference for food production species either for household consumption or market. It also shows multiple

tree type cultivation which can meet diverse requirements. Tree cultivators concentrated heavily on developing high-yielding crop varieties. The role of these trees in meeting subsistent needs and providing conservation and protective functions is negligible. In Tageba community, traditional fir management practices have been overlooked. This has resulted in the disappearance of some species traditionally used and maintained by farmers.

4.1.2 Change in Site Selection and Arrangement

As I described above, land use in Tageba includes: paddy fields, forestlands, and vegetable gardens. Forestland was predominated by fir or natural pine forestry. However, market intervention led farmers to change their site choice and site arrangement. In the early 1980s, Miao farmers in Tageba planted trees around their houses and maintained trees around the edge of their vegetable gardens. At that time trees planted at low density and generally scattered all over the available land area.

After the 1980s, in Tageba, the most important methods for tree growing were in niches in an intercropping situation. This was a response to land scarcity. Farmers mixed fruit trees, vegetables, and others crops on their traditional vegetable gardens or new expansion farms. Trees were increasingly used in a service function in order to support crop production as green manure (using alley-cropping, mixed intercropping or planted fallows). Trees around the house were valued for shade and aesthetics, fruit, firewood and fodder.

Since the 1980's livestock management has influenced tree site selection. In the Miao communities, pigs are usually raised in sties. Chickens are raised free range around the homestead, and cattle are raised on the mountains. Miao farmers often make hedges to prevent animals or people from entering their gardens. These dense hedges demarcating vegetable gardens were the dominant way to administer garden boundaries before 1990, but are relatively less important now. Recently, tree farms have been extended into the areas between the plots of different farmers. These include areas previously taken up with hedges, ownership buffer zones and areas where ownership was not yet clamed, unclear, or common land of community. Farmers now keep their cattle at home and gather grass to feed them, due to the risk of cattle damaging seedlings and saplings in the field.

Historically, Miao farmers in Tageba often planted a few fruit trees around houses or vegetable gardens at a low density. But, now there is much fragmentation of ownership, and most cropping land is already used to maximum capacity. Some paddy fields are used to plant

fruit trees or other cash crops. Many barren mountains are used to plant fruit trees. The average density of free-standing trees (planted and naturally growing) on the farms I visited in Tageba had risen from about 80 trees per mu under traditional systems, to 140 trees per mu under present farming systems. Trees are allocated on different types of area. The high-fertility zone farmers used proportionately fewer for growing timber trees, and more for fruits and other cash crops, while in the general fertility zone farmers planted timber trees or bamboo. Forestry was also the predominant activity in the low-fertility zone, but a much higher proportion of trees were used for fuelwood, fencing, timber, and production in other ways.

Approximately, one-third of the land in Tageba has been converted into terraced fruit orchards. Of the remaining land, about half was already terraced in the anticipation of converting it for new land use patterns incorporating pear trees during the past decades. This increase in the proportion of terraced land indicates that during that time land-use shifted from renewable timber forestry to fruit-based agroforestry farms.

4.2 The Differentiated Practices and Responses in the Five Villages

Currently, tree cultivation in Tageba, can be classified into three models of horticultural production according to the purpose of the farmers' land use: (1) subsistence model; (2) petty commodity production model; (3) industrial model (see **Figure 4-2**). These forms can be characterized briefly as follows.

The category of subsistence model embraces subsistence gardens located in and around residential compounds and plots in rice fields. Individuale households cultivaed a samll farm. In the privately held gardens diverse crops mixes. Usually, trees and crops are mixed on the farm and largely local species were used. Most of paddy fields were used to grow rice. Cabbage and other subsistence crops were grown in the vegetable gardens. Fir or pine was planted in the mountains. A few plum or peach trees were planted around gardens or houses. Also, farmers raised a small amount of pigs, chicken, and cattle. All of these products are for household consumption. Farms cultivaiton usually uses family labor. Traditional fertilizer measures and knowledge involved the application of forms of animal manure and plant ash. Gardens are cultivated different crops in each season.

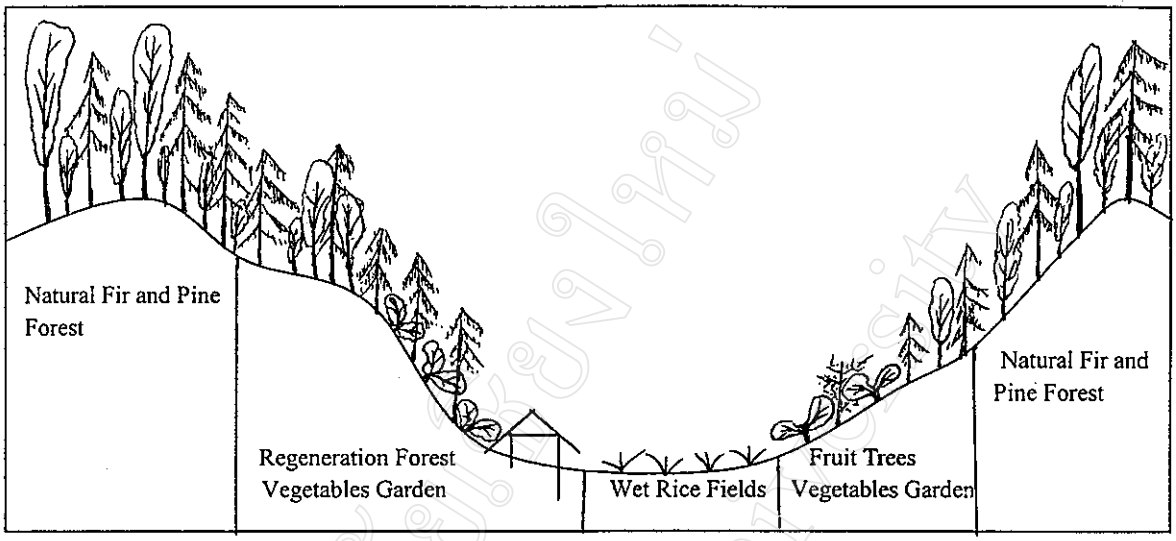
The petty commodity model is typical form of cultivation carried out on an individual household basis insofar as usufruct rights to land are granted to each household. Production is

typically organized on an individual or small work group basis. The partten of garden is multiple-cropping. Local sepecies and exotic sepecies mixed on the farm. Some products are for hosueholds consumption, and a small part of products are for market trade. In this model, farm management use both family and hired labor. In practice, even though this model mostly is individual households' cultivation, but households' production often cooperated with the outsiders. They depend on outside captical support, such as, finance, techology, and information. But farmers is still able to control the crops which they grow. They dispose the products by themselve. For example farmers sell a few timbers or fruits to be able to buy daily commodities. Mostly, households have a large farm or raise several animals. Since the industrial fruit tree project was introduced to Tageba in the 1980s, many households have adopted this model.

