



# Getting the private sector to work for the public good

Instruments for sustainable private sector forestry in China

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# Executive summary

Within the space of two decades, China's forestry sector has been transformed. As part of a broader effort to implement its 'socialist market experiment', China has sought to negotiate a shift in responsibility for forest utilisation and management away from the state sector towards the private sector. While reform has progressed step-by-step, the cumulative change has been significant. As early as 1985 it was estimated that over 50 per cent of the increase in forest area was accounted for by private entities. By 1995, an estimated 95 per cent of all collective households were involved in some form of contract tenure arrangement in forest land.

While China contains the fifth largest area of forest in the world, against most measures China is forest-deficient. Set against its population China has only 0.1 hectares per capita, considerably less than the world average of 0.6 hectares (FAO, 1997). China's forest resources are not only small relative to its area and population, but are also small relative to demand. China is the second largest timber importer in the world.

Reform was set in motion by the extension of the 'Household Responsibility System' from agriculture to forestry in the late 1970s. Under the new system rural households, who had not previously been permitted to generate private returns from forestry investment, were offered new opportunities to lease forest land and own planted trees. Subsequent efforts to liberalise the forest products market in the 1980s, and more recently, to lengthen leases and permit leases to be auctioned and traded have provided critical boosts to the emergence of a private forestry sector.

While the changes underway in China's forestry sector are significant, any attempt to paint broad pictures in such a large and diverse country is fraught with difficulties. Although reform at the national level has provided a framework to guide change, local level implementation is inevitably more complicated. Provinces, prefectures, counties and even Townships and Villages have adopted their own approaches to negotiating the changing roles and responsibilities between the private sector and government.

The wealth of experience generated by local level experimentation makes evaluations complicated. However, it also offers a crucial opportunity for learning lessons. After two decades worth of experiences, it is time to take stock. This paper seeks to make a start at the enormous task of lesson learning



by improving our understanding of the nature of private sector participation in forestry, the associated costs and benefits, and identifying constraints and opportunities for the private sector to become a major force for improving forest management.

The paper looks back as well as forward for guidance. In looking back, the aim is to learn from experience, both negative and positive, generated within China over the past twenty years on forest land tenure and contracting-out systems, as well as forestry taxation schemes. In looking forward, the paper seeks to identify emerging policy opportunities that are being tentatively explored by local and national authorities. Three stand out: company-community deals; payments for forest environmental services; and forest certification. Key insights offered by this paper are summarised below.

## **Making the most of forest tenure reform**

Efforts to contract forest land use rights to private households has been a critical component of broader economic and social reforms underway in China since the late 1970s. However, reform has not been smooth or uniform. Forest tenure varies from province to province, from county to county and even from township to township. Moreover, efforts to ‘decollectivise’ forestry come against a backdrop of frequent policy reversals and high levels of tenure insecurity. This insecurity poses one of the most difficult challenges for policy-makers wishing to promote increased private investment.

Decollectivisation has gone furthest in the southern collective regions. By 1986 collectives had contracted an estimated 69 per cent of forest land in 8 provinces to households for use and management. Positive impacts for forestry yields, employment, income, and the environment are widely praised – and with some justification. Field data from Banliu Village, Yunnan Province, points to significant increases in private investment in forestry where households have been contracted barren lands by collectives. Positive knock-on effects for employment and the environment underpin village enthusiasm for tenure reform.

But not all collectives have been equally enthusiastic, and a number have even stalled or reversed reforms. In some cases collectives have recoiled from reforms they perceive to threaten their authority. In others, early efforts to hand responsibility for forests to local households failed to generate predicted gains. A particular concern is negative spin-offs for equality and marginalisation of less productive households.

Even where collectives have been keen to promote contracting out, a number of constraints have frequently blocked progress. Insecure tenure associated with unsettled boundary disputes, overlapping and conflicting government mandates, an unfavourable investment climate (due to high taxation, remoteness to markets, expensive finance, etc.), inadequate local implementation capacity, restrictive harvesting quotas are some of the factors undermining success.



While constraints are formidable, this paper draws attention to four advances in contracting out that offer potential ways forward. These include:

Introducing more balanced benefit-sharing terms in contracts to encourage private investment;

- Allowing contract transfers so that households may move in and out of forestry more easily;
- Promoting auctions to allocate forest land use rights to the most efficient producer and to maximise revenue for the contracting authority; and
- Lengthening the period over which forest land may be contracted and thus the security and planning horizons of contractors.

Data limitations make it difficult to draw out specific lessons from experience with decollectivisation. Constraints and ‘best practice’ guidelines identified in this chapter are tentative. The challenge facing policy-makers is to build a better understanding of variety of experiences found in China and those factors that underpin success.

## **Rethinking forestry taxation**

While China has made significant strides in promoting private investment in forest management, reform of its outdated forest revenue system lags behind. As progress continues elsewhere, the lack of reform to the taxation and charging system represents a serious bottleneck.



The problems with the existing taxation system are not hard to identify. Taxes and charges are excessive and fail to encourage re-investment in forest establishment and management. There is a lack of control over local-level charges. Implementation of national taxes and charges is characterised by manipulation and rent-seeking. Low levels of efficiency in collection and the diversion of revenue away from the forestry sector create even greater pressures to raise rates.

Combined, these problems represent perhaps the most serious threat to efforts to improve forest management. Already, the taxation and charging system is blamed for a number of damaging economic, social and environmental consequences. In the longer term, high taxes and charges threaten to starve the sector of investment and lead to its ultimate decline. Rather than higher taxes and fees increasing government revenue, lower taxation and charges are essential to securing the forest sector’s health and thereby maintaining the government’s forest revenue base. Most importantly a link between charges and resource value needs to be established.

To tackle these problems successfully, an understanding of the underlying causes of its persistence is needed. This paper highlights how ingrained perceptions of forests as a resource to be mined, the tensions inherent in distributing forest

rents, and the struggle of government institutions to stave off bankruptcy must all be dealt with as part of a broader strategy to bring down taxes and charges.

### **Promoting company-community deals**

In the context of the government's Natural Forest Protection Programme and Great West Development Programme and the associated massive commitments to plantation establishment, company-community deals offer a valuable opportunity for generating much needed private investment in forestry.

On the face of it, such deals offer clear win-wins. Not only do deals allow capital-rich companies to access land and raw materials for their businesses, but landholding communities receive much needed financing for investment and access to new forest technologies. For poor rural households, increased and more reliable income associated with long-term contracts has the potential to boost significantly both their existing asset base and their well-being.

When we take a closer look at emerging deals, a more complex set of relationships and costs and benefits emerge. Based on an investigation of long-term contracts negotiated by the multinational, Asia Pulp and Paper Company Ltd., in Guangdong Province, this section has raised a number of concerns. Perhaps the most important relates to the fact that deals are not between companies and communities, but between companies and local governments. While the government's central role in negotiating and managing deals offers potential benefits for communities by reducing transaction costs in concluding deals, it also alters the balance of power and distribution of rewards. It is not always clear how much consultation takes place with communities, or whether the government's involvement improves outcomes for local livelihoods.

