

Land-Use Issues and the Sustainable Development of the Jingpo Communities of Yunnan, China: Impacts of Governance, Institutions and Culture on Resource Management

Abstract

The Jingpo ethnic minority is located almost entirely in Dehong Prefecture in the west of Yunnan. This Prefecture borders Myanmar, shares a number of natural characteristics with it, and is dissected by rivers which form the upper reaches of the Irrawaddy River. Its climate is influenced by monsoons originating in the Indian Ocean. The total population of this minority is about 118,000 and they are mainly located in hilly areas. This paper examines the rural economy of the Jingpo people, traditional factors influencing their management of local forest resources such as their religious beliefs, and local means of governance. The Jingpo people possess valuable indigenous knowledge about their local forest resources which should be taken into account in the quest for the sustainable economic development of this community. Today, slash-and-burn agriculture is causing economic sustainability problems for the Jingpo. In addition, land ownership problems and conflicts about property rights threaten their conservation of forests and entail economic sustainability problems as explained in this paper. Whether or not improved access to markets and the use of more productive techniques will relieve the situation and reduce poverty among the Jingpo remains to be seen. Currently the incidence of poverty among the Jingpo is high, they obtain little education and pursue mainly a subsistence lifestyle. This situation is not dissimilar to that for many hill tribes in parts of India and in Southeast Asia.

Introduction

Since 1950, the major forest resources of China have been controlled and managed by governments at various levels. National, local, and household interests all converge on forest resources which are often a source of conflict but which have the potential to be managed so as to benefit rural households and communities with access to them. When the "Household Responsibility System" of agricultural land allocation and the "Two Mountains System" of non-agricultural land allocation were introduced in 1982, there were clear differences between these two different categories of land. Since 1982, farmers and villages have been given rights to use most of the collective forestlands. But this has not been so far in the state forestland. The traditional management of state forests takes no account of local communities. Hunting, cutting and gathering by villagers in the state forests is illegal. For this reason, native people are often roughly treated by the managers and officials of state forests for engaging in these activities in

state forests. Consequently, local communities obtain no benefits from state forests and the phenomenon of the “rich forests, poor people” mentioned in many current publications will be continue to exist in these areas. In actual fact, forest resources have been handed down from generation to generation for over a thousand of years by the local people through the powerful impacts of traditional governance, institutions and culture on resource management before any modern administrative interference was involved.

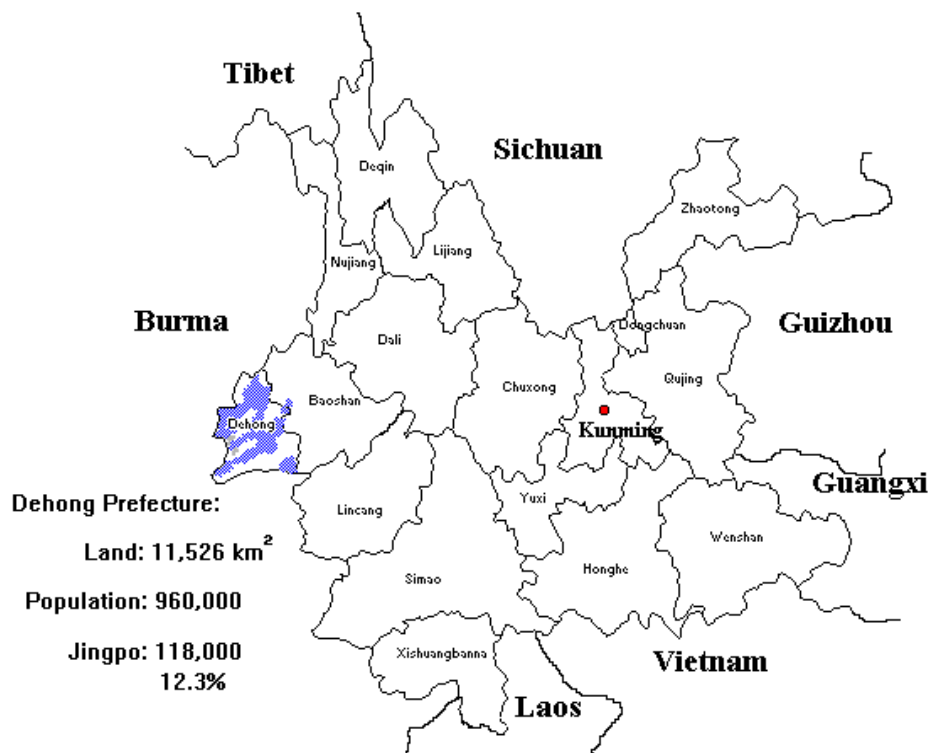
This paper reviews the management and use of natural resources by local communities of the Jingpo ethnic group in the Dehong Prefecture and focuses on land-use issues and sustainable development of the Jingpo communities based on local forest resources and local management. The objectives are understanding the current problems of local development in Jingpo communities, diagnosing the weaknesses of local community development and providing some suggestions for sustainable development of the Jingpo communities. Information has been drawn from a field survey undertaken during 1994 - 1995 using methods of RRA (Rural Rapid Appraisal) and PRA (Participatory Rural Appraisal).

Characteristics of Dehong Prefecture and Jingpo Communities

Yunnan’s westernmost spur of land, known as the Dehong Prefecture, juts into Myanmar. The prefecture is located between 97°31’—90°43’ of longitude east and 23°50’—25°20’ of latitude north. It has a common boundary with Myanmar and the Baoshan Prefecture (see **fig.1.**). The prefecture has jurisdiction over two cities and four counties and its total area is 11,526 km². The Dayinjiang River, Longchuanjiang River and the Ruilijiang River form the upper reaches of the Irrawaddy River. The average annual temperature is 19.4°C and the annual rainfall on an average comes to 1,659 mm. This region contains the terminal of Gaoligong mountain range. It has a hot and rainy season from May to October and a dry sunny season for the rest of the year. The landforms of the prefecture face the southwest wind that carries a lot of warm and wet air masses from the Indian Ocean. The altitude of the prefecture varies from 210 - 2,595 metres above sea level and the topography is quite varied. Because of its warm

and damp climate, rich tropical forests and mountain subtropical evergreen forests are common. Rubber, coffee, tung trees, mango, betelnut, guava, pomelo, jackfruit and papaya can grow well in this area. The main grain crops are upland rice and maize. Vegetables, beans, melons, spices and some medicinal herbs are usually intercropped with the main crops.

