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

Working Paper No. 17

**Financing Nature Reserves in China – The Case of
the State Nature Reserve of Xishuangbanna,
Yunnan: Financial Issues, Political Economy and
Conservation**

by

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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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Financing Nature Reserves in China: The Case of The State Nature Reserve of Xishuangbanna, Yunnan: Financial Issues, Political Economy and Conservation

ABSTRACT

Available funds for protecting and managing nature reserves are extremely limited in developing countries, including China. This article considers the financing and management of Xishuangbanna State Nature Reserve in Yunnan as a case study. This Reserve is under the overall management of the Bureau for the Protection of Xishuangbanna State Nature Reserve but there is considerable decentralisation in the management of its five sub-reserves. These are managed from four stations, one for each of the sub-reserves except for Mengla and Shangyang sub-reserves which share the same station. The source of funds for the Reserve and sub-reserves are listed and the nature of outlays are specified. Almost all available funds are spent on salaries wages and pensions for staff of the Reserve, leaving few funds for overheads, transport and other items, especially capital items. Government is the principal source of funding, but some income is obtained from ecotourism, from a butterfly farm and factory for processing butterflies, from multiple use operations such as rental income from concessions to grow passionfruit in parts of the Reserve, and from resource management fees such as fines imposed for illegal use of the Reserve and payments for the controlled removal of timber and wood from the Reserve.

Political influences on financing are discussed. It is suggested that the high ratio of expenditure on staffing to total expenditure can be partly explained by political considerations. It is, however, observed that actual salaries paid to employees of the Reserve are very low, even by Chinese standards. Given the shortage of discretionary funds available to the Reserve, especially for capital goods and investment, substantial progress with the latter items is dependent on foreign aid. In this respect WWF(Europe) has been one of the most important donors to date. In the future, some funds for such purposes may also become available from the Global Environmental Facility.

Financing Nature Reserves in China: The Case of The State Nature Reserve of Xishuangbanna, Yunnan: Financial Issues, Political Economy and Conservation

1. Introduction

In all developing countries, funds for protecting and managing nature reserves are very limited. This is still the situation in China. The usual situation seems to be that the funds available for administering nature reserves are barely sufficient to maintain the staff employed by the authorities responsible for this administration and that additional funds for transport and items other than salaries are severely limited.

As an example of financing and related issues, this paper considers the financing of the State-Nature Reserve of Xishuangbanna located in Yunnan in southwest China. Much of the data reported here were collected during a visit in October 1994.

Xishuangbanna State Nature Reserve consists of five sub-reserves:

- (1) Mengyang
- (2) Menglun
- (3) Mengla
- (4) Shangyang, and
- (5) Mangoa (or Menghai) (see Figure 1).

Overall responsibility for the protection of these sub-reserves lies with the Bureau for the Protection of Xishuangbanna Nature Reserve located in Jinghong, the capital of Xishuangbanna Prefecture. The day-to-day operations of the sub-reserves and a substantial amount of decision-making affecting their operations lies with their individual field stations or offices located in towns in the proximity of the individual sub-reserves. The administration station for Mengyang sub-reserve is located in Mengyang township and that for Menglun in Menglun township. The administration of Shangyang and Mengla is combined and the station is located in Mengla township. That for Mangoa sub-reserve appears to be located at Mengrai township. Most of the staff are located at these stations rather than in the sub-reserves