Given the tremendous potential for company-community deals to benefit all involved, it is crucial that more research is undertaken to identify successful models and highlight potential pitfalls in negotiating deals.

### **Payments for environmental services – involving private players**

Ambitious plans for natural forest protection and plantation establishment under the Natural Forest Protection Programme and Great West Development Programme are serving to focus minds on the question of financing forest environmental service protection. The government is committed to spending tens of billions of RMB over the coming years. For investment to be sustained, however, innovative thinking is needed.

Getting beneficiaries of environmental services to start bearing a larger share of the costs of service provision offers one potential solution. This is clearly acknowledged in the government's establishments of a central Forest Environmental Benefit Compensation Fund in 2001. But efforts to expand this initiative to the local-level have been slow.

While implementation of Forest Environmental Benefit Compensation Funds are taking time to get off the ground, a number of local initiatives to introduce payments for environmental services are emerging. This paper has drawn attention to examples of payments for forests' watershed protection, biodiversity conservation and landscape beauty services. Not only are regulatory authorities introducing requirements that beneficiaries pay, but state and private enterprises threatened by the loss of key services are increasingly offering to finance improved land management and forest protection.

The introduction of payments for environmental services faces a number of challenges. Factors limiting willingness to pay include a low environmental awareness, low ability to pay, the lack of a mechanism for involving beneficiaries in decisions about payments, and a widespread feeling that it is the government's responsibility to look after the environment. These constraints are compounded by supply-side restrictions relating to the non-excludable nature of environmental services, lack of supplier participation in devising payment schemes, difficulties in valuing the environmental service and high costs associated with implementing payment systems. While constraints are formidable, the greater the pressure for payments the more energy will be devoted to finding solutions.

The analysis of payments for forest environmental service in this paper has been restricted by a lack of written material. The insights provided are offered in an effort to stimulate thought. The need for a more thorough review of experiences in China, and an evaluation of ways forward is becoming urgent.



### **Forest certification – a new market-based policy tool**

Forest certification is a new concept for many in China. Unlike forest taxation and tenure reform, forest certification does not hold prospects for major shifts in forest management in the near term. However, it does offer policy makers a new tool that could neatly complement reforms in other areas. Moreover, its ability to influence private behaviour and promote improved forest management is likely to grow over time.

Given low levels of domestic experience, this paper draws on international experience, especially with Forest Stewardship Council certification. However, two key features of China's situation set it apart from other countries. Firstly, demand for certified Chinese timber is very small. Domestic demand is virtually non-existent, and exports to environmentally conscious markets well below 1 per cent total Chinese production. This fact immediately undermines the likelihood that certification will be a market driven phenomenon in China, at least in the near term. Secondly, China does not have a powerful domestic non-governmental movement seeking to kick-start demand. If certification is to become a force for change, the government will have to play a central role.

Given the essential role of government in getting forest certification off the ground, this paper offers a preliminary assessment as to whether such an initiative would be worthwhile. On balance it is argued that potential benefits from the introduction of forest certification in China could be significant and further investigations are warranted.

## An array of policy opportunities

Based on over a year of research and widespread consultation, the paper ends by setting out key policy options for promoting sustainable forest management in the private sector. The aim is to make the most of reforms already underway, and to highlight potential opportunities for tackling emerging challenges. The proposed options are split into three categories:

- *Establishing a fair balance between risks and rewards.* As risks associated with forest investment are transferred to private actors, the potential for rewards must be augmented;
- *Raising investment in social and environmental benefits.* The challenge is not just one of raising investment in forestry. The government also needs to ensure additional funds are channelled towards socially and environmentally beneficial activities; and
- *Promoting additional research and the dissemination of guidance.* More resources and energy needs to go towards tracking local level experimentation with a number of policy options, and the development of Best Practice guidance for spreading lessons.

The Table below summarises policy options identified under each category.

<b>Policy options for increasing private investment in sustainable forestry</b>
<b>Options for balancing risks and rewards</b>
<p><b>Reduce taxation and charging burden</b>            Increase link between charging system and resource value – develop best practice guidelines for expanding the use of auctions in allocating forest land use rights            Consolidate and reduce service-based taxes and charges            Reduce over-employment in local forestry authorities – support re-deployment to enable clearer focus on forest management and protection activities</p> <p><b>Raising tenure security</b>            Clarify government mandates for land tenure and authority for awarding land use rights            Invest in clearing up boundary disputes            Develop a central land rights registry and strengthen dispute resolution, monitoring and enforcement mechanisms</p> <p><b>Improve tenure flexibility</b>            Lengthen duration            Extend transferability            Update harvesting quota system</p>



**Raise transparency and certainty in policy making**

Set up clear channels for communication between authorities involved in forestry  
Increase transparency and stakeholder consultation

**Options for promoting investment in social and environmental benefits****Support consolidation of un-viable forest plots**

Support communities to co-ordinate production systems through training, provision of information

Develop best-practice guidelines for implementing rights transfer systems that balance the need for a more efficient allocation of forest resources with social equity goals

**Supporting community ventures**

Strengthen community knowledge about options for contracts with companies, risks involved and potential benefits (e.g. through training programmes, workshops, publicity campaigns involving the newspapers, radio, etc.)

Make long-term contracts more flexible to allow communities and companies to reassess their participation at certain points within contract period

Introduce laws that allow legal enforcement of contracts signed between companies and communities

Introduce standardised approach/checklist for evaluating community land and labour inputs to ensure communities get a fair share of rewards

**Promote payments for environmental services**

Invest in education and awareness building to generate willingness to pay for environmental services

Consult on fair systems for raising funds to pay for the maintenance of environmental services

Introduce more effective actions to exclude non-payers, e.g. in scenic forest parks

**Build forest authority capacity**

Training in environmental management

Strengthen social forestry skills

**Options for further research and disseminating guidance****Invest in further research on key policy issues**

Transferable forest rights and auctions

Contract design for company-community deals in different environmental, social and economic landscape

Forest Environmental Benefit Compensation Funds – mechanisms for implementation

Research into potential links between a national certification scheme, and internationally recognised schemes, such as the Forest Stewardship Council scheme

**Develop guidance manuals for implementing key policies**

Contracting out

Auctions

Simplified and less heavy taxation and charging regime

Best practice in developing company-community deals

Implementing local Forest Environmental Benefit Compensation Funds

**Dissemination**

Publicity campaign (television, newspapers, journals) to improve general environmental awareness

Targeted education for forest environmental beneficiaries, e.g. hydropower and water supply utilities

## Next steps

Policy options listed in this book now need to be transformed into a detailed and prioritised strategy for implementation. A first step in moving towards an agreed set of activities must be the dissemination of this report to key stakeholders in national, provincial and local government, the private sector, research groups, local communities, donors and non-governmental bodies. While this report sets out a ‘first cut’ of policy options for moving forward, it is likely that future discussions will discard several options listed here and introduce new ones. Building consensus on next steps is likely to take time.

