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BIODIVERSITY CONSERVATION: STUDIES IN ITS ECONOMICS AND MANAGEMENT, MAINLY IN YUNNAN, CHINA

Working Paper No. 10

Socio-Economic Issues and Strategies for Biodiversity Conservation in China with Observations from Xishuangbanna

by

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Socio-Economic Issues and Strategies for Biodiversity Conservation in China with Observations from Xishuangbanna[1]

by

Clem Tisdell[2]

November 1994

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Research for ACIAR project 40, *Economic impact and rural adjustments to nature conservation (biodiversity) programmes: A case study of Xishuangbanna Dai Autonomous Prefecture, Yunnan, China* is sponsored by the Australian Centre for International Agricultural Research (ACIAR), GPO Box 1571, Canberra, *ACT,* 2601, Australia. The following is a brief outline of the Project

Rural nature reserves can have negative as well as positive spillovers to the local region and policies need to be implemented to maximise the net economic benefits obtained locally. Thus an 'open' approach to the management and development of nature conservation (biodiversity) programmes is needed. The purpose of this study is to concentrate on these economic interconnections for Xishuangbanna National Nature Reserve and their implications for its management, and for rural economic development in the Xishuangbanna Dai Prefecture but with some comparative analysis for other parts of Yunnan

The Project will involve the following:

1. A relevant review relating to China and developing countries generally.
2. Cost-benefit evaluation of protection of the Reserve and/or assessment by other social evaluation techniques.
3. An examination of the growth and characteristics of tourism in and nearby the Reserve and economic opportunities generated by this will be examined.
4. The economics of pest control involving the Reserve will be considered. This involves the problem of pests straying from and into the Reserve, e.g., elephants.
5. The possibilities for limited commercial or subsistence use of the Reserve will be researched.
6. Financing the management of the Reserve will be examined. This will involve considering current sources of finance and patterns of outlays, by management of the Reserve, economic methods for increasing income from the Reserve and financial problems and issues such as degree of dependence on central funding.
7. Pressure to use the resources of the Reserve comes from nearby populations, and from villagers settled in the Reserve. Ways of coping with this problem will be considered.
8. The political economy of decision-making affecting the Reserve will be outlined.

Commissioned Organization: University of Queensland

Collaborator: Southwest Forestry College, Kunming, Yunnan, China

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Socio-Economic Issues and Strategies for Biodiversity Conservation in China with Observations for Xisbuangbanna

ABSTRACT

Brings attention to recent environmental policy documents which have been released in China such as *China's Agenda 21* which is a white paper outlining policies to achieve sustainable developing in China. Another important recent document is *China: Biodiversity Conservation Plan.* **It** identifies tropical reserves in Xishuangbanna Prefecture as having a high priority for nature conservation. A field trip to Xishuangbanna in October 1994 enabled first hand observations to be made about combining economic development and conservation in the Prefecture. Difficulties and initiatives discussed include the fencing and management of Xishuangbanna State Nature Reserve, its income from multiple operations and economic concessions, ecotourism and tourism development, the role of agroforestry and social forestry and other community d evelopment projects in easing pressures for the economic exploitation of the Reserve and the impact of wildlife 'pests' such as elephants which stray from the Reserve and cause damage to agriculture.

Socio-Economic Issues and Strategies for Biodiversity Conservation in China with Observations for Xisbuangbanna

1. Introduction

China still remains a low income country but since its economic reforms commencing in 1978, it has been maintaining a high growth rate of GNP averaging around 9 per cent per annum and at the same time its population policies have helped to curb population growth. Hence, its income per capita is rising rapidly. China plans to be a middle-income country by the middle of the next century. However, China's rapid economic growth is placing its natural environment under considerable pressure. So there is some concerning in China .and abroad about the degree of long-term sustainability of China's economic development. The Chinese government is in the process of addressing such issues.