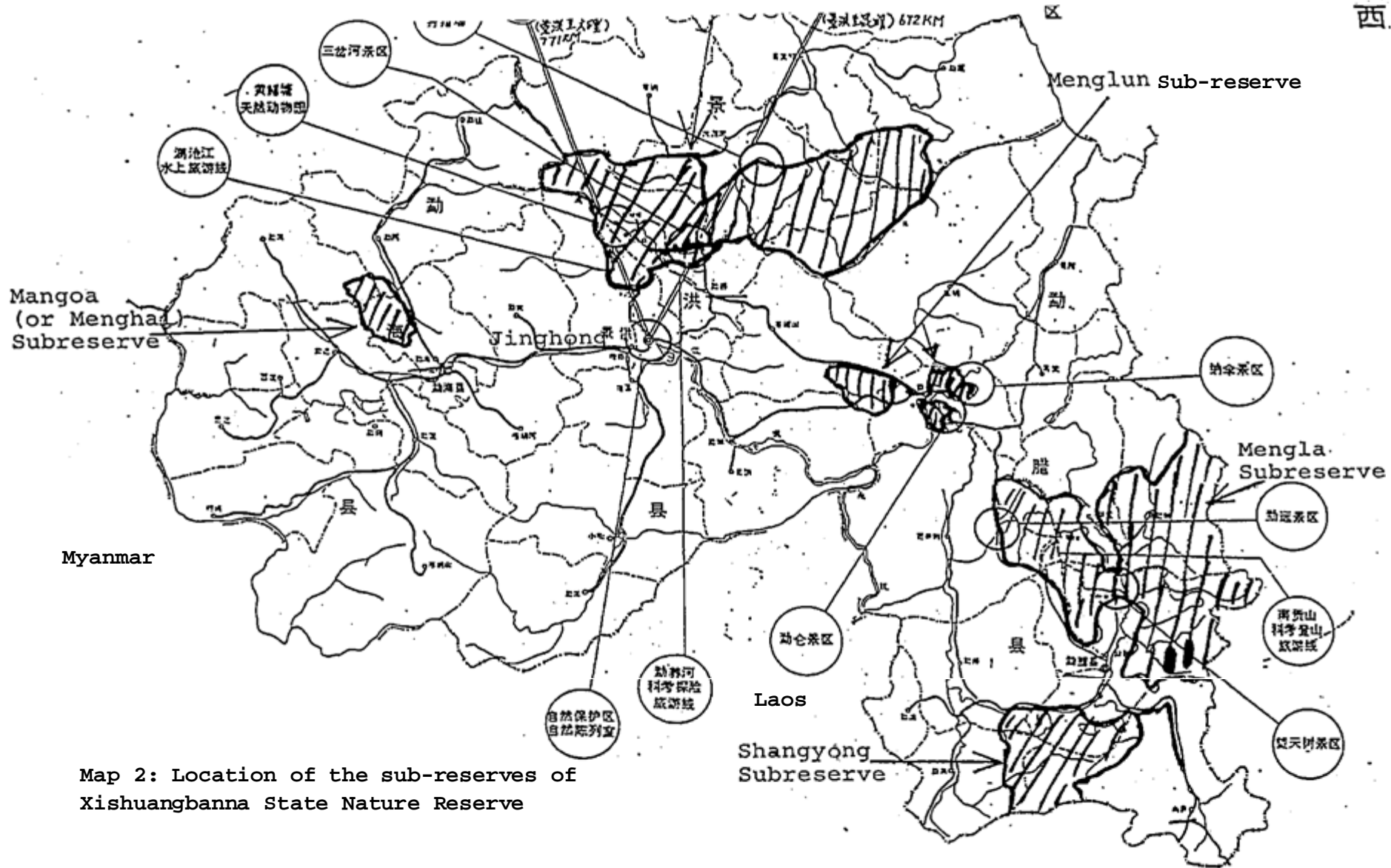
themselves.

2. Some Financial Details

Most of the funding for the Xishuangbanna State Nature Reserve is obtained from the central Government. The Bureau obtains these funds through the Forestry Department of Yunnan and then divides this sum into a fraction for administration of the Bureau and a fraction for the sub-reserve administration. In 1993 the Bureau was allocated ¥1.74m for its operations by the Government of which ¥1.13m was allocated to the administration carried out by the stations of the sub-reserves. The Bureau also obtains a very limited amount of income from other sources such as its butterfly factory located at Jinghong which processes butterflies for sale as souvenirs. Some of the butterflies used come from its butterfly farm located at San-Ca-He in the Mengyang Sub-reserve. The Bureau obtains a small amount of income from the administration of the sub-reserves e.g. a fraction of income from entrance fees to scenic sites.

The amount of funding available from the government for the administration of Xishuangbanna State Nature Reserve is usually adjusted in line with the rate of inflation. For 1994, it has for instance been increased to ¥2.54m to reflect the currently high rate of price inflation in China. Funds available show little or no growth in real terms.