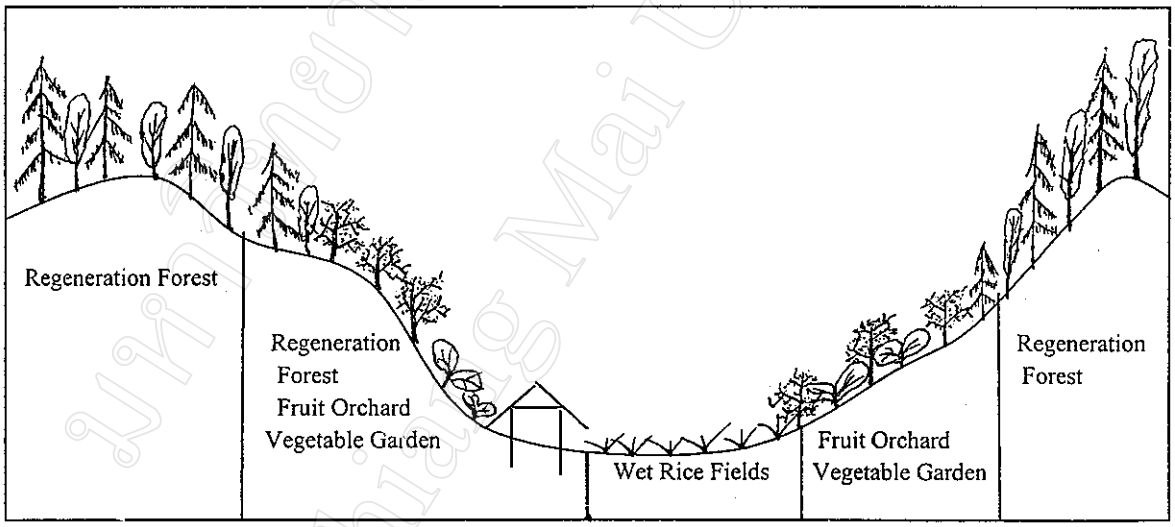
The industrial model is found only in fifteen or sixteen large-scale farms (10-60 ha), all controlled by large land households or private companies. Most farms cultivated one or two species of crops as monocropping system. Crops grown include a number of exotic species that are either exported directly to outside market or destined for sale locally to middermen. In this model, crops are grown to fulfill the needs of the market. The farmers must follow the dynamic of the market and therefore has little control over the crops he grows or how they are processed. Growers utilize the most chemical fertilizers, pesticides and other modern techniques on an increased scale. These farms are based upon different forms of capital (land, labor, costs) the income and benefits that they offer are different. Many heired labors are used in busy season. Horticultural projects are organized along lines similar to those of other communal gardens, with the exception that production decisions are firmly dictated by contract and inputs are provided directly to growers on credit. Costs are recovered at the end of the season before the contracted growers are paid, and labor returns are typically quite low.

Figure 4-2. Different Models of Tree Cultivation in Tageba

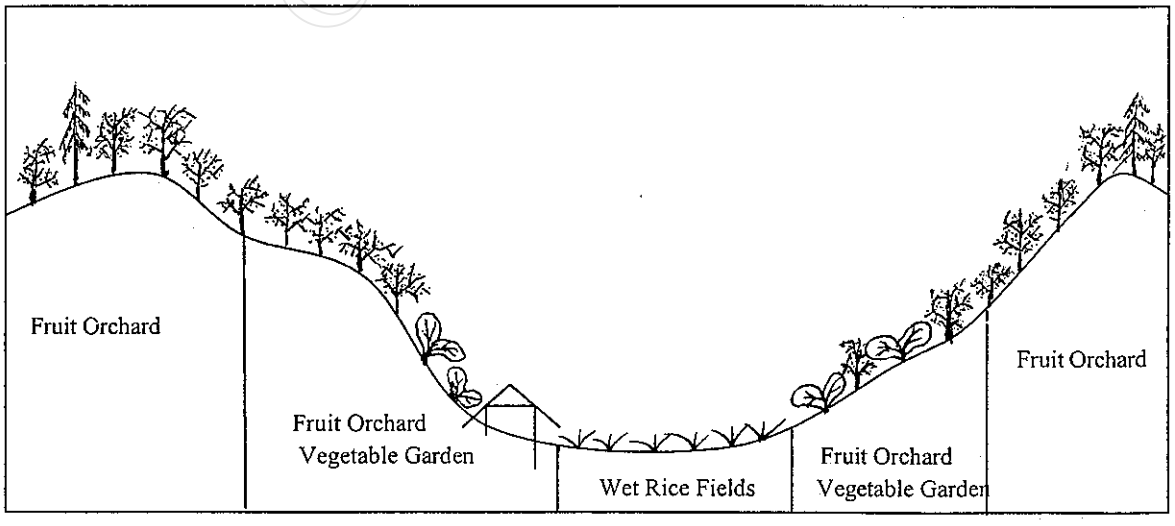
Subsistence Model



Petty Commodity Model



Industrial Model



Tageba's five villages' primary vegetation was fir and pine as a subsistence model of production. But after the spread of fruit cultivaiton in the 1980s, this traditional model changed. As I noted in Chapter III, depending on different ecological context, social-economic context, and natural resource condition, the five villages of Tageba adapted different models of tree cultivation in responses to the market economy and development policies (see **Table 4-1**).

Table 4-1. Five Villages' Differentiation of Responses to Market Economy in Tageba

	Shangten Village	Xiaten Village	Shibanqiao Village	Dade Village	Pingqiao Village
Common Practice	Wet-rice cultivation Chinese fir and mason pine cultivation following traditional customs. Household livelihoods more dependent on forestry Fuelwood				
Land area and use	-2.4 mu per person -Small rice fields - Traditional fir and pine cultivation -Large-scale fir and pine forestry -Large land rented out cheaply -More subsistent production	-2.5 mu per person -Large rice fields -Traditional fir and pine cultivation -Small-scale fir and pine forestry -Renting out land and natural forestry -Subsistence production	-2.1 mu per person -Rice industry -Fruit industry -Least fir and pine forestry -No renting in or out of land. -Land more valuable than other villages -More commercial production	-1.9 mu per person -Small rice fields -Industrial fruit production - Large-scale fir and pine forestry -Limited forestland -Rent land in for planting trees - Commercial production	-2.2 mu per person -Large rice fields -Maintain fir and pine forests -Rent out land for road construction
Forest management	-Most interested in timber forestry management -More bamboo processing and selling -Forest products for self-use	-More interest on firewood management -Bamboo processing and selling -Forest products for market or self-use	-No interest in timber forestry management -High input forest management -Production of forest products more adapted to market demand	-Some are still interest in fir and pine forestry management -Forest products respond to market faster than other villages.	-No change in natural forestry -No interest in fruit tree cultivation -Sufficiency farming slow response to outside influences.
Fruit-tree Cultivation	20% of households planted fruit trees Subsistence model	50% of households planted fruit trees Subsistence and Petty commodity model	80% of households planted fruit trees Industrial model	90% of households planted fruit trees Industrial model	4% of households planted fruit trees Subsistence model
Labor distribution	-125 people wage labor in city or other villages	-47 people wage labor in city or other villages	-People of all ages participate tree cultivation -No one do wage labor in city	-30 people do seasonal wage labor in town - Used hired wage labor from other villages -Borrowed laborers from clan family	-120 people joined the road building - Several people do wage labor in city
Other practice	-Pig farms -Cattle farms	-Fish and pig farms -Woodwork	-Industrial Vegetable production.	-Restaurants -Woodwork -Transportation	-Pig farms - Vegetables -Transportation

Source: villages' survey in Tageba, 2002

Shangten village is the poorest village. There is a total land area of 645 mu and 492 people in 62 households. About 87 per cent of the populations are Miao and most of them still maintain traditional lifestyles. Even now, many households still maintain traditional fir cultivation. The village is located 9 km away from the highway no.210. There are plenty of natural forests around the village. Forestlands are predominatly firs and pines. Historically, trees cultivation was main activity and source of income in this village. Farmers' income came from timber production or other forest products, such as, mushroom, and bamboo shoot. Since 1994, 32 households have earned money through cheaply renting their land out to private companies or other households. Some households started to adjust their forestland into orchards or vegetable gardens. In this village, the paddy fields are limited and rice is not sufficient for household consumption. Around 40 per cent of the households have to buy rice from the market or borrow from relatives. During the last four recent years, many farmers have started to sell their labor in urban areas or other villages.

Xiaten village is located south of Tageba. It has a total land area of 688 mu and a population of 370 in 43 households. This village is 5 km away from the highway no. 210. There are large natural fir and pine forests around this village, but less than Shangten village. Each household's mountain areas are larger than those who people in the other four villages. Logging is the main activity in this village. The income from logging is important to each household. However, the price of timbers declined after 1992, so some households have begun to transform fir/pine forests into fruit farms. After 1995, some households have leased land to private companies or individual households to grow fruit trees or tea. Few farmers have knowledge of business, so they sell their forest products by themselves or to middlemen. Around 90 percent of the households are rice-sufficient. Many of the young generations sell their labor force in urban areas or other villages.

Shibanqiao village is situated close to the highway no. 210, and so there are more opportunities for non-farm and off-farm employment. The village has 821 mu of land and a population of 323 in 51 households. There are large paddy fields but natural forestry is limited. Many households grow vegetables and sell them in the market by themselves. A number of households engage in small businesses, such as, oil extraction, grain milling, transport runing, grocery store, and operating restaurant. After 1990, around 90 per cent of the households have grown fruit trees. Unlike the preceding villages, no households leased land out. Around the village, there is not so much natural forestry. Currently, most of what was previously forest

area is under young fruit trees which require quite low levels of management. Farmers are not much interested in growing firs. Farmers complained about their lack of money, but this is because they spend a large portion on building houses and fruit cultivation, such as the purchase of fertilizers and seedlings. Many hosueholds use bricks for building houses or buy timber from other villages.