In this respect several important documents have recently been released. This year the Executive of the State Council adopted *China's Agenda 21 - White Paper on China's Population, Environment and Development in the 21st Century*. Agenda 21 adopted at the United Nations' Conference on Environment and Development held in Rio de Janeiro in 1992 calls for nations to develop and implement their own strategies for sustainable development and to assist in meeting the common challenges facing mankind. This White Paper is a substantial document of over 200 closely printed page s covering a wide range of social and natural environmental issues involved in achieving sustainable development as can be seen from the Table of Contents shown as Table 1. In addition an *Environmental Action Plan of China 1991-2000* has recently been produced by the National Environmental Protection Agency and the State Planning Commission (Chen Jinghun, 1994) and the *China: Biodiversity Conservation Action Plan* was released in .May of this year with the National Environmental Protection Agency acting as the leading agency. Together these recent publications provide a substantial environmental and social policy framework. It has been said of China's Agenda 21 that it 'puts forward the overall strategies, policies and measures for coordinated and sustainable development of the domestic economy, society, resources and the environment proceeding from the country's actual conditions and links between its environment and development' and that the corresponding White Paper 'will serve as a. significant national document for future domestic economic growth and medium- and long-term social development', (Administrative Centre for China's Agenda 21,, 1994, p. 3).

Table 1

CHINA'S AGENDA 21 – WHITE PAPER ON CHINA'S POPULATION, ENVIRONMENT AND DEVELOPMENT IN THE 21ST CENTURY

CONTENTS

2. Conservation of Biodiversity in China

China was one of the first nations to sign the United Nations Biodiversity Convention, and is a country with valuable biodiversity. It has been claimed that, 'China's biodiversity ranks eighth in the world and first in the Northern Hemisphere' (Chen Jinghun, 1994, p. 171). China has many diverse ecosystems, a great variety of plants and animals and 'has been very successful at cultivating hybrid plants from a wide range of wild species, making China one of the world's three largest centres of origin for cultivated plants' (Chen Jinghun, 1994, p. 171). Nevertheless, there are major threats to the conservation of biodiversity in China.

China has experienced a substantial reduction in its natural forest, woodland and grassland cover so that the proportion of its area under natural vegetation cover is now substantially smaller than in India (World Resources Institute, 1994). Furthermore, at least in the recent past, China's forests have been harvested at an unsustainable rate. Its forest cover diminishes annually by about 5000 square kilometres and grassland and water catchment areas are subject to considerable degradation (Chen Jinghun, 1994, p. 173). These effects· are primarily results of population growth and pressures of economic growth, e.g., encroachment of agriculture on to naturally vegetated areas and. the intensification of ·agriculture and the need for fuel and timber supplies. Consequently **the proportion of threatened and endangered species in China is up to twice the world's average** (15 - 20 per cent compared to 10- 15 per cent) and so globally conservation action in China needs to be a high priority. Apart from this, the introduction of exotic species and the use of high-yield varieties of agriculture has been a factor in the disappearance of genetic material in China.

A number of measures are proposed in *China's Agenda 21* to deal with these problems. These include the establishment of an Office for the Conservation ·of Biodiversity, extension of the systems of nature reserves, conservation of habitats other than those within the nature reserve systems, establishment of national network for off-site conservation of genetic materials, increased efforts to domesticate rare and endangered species and work towards the restoration of degraded ecosystems. Various measures are outlined to strengthen the management of the protection of biodiversity, improve information systems for monitoring biodiversity, for encouraging international and regional co-op ration in the protection of biodiversity and for expanding scientific research on the protection of biodiversity and its sustainable use.

Three models are mentioned {Executive of the State Council, 1994, pp. 177-178) as

demonstration projects for combining the conservation of biodiversity and its utilisation. These are:

1. An ecotourism development model
2. A domestication and artificial breeding model of species in nature reserves. Steps will be taken to conserve the habitats and natural species by means of artificial reproduction.
3. Multiple use of biological resources on a sustainable basis.