In October 1994, 235 staff were employed in the administration of Xishuangbanna State Nature Reserve. Of these, 67 were employed by the Bureau in Jinghong and 158 were employed in the administration of the sub-reserves. In relation to the sub-reserves, 8 staff were engaged at Mengla (for the administration of Mengla and Shangyang combined), 50 at Mengyang, 23 at Menglun and 17 at Menghai. The first mentioned two sub-reserves are the largest in the system. These staff numbers do not include villagers paid a retainer to help with nature protection.



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

The income and expenditure for Mengyang Sub-reserve was reported to be as in Table 1. This indicates that ¥240,000 in 1993 was obtained from the Bureau (government funds). Of this ¥200,000 was spent on salaries, ¥28,000 on protection expenses and ¥1500 on security leaving only ¥10,000 for running vehicles, communication costs, propaganda and so on. Virtually no funds were available for investment purposes and in the view of the officers of the nature reserve, their funds were inadequate to provide support services.

In addition, a small amount of net income, ¥40,000, was obtained from other sources. This included approximately ¥10,000 from the entrance fee to San-Ca-Re scenic site in Mengyang Sub-reserve, ¥10,000 from multiple operations such as payments for the growing of wild ginger in the forest, rent for land used for growing crops such as passionfruit, and income from the guest house in Mengyang. It also includes net income from the butterfly farm at San-Ca-He of ¥10,000 and ¥10,000 from resource management fees such as fees for collection of fallen timber and fines for violation of the nature protection laws. This amounts to just over 14% of income of the sub-reserve. However, half of this income is paid to the Bureau with the sub-reserve administration retaining the remaining half. So this reduces the extra income obtained by the sub-reserve to ¥20,000.

Table 1: Some income and expenditure information for Mengyang Sub-reserve for 1993

Income from Government Budget	¥240,000
Expenditure (Main Items)	
Salaries	¥200,000
Protection expenses	¥1,500
Security	¥1,500
Available for other expenses such as running of vehicles, communication and so on	¥10,500
Other Net Income	
Mainly entrance fee to San-Ca-He scenic site	¥10,000
Multiple operations ^(a)	¥10,000
Net income from the butterfly farm at San-Ca-He	¥10,000
Resource Management Fees ^(b)	¥10,000
	¥40,000

(a) Includes income from cultivation rights in the sub-reserves and ¥4000 from Sub-reserve Guest House in Mengyang township. This latter sum pays the salary of the person in charge of the guest house.

(b) Includes fines for poaching etc. and fees for collection of fuelwood and timber for local village construction.

Menglung sub-reserve station was allocated ¥210,000 from the Government budget in 1993 of which 60 per cent was spent on the salary of its existing staff and ¥ 0,000 was used to pay the annual pensions of 10 retired staff. After these payments, only about ¥24,000 was left from government funds for remaining expenses. Of this approximately ¥10,000 was spent on forest protection and most of the other was allocated for field work. Approximately ¥20,000 - ¥30,000 is obtained as income from other sources. This extra income is mostly used for protection work and to improve the standard of living of employees. The main sources of this income are

- (1) Entry fees to scenic sites e.g. income from the Limestone Forest Cliffs site.

- (2) Income from the guest house in Menglun township.
- (3) Rental income from Reserve land used for fruit growing e.g. passionfruit.
- (4) Resource management fees e.g. fines for poaching, charges for fuelwood collection.

After meeting its salary and pension commitments, the sub-reserve only has ¥40,000 – ¥50,000 (US\$4,200 – 5,200) of funds available to it.

For 1993, the sub-reserve station for Mengla and Shangyang had an income of ¥510,000 from the Government of which the lion's share was spent on salaries and pensions. It received an income of approximately ¥20,000 from other sources. The main sources were income from tourists (visitor fees) to Bubong' scenic site and from resource management fees, mostly fines. Its proportionate income from other than direct government grants is lower than at Mengyang and Mengla. Although the administration of the sub-reserve has given some concessions for the growing of rubber 'trees, no income has been received from this source as yet.