Dade village is the largest among the five villages in the Tageba. This village has 852 mu of land and a population of 668 in 93 households. This village possesses a superior geographic location compared to other villages because it is located beside the highway no. 210. This creates more non-farm employment activities so many farmers set up garages and restaurants along the roadside. The farmers have become less dependent on land. Some households have rented out their paddy and upland to companies. The forestland, predominated by fir and pine, has been owned and managed by the village committee. It was the first area of industrial fruit tree planted in Taijiang County. Chestnut was introduced in this village in 1984. By 1988 the total area devoted to chestnut consisted was 83 mu. Nowadays each household has an orchard. Both males and females are interested in fruit tree cultivation and possess the learned technology of fruit tree management, such as tree grafting and re-vegetation seedling production. Because they are near the highway, they can easily gain access to the market, information and governmental services. During pear harvesting season, farmers can sell products beside the road to passing drivers and by passers. But their land and labor are very limited, so they have to hire laborers from other villages to help them during harvesting. Few households have grown firs since the 1980s. Many households buy timber of house building from other villages, and some households buy vegetables from the market.

Pingqiao village is also located beside the highway. It has 639 mu of land and a population of 228 in 26 households. Recently, a highway was built in this village. Many peoples participated in it's construction, and households in the village were able to rent out land to the highway construction company in 1998. Land rent contributed a large amount of income to each household. During the recent years, several new post-pile houses were built along the new highway, probably using this money. Each household had large forestland. The paddy area of each household is relatively large and the rice surplus is used to feed pigs. Around 40 percent of the households sell their rice in the market. Some households engaged in small businesses, such as trading and transporting local products, wine making, running

restaurants, selling groceries, and rice milling. Many households also raise pigs and fish as well as growing vegetables. These products can be sold directly to the road construction workers. As a result, households are not very interested in fruit tree growing or timber forest management. In this village's vegetation has remained unchanged. The traditional forestry – based economy is mostly maintained.

In short, the five villages in Tageba, under the same agro-environment have followed different paths of development. In Xiaten and Shangten villages, which are far away from the highway, farmers still maintained traditional fir cultivation. In Pingqiao village, farmers joined highway construction, so the farmers in this village were not much interested in tree cultivation. Dade and Shipanqiao villages lie near the highway. Based on the easy transportation and advantageous access to market, the farmers of in these two villages have adjusted their forest management strategies quickly. After the forest and forestland were allocated to households, many forestlands were changed into orchards. Dade village depends less on the land, because farmers in this village had some chances to do off-farm works while the other four villages had relatively high land dependence.

4.3 Complex Livelihood and Differentiation of Household's Responses

We are poor, and poor people have their own lifestyles. They are rich, and rich men have their own activities, but we do not envy the rich. (a farmer in Dade village,2002)

In the five villages in Tageba, rice is the basic and main product for households' subsistence or fodder for livestock. Farmers grow rice because it is their major staple. Generally, while the price of rice remains stable, farmers have progressively provided more input to their paddy. However, rice overproduction in the early 1980s, led the price to decline to 0.6 yuan per kg, and some farmers started to plant other cash crops, such as, chestnuts and pears in order to make money. In Dade, Pingqiao, and Xiaten villages, some paddy fields had been changed into seeding nurseries and vegetable gardens. Now, some farmers in Dade village do not produce basic food needs for themselves. They began to purchase rice or vegetables in the market. After land reform in the 1980s, the income-source structure in the five villages fundamentally changed. Farmers no longer earned their income through being part of the production team labor force. Timber and rice are no longer a dominated ways of making money.

The source of income has become increasingly diverse. Farmers can raise pigs, grow vegetables, plant fruits, and sell labor to earn cash income. Some households have engaged in

rice or fruit business whereas some households have established restaurants or stores. From the information collected in this study, it appears that family's income is derived from three sources: 1) agriculture—the production of food crops either for subsistence or for sale; 2) forest products—mainly timber, fruits for sale and consumption; 3) home industry—the marking of cloth, baskets, household utensils, either for domestic use or for sale. Also in Tageba 91 percent households raise pigs (80 percent for the market), and 65 percent of households bred cattle; fish, sheep and duck were also raised in some households; and 4) off-farm labor—ways labor in the city or other village. Off-farm activities can also be seen as a farmer's response to unequal land distribution (see **Table 4-2**).

Table 4-2. Average Household Incomes and Main Income Source in Five Villages

Income source	Shangten	Xiatne	Shibanqiao	Dade	Pingqiao	Total
Rice	674.0	638.8	507.8	575.7	480.2	2876.5
Vegetable garden	198.9	134.8	211.5	264.4	167.8	977.4
Orchard	57.9	78.9	821.8	740.9		1699.5
Livestock	474.3	930.8	585.2	987.8	773.8	3751.9
Fishing	12.0	100.0	27.0	260.7	25.0	424.7
Timber/firewood	528.2	400.0	20.0	397.5	310.0	1655.7
On-farm income	484.8	264.7	612.5	786.0	389.1	2537.1
Land rent	139.0	259.0		- 200	928.6	1126.6
Govt. service	329.6	526.9	812.5	667.8	349.2	2686.0
Off-farm income	393.2	457.8	513.7	780.4	684.3	2829.4
Other capacity	284.0	556.8	225.0	367.3	994.8	2427.9
Total	3575.9	4348.5	4337.0	5628.5	5102.8	22992.7

Source: Household Survey in Tageba in 2002. **Unit:** yuan.

Because they each have different access to resources, there are different sources of livelihood for each household in Tageba. Each household has developed own ideas for profitable production. For example, the sources of livelihoods for rich and poor households are different. Rich households may easily gain access to market, because they usually have transportation such as tractors or hired labor to transport their products. In fact, rich households have more chances to earning income. But, for the poor, with apparently limited opportunities for alternative economic activities, it is not uncommon to seek chances to do manual labor. Where there is surplus labor, members of poor families leave their villages for short and long periods to be employed as mobile or contract laborers by enterprises and specialized households on a daily or short-term basis.

There were some instances where households managing orchards, planting trees and logging them hired such labor during busy seasons. In a few cases, poorer neighbors worked as wage laborer for their richer neighbors. From household survey during the peak seasons 20

per cent of the farmers in Tageba earned income from casual works in agriculture or by providing services in the villages, such as, bricklaying, and house painting. Further, just over half the farmers surveyed (56 per cent) intended to continue working in agriculture. 12 per cent wanted to change their profession, but had no clear alternative prospects (this willingness to change occupations has been at the same level since 1978); 7 per cent planned to change their profession and then stayed on in the village, while a very small percentage wanted to change their profession and move to a larger town. The last 25 per cent had other plans. Their most frequent aspiration is to sell the farm or to transfer it to a successor or relatives.

Agroforestry industry also provided other chances of expanding income for farmers. Fruits production generates a series of associated activities: harvest, transportation, grafting, weeding, and selling. These activities create some chances for employment of the grower himself or by members of his family. In Tageba, for example, large farm owners sometimes let poor families make use of their land at a very small rent or no rent at all. This increased income for the lesser land farmers, and allowed those with no fruit garden to benefit from fruit production. In addition, all households were able to plant a broader range of tree species around homesteads and in their fields than before. Small farmers hoped to benefit from producing more tree products for home consumption, such as, house post, fruits and mulch. The more land each household operated, the greater the extent of its assets, and the more diversified were its sources of income.

Indeed, after agroforestry developed in Tageba, many households became engaged in small businesses, such as, small shops and restaurants. Income from urban employment increased as the shift in rural labor to off-farm activities increased. The impacts of these adaptations are felt unequally and differently according to age, gender and class. Old men and women became the main laborers of contributing to tree management. They worked full-time on the farm. Many middle-aged men found full-time jobs in road repair or construction firms in Taijiang, while the younger generations sold their labor in urban areas. Seasonal off-farm employment also contributed some income for farmers, such as, selling food and drinks for drivers along the highway near the village. Making and selling handcrafts, wood carvings and silk textiles in the tourist centers of Taijiang provided much seasonal employment for farmers outside of cultivation periods which had peak labor demands.