Specific areas are mentioned where these demonstration models can be trialled.

The document *China: Biodiversity Conservation Plan* (Environmental Protection Agency, 1994) provides further details on China's strategies for biodiversity conservation and expands on Chapter 15 of China's Agenda 21 (Executive of the State Council, 1994). This document identifies a number of reserves in Yunnan Province as having a high priority for protection for their tropical and sub-tropical forest ecosystems. All the tropical reserves mentioned for Yunnan are located in Xishuangbanna Prefecture and the sub-tropical forests occur in the south of the Hengduan Mountains. One of the important projects mentioned in China: Biodiversity Conservation Plan is the 'investigation of the feasibility of integrating conservation of biodiversity with efforts for economic development by people living in areas surrounding nature reserves' (p. 83). The reason for this project, which will involve test cases at four selected nature reserves, has been explained as follows:

'Most of China's nature reserves are located in poor rural areas with limited opportunities for economic development. People depend heavily on natural resources for subsistence and cash generating activities. They continue to utilize resources from high biodiversity ecosystems· set aside for protection, and increasing population and economic growth lead to over-exploitation of the land·and degradation of the resource base on which the people depend. Pressures then increases to use resources inside nature reserves, and ecological damage of surrounding areas threaten the function of protected ecosystems. As a result many nature reserves have been severely degraded since they were established, and some have entirely lost the biodiversity values they were intended to protect.

The future viability of the nature reserve system depends on developing successful programs

to address the economic needs of local people while still fulfilling·the conservation goals. Instead of simply discouraging unwise development, nature reserve managers need to cooperate with local communities to encourage the search for types of development sustainable over the long term and compatible with reserve management goals. The issue is whether the natural resources outside reserves can support the human population in the long term.

The chief obstacles to sustainable development are:

- Lack of coordination among the various agencies;
- Lack of information ·among the local people -about the values of biodiversity and of methods of development that protect biodiversity;
- Lack of opportunities developed to allow local people to benefit from biodiversity while not destroying the biological resources;
- Lack of funds necessary for the short-term investments that will generate long-term benefits; and
- Too much focus on immediate financial gain (this can ruin the most carefully planned sustainable development projects, because a few people may not be satisfied with the benefits provided by the 'sustainable activities' and may decide to over-exploit the natural resources as before, for extra personal or community gain)' (Environmental Protection Agency, 1994, p. 83).

These are all important issues in Xishuangbanna Prefecture where population pressures and desires for higher levels of cash incomes continue to place pressure on nature protection and on the nature reserves located there. Ways are being considered by the Ministry of Forestry and the Nature Reserve Protection Bureau of Xishuangbanna to reduce these pressures. Methods considered or being trialled include ecotourism, economic assistance with community (village) development projects such as agroforestry and regulated multiple economic use of reserves by local people.