This report represents a synthesis of the following five **sub-studies** produced in China over an eighteen month period from March 2000:

Xu Jintao, Dai Guangcui, Xie Chen and Liu Jinlong. 2001.

*Forest tenure and contracting in China – getting to grips with a wealth of experience.*

Liu Jinlong, Xiao Wenfa, Sun Changjin, Hou Yannan, Xie Chen, Zhang Xiaojing, Wang Guang, Zhang Xuemei, Huang Xiaocun and Li Jizhong.. 2001.

*Study on the forestry taxation and charges system in South China collective forestry areas*

Lu Wenming, Zhang Caihong, Yan Shuai, Wei Yuanzhu, Yu Fawen and Tan Xiufeng. 2000.

*Company-community deals – some emerging experiences.*

Liu Can, Hu Tao, Zhong Maogong and Shi Feng. 2001.

*Markets for forest environmental services – increasing private sector participation in forest protection.*

Lu Wenming and Xu Bin. 2000.

*Forestry certification in China – a potential opportunity.*

These sub-studies, which are available from IIED in London and the Chinese Academy of Forestry in Beijing at the addresses listed on the inside cover, include additional background information, interpretation and opinion, and references to additional material. These studies are treated as source material for this synthesis and are thus not individually referenced.

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## Acronyms

DFID	Department for International Development
EC	European Commission
FSC	Forest Stewardship Council
IIED	International Institute for Environment and Development
ISO	International Organisation of Standardisation
NTFPs	Non-timber forest products
SFA	State Forestry Administration



# Introduction

## 1.1 Background

Since China initiated its policy of ‘opening up’ its economy in the late 1970s, it has experienced rapid social and economic development, with growth in Gross National Product averaging over 10 per cent per annum between 1978 and 1999. Over time, China has moved from a system where the government controlled most social and economic activities, to one where the private sector plays an increasing role. While reform has progressed step-by-step, the cumulative change has been significant.

The growing prominence of the private sector is particularly striking in the forestry sector. Emerging from the Cultural Revolution in the late 1970s in which all private forestry was banned, as early as 1985 it was estimated that over 50 per cent of the increase in forest area was accounted for by private entities (Li Jinchang *et al*, 1988). By 1995, Bruce *et al* (1995) report that 95 per cent of all collective households were involved in some form of contract tenure arrangement. As regards private foreign investment, *ad hoc* data suggests significant expansion. In 1996 alone, the government estimates that about US\$800 million was invested in forestry. Since then foreign investment has grown steadily rising to about US\$900 million in 1997, US\$1 billion in 1998 and over US\$2 billion in 1999.

Early moves to increase private sector participation in forestry hinged on the extension of the ‘household responsibility system’ from the agriculture sector in the late 1970s and gradual liberalisation of the forest product markets through the 1980s. Through these reforms the government had increasingly allowed individual farmers and groups to lease land (both barren and forested) owned by local communities (collectives) and permitted individual ownership of planted trees. Moreover, the reforms have increased individuals’ security by clarifying land-use rights and issuing legal certificates. Later, state-owned forest farms were also contracted to groups of farmers or individuals to manage.

The passing of the 1998 Forest Law and the launching of the Natural Forest Protection Program in the same year have accelerated the growing role of the private sector in forestry. The Natural Forest Protection Programme set out plans to protect over 95 million hectares of natural forest (which are mostly managed by the state) by 2010, while at the same time encouraging a dramatic increase in private sector investment in plantations. A target for reforestation, either through natural regeneration or artificial planting, has been set at 30.97



million hectares. As the source of timber supply shifts from natural forests to planted forests, private entities will become a growing force in the sector.

With the private sector emerging as a key player in Chinese forestry, the government must urgently develop a policy framework that ensures increased private investment is channelled to sustainable forest management, in line with public objectives.<sup>1</sup> This task is made more pressing with China's accession to the World Trade Organisation and the associated opening of its economy to foreign imports. This report sets out the key findings from a research programme launched in December 1999 to offer timely information and recommendations for policy-makers at all levels of government and key stakeholders (e.g. the private sector, researchers, donors, communities, etc.) on five critical issues:

- forest tenure and contracting systems;
- forestry taxation and charging systems;
- company-community deals;
- markets for forest environmental services; and
- forest certification.

These issues were identified through wide consultation with government officials, the private sector, academics, donors and other non-governmental representatives in Beijing, Zhejiang, Guangdong and Jiangxi provinces. The key issues tackled under each research theme are set out below.



## 1.2 Aim of study

This China Country Study serves as a part of wider International Institute for Environment and Development (IIED) project on “*Instruments for Sustainable Private Sector Forestry*” funded by the European Commission (EC) and UK Department for International Development (DFID) (see Box on the inside front cover of this report). The larger project aims to identify effective market and regulatory instruments for ensuring that the private sector produces social and environmental benefits from forest management; and to promote these instruments. The work is based on collaborative research with local, multi-disciplinary teams in five focal countries (China, India, South Africa, Brazil and Papua New Guinea), and on assessing key experience elsewhere.

The central aim of this China Country Study is to:

*“improve our understanding of the role of the private sector in forestry in China, and to evaluate how government policy can promote and channel private involvement to sustainable forest management, where sustainable forest management incorporates social, environmental and economic sustainability criteria.” (China Country Study Work Plan, 1999)*

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1. There is no official definition of sustainable forestry in China. Most documents use definitions developed by international organisations such as the United Nation's Food and Agriculture Organisation or the International Timber Trade Organisation.

To achieve these aims, this study has focused on the five key themes noted above. While these themes represent only a selection of the many issues in China's forestry sector today, they have been chosen for their relevance to ongoing policy debate, the possibility that research results can contribute to this debate and their relevance to broader international issues. Attention was also given to ensuring that this research does not duplicate past, or ongoing, work and adds new insights. The five themes are outlined briefly below.

### **Forest tenure and contracting**

The current forestry tenure and contracting system requires urgent attention. While reforms to this system in the 1970s and 1980s are behind the dramatic increase in private sector participation in the sector, implementation has been patchy, unstable and success rates have varied significantly around the country. As a result, there is a real need to synthesise experiences and analyse lessons for wider application. Research under this project on forestry tenure has involved an evaluation of the historical context in which current tenure systems have evolved, an assessment of the current status of reform in collective and state forest areas, identification of the key drivers for reform and exploration of constraints limiting change. Based on this analysis, potential recommendations for learning from past experience and adopting 'best-practice' are put forward.

### **Forestry taxation and charging systems**

The government's charging and taxation system is generally agreed to be a major constraint to private sector investment in the forestry sector. Not only does the Central Government impose taxes, but lower levels of government and sector authorities also have revenue-raising powers. There is little attempt to coordinate charges and as a result they are not only complex, but also excessive. In some provinces, the total burden of charges and taxes can reach 60 per cent or more of the forest product price. Focusing on forestry taxation systems in China's southern collective forestry areas, this research has identified potential reforms to forestry taxation systems that provide positive incentives for improved private sector forestry management.