Table 4-3. Access to Land and Household Responsive Differentiations

	Large Sized Land Holding Households	Middle Sized Land Holding Households	Small Sized Land holding Households
Features	-Under population -Some people died or married out after 1983 - After 1983, occupied large sized land - Food security, much rice -Short of labor force, household includes older people as well as young and middle aged. -Have some traditional forest practice knowledge - Have long history of kin/clan relationships -Access to market and information limited. -Not worried about money, instead motivated to satisfy other needs such as status or materialistic needs. -Incomes from land cultivation, economy is land based.	-Medium population - Not so much population change after 1983. -Population intake to the family and outflow such as birth, death, and marriage in or out are equal. -Land occupancy maintained at an average level in 1983 -Medium food security. - Labor force of a medial size. -Both traditional and scientific technology is used. -Both inside and outside social relations are excellent -Access to market and information average. -Needs fulfilled lie somewhere between subsistence and development. - Incomes vary widely between households -Incomes from a diversity of cash crops	-Over population due to separation from mother households, sons being born or marrying a wife, after land distribution in 1983 -Only allocated small scale land (one or two person) - Food insecurity, experience rice shortage more than two mouths per year -Oversupply of labor, most of them are young. -Use some scientific technology - Have good relationship with local government -Access to market and information more easy -Pursue fast returns and subsistence needs -Incomes from one or two crops, but most make a living from wage laboring.
Land-use pattern	-Lease land to private companies or landless households -Use land in cooperation with other households or companies -Maintains a large fir and pine forestry industry. -Land-use change slow -Grow trees in order to reduce fertilizer leaching and maintain tenure.	-Land rented to or from other people or cultivated by them. -Both fruit trees and timber trees are cultivated -Within this group have a diversity of purposes for growing trees	-Rent in land for cultivation -Use capital of various types (funds, labor, technique) to cooperate with households or companies -No interest in fir planting, seek high return crops -Land-use changes fast. -Grow tree in order to generate income, not for self-use.
Labor Distribution	- Managed their own land. -On-farm activities. -Sometimes hired labor.	-Some work on the farm, some sell labor in urban areas. -Both Hired and sold labor -Participated in both on/off farm production - Some out-migration from the family and hired labor in-migration to the family occurs.	-Sell labor force in urban areas -Have off-farm production activities -Assists their relative family in the busy season. -Much out-migration
Fruit-tree Practice	-Growing fruit-trees more than other crops. -Monocropping of orchards -Not careful in managing fruit trees. -Use little fertilizes and pesticides -Low density of trees -Full-time work on farm -Land tenure more important than tree tenure -Share benefit of land with other	-Planted fir, pine, pear, and other crops -Some households use simple cropping some use a diversity of species. - Fruit trees are managed only to get a fast return, not to maintain tenure or retain fertilizer. -Use some fertilizers and pesticides -High/low density of trees. -Full or part time work on farm -Both land tenure and tree tenure important	-None of them much interested in fruit-trees cultivation. Some have a small fruit farm, some not. - Intercropping of orchard -Careful and detailed management of fruit trees -Use much fertilizes and pesticides -High density of trees Small tree farm areas rented in from outside. -Part-time work on farm -Tree tenure more important than land tenure -Share benefit of trees with others
Other practices	-Easily gain credit or other government support -Don't pay much attention to social relations -Lend or cheap rent some idle land to landless families. -Cooperate with families.	-Some find it easy, some find it difficult to gain credit -Negotiation and cooperation with different people a normal practices.	-Have difficulty gaining credit -Try to construct good social relations or gain favor with other people. -Often negotiate and cooperate with other people -Have land competition between brothers.

Source: Household Survey in Tageba, 2002

Moreover, following market reform, renting out land to other people and renting land from other people became possible and flexible. In the Tageba, a total of 24 pieces of land were rented out after 1995, and the ratio of rented land to total land was 21% (see **Table 4-2**). Among the households that were rented out, there were usually only two or three older persons. There were many households that managed restaurants and some households operated small plants to produce wood and bamboo craftworks. In the other households, the sons and daughters employed in city. Households could rent out all of their land or a part of it. Generally the households that rented land in other areas were the households that had more than two laborers to take part in agricultural activities, as they had no other work opportunities. Some households rented ponds from the production group for raising fish. Some households joined the new highway construction, and some households raised turtles. These cases show that individual farmers dealt with their own land according to their situation. If they were not able to manage the land for any reason, they would rent land out to other people. If farmers needed more land, they would rent land from other people.

The diversification of sources of income had a two-fold effects on land-use. The first effect was that diversification increased the number of income sources for some of the farmers. Some of the households became less dependent on their land. Some resources, for instance, timber, have lost their value. As a result, the pressure on land decreased and these resources were protected more naturally or managed less intensively. The second effect was that for households with fewer opportunities to eran income land became a more important resource. They tended to plant short-term return crops or trees. When the market price for these products was good, they invested more labor and money on their land. In other words, although household income still correlated positively with farm size, off-farm labor to some extent compensates for the handicaps of insufficient land.

4.4 Access to Scarce Resource and Adaptation

> *There is no landowner [like old society before established People Republic of China] in our village (cun), but we have plenty of tree-lords. This is a good arrangement because everyone can make a living. A small farmer can still grow vegetables even when the trees on his land are leased-out. (Headman of Dade village, 20020)*

4.4.1 Household Access to Scarce Land

Land in Tageba has never readjusted since it was divided to individual households in the early 1980s. As a result, each household now differently accumulated land. For instance, all households have been allocated the same land size in 1984. But as the population of each

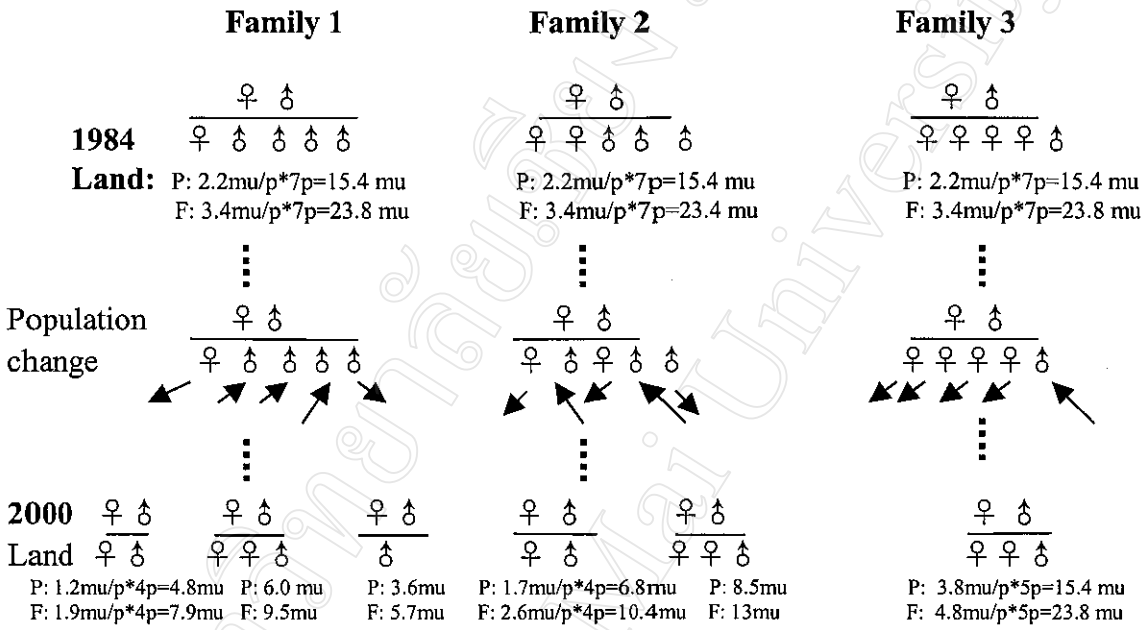
household has changed through old people dying, daughters marrying out, sons marrying in, children being born, nowadays, each person occupied land differently. The percent of land held by each household and each people has changed fundamentally. A big family might now be separated into several small households, and the original land has been redistributed among the children. So, most of the new families established after 1984 own small plot of land. Their smaller land holdings had to support more persons than had been originally reckoned with at the 1984 distribution. During the time I came out my study, in Tageba, 46 households become landless, most of them are young men who had just separated from their fathers. Contrarily, in some families the old died and the daughters married out. Thus, a few people owned large land holdings. But while the daughters were married into other villages, they received no land and had to be supported by their natal household.