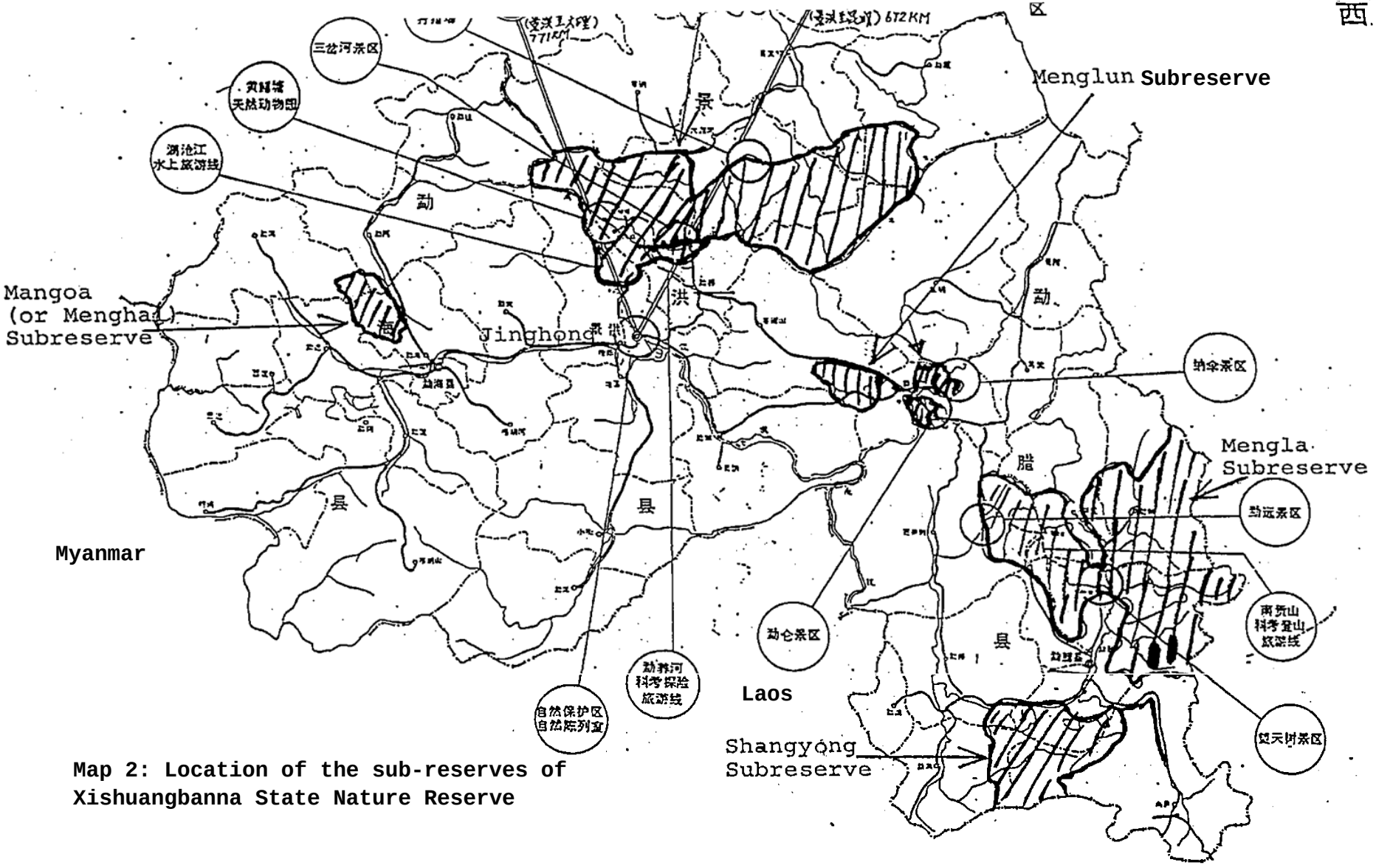
I visited Xishuangbanna Prefecture in October 1994 to observe such issues and development. The research involved was undertaken as part of the Australian Centre for International Agricultural Research Project No. 40, 'Economic impact and rural adjustments to nature

conservation (biodiversity) programmes: A case study of Xishuangbanna Dai Autonomous Prefecture, Yunnan, China'. This research is being jointly conducted by Associate Professor Zhu Xiang of the Southwest Forestry College, Kunming and myself. It may be useful for me to report some of my preliminary observations.