In 1993, the overall distribution of government funds between the sub-reserves appears to have been

Mengyang	¥240,000
Menglun	¥210,000
Mengla/Shangyang	¥510,000
Mangoa	¥170,000
TOTAL	¥1,130,000

3. Discussion of Financial Issues

Lack of available finance seriously constrains the management of the sub-reserves. The average salary rate of employees is only ¥4,000 per year (around US\$470) which is a low subsistence level. However, housing is provided free and food supplies are supplemented in some cases from gardens and fruit trees grown in a limited area. Nevertheless, low incomes (even by Chinese comparative standards) are a fact of life for employees of the Reserve so it

is not surprising that pressures to expand standards of living are strongly felt. There is some interest (because of the shortage of government funding) to earn income from other sources, a number of which have already been indicated.

Income from ecotourism

Ecotourism is one such income source. Income is earned from entrance fees to three different sites in the sub-reserves. The Bubong site (Mengla) and the Limestone Forest Cliffs (Menglun) site appear to be profitable if only tourism operations are considered. .

The Bubong site has about 10,000 visitors per year and appears to earn ¥10,000 - 15,000 per year from visitors' fees. However, it was originally planned as part of Bubong Ecological Research Station which was a joint venture of the Xishuangbanna Nature Reserve Bureau and the Yunnan Ecological Institute and was intended for scientific research with an expectation of earning some income from visiting scientists paying fees to use the research facilities. However, this use has not materialized. The accommodation and research facilities built in Bubong village are virtually unused by scientists. Scientists from the Yunnan Ecological Institute consider the area to be remote and find it difficult to obtain supplies there so now the building in Bubong village is mainly rented for general accommodation and the scenic site is basically only used for tourism.

The treetop walk in Bubong scenic site was financed by an American wildlife group. It is likely to need major repairs in the future for tourism purposes. Possibly a future joint venture could be considered to finance repairs and improvements.

A joint venture arrangement has been entered into for development of the Limestone Forest Cliffs site in Menglun Sub-reserve for ecotourism. The joint venture is between the sub-reserve and a local farming co-operative. The sub-reserve is assured of an annual payment for five years from the venture (paid by the farming co-operative) increasing year by year. After the fifth year, the sub-reserve and farming co-operative will share receipts equally. In return, the farming co-operative has carried out capital works at the site e.g. constructed a substantial walking bridge across a river to provide access to the site and walking paths. Thus the administration of the sub-reserve has not had to meet any capital costs and the development is virtually riskless from its point of view.

This is not the situation at San-Ca-He in Mengyang sub-reserve. An attempt is being made

here to expand the number of paying visitors at the site and increase income obtained from ecotourism. The theory is that by providing improved infrastructure and facilities at the site, joint venturers or sole venturers will be attracted to set up tourism-related enterprises there. A substantial concrete road has been constructed and a small hotel/guest house is being built. Walking tracks using concrete bricks have been constructed. For this purpose, the Bureau has borrowed about Rmb5m from the Yunnan Tourist Development Corporation. As yet no joint ventures have been attracted. The economic viability of the project depends on joint or sole ventures interested in tourism being attracted to the site. If the administration of the sub-reserve is forced to operate the new hotel/guest house and no other tourist ventures are attracted to the site, income will be insufficient to repay the loan. Without other participants, the development will result in an economic loss for Xishuangbanna Nature Reserve Bureau and will be a financial drain. In this case, the risk is being carried by the Bureau and the capital sum is relatively large. In contrast with the previous example of ecotourism development in Menglun sub-reserve, the development at San-Ca-He involves considerable financial risk for the Xishuangbanna Nature Reserve Bureau. While tourism ventures can add to the financial resources of the Reserve, they become a financial drain if they are not a business success.

It was also mentioned that while financial assistance for capital works from various donors is always welcome, that problems arise in many cases (e.g. GEF funds) because no provision is made for expenditure on maintenance. Often local funds are insufficient for this purpose.

Income from the butterfly farm

Mengyang operates a butterfly farm at its San-Ca-He site. Butterflies are bred and reared there and then processed in Jinghong at the Bureau's headquarters for sale for souvenirs. The farm is partially an initiative of the WWF to increase the finances available to the sub-reserve. Facilities consist of a small building containing displays and a nursery and an outdoor meshed dome in which butterflies can be released.

Three persons are employed at San-Ca-He to operate the butterfly farm of which only one is funded from the sub-reserve's budget. The remainder are paid from actual income from butterfly sales. The butterfly farm is said to be profitable earning a net income of about ¥10,000 annually.