According to the data from Tageba community, in 1984 the 182 households in Tageba held approximately 3,645 mu of land as each person on average received about 5.8 mu land. However, with population change the proportion of land people occupied has been becoming more and more unequal. Today, there are 249 households with a population of 2,081. Structure of agricultural land has been changed. As a result, some of households are occupying large areas of land while others are becoming small landowners. In 1998, approximately 180 out of the 753 people of working age in Tageba either owned land or worked on the land. Most of the people in agricultural land did not have enough land to support their families. Only the 60 per cent of households have enough land to support their own family. Contrarily, many households have to engage off-farm activities to earn income, such as, carpentry, and small business. Only 40 per cent of households had enough land so that they could concentrate purely on farming. For example, in Shangten village, five persons just cultivated one person's land that allocated in 1984. In practice, each person was allocated an average of 2.2 mu paddy fields and 3.4 mu forestland in Shangten village, but now, land is distributed differently for each person. Some people may own as much as 3.4 mu of paddy fields whereas others may own only 1.2 mu of paddy fields (see **Figure 4-3**).

The poorest households in the villages were those whose land allocations were grossly inadequate to support family members. In Xiaten village, there four of the poorest households are each using one person's allocation of land (from 1984) to support a large family. In the first household, the sons separated from the main family and inherited his portion of land. As he married and bore one child, so three people now had to be supported on one person's land.

In the other household, it was one woman's land was required to support her, her husband and two children. In the third household, the first son originally had enough land for his wife and son, but after his first wife died, he remarried and had two more children, so that now the land that formerly supported three persons had to supporting five persons.

Figure 4-3. The Three Models of Land Unequally Accumulated among Different Families



Notes: P=Paddy Fields; F=Forestland; p=Person
♀=Female; ♂=Male; ↙ = Died or Married out; ↖ = Married in or Children Born
Source: Case Study in Shangten Village, 2002.

This figure shows the differentiation and division into three models of household land access. As mentioned above after the equal distribution of land in 1984, some families have become small landholders and some have become large landholders. Based upon their different sizes of land holding, households have different agroforestry practices. I found that in Tageba, general households on larger land areas were more likely to plant fruit trees than landless households because they could absorb the loss of waiting several years for trees to grow. Also, they did not worry much about the risks of fruit tree growing. Around 52 per cent of large land households had more than 5 mu of orchard, compared with 37 per cent of middle land holding groups with between 2 and 5 mu and 15 per cent of landless households with lands less than 1 mu. These findings are of particular interest, when considering the fact that in almost all other respects, small farmers always followed the cropping patterns of large land farmers and used similar proportions of inputs per land area, such as, chemical fertilizers, as large farmers. However, uneven access to land increased social differentiation among many

households. Many households occupy large farms but due to their low labor resources are incapable of utilizing all their land. The small-scale landholders had labor surpluses but had no land to cultivate and had to push one or more household members partly or completely into the wage labor.

4.4.2 Variation of Adaptations on Agroforestry Practice

Before 1980, all land and forestry in Tageba was owned by the state. Farmers had no right to dispose of land. Rent and sale of the land was impossible. Miao farmers in Tageba managed land based on some customary laws, such the "*three hundred*" law (as I mentioned in Chapter III). Miao farmers in Tageba managed burial lands by local contract (*qieye*). They used *qieye* to transfer land or register burial lands for each clan family. However, with state land reform in 1979 farmer received a usufruct right to land, so land became a more valuable asset to individual farmers in Tageba. Since then, the mechanism of land operation has changed, in particular after the fruit-trees industry was introduced in the mid-1980s. Various forms of tenure have emerged in Tageba to regulate access to land. A growing proportion of the land is operated under tenurial contracts (**Table 4-4**).

Actually, tree tenure has become more important than land tenure in Tageba. The high commercial value of fruits has reinforced the separation of tree tenure from land tenure, because in agroforestry farms if farmers transfer land ownership to outsider they cannot grow anything on the farm. If they share tree tenure with the outsider, they still control land use and can grow other crops underground. Recently, tree sharing has become a popular activity in Tageba. Fruit-trees have become a valuable asset with higher marketability than the land itself. In sometimes rights over tree is better to distribute the benefit between stakeholders. Forest policies contend that trees follow the land, whoever owns the land owns the plants growing on it. This policy has created some conflicts in fruit-based agroforestry farms. Usually, farmers own the land, but other people plant the trees. As a result, most landholders in Tageba have converted their land into fruit-based farming systems. For them, access to land does not reflect control over fruit-tree growth or control over fruit harvests. For example, in Xiaten village, outsiders rented 15% of their lands but controlled 40% the fruit harvests. While only 21% of the village's households were small landholders. Many of them did not have any access to fruit harvests. The large land households making up 15% of the population, controlled 35% of the land, but 50% of the fruit harvests

Table 4-4. Variation of Access to Agroforestry Resources in Tageba

Form of Access	Access Rules	Cases Acreage (ha)	of Plots N	%
Owner-operated	Land cultivated by household of owning family fixed.	39.4	26	36.8%
Land leasing	Number of years land is leased extendable. Rent payable in advance Lessee has absolute use of the land, including trees. If lessee plants pear trees, future harvests will be shared with Landowner when lease term expires.	21.6	21	21.1%
Tree leasing	Lease period is fixed period of lease extendable after each harvests Rent payable in advance Lessee gains absolute access to pear trees Variation:	7.5	10	6.92%
	--Lesser maintain rights to cultivate undergrowth	3.2	4	3.2 %
	--Lesser has limited rights to cultivate undergrowth	1.3	2	1.1 %
	--Lesser has no more rights, and	1	1	1.0%
	--Lesser acts as wage labor to work on his leased land	2	3	1.6 %
Land sharecropping	Occurs between close relative Tenant gains access to cultivating the land Tenant and landowner share crop yields arbitrarily Tenure of existing perennials remains with landowners	13.5	10	12.5%
Tree sharecropping	Contract binds as long as the trees live Tenant plants fruit-trees or acquires rights to them Tenant maintains fruit cultivation Tenant and landowner share fruit yields equally Land owner keeps rights to cultivate undergrowth Variation:	8	9	7.4%
	--tenant bears input costs	6	7	5.6%
	--tenant and landowners share input costs equally	2	2	1.8%
Pawning	Access to land or tree is pledged as security for a debt	2.3	2	2.1%
Borrowing	Access to land is granted without conditions, revocable at any time	10	8	9.3%
Fruit Contracting	Fruit rights belong to absentee owner Owner bears cost for chemical input Contractor provides labor and gets and agreed share of harvests and/or monthly wage	6	10	5.5%
Total case		107.4	95	100

Note: 107.4 ha of land are operated by 95 households in the sample. A household may be involved in more than one form of tenure at the same time.
Source: Households Survey in Tageba community, 2002.

The above table summarizes the various tenurial contracts found in Tageba after agroforestry industrial development. Interpretations of these contracts vary widely. New forms of contracts are developing to accommodate the specific needs and interests of different parties involved in transactions over trees. Interested parties negotiate the conditions of the contracts by referring to the customary law while being influenced by the contemporary

economic situation. The traditional tenure transfer type, pawning, has declined as selling tree tenure becomes the chosen means of temporary assert liquidation. The traditional land borrowing and labor aiding has become scarce within clan families; these assets and labor assistance only exists between very close relatives. In 2001, within my 95 sampling households survey in Tageba, 36 percent of households are owner-operated. Only 21 percent of households are rent out the land. Two new tenurial forms, tree leasing and tree sharecropping, have become important institutions in agroforestry management.