Fig.1. Distribution Map of the Jingpo Minority



(Source: Booz, 1987, redrawn)

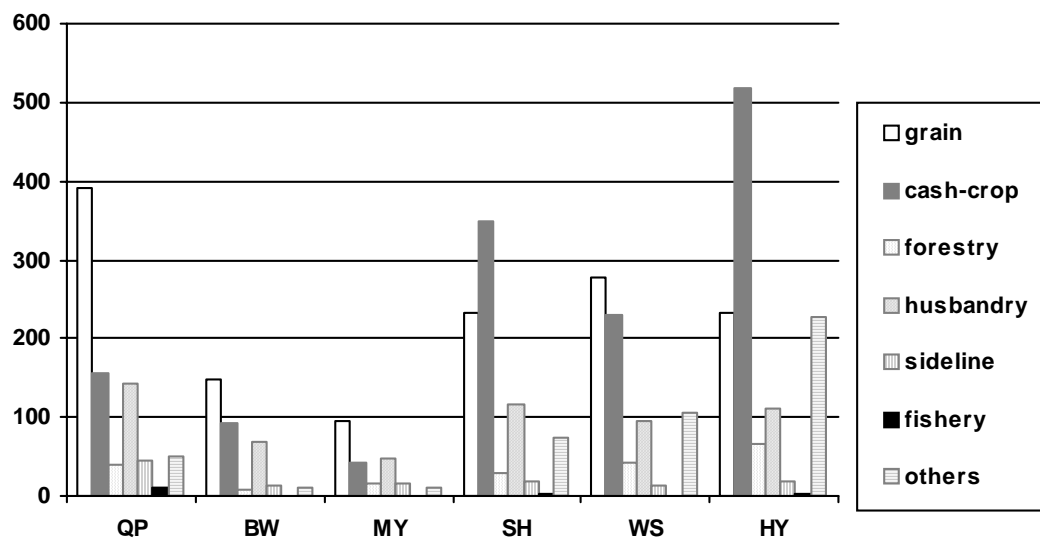
Dehong has a total population of 960,000 people, of which minority people account for 51.76%. Among the minority groups, the Jingpo and Dai are the most important ethnic groups, accounting for 12.34% and 32.01% respectively of the population of the prefecture. The Dehong Dai are considered by many Chinese to be even more handsome and refined than their brethren in Xishuangbanna. Other minorities of over 1,000 people in Dehong are the Achang, Lishu, De-Ang, Bai, Hui, and the Yi (Wu, 1994). Although over the half of the local population in this prefecture consists of

minority people, the majority Han people and superior minority Dai people mainly live in the urban and lowland areas. The Jingpo people account for the overwhelming majority of the local ethnic groups in the uplands of Dehong.

A population of 118,000 Jingpo people live in the subtropical mountainous areas of Dehong prefecture at heights of 1,500 to 2,000 metres above sea level. They account for 95% of total Jingpo population of China. The Jingpo minority villages, scattered in the mountainous areas, keep traditional modes of production and practice slash-and-burn agriculture.

In the Jingpo areas, only about 11% of the land is arable. About 80% of forestland and grazing land produces 30% of general income. Figure 2. shows the sources of income in some close communities (six townships) of the Jingpo people.

Fig.2. Sources of Rural Income in Six Communities (townships) of the Jingpo



Scale: 1 =

10,000 yuan (100 USD = 820 yuan)

Townships: QP = Qingping, BW = Bangwa, MY = Mengyue, SH = Saihao, WS = Wangshuzi, HY = Huyu

Data from the *Year Book of the Dehong Prefecture 1994*

The income in these townships is greatest from grain and cash crops other than grain. Animal husbandry is the next most important source of income. Forestry and sideline activities are significant sources of income in some townships. The item *sideline* in the

figure is the income from selling sideline products such as bean curd, farm tools, rattanware, bamboo work and other non-agricultural products. The item *others* in the figure refers to non-agricultural income from sources such as local industry, commerce, transportation and so on. The fishery in most townships is almost negligible.

Traditional Factors Influencing Management of Local Forest Resources

In major Jingpo areas, the primitive public ownership system continued until the end of 1950s. Under this system, forests, arable lands and grazing lands all belonged to the local Jingpo communities. “Shanguang” was the title of the chieftain of a Jingpo community and the title was inherited. A Shanguang usually ruled several villages and controlled a vast tract of forests. He had privileges to occupy and sell the fertile farmland belonging to the community, but the other people had no rights to do so without permission. Immigration of outside people must be approved by the Shanguang first. In the beginning of a busy farming season, local people had to give one-day voluntary labour to their Shanguang. Together with the elders in the community, the heads of villages and the leaders of religious affairs, Shanguang decided which tract of forestlands could be slashed and burnt for cultivation this year, how the lands would be allocated to each household and he settled land disputes between villages or village people. After 1958, the Shanguang system was phased out. Vast areas of virgin forests were taken over by the state and the other small pieces of forests near the villages and farmlands shifted to community. However, up to now, the community management of forestlands is still important in Jingpo society.

Living on their land for several centuries, the Jingpo people accumulated a lot of knowledge and developed many skills for their production and life support. They are careful in the management and use of forest resources in this area. Their religious beliefs, and their local means of governance perfectly reflect the feelings of the local people for the forests.

1. Effects of Religious Beliefs

Jingpo people believe that “all things on earth have spirits”. They worship almost all

natural things such as forests, trees, animals, mountains, rivers, etc. They think that the spirits of their ancestors reside in the big trees and in the forests near by the entrances of villages. These trees or forests can bless and protect the village and bring good weather for its crops. For this reason, the Jingpo keep the trees and forests holy and inviolable and hold grand ceremonies twice a year to offer a sacrifice to trees or forests. In accordance with the roles of the forests, Jingpo people used to distinguish between and manage three kinds of forests. Holy forests house the ghosts of their ancestors, so that no tree and shrub in these forests can be destroyed. Village people believe if anyone offends the ghosts in the forest, he/she will become seriously ill or the whole village will suffer disaster, therefore, it is strictly forbidden to cut these forests, hunt in them, graze stock in them and even relieve oneself in them. Around the village is the landscape forest. It is forbidden to cut trees in this forest without the permission of village leaders. Watershed forests protect the water supply of the village for living and farming. Besides the protection of these three kinds of forests, the Jingpo people also believe the ghosts or spirits like to stay in the mountain valleys and ravines. So they do not cut forests in these areas.