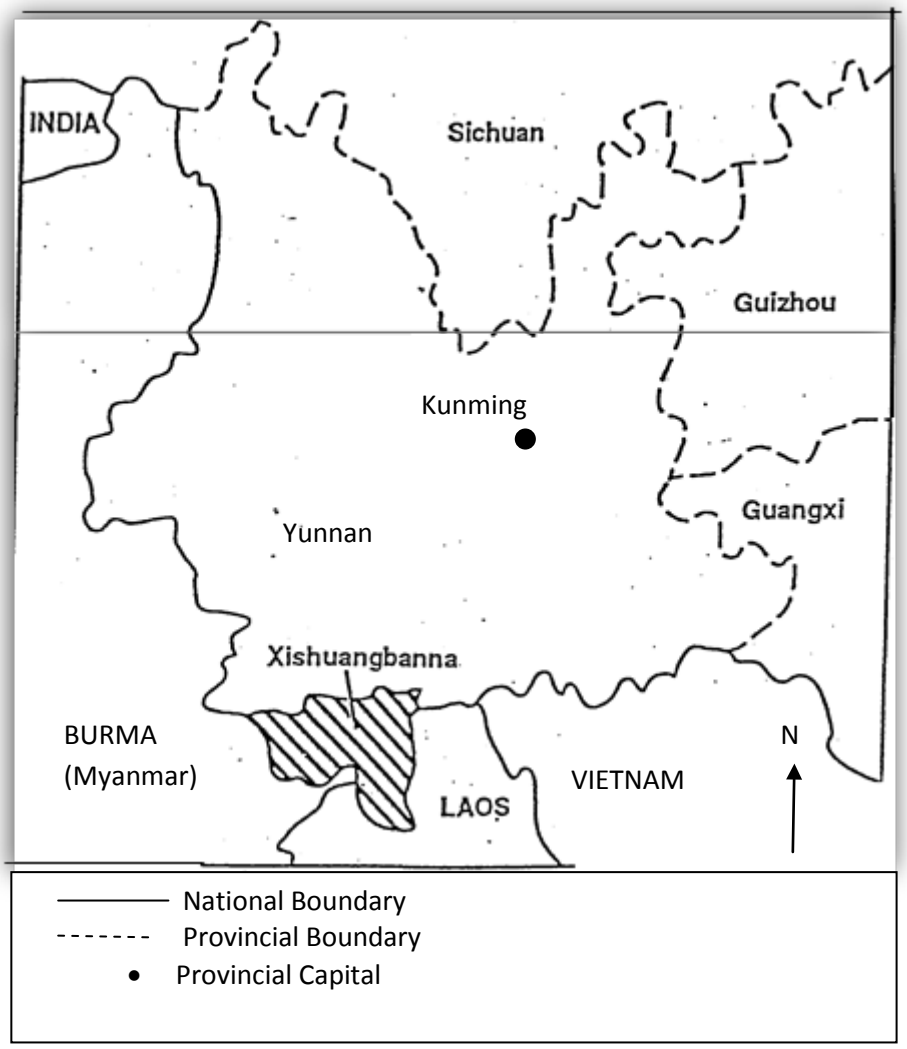
3 Observations from a Recent Journey to Xishuangbanna Prefecture, Yunnan

During my visit to Xishuangbanna I was able to visit three of the five sub-reserves of the Xishuangbanna Nature Reserve, namely Mengyang, Menglun-and Mengla and speak with the managers of these sub-reserves. It might be noted that the management of Mengla and Shangyong sub-reserves -is combined. The overall management of the Xishuangbanna is the responsibility of the Bureau for Protection of Xishuangbanna Nature Reserve located- in Jinghong and the Director of this Bureau, Kao Meng Liang, and Zhu Xiang accompanied me throughout the fieldwork. The general location of Xishuangbanna is indicated in Map 1 and Map 2 indicates the five sub-reserves.