4.5 State Enterprise, Private Company and Household Land Use Pattern

State enterprises and private companies have also been very active in tree planting in Tageba, as mentioned in Chapter III. After 1984 the Taijiang County government encouraged it's offices to participate in agroforestry development. Thus, there are now five county offices involving in tree cultivation in Tageba, such as, the Poverty Alleviation Office and the Forest Bureau. They expanded their budget as well as applied the policy of promotion of fruit gardens at the local level. They worked in Tagebe not only to implement agroforestry policy, but also to formulate policy. At the same time, there were four private companies and two state enterprises planting fruit trees in Tageba. A total of about 684 mu of fruit trees (accounting for 35 per cent of fruit tree farms) were organized by these government offices and private companies. They rented land from farmer households and cooperated with farmers. In harvesting seasons, they hired labor from the village. They adopted different forms farm organization based on different conditions. Sharecropping and tree leasing was usually popular for them because it best fitted their conditions.

4.5.1 Sharecropping

> *If you want to grow trees but you don't have enough money or skill to care for them, the best bet is to go to a big, reputable farmer and offer him your land to sharecrop (a farmer in Shangten villager,2002).*

The tree sharecropping began during the mid-1980s in Tageba, and is a modified form of a credit arrangement common for growing chestnuts in 1984. Sharecropping is the most important form of tenancy contract. In Tageba, sharecropping was primarily a means for securing labor to work the land. Farmers, in return, provided the land to state enterprises and private companies for growing chestnut trees for 10-50 years, but retained the right to grow annual crops underneath the trees until it is prohibitively difficult to do so. From 30 cases of sharecropping in the Tageba, almost all of the land owners cited lack of household labor—due

to old age, illness and out-migration of family members—as the reason for sharing out their lands. About one-third of the share-tenancy contracts in Tageba were between parents and their children.

The sharecropping has been effective for different stakeholders. Sharecropping is a way in which different groups depend on different types of capital in order to gain access to the tree cultivation. State enterprises depend on the relations with the government and credit from banks; private companies focus on the funds and technology of tree cultivation; farmers based land or labor to access to the potential profits from fruit production on their land. For instance, some households in Dade village shared land with outsider followed the 3:7 principles of profits sharing means that 70 per cent of net profits from harvest of fruits went to state enterprises and 30 per cent to farmer households. In Shibanqiao village, there are a large number of private agroforestry farm companies which is regarded as best one of successful farm in the Tageba. Their success is due in part to share benefits with farmers. Actually, agrofoestry industry is highly dependent on outsider capital, such as, finance, technology, and market information. Thus, the sharecropping is much better for large or middle landowners (usually is rich farmers). Poorer farmers lack access to sharecropping because they lack the capital required to profitably cultivate land underneath the trees or maintain its fertility. This has excluded poorer farmers from sharecropping.

The following examples illustrate the various types of circumstances that have led to tree sharecropping in Tageba. In our first case, enterprises from the outside wanted to invest in fruit tree cultivation and sought landowners who would let them plant fruit trees on their land on a sharecropping basis.

> Five years ago some government workers from Taijiang came to our village and wanted to use our land for planting pears. We did not know anything about pears then, but I let them plant them anyway. We only agreed because he promised to share the harvest equally. I don't have to worry about the cost of fertilizers or pesticides. I can still grow soybeans and cabbages between the trees (a farmer in Dade village, 2002).

In another case, sharecropping was sought from a landowner who lacked capital to cultivate land. Due to the high capital requirement of fruit cultivation, the landowner has to negotiate with outside cultivators.

> Three years ago, I have 10 hectares of barren mountains. I wanted to grow pears there, because everybody who did quickly became rich. However, I did not know how to take care of the pears. Besides, I had heard that pears need expensive pesticides. So

> I went to my clan family (leader) Ban God ing and offered to let him to plant pears on my land. He agreed, but only if I shared the labor and material costs (a farmer in Shibanqiao village, 2002).

In the first case, the contract was negotiated between 1989 and1995 when growing pears was not yet a popular option. There was a relative scarcity of available land for investors who wanted to grow pears, resulting in a classic landlord-tenant relationship in which the landowner had an upper hand. In the second case pear cultivation has become a desirable activity for many landowners, yet they lacked the necessary skills and capital. In this case, landowners sought capital-rich fruit tree growers and offered them generous sharecropping terms. More than 63% of the cases of sharecropping surveyed in Tageba belonged to the second category. Most capital-rich pear growers received a greater share of the total profit than the capital-poor landowners (see **Table 4-4**). In the following section, I will show that sharecropping contracts can also grow out of tree-leasing arrangements. The terms of this form of tree sharecropping are also favorable to the capital-rich lessee/sharecroppers.

4.5.2 Tree Leasing

> *If I have extra money, I would rather use it to buy seedlings and rent land to plant fruits than deposit in the bank. Particularly for planting pear, Because growing fruit trees results in advantageous returns, this may be a good way to earn more money (a farmer in Shangten village,2002).*

Tree leasing only began during recent years, a few years later than the tree sharecropping practice. As capital-rich tree-growers began to acquire management skills and reduce production risks, they came to prefer fixed-rent leasing to sharecropping pear trees. Meanwhile, the persistent cash liquidity crisis of smaller scale owner-operators has created a rental market for pear trees. An increasing number of pear owner-operators are in need of credit. The typical arrangement involves capital-rich growers leasing pear trees from landowning, capital-poor peasants. To landowners, leasing out trees is preferable to leasing out land because the absolute access to the land is not lost. The remaining access could provide a means for sustaining livelihood, regardless how small it may be. To lessees who are interested only in pear production, leasing trees is a better bargain than leasing land. The trees are already planted, and in most cases, are already producing.

Invariably, the reason for leasing out trees is a pressing need for cash. The need may arise from personal life events such as marriage, illness or death of a family member, education costs for a child, building a house or purchasing a new vehicle. The new prosperity brought by tree cultivation has increased the level of consumerism among villagers, which in

turn has pulled them further in the debt cycle. This pattern has been observed elsewhere in societies experiencing a commodity boom. Insufficient chemical inputs often result in pest and disease infestations that could kill the trees. Renting out the trees is the only option if a farmer does not want to lose the investment he has made thus far through the death of the trees. If a farmer owns several fields, leasing out one plot may be a way to raise the capital to finance the operation costs of another field.

The duration of tree-leasing contracts range from one year to 5 or 20 years. If leasers need extra cash before the contract expires, he can choose to extend the contract. Alternatively, the leasers may request a suspension in the contract and share the net profit from an agreed number of harvests. The leasers' bargaining position however, is then far weaker when the contract was imposed. He or she will face more restrictions on growing field crops, or have more troubles claiming a permanent tenure of the trees. There are total 10 households leasing trees in Tageba, but more than half of them renegotiated their contracts before the original terms expired, resulting in increased benefits for tree leasers.

In general, the terms of tree-leasing contracts become progressively unfavorable to the leasers as the trees grow. Spatial conflict and competition between trees and vegetables underneath them increases as pear trees mature. Frequent trampling by pear workers who are indifferent to the crops growing under the trees often damages vegetable crops. Meanwhile, tree farmers view the activities of cultivation of vegetables under the pear trees as potentially harmful to the fruit's appearance and ultimate market value. Pressure is exercised through formal conditions in the contract extensions or through willfully careless by pear workers when moving in the pear orchards which damages vegetable crops under the pear trees and makes it hard for them to grow. As a result, many fields have effectively been turned into monoculture pear orchards. Tree-leasing contracts effectively become land-leasing contracts as contract amendments allow tree planters to take over the residual rights of landowners. Tree lessees gain a strong bargaining position especially in cases where contracts are extended, in which landowners must compromise or give up some of their residual rights in order to get an extra loan or advanced rent payment. A total of about 24% of the leasers/landowners in the five villages combined work as paid laborers for their tree leasers. These landowners managed to grow vegetable crops underneath the trees, with a decision-making pattern similar to the owner-operators who hold tenure over all resources connected to their land. About half of them chose to grow the more valuable, but risky, cabbages,

potatoes, and garlic.