### **Company-community deals**

There is a growing trend in the collaboration between private companies (both domestic and foreign) and local communities and households in the supply of raw wood. Such deals between companies and communities are set to continue to grow as the government promotes increased investment in plantations and forest regeneration under the Natural Forest Protection Programme, and as companies seek secure supplies of raw material. These relationships already vary tremendously and there is a need to take stock of those that work and those that fail and begin to identify lessons for policy-makers. This research draws on case studies of deals between foreign or domestic companies and local communities to improve our understanding of the conditions under which such deals can contribute to the promotion of sustainable forestry and the key challenges faced.

## Markets for forest environmental services

The need for a mechanism to compensate landholders for their forests' conservation values has come to the fore with the introduction of the Natural Forest Protection Programme and plans to set aside vast areas of natural forests from extraction. Forest-dependent communities need new sources of income to survive. A partial solution may lie with payments systems aimed at rewarding the supply of forest environmental services. The government is taking a lead in establishing payments for environmental services through its newly established Forest Ecological Benefit Compensation Funds. This research reviews increased private sector provision of forest environmental services in China, including watershed protection, biodiversity conservation and landscape beauty values, and draws attention to emerging challenges. Based on this review, policy recommendations for promoting further advances in the establishment of payment systems are put forward.

## Forest certification

Forest certification is widely acknowledged as a potential market-based instrument for promoting sustainable forestry. Discussions in China, while still at an early stage, are gaining attention as the government seeks to establish a mechanism for regulating use of the vast areas of natural and planted forests, and as exporters are waking up to potential market opportunities. This research aims to offer a timely input into the debate by evaluating the desirability of alternative forest certification schemes for China, highlighting constraints and putting forward policy recommendations.

While the first two themes deal with existing issues that have received considerable attention from researchers, there is a real need to synthesise this work and undertake a systematic analysis to draw out lessons. The last three issues represent emerging policy opportunities for promoting private investment in sustainable forestry.

## 1.3 Defining the private sector in China

This paper adopts a broad definition of the private sector to include all those non-governmental entities (e.g. individuals, households, informal household groups, domestic enterprises and foreign companies) that are organised for profit-making. In addition, shareholding co-operatives are generally considered private entities. Shareholding co-operatives are typically set up through the allocation of shares in an enterprise to local households, often according to their labour, financial or material inputs. However, where shareholders include government entities and the cooperatives represent a new state entity, these cooperatives have not been considered.

## 1.4 Methodology

### Process

China, along with Brazil, India, South Africa and Papua New Guinea, was selected as a key country for detailed investigation in late 1999 under IIED's "*Instruments for Sustainable Private Sector Forestry*" project. China was first identified as offering potentially valuable lessons for the outside world on private sector participation in forestry in a global review carried out by IIED in early 1999. Subsequent discussions with key stakeholders and at an international workshop held in the UK confirmed China's participation.

Following two scoping visits to China by staff from IIED and the London-based Overseas Development Institute in July-August and October-November 1999, a workshop was held in Beijing on November 11, 1999 to bring together potential researchers and other interested stakeholders from the government, private sector, academia and donor community. Workshop participants (see Annex 1) identified the five research themes highlighted in Section 1.2 above.

Following the workshop, five multi-disciplinary research teams were selected, bringing together members of a range of different research institutions. These include the Chinese Academy of Forestry, the Centre for Chinese Agricultural Policy, the China National Forestry Economics and Development Research Centre, Beijing Forestry University, the Research Centre for Ecological and Environmental Economics and the Policy Research Centre for Environment and Economy. The study was co-ordinated by Professor Lu Wenming of the Chinese Academy of Forestry and Natasha Landell-Mills of IIED. Gill Shepherd of the Overseas Development Institute provided technical support. Also, a Project Advisory Committee was established to help guide the study and support dissemination of research findings. A list of those who were involved in, and contributed to, the study is set out in Annex 1. An effort was made to ensure a multi-disciplinary approach involving individuals from different institutions.

The research commenced in March 2000 and first drafts of team reports were completed for a preliminary findings workshop held in the Chinese Academy of Forestry on November 7, 2000. Based on comments from this workshop, reports were revised and presented at an international meeting held by IIED in London between November 22-24, 2000. This meeting provided an opportunity for representatives from different country studies (also including India, Brazil, South Africa, and Papua New Guinea) under the wider "*Instruments for Sustainable Private Sector Forestry*" project to share results and discuss lessons learnt. This paper represents a synthesis of final results from the following five sub-studies:

- Xu Jintao, Dai Guangcui, Xie Chen and Liu Jinlong. 2001. "Forest tenure and contracting in China – getting to grips with a wealth of experience".
- Liu Jinlong, Xiao Wenfa, Sun Changjin, Hou Yannan, Xie Chen, Zhang Xiaojing, Wang Guang, Zhang Xuemei, Huang Xiaocun, Li Jizhong. 2001. "Study on the Forestry Taxation and Charges System in South China Collective Forestry Areas".

- Lu Wenming, Zhang Caihong, Yan Shuai, Wei Yuanzhu, Yu Fawen and Tan Xiufeng. 2000. “Company-community deals – some emerging experiences”.
- Liu Can, Hu Tao, Zhong Maogong and Shi Feng. 2001. “Markets for forest environmental services – increasing private sector participation in forest protection”.
- Lu Wenming and Xu Bin. 2000. “Forestry certification in China – a potential opportunity”.

These sub-studies, which are available from IIED in London and the Chinese Academy of Forestry in Beijing, include additional background information, interpretation and opinion, and references to additional material. The final results of the China Country Study were presented at a seminar in Beijing in May 2001.

## Methodology employed for research

While approaches adopted by research teams varied, in the main they all included two principal steps:

- a review of relevant domestic and international literature – published and grey material was reviewed and internet searches conducted; and
- primary data collection to fill gaps – interviews were held with key stakeholders in national research institutes, government policy making departments, company headquarters and at the local level.

The balance depended on the amount of information currently available. Primary data collection was also limited by available resources. Details on research teams’ approaches may be found in the final reports listed above.

## 1.5 Structure of this report

This report is set out in eight sections including this introduction. Section 2 sets the scene by providing general information on China and the importance of forestry, identifying the main stakeholders involved in the forestry sector and outlining government policy and legislative milestones on the road towards greater private sector involvement in forestry. It ends by flagging the key emerging challenges as reform proceeds. Each challenge is taken up in Sections 3 to 7, where results from the five research teams set up to investigate these issues are described. Section 3 and 4 consider forestry tenure and forestry taxation. While these issues have been much discussed by policy-makers, and in some cases throw up exciting examples of advancement, in too many instances they continue to represent obstacles to increasing private investment in sustainable forestry. Sections 5 to 7 turn to more recent initiatives in the forestry sector aimed at providing a positive framework for private participation in forest management and protection. These include: the emergence of company-community partnerships, markets for forest environmental services and forestry certification. In Section 8 an attempt is made to draw this work together to highlight an array of policy opportunities and to put forward recommendations and possible next steps for government and other key stakeholders.