Details were obtained about the financing of the management of the Xishuangbanna Nature Reserve. The largest share of funds comes from the government through the Ministry of Forestry. For example, Menyang sub-reserve had a net outlay last year (1993) of ¥280,000 of which ¥240,000 was provided by the government and mostly spent on salaries. The average level of salaries of reserve employees is very low being only ¥4000 per year (US$470). Earned income of ¥40,000 was almost equally divided between entrance fees to San-Ca-He scenic site in Mengyang sub-reserve, ‘multiple operations’ (rent from land areas used for cropping, e.g. in forest cultivation of special local ginger plants, income from the guest house located in Mengyang village, etc.) net income from the butterfly farm at San-Ca-He (see Photograph 9) and income from resource management fees (e.g. incomes from concessions for timber collection, fines for poaching and so on). Few funds are available for management of the reserves after meeting salary commitments and this limits the initiatives that can be taken by management. Little funding is available for research and for the provision of information to visitors.



Map 2: Location of the sub-reserves of Xishuangbanna State Nature Reserve



Map 1: The location of Xishuangbanna Dai Autonomous Prefecture, Yunnan Province, Southwest China

Mengyang sub-reserve plans to expand ecotourism at its San-Ca-He site and has undertaken considerable investment to establish suitable information there. It has taken a soft loan from the Yunnan Tourist Development Corporation to do this. As yet it has not been able to attract any joint ventures (or sole ventures) willing to propose complementary tourist developments at this site. There is a chance that it could actually make a loss on its investment. In Mengla, the main ecotourism site is Bubong. This is currently purely operated by the management of the Su -reserve. The tree-top walk there (see Photograph 1) was originally paid for by an American wildlife group to assist tree-top research but it is now little used for research purposes. It may soon be in need of major repairs. Possibly this site could be considered in the future for an ecotourism joint venture. Photograph 3 shows a roadside view of Mengla sub-reserve.

There was a chance to study a joint venture ecotourism development at Menglun sub-reserve (see Photograph 2). A nearby village farming co-operative has developed the Limestone/Forest Cliffs site near Menglun by constructing a pedestrian bridge across a stream and paths to ensure accessibility. In return, the farming co-operative will make fixed payments to the sub-reserve authority for five years and then income will be equally shared between the co-operative and the nature reserve authorities. This case is an example of a close connection between local farmers and ecotourism development.

In the towns many local people are employed in the tourist industry, e.g., ethnic restaurants, and in hotels and guest houses. A Dai village near Gannanba has embarked on its own tourist park (featuring concrete replicas of identities from Dai mythology) as shown in Photograph 4 but this is not· directly linked to the Nature Reserve.

The pest problem was also investigated. The major pests associated with the nature sub-reserves are elephants. Elephants for example, destroy rice crops ready for harvest, maize crops and bananas. In some areas, electric fences are used to exclude elephants from farming areas. While electric fences are initially very successful, some elephants learn how to disable them, e.g., by pushing over the posts holding the electric fence. Photograph 5 shows an example of electric fence at Zhong Tian Ba village. The Reserve Protection Bureau pays out about ¥100,000 per year in. compensation for ·damage to farms by pests (mainly elephants) but damage by elephants from the Reserve is estimated to be about ¥1m per year. The amount of compensation paid to each farmer is a given proportion of the claim, e.g., around 10 per cent depending upon the total size of the annual claims compared with the total funds available for compensation. Farmers may have to wait a considerable time for compensation and it has been suggested that farmers with minor crop damages fare relatively better under the system than those with severe crop damage. The WWF has supplied the electric fence equipment which is powered by solar charged batteries and maintained by the Reserve Protection Bureau.·Despite the fact that electric fences are not 100 per cent excluders of elephants, the villagers believe that they play a useful role in excluding elephants.

Photograph 1: Bubong tree top walk

Photograph 2: Entrance to Limestone Forest/Cliffs. A joint ecotourism venture of local farmers and Protection Bureau.

Photograph 3: A view of Mengla sub–reserve from the Mengla to Menglun road.

Photograph 4: Tourist park being developed by the Dai people in a village near Gunnanba.

Photograph 5:
Electric fence for excluding elephants in a village adjoining Mengyang sub-reserve. This fence is solar powered and supplied by WWF.