In summary, the introduction of capital-intensive agroforestry farming reinforces the process of access diversity. Under access multiplicity, choices of cropping strategies are determined by the social relations between opposing tenure holders, with those who control fruit trees invariably having the advantage of being able to control agroforestry-cropping patterns. Tree leasing in particular slowly dispossesses capital-poor landowners from any land-based production, as access to growing field crops is increasingly suppressed by the lessees. Agroforestry cropping options in these environments for marginal farmers who are unable to raise enough labor and capital to sustain fruit-tree cultivation are limited. Despite their lack of family labor to divide between cultivation and wage laboring, they have been pushed into entering dependence on wage-labor relationships. As a result of male family members being tied up in wage labor, women have been re-mobilized to cultivate farms.

4.6 Gender Related Practices in Agroforestry

Miao families are high patrilineal. 'Daughters are like water which splashes out' (*bochu,qudesui*). Generally it is more difficult for women than men to gain access to and manipulate information, technology, resources, and credit in Miao society. Yet, the inequality access to resources led to women play different roles in agroforestry cultivation.

4.6.1 Women's Access to Resources in Miao Community

In Miao society, men are heads of the households and the holders of land. According to Miao custom, women have to leave their parents and go to live with her husband after marriage. In Tageba, most women once married cannot receive land from their husband's community. The only access to land that women have is assisting their husbands on special plots managed by the husband. This inadequate access to land means women are just a labor on agroforestry farms.

Technologies appropriate for the activities and production conditions of women farmers are short in supply in Tageba. The inadequate supply of technologies for women has had an impact on women's productivity. In Miao society, women are responsible for food preparation and cooking while her husband sits by smokes and waits. This is the typical Miao way: no man is supposed to lend a hand in cooking. At most, the man's contribution to cooking is to gather some firewood. After dinner, the wife has to clean the utensils then feed the pigs and cattle. Furthermore, each day, several additional hours are needed to collect fuel and water.

Only completing these tasks the women have time for farming activities.

Indeed, Miao women have been marginalized by modem agricultural technology. Developers have usually assumed that information given to males will be passed along to other farming members of the household, for example the women and children. However, men are less likely to pass information along to women, due to assuming that women have poor adaptation skills. In the past decade, most agroforestry developers and foresters working in Tageba were men. Under Miao cultural restrictions on interaction, women would not even speak to men from outside their own community and most of their conversations are with other women or their husbands. As can be expected this, women have been shown to have less contact with extension workers than men do.

In Tageba, the low level of girls' education reflects the practice of removing girls from school to earn income or provide domestic labor. Traditionally, investment in a girl's education was considered a waste of money because she would be married out of the natal family. Though women's life is difficult in Miao society, through their family they still enthusiastically worked and participate in agroforestry practice. In modern times the role of women in agroforestry has been becoming increasingly more important. Some women have been able to take a quite different role in Miao society.

4.6.2 Women in Agroforestry Practice

Fruit trees cultivation affects the role of women in Miao society. Traditionally, a few Miao women went out of their village. But, fruit production has changed women's roles. In Tageba, the women sold most of the fruits. As one man in Dade village said: "Women like going to the market, because they can sell things at high prices. Men usually don't have much knowledge of negotiation with buyers. Men usually sell their produce at cheap prices and go back home quickly." In practice, women sold 60 per cent of the agricultural products in Tageba.

Traditionally, men have been responsible for tree planting and logging in Miao society. Women have played a minor role of tree husbandry. But recently, taboos against women's participation have been found to be not as strong as reported. There are more and more women participating in fruit tree cultivation. Sometimes even fourteen-year-old girls have a role in cultivating trees after school. This might include drawing water, taking care of children, shopping, and preparing food. While the girl is engaged in these duties, their mothers hurry

off to the gardens for two or three hours to complete whatever work is required, such as repairing seed beds, pulling weeds, and applying fertilizers. At noon, the women return home to finish preparing lunch. Then, between four and five o'clock in the afternoon, when the most extreme heat of the day has passed, the women return to the gardens to pull out weeds again and attend to a variety of other special tasks before dusk. For example, women use smoke to ward off insects. In many fruit tree farms, water is carried by women, thus, women's labor is important when seedlings are growing. After the industrial tree cultivation, the gender division of labor in Tageba has shifted towards greater female responsibility for agricultural production. The increasing feminization of agriculture in response to male out-migration demonstrates that women are capable of carry out tree-related 'male' tasks.

Women are major earners of domestic sidelines. One grandmother described herself as 'too old to work' and 'only able to do her bit by cooking the meals, taking care of the grandsons and the raising two pigs and fifteen chickens.' Actually, by selling her pigs, chickens and eggs, she can make 2300 yuan, which is half of the household's cash income per year. In Shibanqiao, women operated 35 to 40 per cent of the business of each rich household and women managed 55 percent of the very best farms. In Shibanqiao, a forty-year-old woman who used her savings and state loans to plant 20 mu of pears along the highway established a successful fruit tree farm. After five years, she not only repaid the original loans, but also earned an income of more than 10,000 yuan. In Pingqiao village, many men have left the farm and women have had to work the family farms single handedly. For instance, one wife whose husband worked in town was often seen in the fields applying fertilizers and doing other jobs while keeping an eye on her children playing nearby. She earned several hundred yuan on the plots and also earned a considerable income by raising pigs and chickens. She managed the household economy in such a way that it not only supported the family but also allowed them a surplus to purchase a new house. As one husband in Dade said, " Now she [his wife] handles everything in and outside the house, I just obey her." These show a major change on gender role in the Miao society.

There are some differences between women and men for farm management. Usually, women's farms had significantly more trees used primarily for households, which may partially reflect women's greater emphasis on use for household needs, e.g. fuelwood. The tree densities on women's farm are lower than men's farm. For example, in Dade village, tree the density on a man farm is 50 of trees per mu, but density in a woman is 30 of trees per mu.

Women managed the trees more cautiously, maintaining subsistence value; they still produced timber trees, herbal medicine, and fuelwood trees within the farm while weeding on their farms. Women showed a higher preference for intercropping than men.

The differences between men and women working on the land can been found in Tageba community through the study of the household economic activities of the male and female household members. The table below shows data on the principal occupation for the males and females in the 95 sample households.

Table 4-5. Roles of Men and Women in Tageba Community

Primary occupation	Sex		Total
	Male	Female	
House Work	14	103	117
Crop Farming	87	55	142
Animal Farming	6	5	11
Timber Forest Farming	30	14	44
Orchard Farming	39	34	73
Non-Farming non-farm salary	30	11	41
Self-employed (Marketing/handicraft)	28	10	38
Outside working	35	22	57
Total	269	254	523

Source: Household Survey in Tageba Community, 2002.

Table 4-5 shows that there were 103 women who did housework as their principal occupation (40% of the total number of women). Only 14 men did housework as their principal occupation (5% of the total male population). This shows that the male was still the main manager of forest in Tageba. Women assisted men in managing the land and by doing some farming activities but the ability, ideas and activities of the male played a dominant role in land-use as well as forest management.

4.7 Change in Social Organization and Social Relation

4.7.1 From Clan-based Family to Economic-tied Unit

Traditionally, clanship in the Miao culture cuts across all locations and encompasses all people with a direct recognizable blood relationship. The importance of clanship in the Miao economy has noted by many researchers (e.g Geddes 1976, Cooper 1984). Clanship was the strongest tie in the Miao society. Members of households usually used the term 'clan family' (*jiazu or jiating*) for family members. Members of people share a common surname. All men of the same clan were considered "brother" (*xongdi*). All women of the same clan were considered "sister" (*zimei*). Miao people often help each other in agricultural production or other affairs. They often borrowed money and exchanged labor within families.

Traditionally, when doing business, Miao farmers will first cooperate with their kin members then with other people that they know. The *jiazu* is an identifiable clanship unit corresponding to a patrilineage group of men descended from a single male ancestor, plus their wives, and unmarried sisters and daughters. For instance, the seven brothers of the Pan clan co-manage a big fir farm in Dade village. As a result of their cooperative effort, each person or household earns from 1,000 up to 2,000 yuan from fir yields annually. The success of kin cooperation among this group of brothers has been recognized as the reason for high economic status in the village. In fact, the clan connections are a very important element in the Miao social structure.