Unfortunately, their religious tradition has been eroded since the end of 1950s, and was especially undermined in the era of the “Cultural Revolution”. Today the new generation in some villages does not take the old rules and regulations seriously. As a result, many forests around these villages have been damaged. Remaining protected forests are mostly in the remote areas where the local customs are little affected by the outside world.

2. Powers to Make Decisions

With the collapse of the Shanguang system in Jingpo areas, a village council accepted by the local government replaced it. The village council took over the management of the natural resources of village. The village council were selected by the local people or appointed by a special team on behalf of local government. They make decisions to protect forests and to arrange slash-and-burn cultivation. They may decide where the villagers can get their timber and firewood. Usually, the elders and wizards in a village influence such decisions. In fact, a respected elder or wizard sometimes has more rights

to speak for the affairs of the village than the leaders of the village council. A village council is always willing to listen attentively to the suggestions of the traditional village leaders, consequently, traditional or religious rules influence the management of natural resources.

3. Local Regulations and Rules

Because all the natural resources are public property in the traditional system of ownership in Jingpo areas, some rules for management of natural resources are widely accepted through common practice. Usually the community regulations and rules are developed by several consultative meetings of local community leaders. They are respected by all villagers after a ceremony of swearing an oath accompanied with a blood sacrifice. Representatives from villages in the community participate in the ceremony. The local laws usually refer to various affairs of the local community such as the code of conduct of village people, the management of productive actions, protection of forests and landscapes. In the local laws, regulations for protecting forest resources are quite detailed. For example, the local law preserved in Mangben village provides the following words: "...any tree can not be cut down during the period of closing hillsides to facilitate afforestation; it is forbidden to fell watershed forest, landscape forest and the trees by the entrances to village; the holy trees near the village can not be touched roughly; trees for timber cannot be cut without approval of village leaders...". The final rules and regulations will be announced in a mass rally and implemented under mutual supervision.

Violations of the rules result in serious punishment. In the past, the special punishments such as cutting off fingers or limbs have been given to those violating protected trees and forests and even the extreme penalty could be taken in the case of destroying holy trees and forests. Although the extreme penalty has ceased in recent decades, special punishments are still retained in some remote areas. More civilised measures of punishment such as payment of indemnities, voluntary labour for the community or provision of an apologetic dinner to the whole village have become more common. From the local rules of Bengling village, the amount of indemnity is listed in detail: "one yuan (RMB) for cutting a small tree; five yuan for a

middle tree; ten yuan for big one; fifteen yuan for a tree by a stream

Valuable Indigenous Knowledge about Local Forest Resources

The indigenous knowledge about their local forest resources is handed down from generation to generation. This kind of knowledge is based on experiences from daily life. Therefore, it may be more useful and suitable to the local conditions. To collect and analyse these sorts of information may help us find some solutions for the paradox of socio-economic development and environmental protection. The Jingpo possess much knowledge about the use of local forest resources.

1. Timber

There are various native well-known tree species for higher timber quality. *Dalbergia fusca*, *Schima wallichii*, *Morus macroura*, *Dipterocarpus turbinatus*, *D. gracilis*, *Shorea assamica*, *Betula alnoides* var. *pyrifolia*, *Cinnamomum glanduliferum*, *Phoebe lanceolata*, *Lindera megaphylla*, *Litsea monopetala*, *Photinia beckii*, *Michelia* sp., *Lithocarpus eremiticus*, *Alangium kurzii*, *Carallia brachiata*, *Syzygium tetragonum* are all used as popular building materials in local communities. Some of them produce very hard wood and have found commercial use recently.

2. Fuelwoods

Fuelwood is the most important type of rural energy. In the mountain areas the fire pan is a symbol of life. The mountain ethnic people, including the Jingpo people, have the traditional custom to making a fire in a pan set in the middle of the bridal chamber on their wedding day. From then on the fire should be kept burning until the death of the couple. The Jingpo have the experience to select wood with good and durable burning qualities and with few showers of sparks for safety. Naturally, they know of the best fuelwoods in their location. The local best fuelwood is considered to be the wood of *Lithocarpus* spp., especially the species *Lithocarpus mannii*. Besides, *Hyptianthera stricta*, *Dalbergia burmanica*, *Broussonetia papyrifera* etc. are also good native fuelwoods.

3. Bamboo

Bamboo is a very special kind of plant. It grows quickly and can be easily cultivated around buildings and corners of the field. In the Jingpo areas, bamboo has a wide range of uses such as for building materials, fences, containers, mats, stools and so on. Bamboo shoots are considered to be a traditional tasty food. They are processed for export and a unique species of nymph living in the culm of bamboo is a local food delicacy. More than ten local bamboo species are used: *Bambusa burmanica*, *Bambusa pallida*, *Cephalostachyum virgatum*, *Cephalostachyum pergracile*, *Chimonobambusa yunnanensis*, *Dendrocalamus semiscandens*, *Dendrocalamus membranaceus*, *Dendrocalamus patellaris*, *Dendrocalamus giganteus* and *Pseudostachyum polymorphum* are distributed widely in these areas.

4. Wild Vegetables

Almost all nationalities in upland Yunnan utilise native vegetable plants. According to the survey in several local markets, vegetables marketed involve many kinds of trees, shrubs, herbs and vines. The edible parts of plants consist of roots, stems, leaves, shoots, flowers, fruits and seeds. *Callipteris esculenta*, *Houttuynia cordata*, *Solanum nigrum var. photeinocarpum*, *Tupidanthus calyptratus*, *Monochoria vaginalis*, *Dickinsia hydrocotyloides*, *Ehretia corylifolia*, *Oenanthe javanica* and *Crateva unilocularis* are all welcome vegetables in local communities. Some of these have been introduced to home gardens for commercial cultivation.

5. Wild Fruits

The common wild fruits in the markets of Jingpo areas are *Calamus viminalis* (rattan palm), *Elaeocarpus decipiens* (ebony heart), *Rubus spp.*(raspberry), *Baccaurea ramiflora* (rambai), *Canarium strictum* (canarytree), *Nephelium chryseum* (rambutan), *Syzygium forrestii* (rose apple) and so on. Industries processing wild fruit juices are rapidly increasing in the other areas of the province and often benefit the local rural communities. This kind of forest resource provides an opportunity for the development of Jingpo community.