Photograph 6: Young Cassia simea trees in a tea field in the same village as the electric fence against elephants; a part of an agroforestry project.

Photograph 7: Dai girls skipping in Wongwu, a Dai village near Mengla.

Photograph 8: Yao women on the road leading to Laotian border crossing at Menghan.

Photograph 9: Sorting butterflies at the Nature Protection Bureau at Jinghong prior to further processing for sale.

Photograph 10: In the paddy fields at Zhong Tian Ba (the village referred to in photographs 5 and 6). Mengyang sub–reserve can be seen in the background.

While elephants account for around 90 per cent of damage to farms caused by animals from the Reserve, other animals which cause damage are monkeys, bears, gaurs, spotted deer and wild pigs.

In comparison to the total number of Chinese domestic tourists who visit Xishuangbanna annually (about 1 million) not many actually visit scenic sites in the sub- reserves. The sites in the sub-reserves appear to ·get about 10,000 visitors per year. By comparison, Menglun Botanic Gardens, operated by the Chinese Academy of Science, receives about 100,000 visitors per year. On the other hand, of course many visitors to Xishuangbanna see the sub-reserves while travelling on the main roads (see Photograph 3). Around 90 per cent of domestic tourists to Xishuangbanna participate in cross border travel to Laos and Mynamar with the latter being the most popular destination.

A keen interest does not yet ·appear to have developed in ecotourism as far as the average Chinese tourist is concerned. Chinese seem to be more interested in 'cultural' and packaged tourist attractions – folk villages, local food and dance restaurants, botanic gardens. One local tourist officer attributed this to (1) the short length of their visit (on average 3 nights and 4 days to the Prefecture) reflecting a short holiday period, (2) the fact that many Chinese find untamed forest forbidding and (3) most like to enjoy nature passively rather than actively (e.g. by bushwalking and other activities) as compared to Westerners. In addition, interpretation of ecological and natural features is poor so that environmental education for tourists is almost completely lacking. This is true even in Yunnan at sites open for tourism for a long time such as the Stone Forest located about 100 kms from Kunming.

Efforts to develop tourism in Xishuangbanna began rather late in comparison·to the opening up of China. It. did not begin until1985 and in fact Mengla County was only opened to foreigners last year. In 1993, there were 1 million domestic tourists to Xishuangbanna, 15,300 foreigners inclusive of Taiwanese and those from Hong Kong. Access has been much improved by the opening of Jinghong airport with direct flights from Kunming by Yunnan Airlines using Boeing 727 aircraft. However, transport still rema1ns a bottleneck to the growth of tourism in the Prefecture. Tourism can be extended by allowing airlines from other parts of China and from abroad to land at Jinghong the capital of Xishuangbanna Prefecture. The administration of Mengla County is also aiming for an airport. Upgrading of roads, improvements in tourist services and other facilities including telecommunications and energy supplies were mentioned by the Deputy Administrator of this County ·as important for tourist

development in the Prefecture.

A Tourism Development Plan is being drawn up for the whole of Xishuangbanna Prefecture by the Tourism development Bureau of Xishuangbanna. Because tourism and other developments involved environmental externalities, a co-operative or collective approach to tourism development is called for. Each public authority having an involvement in tourism development is required to develop a plan and submit it to the Xishuangbanna Tourism Development Bureau. Plans will need to accord with guidelines for the Prefecture and development will only be allowed in accordance with the adopted plan.

The Nature Reserve Protection Bureau of Xishuangbanna has already drawn up such a plan (Yunnan Forestry Investigation and Planning Institute, 1993) and Mengla County has completed the first step towards its plan, namely the investigation of its tourism assets and their cataloguing which has been undertaken by members of the Geography Institute of the Academy of Science. This process has now commenced in Jinghong County and will be started and completed in Menghai County by August 30, 1995. After this the Prefecture's tourism plan can be finalised. The Tourism Development Bureau of Xishuangbanna has the responsibility and authority to see that tourism developments are in accordance with the Prefectural tourism plan.