# Setting the scene

## 2.1 Brief profile of China

The People's Republic of China covers about 9.6 million square kilometres and is the third largest country in the world, next only to Russia and Canada. China is also the world's most populous country, with 1.26 billion people at the end of 1999, about 22 per cent of global population. Given its tremendous size, presenting a simple picture of China is extremely difficult. Nevertheless, in what follows an attempt is made to draw out key features of China's environment, economy and governance structure to provide a backdrop for the remainder of the report.

**Geography and climate:** From north to south, China covers 5,500 kilometres while from west to east, the distance is 5,200 kilometres. China extends over a wide array of climatic zones including tropical, subtropical, warm-temperate, temperate and cool-temperate zones. In the north, mean annual temperatures may be as low as  $-5^{\circ}$  Celsius, while in the south temperatures rise to  $25^{\circ}$  Celsius. Annual precipitation is equally varied, ranging from 2,000 millimetres in the southeast to 100-200 millimetres in the northwest. Geographically, China is also characterised by contrasts. In the west, high plateaux and mountains dominate, covering 26 and 33 per cent, respectively, of China's total area. As we move east, mountains give way to basin areas and plains. Snow melting in the high plateaux and mountains in the west provide the headwaters for many of the country's largest rivers.

**Flora and fauna:** Given its geographical and climatic diversity, it is not surprising that China is also one of the most biologically diverse countries in the world. China is home to more than 4,400 species of vertebrates, or 10 per cent of the world's total. There are nearly 500 mammal species, 1,189 species of birds, more than 320 species of reptiles and 210 species of amphibians. Endemic species abound and include well-known animals such as the giant panda, golden-haired monkey, South China tiger, brown-eared pheasant, white-flag dolphin, Chinese alligator and red-crowned crane. There are about 8,000 tree species in China, among which 2,000 are conifers (26 genera) and broad-leaves (260 genera). Some of the world's most precious and rare tree species are found in China, e.g. the Dawn Redwood (*Metasequoia glyptostroboides*), Gingko (*Ginkgo biloba*) and Chinese tuliptree (*Liriodendron chinense*). To protect this diversity, by the end of 1999 776 nature reserves had been established, covering 67 million hectares, or 7 per cent of national land area.



**Land use:** China's land area is divided into cropland (10.4 per cent), permanent pasture (42.9 per cent), forest and woodland (13.6 per cent) and other (33.1 per cent). About 95 million hectares of land are cultivated, mainly in the Northeast Plain, the North China Plain, the Middle-Lower Yangtze Plain, the Pearl River Delta Plain and the Sichuan Basin. Grasslands in China cover an area of 400 million hectares, stretching more than 3,000 kilometres from the northeast to the southwest. Forests cover 154 million hectares.

**Governance:** China is a 'socialist market' country, governed from the centre by the National People's Congress. The National People's Congress is the highest organ of the state power and the State Council is the most important body responsible for state administration. Under the State Council, the government administration may be broken down into several levels. The State Council has direct oversight of 23 provinces (including Taiwan), 5 autonomous regions (Inner Mongolia, Ningxia, Xinjiang, Guangxi, and Tibet), 2 special administrative regions (Hong Kong and Macao) and 4 municipalities. Within each province and autonomous region the next level of administration lies with prefectures and cities.<sup>2</sup> Lower down we have counties, towns and villages. The governance structure is dynamic in that where populations and resources change significantly, administrative units may be upgraded or downgraded. For instance, over the past decade many prefectures have been reclassified as prefecture-level cities, and counties have been upgraded to county-level cities.



**Economy:** Over the past twenty years, China has achieved average growth in GNP of around 7-10 per cent per year. During this time, the country has lifted some 300 million people out of poverty, representing the most successful poverty reduction campaign in history (Ziegler, 1997).<sup>3</sup> This achievement is perhaps the most visible benefit of the government's 'socialist market experiment' launched in the late 1970s. According to this new model, efficiency is promoted through the expansion of markets in the allocation of resources and a greater role for the private sector. Today private enterprises are estimated to account for 33 per cent of GDP, almost on a par with the 37 per cent contribution of the state corporations (Kynge, 2000).

Reforms have gone furthest in rural areas where farmers have been allowed greater freedom to work for themselves on leased land, and are permitted to keep the rewards of their labour. However, the pressure on state enterprises to reform is growing, especially in light of China's accession to the World Trade Organisation and the increased competition that will entail. Not only are state enterprises being required to become self-sufficient and adopt modern management systems, but the government has shown a growing willingness to allow bankrupt companies to close down. With 70 per cent of the 100,000 state enterprises thought to lose money, the potential impact of closures for unemployment and social welfare are enormous. Yet, there are signs that the

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2. Prefecture-level cities are an administrative unit that may itself control counties, townships, villages and large areas of forests.

3. In 1999, the national rural poverty line was set at an annual RMB 625 (US\$75) per capita (China Rural Poverty Monitoring Report, 2000).

slack will be quickly taken up by new private enterprises that are springing up in urban and rural areas to produce goods and services demanded by consumers. Township enterprises in rural areas, for instance, are estimated to account for two-fifths of China's industrial output (Ziegler, 1997). Today, China ranks among the top ten manufactured good exporters, and its outputs of some major agricultural products (e.g. grain, cotton, meat) place it first in the world.

Nevertheless, growth has not been uniform. Two-thirds of the population live in China's eastern coastal areas, accounting for about one-fifth of the land and generating the greatest economic growth. But, with over 90 per cent of the 30 million Chinese living below the poverty line living in the west, the economy remains fragmented (Kynge, 2000b; Liu Jinlong, pers. comm. May 2001).  
Forestry in China – getting to grips with a vast resource

## 2.2 Forestry in China – getting to grips with a vast resource

### Extent of forests

According to the fourth nation-wide forest resources inventory (1994-1998), China has 153.63 million hectares of forest, with a stocking volume of 11.267 billion cubic meters, ranking fifth in the world (see Table 1). This figure includes bamboo and cash crops, e.g. fruit, rubber and oil seed trees. The area of land set aside for forestry is 263 million hectares, or 27 per cent of the national total.<sup>4</sup>

China's forest land spans a wide range of latitude, elevation and soil. Consequently, forest species are diverse, ranging from pure larch in the cool-temperate northeast to the complex multi-species mountain rain forest in the tropical south. Forest land is divided into eight zones based on forest types. These are: cool-temperate cold-resistant coniferous forest zone, temperate-coniferous and broad-leaved mixed forest zone, warm-temperate deciduous broad-leaved zone, northern subtropical evergreen and deciduous broad-leaved forest zone, central and southern subtropical evergreen broad-leaved forest zone, tropical seasonal rain forest and rain forest zone, East Tibet Plateau dark coniferous forest zone and Gan-Xin mountain coniferous forest zone.