6. Forage

One of the major sources of local income is from raising livestock. Almost all households without exception have several head of cattle. Many families have a few goats or pigs as well. Usually the cattle and goats are not fenced, but roam freely in forests or grasslands. Pigs are fed forage from wild areas and forests. *Impatiens arguta*, *Rumex nepalensis*, *Melampyrum roseum*, *Enseta glaucum*, *Pilea martinii*, *Lecanthus peduncularis*, *Gynura segetum*, *Commelina bengalensis*, *Amischotolype hispida* and *Elscholtzia rugulosa* are commonly used for forage in Jingpo community. *Enseta glaucum* is even planted in garden and its stems are seen as a good kind of forage.

7. Medicinal Herbs

Many medicinal herbs occur in this region. There are over 1,000 species of medicinal herbs commonly used in the area. Some herbs are found to be effective cures for local epidemic diseases. For example, the leaves of *Lysimachia christinae* and the roots of *Gomphostemma lucidum* are good for treating the most common disease - malaria; the flowers of *Buddleja officinalis* can be used for curing hepatitis; and the fruit of *Symplocos cochinchinensis* has a curative effect on mumps.

8. Specially Used Plants

Polygala arillata and *Vitex simplicifolia* are two local kinds of common hedge shrubs; *Engelhardtia spicata*, *Sambucus williamsii* and *Quercus acutissima* are useful for green manure in paddy fields; it means the season of slash and burn is coming when *Symplocos paniculata* and one kind of *Rhododendron* is in full bloom; it is the proper time for buckwheat planting when pear and peach are in full bloom; before red bayberry matures, upland rice should be sown; *Arenga pinnata* and one kind of cogongrass are used as the roof materials for thatched cottages; the wizard of a village uses a leaf of *Curculigo orchioides* or a piece of culm of *Pseudostachyum polymorphum* as tools for divination; *Anthoxanthum hookeri*, a fragrant grass, is a unique gift for a girl friend; *Carex alta* is a valuable material for the weaving of mats.

Key Problems Confronting Sustainable Development of the Jingpo Communities

The new idea of sustainable development originated from the United Nations Stockholm Conference in 1972, but prevailed throughout the world nearly twenty years later. Although there are now several concepts of sustainable development and some new concepts are evolving (Cf. Tisdell, 1994), many argue for the development of “sustainable” economies in order to deal with issues of growth, economic and community development, and environmental protection. The emphasis of sustainable growth and natural resource development will help the Jingpo communities use natural resources more prudently and sensitively than in the past and ensure their continued survival.

The sustainable development of the Jingpo communities is confronted with various hindrances, but the following factors can be regarded as most urgent issues.

Evaluation of Slash-and-Burn Cultivation in Practice

The Jingpo people have been in the Dehong prefecture as a significant ethnic minority engaging in slash-and-burn cultivation for about six centuries. According to the legends of the Jingpo, their ancestors migrated from the eastern edge of the Tibetan plateau along the Hengduanshan mountain range to their present location. The Jingpo people were described prior to this in the historical records in the Sui and Tang Dynasties (A.D. 581-907) as a minority living in mountains and hunting for their livelihoods (Yin, 1993). Slash-and-burn agriculture is a primitive method of cultivation. Trees and shrubs in forest are cut down and left to dry in the sun for nearly two months, and then burnt to prepare the land for cultivation. Slash-and-burn agriculture can be divided into two types, i.e., one year cultivation and cultivation for several years, usually for two or three years, before fallowing. The latter type of slash-and-burn agriculture is popular in Xishuangbanna. The Jingpo cultivate their land for only one year and then shift to another woodland for their cultivation. The used land is left uncultivated for several years until the new generation of trees and shrubs cover it. The duration of fallow of land after cultivation used to be a dozen of years in this region, but it has been gradually curtailed to 7-8 years because of increased population density and loss of forested land for cultivation.

In the slash-and-burn cultivation system of the Jingpo people, upland rice is the main crop. Many crops such as wheat, corn, millet, buckwheat and sorghum, garden pea, broad bean, soy bean, kidney bean, cucumber, bitter cucumber, loofah, pumpkin, white gourd, eggplant, chilli, tomato, cabbage, oil-seed rape, radish, garlic, ginger, coriander, shallot, chive, fennel, mint etc. are intercropped with upland rice. The Jingpo people sometimes adopt a mixed cultivation system of upland rice and alder trees (*Alnus nepalensis*) to enable faster rehabilitation of forests after cultivation and provide some small timber for their use.

Slash-and-burn agriculture depends on full forest resources and strict land-use rotation. In a Jingpo community, usually a village, land resources for the cycle of slash-and-burn cultivation are divided into twelve parts, called “Yingwang”. One “Yingwang” and sometimes a few small pieces of forestland will be slashed and burnt for cultivation in a village each year. Every household occupies a plot of land in the “Yingwang” just sufficient for its food production. After cultivation for a year a Yingwang is left for 11 years before it is cultivated again. Increasing population in some regions has produced a shortage of land resources. In some Jingpo communities, the duration of the fallow has to be reduced to 7-8 years. Village people can borrow or hire lands from their friends, or relatives in neighbouring villages if they really need more farming lands for grain production.

Every family slashes its own allocated forestland in January or February and can take useful logs and fuelwood from the land. Usually in the latter of April, the strong and experienced young persons in the village set fire to the slashed field. The whole action is fully discussed and elaborately organised under the direction of village elders and leaders beforehand. A fire break of about three metres in breadth will be set up in advance. Who is to start the fire, where and when, how to withdraw safely, and how to put out the fire to save the forests outside the slashed area will be considered before the burning begins.

Slash-and-burn cultivation in the Jingpo areas is a typical rotation system. In the

early times when there were richer forests and a sparse population, this cultivation system yielded the following benefits to local communities and ecosystem:

- many trees and shrubs can survive and flourish quickly after cropping stops;
- fewer weeds and pests harm crops after burning so that it saves cost and labour;
- less soil is eroded because of the till-less agriculture;
- higher productivity can be expected in this land because plant ash fertilizer and nutrient build up in the soil;
- some special seeds of plants can sprout and grow well after burning; and
- some herbivorous animals like to roam and seek food in the cultivated land.