All major townships in Xishuangbanna have tourism development zones. Much building is being undertaken in these areas to provide facilities to cater for tourists, e.g., at Menglun, outside the Botanic Gardens. There are many plans to expand tourism in the Prefecture. It remains to be seen how successful tourism development will be as a regional development strategy for Xishuangbanna and to what extent it will relieve economic pressures on the Xishuangbanna Nature Reserve

Social forestry (agroforestry) is being investigated as· a means of reducing economic pressure on the Nature Reserve. A pilot agroforestry project has commenced at Zhong Tian Ba village which borders Mengyang Sub-reserve (see Photograph 6). The project has been sponsored by the WWF and the trees are supplied by the Nature Reserve Protection Bureau. A mixture of trees is being trialled but *Cassia siamea* predominates. It has nitrogen fixing properties, its leaves can be used for fodder and it allows lopping for firewood. It is traditionally grown in Dai villages but not by other minorities.

The theory is that agroforestry will reduce pressure on the nearby sub-reserve e.g. for timber

collection and reduce soil erosion. However, Zhong Tian Ba village does not have steeply sloping land and erosion is not a problem there. The project may be a top down one and this village may not be the best site on which to demonstrate success. The trees have been planted in between tea bushes, and on one site, terracing has also been undertaken.

The Ministry of Forestry is now searching for community (village) development projects which could economically assist villagers living near sub-reserves. It intends to use Rapid Rural Appraisal (RRA) techniques to help identify such projects. This involves communication with villagers and is a bottom-up process.

It is hoped that by appropriately identifying and funding such projects, that the Ministry through the Nature Reserve Protection Bureau, can enter into agreements with village leaders to prevent poaching and illegal use of natural resources in the villages' assigned area of the sub-reserve. It is planned to draw up a formal agreement in contrast to the situation at Zhong Tian Ba. The community projects will be funded by a Global Environmental Facility (GEF) loan to be made to China through UNDP and supervised by the World Bank.

Poaching is a serious threat to wildlife in Xishuangbanna. It is common to see minorities carrying guns for hunting purposes even on the roads leading through the sub- reserves.· Guns are frequently home-made and it is very difficult for Chinese authorities to control illegal hunting by local minorities in the sub-reserves even though legislation and surveillance exists. It is likely that a system of awards for reporting illegal activities will be introduced.

An important tourist asset for the Prefecture is the presence of the culture of a number of minority groups of which the Dai is the largest (Photographs 7 and 8). However, the Dai are diverse and can be divided into sub-groups. Traditional villages, clothing and customs can still be observed. Chinese authorities are a are of the importance of conserving local cultures and villages as tourist assets. Rebuilding of houses in traditional style is encouraged. Restaurants selling the special dishes of minority groups are relatively frequent.

It might also be noted that local minorities appear to be more in evidence in Xishuangbanna than in Thailand. They are an important tourist resource and the culture and artefacts could along with the natural resources including biodiversity, be a strong force to attract foreign tourist to Xishuangbanna.

4 Concluding Comments

Given that Xishuangbanna has been noted as on area of megadiversity (Mittermaier and Werner, 1990; Myers, S. 1988, 1990), has very valuable ecotourism assets and involves important socioeconomic issues from an economic development point of view (Tisdell and Zhu Xiang, 1994), it is an ideal Prefecture to study biodiversity conservation strategies in China. It is also important for these strategies to succeed in this Prefecture. As has been seen the Chinese Government is searching for and testing alternative approaches to achieving sustainable development in the Prefecture. There is a strong will to combine conservation and economic development effectively.

5 Acknowledgments

I would like to thank all who assisted with my fieldwork in Xishuangbanna in October 1994, especially Cao Meng Liang and Zhu Xiang. I also thank Samuel Boamah for inviting me to give this presentation.

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