### Forest rich or forest poor?

While China contains the fifth largest area of forest in the world, against most measures China is forest-deficient. Set against its population China has only 0.1 hectares per capita, considerably less than the world average of 0.6 hectares (FAO, 1997). In terms of land area covered, China's forests grow on only 16.6 per cent of its territory, about 60 per cent of the world average.

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4. The total land area for forestry used means that land is put under the forestry sector administration for forestry development by the Central Government, it includes forested land (closed forest), scattered woodland, land for brushwood, land for new planted juvenile forest, land for nursery and non-stocked land.

China's forest resources are not only small relative to its area and population, but are also small relative to demand. China is the second largest timber importer in the world. In 1999, China's imports of timber and related products came to about US\$7.8 billion split roughly evenly between timber products (including logs) and pulp and paper (SFA, 2000). Even with significant imports, in 1980, about half the rural population suffered fuel shortages for up to 6 months a year and timber-using industries have increasingly turned to non-wood substitutes (Li Jinchang *et al*, 1988). This is true for 90 per cent of China's pulp production and over 80 per cent of the paper industry, which relies on straw, reed and grass inputs. Imbalance in supply and demand have recently worsened following the government's imposition of a logging ban in large areas of natural forests in 1998 under its Natural Forest Protection Programme (see Section 2.4). Tropical timber brought in through a port in Shanghai increased four-fold in the first three months following the ban, calculated as an average increase on the same period in 1997 (Gilley, 1999; FAO, 1998).

The existing pressure on China's forests and other resources is enormous. Thirty-eight per cent of the country (about 367 million hectares) is affected by soil erosion, while desertification is prevalent in 27 per cent of the nation and is expanding annually by a quarter of a million hectares (SFA, 2000). About one third of grasslands are degraded. Biodiversity is also under threat with 15-20 per cent of fauna and flora species threatened with extinction. A World Bank report in 1994 estimated that about 200 species of Chinese plants have recently become extinct (Yaoqi Zhang *et al*, 1998). Deforestation and conversion of fragile lands for agriculture are thought to be the most serious causes.



**NTFPs in China provide a valuable supplement to rural households' farm production. Fruit trees, in particular, can offer important nutritional benefits and opportunities for augmenting income**

Year	Area of forest land (million hectares)	Volume of standing stock (million m <sup>3</sup> )	Area of land with forests (million hectares)	Volume of forests (million m <sup>3</sup> )	Forest cover (%)
1973-1976	257.60	9,530	121.86	8,660	12.7
1977-1981	267.13	10,260	115.28	9,030	12.0
1984-1988	267.43	10,570	124.65	9,140	13.0
1989-1993	262.89	11,790	133.70	10,140	13.9
1994-1998*	263.29	11,306	153.63	11,267	16.6

**Source:** The First to Fifth China National Forest Resource Inventory (1973-1998). Forest resource inventories have been undertaken every five years, except for a gap between 1982-1984.

\*The data for 1994 to 1998 was assessed by the new criterion that crown density of forest is at least 20 per cent. In previous years forests were associated with crown density of at least 30 per cent. Figures exclude forest resources in Taiwan.

However, these threats are not new and since the foundation of the People's Republic of China the government has placed great emphasis on forestry development and invested significant sums in forest resources expansion through afforestation and natural forest regeneration (see also Table 4 in Section 2.3.2). As a result, China's forest area and volume has steadily expanded over time (see Table 1).

Today, China has the largest plantation area in the world with 46.7 million hectares, accounting for 30.4 per cent of the total forested land (SFA, 2000).<sup>5</sup> In terms of volume, plantations account for 1 billion cubic meters, or 10 per cent of the nation's forest volume. Moreover, the government is seeking to raise forest cover to 19.4 per cent, 24.4 per cent and 26 per cent of the total land area by 2010, 2030 and 2050 respectively (State Environment Protection Agency, 1999) from 16.6 per cent in 1994-8. Most recently, the government's decision to implement a logging ban in large areas of natural forests has served to make the shift to plantations more urgent (see Section 2.4.6). To achieve these targets, this paper will show how the government is increasingly looking towards the private sector as a major investor in forestry.

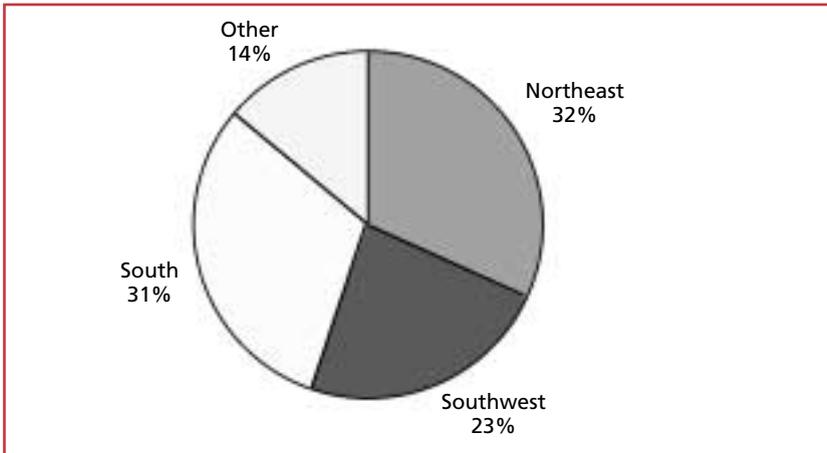
### **Regional variations**

Figures 1 and 2 provide a breakdown of forest resources by region. The highest concentration of standing timber volume is in the southwest and the northeast. The other 14 provinces and autonomous regions in China's north, northeast and northwest are sparsely forested, but have been the focus of significant efforts to encourage tree planting on farms and to develop shelterbelts

5. Fifth National Forest Resource Inventory (1994-1998).

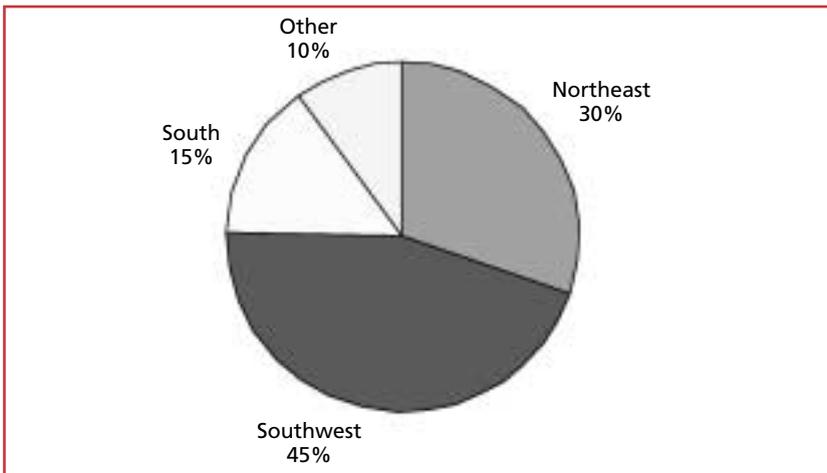
(Runsheng Yin, 1998). In terms of both area and volume, forest resources are concentrated in nine state-owned forest provinces or autonomous regions: Heilongjiang, Jilin, Inner Mongolia, Yunnan, Sichuan, Shannxi, Gansu, Qinghai, and Xinjiang. These provinces account for just under half of the forest area and a significant 65 per cent of the forest standing volume. Another 38 per cent of the forest area and 18 per cent of the volume is located in ten collective forest provinces and autonomous regions: Zhejiang, Anhui, Fujian, Jiangxi, Hubei, Hunan, Guangdong, Guangxi, Hainan and Guizhou.