This productive system has been greatly changed since the rapid reduction of forestland and expansion of local population. Slash-and-burn cultivation is becoming less economic and hence a new system should be developed to substitute for the old one. However, good aspects of the system should be retained. Furthermore, the farming culture included in this system such as sacrificial rites for slash-and-burn, sowing and harvest should be studied as well.

Transformation of Land Ownership System and Tenure Conflicts

In the early 1950s, except in a few minority ethnic areas, almost all lands, minerals and forests in China were nationalized. Through the legislative process, land and forest tenures were divided into two types: state ownership and local collective ownership. Before 1950, most agricultural lands and forests of Yunnan belonged to landlords, ethnic chieftains and local tyrants. Only a few forests such as the Yipinglang Salt-well region, the Gejiu Tin Mining Enterprise and a few forest experimental stations were under the control of the Yunnan provincial government. After the establishment of the People's Republic of China, three types of changes in rights to land were implemented in Yunnan, i.e. : 1) the People's government took over the the state lands and forests of the old government; 2) virgin soil and forests, and private forests with an unbroken area of over 500 mu (about 33.3 hectares) were nationalised; 3) small, broken scattered lands and forests of landlords were allocated to local communities or individual peasants (Zhao *et al.*, 1993).

Up to the period when the “Household Responsibility System” for agricultural land allocation and the “Two Mountains System” for non-agricultural land were introduced in 1982, most village lands or community lands were allocated to each land-based household according to contracts which spelt out their rights and responsibilities as well as how profit after harvest would be shared between the farmer and the collective. Only small areas of land were set aside under collective ownership and management with the revenue from harvested timber often being set aside for community expenses such as the village school or the maintenance of infrastructure such as roads, bridges and irrigation canals. In fact, while most farmers had a legal certificate guaranteeing their usufruct of land, very few farmers have a contract document specifying the content and limits of the farmer’s obligations to the collective. That caused severe conflicts and deforestation. Because of legal uncertainty, unstable policies and an increasingly urgent need for agricultural land for feeding an expanding population, almost half of the forests in Yunnan were destroyed after the late 1950s.

State forest and collective forests form the basic components for forest resource management in China, and these two types of ownership have functioned over the vast areas of China since 1950s. Collective land is the traditional place for the production and life of village people. In this land, local people have rights for self-determination. For example, they can determine which piece of forest should be slashed and burnt for cultivation, which piece of forest should be protected as a water source forest, and they can work out some local regulations and rules for the management and use of village forest resources. Collective forests belong to the local communities. The term “collective” contains the administrative villages and the individual natural villages. On this basis, collective forests are the common estate of community members. However, local governmental departments, for example, the local forest station also have some powers to control this type of forests. The commercial felling in this kind of forests requires a license from the local forestry bureau.

In order to prevent the further deforestation, readjustment of land and forest tenures had to be initiated by the countrywide political authorities. In the Jingpo areas, the task was completed with a solution of some protracted land conflicts in 1983, but the survey and planning of a nature reserve in Dehong Prefecture introduced a series of new problems. The Tongbiguan Nature Reserve is a provincial protected area located in the Jingpo region. It has resulted in sharp conflicts between local villages and local administrative authorities since its establishment in 1986. There are 13 villages in the reserve and a large quantity of village forests and croplands were transferred to the protected reserve. In 1988, the provincial government approved a resolution for removing the local people to other areas and allocated a sum for resettlement, but owing to the shortage of funds, the plan failed. The local people raised a higher claim than the government could meet and simultaneously the conflicts between villages to use forested land and the reserve became increasingly intense. Finally in 1993, the provincial government agreed to transfer the usufruct of 4,000 hectares of forestland to local communities. The new boundaries for the reserve were drawn up in 1995, but the conflicts are still occurring because the Jingpo have insufficient arable land and forestland for slash-and-burn agriculture.

Local governments have attempted to control the depletion of forest resources, especially in the past decade. Many official coercive measures for forest protection caused frequent conflict between governments and local people. Although governments have a very strong power to punish the activities of felling trees unlawfully, it has been ineffective in preventing increasing deforestation. For example, according to the statistics of the Prefectural Office of Natural Protection, 402 cases of deforestation occurred in the period January - August in 1994 in the state forests of Dehong Prefecture. This number increased by 175.5% compared to 1993. The destroyed areas and the losses of forest value are 9 and 22 times of those in the same period of 1993 respectively. Of course, the rapidly rising price of timber encourages the trend to deforestation.

Adequate land and forest tenures are at the core of community development in the Jingpo areas. The development of the Jingpo community should stress the

conscious participation of local people in the use of such resources. Clearer property rights in land and forest resources and rights to manage these will motivate local communities and villagers to take better care of these resources. The present policy of land leasing gives a good beginning for reducing conflicts. According to the new land policy of the “Transfer for Four Types of Wastes on Lease”, the wastelands, barren mountains, flood lands, and unused water resources whether state-owned or belonging to the collective will be shifted to individual households on lease. That can at least address the land claims of local people partly. Even in the above mentioned protected area, there were about 4,500 hectares of forestland destroyed in 1970s. Now it still remains barren. Local people would like to cultivate the land, but without explicit permission from higher authorities, local administrative officials hesitate to allow it. According to the new land policy, the barren mountains could be managed by local people on lease. But they can only plant trees and shrubs. Furthermore, where a tenant fails to do this the land will be taken back and transferred to other people.

Techniques and Markets for Cash Crops

Dehong Prefecture has a good climate for many crops. Sugar cane is one of the most important cash crops and its area of cultivation is only second to that of grain in the Jingpo areas. Tea plantations and rubber tree plantations are often listed in importance after sugar cane. Fruit trees, rape, tobacco, coffee, pepper, and amomum are also significant cash crops. Actually in some richer townships, the cash crops surpass income from grain production and provide the largest sources of income (see **fig.2**, Saihao and Huyu townships). Local major sources of income from forestry include bamboo shoots, seeds of tung trees, walnuts and palm fibre besides timber products. Other local non-timber forest products are chestnut, edible fungi, lac, tea-oil, Chinese prickly ash, and anise.