However, with declined the collective production structures, relations between closely-clan-related households have been reinvested with a new economic significance as new demands have frequently appeared beyond the capacity of the same family name individual household. The clan unit has been replaced by individual households which were more tightly incorporated into larger economic structures although they had maintained their main focus on various informal economic forms of cooperation. This tendency towards economic association and cooperation between closely related members of the same family has been further developed in agroforestry cultivation.

In practice, with the agroforestry development, Miao farmers in Tageba have to reorganized their capital and labor exchange through new forms of negotiation. In order to invest in farms, they have redinfied the clan-basis social relathiship. New incentives have been created for families to extension and try to build larger and strong households. The new external orientation of family economic activities may also foster alliances and co-operation with the outside. A new economic-tie, "pal family" (*hehouren*), has gradually replaced the tie of being in the same clan-based family. The pal family as a new strategy and organizational form in agroforestry farm is a response to rural development privatization policy and market intervention in Tageba. Several individual households have joined tree cultivation, which included some forms of share investment and pooling of labor. Usually, same or different clan households that are related economic needs came together to invest in fruit-tree cultivation.

I termed this new organization form the "pal family" because it was made up of two or more households which are linked and co-operated together much lie an extended family in social as well as economic activities, despite maybe consisting of different clan families. The pal family put more emphasis on the mobilization of resources than the traditional clan

structure, in order to meet new economic needs. For example, in Shipanqiao village, pal families organized 60 percent of the fruit farms. Cultivators either came from closely related clan households or from different families. However, they shared the risks and benefits of fruit farming. This organization seemed to be the best way to helping each other to earn cash income from tree cultivation. Interviews in Tageba show how households developed successful fruit-tree cultivation, and then proceeded to help close clan members share similar risks or incorporate them into the same venture. Alternatively, it might evolve into a labor division structure whereby one household undertakes and cultivates all the lands allocated to the pal family, while others are promoted into some kind of commodity production or service and while the others provide transport, technical or commercial marketing expertise so that the member households were to a large degree interdependent and relatively self-sufficient.

Certainly, my study in five natural villages of Tageba has revealed the importance of affinal kin in providing gifts and loans for peasant households. Whether it is in meeting extraordinary expenses or basic needs, it was the wife's kin who almost invariably provided funds. For example, in Shangten village one family obtained ten thousand yuan of funds and technology support for pear growing from their father-in-law in Dade village. Even if affinal kinship ties may have previously been more important than was generally accepted by interviewees, they have probably assumed greater significance. Since the introduction of new structures, they have become more significant as a potential source of credit and other assistance. Their increased importance reflects one of the most interesting new social phenomena in Miao society, the new importance which is attached to spatially extended networks by households or pal families or kin ties beyond the immediate village environs.

It seems that where kin ties in nearby cities are possible, towns and distant villages have been activated to facilitate production, processing and marketing, and it has been interesting to note that the tendency for farmers to establish such links in towns and urban centers has grown. Traditionally, people in Tageba were not keen on out-migration, many households have no pre-existing extensive ties with outside, and they have commonly set out to establish them by several means including the time-honored device of negotiating the marriage of daughters with potential allies. This has meant that marriage negotiations could still be employed for these purposes, and there is some evidence that such purposive alliances have increased during the recent years. Alternatively, a single household or a group of households might marry one of its members to an inhabitant of a local town or even distant cities to

facilitate access to new resources and market outlets. Migrants have the potential to find employment in the expanding number of urban areas and bring market goods back home. A young peddler moved to Taijing city from Dade village five years ago. He established a street store. In fact, he often helped his relative's family sell fruits and other goods. Also, he introduced some information to their family, such as, fruit prices. New market condition has lead to both the extended networks and the spatially bounded relations between households have proving increasingly important for the income and welfare of each individual household, which has had implications for interfamilial relations.

4.7.2 From Exchange Labor to Hired Labor

In 1984, as already mentioned above, both farmland and forestland were distributed approximately equally to each household. An average holding was 2.4 mu, which was operated by the owner. However, with population change, this egalitarian distribution of land has been altered. A few households occupy land of more than 10 mu while other become land lesser. The unequally access to land has transformed social relations and contributed to a process of rapid economic differentiation in Tageba. Unequal access to land led farmers not only to struggle over land, but also over the utilization of space beneath the trees in agroforestry cultivation. Tree cultivation under such different circumstances of access to resources has contributed to a process of rapid economic differentiation in Tageba. Despite the fact that the pattern of land distribution has remained relatively undisturbed, two new classes, 'landowners' and 'tree-owners' have gradually emeged in Tageba. The richest 15 percent controlled only 50 percent of the land in the village, and controlled 80 percent of the fruit harvest. As a compliment to this, although only 21 percent of the village's households were landless, 48 percent did not have any access to fruit harvest. In this regard, fruit tree cultivation bring about social differentiation by creating a limited class of exceptionally wealthy farmers.

Agroforestry development in Tageba has led to the weakening of local traditional institutions involving practice of labor exchange. Social relations in Tageba are being redefined, and farm income distribution is becoming more concentrated in the hands of better-off farmers. Fruit-tree cultivation provided higher income than rice cultivation. It also increase the demand for additional household members to engage in off-farm employment (e.g. transport, fruit wholesale), thus increasing labor demands. Fruit tree growing used more labor over a shorter time and coincided with other labor demands. So, the traditional Miao

custom of labor exchange among families became impractical. For instance, when the pear crop matured in August, the cultivator must straightaway hired more labor to harvest their pears for two weeks. However, this period overlaped with the rice harvest period, so there was no way that the demands could be met by traditional labor exchange practices. Also, pears required a large amount of additional nutrients. A hectare of pear on average received 350 kg of chemical fertilizers and 1 ton of animal manure each year to maintain its level of production. In the process of applying such heavy inputs of labor and fertilizers, farmers spent about 100 days of labor investment on fruit tree cultivation each year. However, because it was very labor intensive, cultivators had to outlay cash to hire additional laborers from the clan family or other villages to do this work. As a result of all these changes, traditional labor exchange and the custom of helping each other have become unpopular in Tageba.

This process has brought profound changes on how people and households relate to each other in Tageba. Hired labor was easy to recruit and the agreements were straightforward. Farmers became more and more independent their clan family. They were more like to sell or hired labor through pay cash, because after paying money to the laborer they felt less obliged to distribute food to their extended family or to neighbors. Also, the hired laborer was the more loyal than members from the clan as exchange laborer. Avoiding social negotiation for access to labor also meant that, after harvesting, they could conserve subsistence and income generating supplies for themselves. In the past, if they waited— before selling rice, they could fetch better prices. But, during the time when they were holding the rice before sale, many friends, neighbors, and especially relatives would come to borrow rice. The relatives could ask for rice loans because they had offered some help in the farmer's fields in harvest and other periods requiring high labor inputs. In order to refuse their relatives, they would have to lie that they did not have enough grain. To maintain this deception, sometimes the farmer would have to delay the sale of his crops past the optimal time (price wise) for selling grain. With the introduction of wage labor, farmers are free to sell their rice after harvest.

Summary

The absence of any substantial inheritance or accumulated capital from the period of collectivization has meant that households have been able to establish new economic activities using family capital generated through saving the member's incomes. Thus, both assets and capital have been the most important determinants of livelihood and welfare in contemporary rural China. When peasant households were liberated from collective

production, income earning became the main purpose of their cash crop cultivation, livestock raising, and working off-farm to generate income for their families. However, the individualization and privatization led farmers to pursue benefit maximization as well as risk minimization in tree cultivation.

In order to make a good living they had to change their land use patterns and labor distribution of family. At same time, access to resources as well as social capital became more vital. Thus, when farmers responded to market and policy change, some new forms of forest practice emerged in rural areas. Contractual land-use, sharecropping, pal families, and hired labor all became popular practices. Depending on their different access to resources and different social relations, villages, groups and households generated different agroforestry practices. Under market incentives, the traditional practices of pure forest management have changed to diversified production. Fruit tree cultivation has created a partial material dependence on external resources, farmers' attitude toward farm have change since market reform. The diminishing returns to labor input has therefore made farmers become accustomed to adopting new major technological changes, such as, the use advanced exotic species or other scientific agricultural agents. The Miao traditional fir planting practice has been replaced by new strategies of commercialized production. The Miao traditional lifestyle was forced to change to seek opportunities within the new economic market structure.