**Figure 1 Regional distribution of forest area (1994)**



Source: Centre for Forest Inventory (1994) cited by Runsheng Yin (1998).

**Figure 2 Regional distribution of timber volume (1994)**



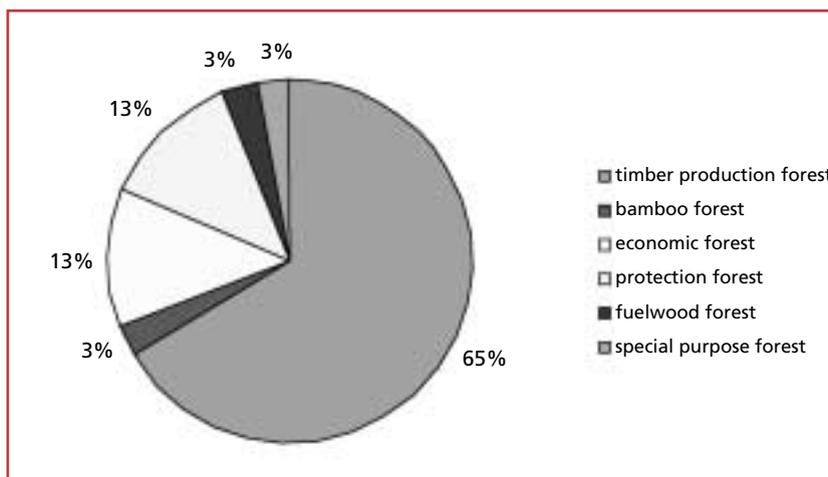
Source: Centre for Forest Inventory (1994) cited by Runsheng Yin (1998).

**Note:** the north-east includes three provinces: Heilongjiang, Jilin and eastern Inner Mongolia; the southwest includes Sichuan, Yunnan and Tibet; the south includes Zhejiang, Fujian, Anhui, Jiangxi, Hubei, Hunan, Guangdong, Guangxi, Guizhou and Hainan

## Administration of forest use

China's forests are split into five categories for administrative purposes: timber production forest, protection forest, economic forest, fuelwood forest and special purpose forest (Article 4, Forest Law, 1998). Timber production forests are themselves split between timber and bamboo production forests. All six categories are illustrated in Figure 3 with estimated areas for each.

**Figure 3 Forest breakdown by class (1993)**



**Source:** China's Fourth National Forest Resource Inventory, 1989-1993.

Protection forests cover all those areas where forests are protected from harvesting to ensure they can act as barriers to erosion and to ensure watershed protection. Special purpose forests cover 28 per cent of the natural forest area and include 932 nature reserves, 874 forest parks and 2 preserved forest farms in Tibet and Hainan. Timber production, bamboo, fuelwood and economic (used for non-timber forest products (NTFPs)) forests are used for extractive purposes and account for over 80 per cent of the total closed forest area.

While this system of categorisation still applies, the government has recently initiated research into a new 'classification-based forest management' system. The proposed system – which is still undergoing trials – replaces the five classes used today with three classes, commercial, non-commercial or mixed forests, and develops clearer criteria for classifying forests into these classes (Liu Jinlong, pers. comm., May 2001). Whereas commercial forest land is intensively managed to produce forest products for exchange in the market, non-commercial forest land is managed to promote, maintain and improve forests' ecological functions with support from government and society as a whole. More systematic classification is expected to avoid wasteful investment. Experimental sites have been established in 49 counties in 21 provinces to test the new system (SFA, 2000).

## Economic, social and environmental contribution

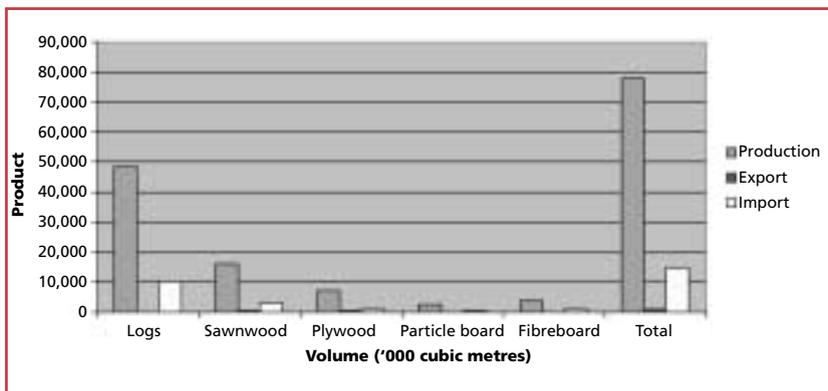
In economic terms, forestry accounts for less than 1 per cent GDP, but is an essential source of energy for 40 per cent of the rural population and supplies virtually all the timber input for the construction sector. In global terms, its output of forest products is ranked amongst the top few in many product categories. For instance, China is the third largest sawnwood producer in the world after the United States and Canada and it accounts for over 30 per cent of total bamboo-based production and for 40 per cent of rosin, an important chemical raw material for industry (Yaoqi Zhang *et al*, 1998).

Since the 1980s, China's forest products industry, including the production of wood-based panels, forest chemical industry and paper-making, has experienced rapid expansion. In 1999 alone, the production of raw logs reached 48 million cubic metres, that of wood-based panels exceeded 15 million cubic metres, and the production of paper and paper board reached 22 million tonnes (SFA, 2000).

While China is a global leader in terms of total production, only a tiny fraction is traded. Figure 4 below highlights how, of total production an average 1.2 per cent is exported. Plywood is the most traded product, with exports accounting for almost 6 per cent of production. Moreover, since the early 1990s, China's forest product exports have remained relatively constant in value terms. The main exception is that of furniture products which have seen an increase of 145 per cent between 1995 and 1999. In 1999 furniture exports accounted for 67 per cent of total export value.

In addition to timber products, economic, bamboo and fuelwood forests are highly valued as a source of NTFPs. Apart from bamboo and fuelwood, important products include nuts, fruit, oil, industrial materials, medicinal herbs, spices, edible *fungi* and chemicals such as tannin, rosin, shellac and turpentine oil. The collection of NTFPs for domestic use is informal and no permission is required except in the case of protected species. Commercial extraction is

**Figure 4 China's production and trade balance in timber products (1999)**



Source: State Customs Bureau (1999), SFA (1999c)



**Basket weaving from materials collected in forest areas can offer new opportunities for generating income for the rural poor**

controlled through a licensing system and forest user fees are charged for some products (Waggener, 1998).