Technique is the most important limiting factor for the production of cash crops. For example, the per hectare yield of sugar cane in the Dehong Prefecture in 1993 was 55.6 tons, but Fujiang and Guangdong provinces with similar climate have an average per year yield of 69 tons and 66 tons respectively. The output of tea plantation in this prefecture in 1993 was only 494.5 kg per hectare, distinctly lower

than the state average yield of 660 kg per hectare (Li, 1993). Major reasons are the following:

- available skilled personnel mainly work in the institutions of governments, research institutes and state-run farms
- lack of technical services at the basic level
- lack of an effective technical extension system
- low educational level of local communities

Another factor affecting the production of cash crops in Dehong Prefecture is China's international commercial policy. Due to limited tropical areas in China, China's outputs of tropical cash crops are insufficient to meet its domestic consumption. It therefore imports tropical products. But a problem rose after the government eased controls on exports and imports in 1980s. The price of products from tropical crops started to fluctuate. For example, during 1987 and 1988 the prices of sugar and rubber were up to the 3 times the state fixed prices because of reduced imports. Stimulated by the market, the growers of sugarcane and rubber extended the areas of cropping in the next year. Simultaneously, the central government eased import restrictions and the local governments and subordinate departments were given more authority to import. In the following year, large amounts of sugar and rubber were imported. Consequently purchase of domestic sugar and rubber fell to very low levels so that in some areas sugarcane remained unharvested and the crude rubber went bad on farms. The results affected the Jingpo communities in the Dehong Prefecture. Other tropical crops in the prefecture such as coffee, shellac, amomum and pepper faced a similar situation.

Poverty in the Jingpo Communities

The incomes in major Jingpo townships from agriculture, forestry, husbandry and sidelines are listed in the following table with reference to the population, arable land, average income and grain production per capita per year. There are three townships where average per capita income is below the poverty line of 530 yuan net income per capita. These townships contain 33,558 people make up about 60% of the total population of these seven Jingpo townships. Actually in the Jingpo

communities, the incidence of poverty is higher than for the Han, Dai and the De-An people who are living together with the Jingpo.

Table. Population and Economic Situation of Major Jingpo Communities

township	population	Jingpo %	arable land (mu)	total income (million yuan)	total grain production (million kg)	per capita net income (yuan)	per grain (kg)
Qingping	13266	55.9	27800	8.3394	6.2345	402	485
Bangwa	7023	89.4	15328	3.4315	2.5303	429	373
Mengyue	3057	83.9	8448	2.2820	1.2074	637	414
Saihao	7663	68.9	23329	8.2046	3.3825	759	458
Wangshuzi	13269	48.5	24722	7.6379	3.9403	399	306
Huyu	6130	40.0	20415	11.7777	3.2508	1006	560
Tongbiguan	5812	64.5	9330	4.8251	2.1010	713	377

1 hectare = 15 mu, 100 USD = 820 yuan
The average food per capita includes staple food and non-staple food or coarse cereals
Data from the Year Book of the Dehong Prefecture 1994

According to current views, the major causes of impoverishment in the Jingpo areas are the subsistence type society, low educational levels, poorly developed economic system and drug addiction. The concrete reasons are described as follow:

- As mentioned above, the development of the Jingpo communities was basically in the period of primitive commune before 1950s. The major means of production belonged to the community. However, the new relations of production were forming and the Shanguan was becoming the owner of lands and forests at that time. Although this ownership system was gradually stopped by the end of 1950s, the level of productivity and the mentality of non-commodity exchange have changed little since then. Consequently, the slash-and-burn agriculture with extensive cultivation remains the Jingpo's main means of survival and can only meet their lowest level of economic needs.
- Based on the survey of educational departments of Yunnan Province, the illiteracy rate of minority population in poor mountainous areas is up to 40% and the percentage of children not attending to school in 7-11 old group is

nearly 30% (Shen, 1992). In the Jingpo areas, many small villages are scattered in the remote mountainous districts. The children from remote villages spend one or two, even more hours in walking to school. The situation has not been improved because of the insufficient investment in education and the shortage of teachers in these areas.

- The less developed society and low educational level result in the existence of poor economic base for the Jingpo. In fact, the characteristics of the Jingpo economic system is still simple, isolated and natural though change has occurred since 1980s. Generally speaking, the life of the Jingpo people almost completely relies on the endowment of nature and they are self-sufficient. The major items in the local markets are natural products such as mushrooms, wild vegetables, wild fruits and wild animal meat. Even in the remote areas, local people are still ashamed to sell their own products. The appearance of the towns and township enterprises are the new things in the Jingpo areas. The isolated mountainous environment and lack of believe in commodification prevents the development of the local economy.
- Drug addiction is currently a serious local social problem that worsens the local living conditions. Lots of the Jingpo villages are close to the well-known drug base of the Golden Triangle Region. Since the middle 1980s, the prefecture has been one of the major passageways for drug smuggling. Consequently, the local people suffered not a little from drug taking. Some statistical data indicate the serious situation in Jingpo villages. During 1992-1993, Luliang administrative village had 103 drug addicts and 5 died; in 1990, Huyu township has 335 drug addicts, of which 274 were the Jingpo, and 9 died. A small village of only about 200 people, Banyang Jingpo village, has had 11 drug addicts dying in past decade. Recently, the local government has introduced strict measures to force the drug addicts into give up the drug. For example, Longba township uses a special wood coop to keep drug addicts in. The wood of *Schima wallichii* makes drug addicts excruciating itchy when they touch it. Finally after a few months, it was said that all drug addicts gave

up the drug. That is a cruel and miserable story, but local communities are always dealing with this kind of problem and go to extremes to punish the victims of drugs because many social issues are related to the drug addiction. For instance, theft was unknown in Jingpo society, but it prevails in the present decade.

Strategies of Sustainable Development in the Jingpo Communities

Poverty and environmental deterioration seem to be a twin brothers. None can control the excessive exploitation of natural resources by a mass of poor people facing starvation. Due to the deep influences of traditional culture and farming techniques, rapid change in the Jingpo communities is almost impossible. Gradual advance might, however, be made by means of some currently proven effective approaches for sustainable development in rural areas based on the local realities. For this reason, social forestry is a useful tool for sustainable mountain development.

Social forestry or community forestry is a practice referring to a broad range of tree- or forest-related activities which rural land owners undertake to provide wood products for their own use and to generate local incomes. Its definition can be traced back to the 8th World Forestry Conference held at Jakarta in 1978. At that time, "Forests for People" became the theme of the conference and social forestry or community forestry was defined as:

any situation that intimately involves local people in a forestry activity. It embraces a spectrum of situations ranging from woodlots in areas which are short of wood and other forest products for local needs, through to the growing of trees at the farm level to provide cash crops and the processing of forest products at the household, artisan or small industry level to generate income, to the activities of forest dwelling communities. It excludes large-scale industrial forestry and any other form of forestry that contributes to community development solely through employment and wages, but it does

include activities of forest industry enterprises and public forest services which encourage and assist forestry activities at the community level. The activities so encompassed are potentially compatible with all types of land ownership. While it thus provides only a partial view of the impact of the way in which forestry and the goods and services of forestry directly affect the lives of rural people (FAO, 1978).