Eight persons are employed at the Bureau's headquarters in Jinghong processing butterflies

and producing products incorporating butterflies. This is also a profitable operation.

However, the 'butterfly factory' at the Bureau's headquarters does not rely solely on supplies from the San-Ca-He butterfly farm but purchases a substantial quantity of butterflies from those who collect these along the roadways. This appears necessary to meet the competition because there are a number of independent operators producing products from butterflies collected from the wild. Whether or not this 'open-access' collection is endangering populations of some species of butterflies is unknown. However, while it has been reported that WWF has some concern about this, Chinese authorities are of the view that the practice is not currently endangering any species of butterflies. A greater danger to butterfly populations would be loss of the food sources used by different species of butterflies. Within the Reserve, these are relatively secure but this is not so outside the Reserve where satellite imagery indicates that vegetation cover has declined considerably in recent years in Xishuangbanna Prefecture.

The butterfly processing factory at the Bureau's headquarters operates basically in two large rooms. In one room, butterflies are sorted by species and according to their condition. In the second room, any detailed work on the butterflies is done and they are incorporated into products e.g. put in glass display frames, mounted on display plates etc. Although there is considerable competition with independent operators, according to the Director of the Bureau, the butterfly enterprise of the Reserve is profitable.

Income from multiple operations

Within the sub-reserves of Xishuangbanna State Nature Reserve so-called multiple-use projects are undertaken. For instance, local villagers pay a fee to grow local wild ginger in the forest. This ginger is used for medical purposes and requires tree cover. This use may have little adverse effect on the forest.

Concessions have also been given for the growing of passionfruit, pomelo (also known as shaddock *Citrus grandis*) and rubber trees in Xishuangbanna State Nature Reserve. Clearly such operations substantially replace natural vegetation and exhibit some conflict with biodiversity conservation even though the extra funds are said to be used to protect the sub-reserves. In those sub-reserves that are especially short of finance, there is a temptation to extend these 'multiple uses' because they involve no capital outlays by the administration of the sub-reserves and provide a relatively assured source of income in terms of annual rent or

fees.

The manager of one sub-reserve thought that more 'wasteland' in his sub-reserve could be used in this way to generate income. However, at least one of the discussants present raised the point that there is rarely such a thing as wasteland in a forest ecosystem, and suggested that great caution be exercised on biodiversity grounds in allocating such land to 'multiple projects'. While multiple projects may help to gain local support for a sub-reserve, it is not clear whether they are all allocated to local villagers with low to moderate income.

Extension of multiple use needs to be carefully monitored so as to not compromise the biodiversity objective of the Nature Reserve. Already existing villages encompassed by the Reserve and their immediate surrounds are excluded from the Xishuangbanna State Nature Reserve. The areas around these villages, usually located along streams, are intensively cultivated in most cases. Many of these areas were already cultivated prior to the establishment of the Reserve.

Another small source of income is from the guest house of the sub-reserves located at their main stations of the sub-reserve in the towns. They are in the same area as the general accommodation provided for many of the staff of the sub-reserve and some rooms appear to be occupied by permanent staff. Priority for accommodation is given to visiting staff of the Bureau or of officials involved in business connected with the Nature Reserve. However, other tourists may also be accommodated. The charge is very low at ¥20 for a room per night. Facilities are quite reasonable by Chinese standards but maintenance, because of lack of funds, appears to be a problem. There is probably scope to increase income from these facilities by spending a small sum on fixtures and fittings. Currently, the income from these guest houses is only enough to pay the salary of one person who maintains them. If capital and other items were included, then these operations would run at a loss using Western accounting methods. However, there would be good prospects for increasing income from this source with small outlay.

Resource management fees

Income from resource management fees covers two basic items: (1) income from rights to take resources from the Reserve and (2) income from fines for violation of the law e.g. illegal poaching and removal of timber. Local villagers are permitted to collect firewood in the Reserve and may also be permitted to fell some trees for limited local use e.g. for use in

house construction. By permitting some legal use of the resources of the sub-reserves, local people may be more sympathetic to its existence and have less excuse for illegally using such resources. Fines are levied on those caught for illegal hunting or use of the resources of these sub-reserves and these may be retained by administration of the sub-reserve.