In the literature, social forestry is used interchangeably with the terms rural forestry, farm forestry, community forestry, forestry for people, forestry for local community development, rural development forestry and community woodlots etc., the differences being purely semantic and definition of most of these terms is fuzzy. The relationship between them and what occurs in practice are often not clear (Arnold, 1987; Winterbottom and Hazlewood, 1987).

The old saying “those living on a mountain live off the mountain” reflects the fact that the core of mountainous community development is the rational exploitation of mountain. To develop mountainous region one must focus on sustainable forest management and use and rehabilitate a forest ecological environment. Agroforestry, a major technique of social forestry, can be introduced as one of alternatives to local slash-and-burn agriculture and it can be connected with the traditional governance, institutions, culture and indigenous knowledge of the Jingpo people.

Unlike the mountainous Han people who have been practising terraced agriculture for centuries, the Jingpo people are used to practising slash-and-burn cultivation based on rich tropical and subtropical climate conditions and old institutions. In past decades, in order to prevent the shrinking of forests, local governments attempted to forbid the slash-and-burn cultivation, but it failed because they could not find a proper solution for the supply of the subsistence needs of the local people. Although some experts, today, suggest that the Jingpo adopt terraced agricultural techniques as an alternative to the slash-and-burn cultivation system, most believe that the adoption of some indigenous knowledge such as the establishment of permanent plantations originating from local practices is more likely to meet the demands of the

mountainous communities because their daily subsistence relies very much on forestlands for fuelwood, fodder, grazing, and for generating cash income (Lu, 1995; He, 1995). Recent surveys conducted in the nearby Baoshan Prefecture has shown that there are 5 patterns, 10 subpatterns and 27 types of agroforestry plantation models which prevail the mountainous areas of the Prefecture (Guo, 1993). Many of these models also exist in the Jingpo areas according to our field work. For example, the type of *Alnus nepalensis* + upland rice intercropping can produce food, small timber, fuelwood and green manure to meet the demands of the Jingpo communities. It maintains as a “sustainable” production cycle by the regular rotation of the crops and trees and the nitrogen-fixing capabilities of *Alnus nepalensis* trees (Cf. Zhuge & Tisdell, 1996). Tea plantations commonly established in this region have also proven to be a practical alternative to slash-and-burn agriculture. In addition, the development of ecotourism, animal husbandry, small processing industries, especially those based on the local natural resources, provision of employment opportunities in management of nature reserves and service industry can play an important role in altering the traditional productive system as well (Cf. Tisdell, 1995).

Participation of local communities and role of government is another important subject in social forestry. Early in June 1992, the Earth Summit on the global environment and development declared the first global statement on forests in human history. In this historical document, the following policies were aired:

Governments, in full partnership with indigenous people and their communities should, where appropriate:

Develop or strengthen national arrangements to consult with indigenous people and their communities with a view to reflecting their needs and incorporating their values and traditional and other knowledge and practices in national policies and programmes in the field of natural resource management and conservation and other development programmes affecting them;

Cooperate at the regional level, where appropriate, to address common indigenous issues with a view to recognising and strengthening their participation in sustainable development (UNCED, 1993, p228).

Launching or improving opportunities for participation of all people, including youth, women, indigenous people and local communities, in the formulation, development and implementation of forest-related programmes and other activities, taking due

account of the local needs and cultural values (UNCED, 1993, p92).

According to the statement, local people have a right to take part in activities which concern local community development. Their “participation” is not only limited to participation in investigation, planning, designing, management, monitoring and evaluation, but includes sharing of the benefits. The real participation of local communities should reflect the principles of equity and equality. In reforming land ownership systems and in the solution of tenure conflicts, government should listen attentively to the views of local people and simultaneously government should provide some guiding opinions for reducing biases in the traditional culture. For example, the various reform types of land tenure or usufruct are currently the major sources of tenure conflicts in this region. Local governments are more willing to transfer power to the local leader teams, usually village councils of local communities than before. These local leader teams take charge of the concrete tasks involving in land allocation. But a new question may come up. Since the issue of gender is so frequently neglected in the Jingpo communities, some women may lose their living conditions because they have no inheritance of land and this will produce a negative impact on the sustainable development of local communities. Therefore, a side-by-side approach, i.e., combining the knowledge of both government and local people rather than either a top-down approach or a bottom-up approach, is necessary to improve the participation of local communities and the decision making of government under the rational way (Tisdell, 1995).

Otherwise, the development of social forestry in local communities should also combine with the superiority of local natural resources and geography. For example, the Dehong Prefecture is contiguous to Myanmar with a boundary line of 503.8 km and has many trading ports and passages. Since the prefecture started to open its border ports to the world in July 1990, cross-border trade has developed quickly. According to the statistics, the total sum of import and export through local border ports in this prefecture were to 20,150 million yuan (about 2,400 million USD) in 1993, 17.3 per cent higher than 1992 and the sum of export is 1.6 times that of import. Furthermore, cross-border tourism becomes more and more attractive to countrymen and foreigners that promote the vitality of social forestry projects such

as ecotourism projects based on natural resources and environment and the growth of local tertiary industry. The total income from tourism in this prefecture in 1993 reached 30 million yuan, nearly to be double that of last year (Wu,1994). Cross-border trade and tourism indeed have increased the incomes of the Jingpo communities and introduced the idea of commodity exchange that may contribute to the economic development of local communities. The full potential of cross-border trade and tourism in the Jingpo areas still remains to be exploited. For example, the booming tourism attractions of folk villages organised by local minority people in Xishuangbanna can also be introduced to the Jingpo areas. However, cross-border trade and tourism have successfully attracted outside investment and techniques, and formed numerous local markets for the exchange of local non-timber products that could generate a steady income for local people. Local Jingpo communities such as those in Huyu, Saihao and Tongbiguan townships were initially lifted out of poverty by means of the development of tertiary industry and cross-border trade.

Concluding Comments

The Jingpo communities in Yunnan experienced much change in forms of governance and in property rights regimes in the second half of the 20th century. The Jingpos' traditional forms of governance and property rights were altered by the Chinese communist government after it came to power, although vestiges of the pre-existing system remained with only little effective modifications being possible in remote areas. Furthermore, the Jingpo continued many of their traditional ways of life. For example, they continued to engage in slash-and-burn agriculture, showed little interest in commercial exchange and persisted with a subsistence life-style based on their established customs and use of traditional production techniques. However, with rising population and changing income aspirations, their way of life has become increasingly unsustainable and poverty among the Jingpo has become widespread.

To some extent the economic position of the Jingpo was made more difficult by the transfer of much of their communal land to state control by the widespread creation

of state forests and reserves after 1949, a process accelerated later by the Cultural Revolution. This change meant the availability of smaller land areas for legal communal use by the Jingpo. Consequently, they often illegally used state property (state forests and reserves) which now were treated more like open-access resources. Despite such changes, the culture of the Jingpo seemed to survive.

With the commencement of China's economic reforms in 1978, a new economic system began to develop for the Jingpo, not instantaneously but with a lag. With China's economic reforms, new forms of governance and poverty rights as well as new methods and wider scope for exchange and choice of production techniques began to emerge.

Features of the new system are greater creation of *de facto* private property rights (signalled by the introduction of Household Responsibility System and the Two Mountains System), increased use of market systems, greater freedom of movement, greater state consultation with local communities with increasing use of side-by-side governance. In addition, China's opening up to the outside world has exposed local communities such as the Jingpo to international market forces. Being on the border with Myanmar they are in a position to gain from increased cross-border trade. At the same time however, such trade and increasing involvement in the market system exposes them to market risks such as fluctuating prices for their produce and many necessitate economic restructuring of village activities. Old customs and traditions may lose their social and economic relevance and new forces of social tension and disintegration may be unleashed, evidence to some extent by the incidence of drug addiction amongst the Jingpo.

It seems that little can be done to shield minority and tribal groups from the forces of social and economic change, except in some cases to moderate the pace of change to allow their social system to co-evolve without undue strain and do develop techniques and methods to help them cope with transition to a new socio-economic system. In this respect, the best aspects and techniques of the Jingpo people need to be forested. For instance, it seems that slash-and-burn agriculture is becoming less and less viable. An alternative is to develop settled forms of agroforestry and

communal forestry of a sustainable nature tailored to the experience and needs of the Jingpo. Such systems can involve a combination of private property and communal property. With economic change it is also possible that an increasing number of the Jingpo will have to seek non-agricultural occupations and education can play an important role in preparation for these. There is little doubt that change in Jingpo society is inevitable, as it is for many tribal and minority groups throughout Asia and on the Indian Ocean rim. The big question is how can these societies best manage social and economic change which usually involves variations in governance and in property rights. It is a pipe dream to believe that the socio-economic situation of such communities can remain frozen in time. Even if it could be, it is far from obvious that such sustainability would be desirable.

References

- (1) Arnold, J.E.M. 1987: Community forestry. *Ambio* 6: 122-128.
- (2) Booz, P.R. 1987: YUNNAN: Southwest China's Little-Known Land of Eternal Spring, Chicago, Passport Books, p52.
- (3) Food and Agriculture Organization (FAO). 1978: Forestry for local community development. Rome: FAO Forestry Paper 7.
- (4) Guo, Huijun. 1993: AGROFORESTRY SYSTEMS IN BAOSHAN, YUNNAN, SOUTHWEST CHINA. Yunnan University Press, Kunming.
- (5) He, Peikun. 1995: Primary analysis of slash-and-burn in Yunnan. In He, P.K.: SOCIAL FORESTRY — RESEARCH AND EXPLORATION, Yunnan Science and Technology Press, Kunming, pp118-122.
- (6) Li, liangsheng. 1993: A STUDY ON THE EXPLOITATION OF TROPIC RESOURCES IN SOUTHWEST PART OF YUNNAN PROVINCE, Yunnan People's Press, Kunming.
- (7) Lu, Rongsen. 1995: Rehabilitation of degraded lands in mountain ecosystems: a technical report of plantation establishment in Nepal. In Pei, S.J (ed.): REHABILITATION OF DEGRADED LANDS IN MOUNTAIN ECOSYSTEMS OF THE HINDU KUSH-HIMALAYAN REGION, published by ICIMOD, Kathmandu, pp85-106.
- (8) Shen, Kangda. 1992: Social and economic factors of impoverishment and analysis of its structure. In Guo, L.X. & D.M. He (eds.): POVERTY- A PROBLEM CHALLENGING HUMAN BEINGS, Chinese Science & Technology Press, Beijing, pp45-64.
- (9) Tisdell, C.A. 1994: Sustainability and sustainable development: are these concepts a help or a hindrance to economics? *Economic Analysis & Policy* 24(2): 133-150.

- (10) Tisdell, C.A. 1995: Issues in biodiversity conservation including the role of local communities. *Environment Conservation* 22(3): 216-228.
- (11) United Nations Conference on Environment and Development (UNCED). 1993: Agenda 21: Programme of Action for Sustainable Development, the United Nations Conference on Environment and Development, 3-14 June 1992, Rio de Janeiro, Brazil. Published by the United Nations Department of Public Information.
- (12) Winterbottom, R. and P.T. Hazlewood. 1987: Agroforestry and sustainable development: making the connection. *Ambio* 16: 100-110.
- (13) Wu, Zhixiang (ed). 1994: ANNUAL BOOK OF THE DEHONG PREFECTURE. Dehong Nationality Press, Mangshi.
- (14) Yin, Shaoting. 1993: A FARMING CULTURE BORN OUT OF FORESTS: SWIDDENING IN YUNNAN, CHINA, Yunnan People's Press, Kunming.
- (15) Zhao, Junchen *et al.* 1993: SOCIAL FORESTRY IN YUNNAN, Yunnan Science and Technology Press, Kunming.
- (16) Zhuge, Ren & Clem Tisdell. 1996: Developing community-based forestry in the uplands of Yunnan: dictates of environment and socio-economics. In Tisdell, C.A and Chai, J.C.(ed.): CHINA'S ECONOMIC GROWTH AND TRANSITION: INCLUDING REGIONAL, ENVIRONMENTAL, TECHNOLOGICAL AND OTHER DIMENSIONS. Department of Economics, The University of Queensland, Brisbane, 4072 (forthcoming).