Concluding comment on finances

The scope for the management of the Xishuangbanna State Nature Reserve to earn income is relatively limited particularly as it does not want to compromise its biodiversity conservation objectives. The Bureau seems likely to be dependent on government funds for the major part of its finance for some time to come. While some ecotourism projects in the Reserve are bound to be net income earners, others involve considerable business risks. While concessions for multiple projects involve little financial risk for the administrators of the sub-reserves, some types of multiple projects can have major adverse environmental impacts on natural ecosystems and therefore caution is needed in increasing financial reliance on these.

4. Political Economy Aspects

The Bureau for the Protection of the Xishuangbanna State Nature Reserve has been established under the regulations of the Xishuangbanna Dai Autonomous Prefecture. Therefore, its operation is to some extent influenced by the administration of this Prefecture. However, the major part of its funding is from the Ministry of Forestry through the Yunnan Provincial Forest Service. So it has several bodies that can exert an influence on the Bureau.

As for the administration of the sub-reserves, the Bureau has to approve all appointments and allocates funds for the sub-reserves. However, the county government or administration can also have an influence e.g. in relation to appointment of leaders of the sub-reserves and may issue instructions to the administrators of the sub-reserves.

The political system therefore allows for multiple influences on policies pursued by the administration of Xishuangbanna State Nature Reserve. Because multiple bodies can have an influence, there is a possibility of conflict between these and such conflict has to be resolved by political means. Lines of command are by no means as hard-and-fast or definite as one might imagine. While this allows the interplay of a variety of social forces, it also provides

scope for slack and inefficiency in the administrative system.

The sustainability of the Nature Reserve depends to some extent on political perceptions about its role. Politically, it is desirable to have the support of local communities or at least not to have them hostile to the Reserve. Therefore, local communities should obtain some benefits from the existence of the Reserves and have any of its adverse impacts (such as caused by straying elephants) mitigated. The challenge is how to provide benefits to local communities without compromising the conservation goals of the Reserve. Apart from the use (mentioned above) of some of the resources of the Nature Reserve by local villagers, the Bureau is interested in supporting economic development projects for local communities. In this respect agroforestry (social forestry) projects are being explored and rapid rural appraisal (RRA) will be used in an attempt to identify community projects which are wanted by local communities and which may raise their income. The theory is that by increasing the productivity of the land outside the reserve and improving economic opportunities in Xishuangbanna Prefecture, this will ease pressures to use the resources of sub-reserves unsustainably for economic gain.

5. Concluding Comments

Even in developed countries, funds for the management of national parks and nature reserves always appear to be in short supply but the situation in developing countries is more acute. The State Nature Reserve of Xishuangbanna provides a practical example of the financial difficulties faced by administrators of Nature Reserves in developing countries and in particular is representative of the financial and political difficulties faced by such administrators in China. Given the constraints mentioned, international aid can play an important role in financing initiatives for supporting biodiversity conservation in China. This is because few funds are available to administrators of nature reserves to fund biodiversity conservation initiatives after meeting operating expenses. While there may be technically scope for economising on the use of funds for administration of Nature Reserves, for example by reducing the number of staff employed, politically scope for this may be limited. Furthermore, any reduction in employment in nature protection is liable to add to China's rural labour surplus and may do little to bolster local political support for Nature Reserves. In addition, most administrators are aware that public funds are less likely to be reduced if they are required for salaries of employed staff than if they are needed for 'discretionary' purposes. Thus for sound political reasons there is an upward bias in the employment of labour in

relation to other purchased inputs for administration.

In the case of Xishuangbanna State Nature Reserve, overseas funds have played a useful role in enabling development initiatives to be taken. Funds from the Worldwide Fund for Nature (WWF) have been used to establish the butterfly farm at San-Ca-He, for the provision of electric fences to exclude elephants from farms and for experimental agroforestry. Construction of the treetop walk at the Bubong scenic site was financed by an American wildlife organization. Capital works seem to be heavily dependent on outside funding. Joint business ventures have been used recently to tap outside capital for the Reserve, e.g. the Limestone Forest Cliffs development at Menglun. One of the problems raised about international aid, however, is that no funds are made available for maintenance and operating costs as a rule. Funds are usually provided only for the establishment of projects, not their maintenance. It is very difficult for the administrators of Nature Reserves in China to find sufficient funds from their own sources to take care of such items.

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