NTFPs provide an important source of livelihood for rural households. Fuelwood is thought to account for about 30 per cent of total annual energy consumption and over half the population is estimated to rely on forest-based traditional medicines for at least some of their health needs.

Large volumes of NTFPs are sold both on domestic and foreign markets. In volume terms total production of the 11 major marketed NTFPs increased 95 per cent from 1.52 million tonnes between 1978 and 1997 (SFA March, 1999). In economic terms, in 1992 commercial NTFPs yielded a gross income of US\$5 billion and exports earned US\$1.2 billion (Ministry of Forestry, 1995; Lu Wenming, 1998). The growth in bamboo-based products is notable. In 1988 there were 100 bamboo panel factories. By 1994, 200 factories were producing two and a half times more output valued at about US\$100 million in 1994 prices (Zhong, 1996, cited in Yaoqi Zhang *et al*, 1998). At present, the annual value of bamboo output is about US\$1.5 billion, of which about US\$400 million is exported.

The importance placed on NTFPs has increased over time. Particular emphasis is placed on the role of NTFPs in promoting rural development. The government has set a target for expanding the area devoted to the use of NTFPs to 21.47 million hectares (Ministry of Forestry, 1995). By the end of 1999, economic forests covered about 20.22 million hectares, but in line with government objectives, they are growing by 670,000 hectares every year (SFA, 2000). By 2010, not only does the government plan to plant an additional 10 million hectares of fuelwood forests, more than tripling existing stocks (Yaoqi Zhang *et al*, 1998), but it plans to improve 3 million hectares of low productivity bamboo forests and plant an additional 1.2 million hectares (Jiang Zehui, 1998).

While impressive, these figures underestimate the forest sector's contribution to economic and social well-being. Forests provide multiple ecological, economic and social functions that are not directly sold in markets, yet which underpin human well-being and a number of economic activities. For instance, forests provide critical ecological services that support soil fertility and the hydrological cycle, directly benefiting agriculture and other water-based activities.

In addition to their protection of biodiversity, forests are thought to play a critical role in preventing soil erosion, desertification and flooding.<sup>6</sup> Currently, it is estimated that about 3.7 million square kilometres of land are affected by wind and water erosion and about 2.6 million square kilometres are desertified (SFA, 2000). A dramatic reminder of the economic and human costs of flooding was given with the recent flooding of the Yangtze River in Central China and Songhua River and Nenjiang River in the Northeast China. The floods killed over 3,000 people, affected a fifth of the total population and led to over US\$12 billion in damages and lost output (*The Economist*, 1998; Lu Wenming, 1999).

China's forests are also increasingly valued for their beauty and amenity potential. With rising disposable income, eco-tourism has grown rapidly. The Ministry of Forestry estimated that since 1994, forest landscapes have attracted between 50 and 60 million person visits a year, generating between US\$30 to 50 million. It is estimated that the number of person visits will rise to 100 million by the year 2000 and to 200 million by 2010, including 2 million foreign tourists (Yaoqi Zhang *et al*, 1998).



## 2.3 Identifying the main players and their functions

Forestry development relies on the participation of a range of stakeholders. Table 2 provides an overview of the key actors involved and their different functions.

The roles and responsibilities of different stakeholders in China's forestry sector have evolved over time. Change has been particularly dramatic since the late 1970s when China embarked on its efforts to transform itself into a socialist market economy. The associated liberalisation has had profound impacts on stakeholder participation in the forestry sector. Most importantly, while forest land ownership remains in public hands (either state forest farms or collectives), forest utilisation and management is increasingly being handed to households, communities and private enterprises. In addition, responsibilities are being transferred within the public sector from the centre towards local level authorities. In Section 2.4 the key legislative and policy reforms that have underpinned the changing role of stakeholders are outlined. Here we focus on identifying the key actors involved in forestry today. The discussion is broken down according to the function being performed.

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6. See discussion on scientific uncertainty surrounding forests watershed protection functions in Annex 2.

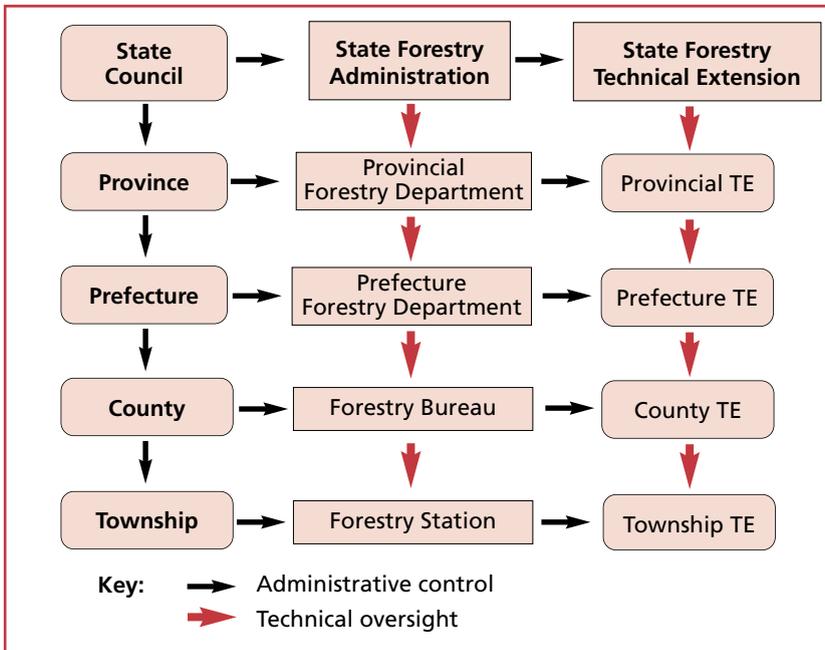
<b>Function</b>	<b>Stakeholders</b>	<b>Main objectives</b>
Forestry sector administration	State Forestry Administration	Ensure sustainable forest management
	Provinces and prefectures: Forestry Departments	Protect and cultivate forest resources and promote forestry sector development
	Counties: Forest Bureaus	
	Townships and villages: forestry stations	
Forest ownership	State	All forest land is publicly owned
	Collectives	
	Households, private entities	Individuals have the right to own planted trees
Forest utilisation and management	Households	Harvesting; protection of soil and water resources; fuelwood and NTFPs; and spiritual forests
	Farmer cooperatives / communities	
	Collectives	
	State forest farms	Harvesting; environmental protection; and natural landscape and historical site protection
	Foreign investors	Generate income and raw material base for processing
Forest product marketing	Middlemen and private companies	Economic returns
	State timber companies	
Processing	Small-scale private enterprises	Economic returns
	Medium-scale private or state enterprises	
	Large foreign investment enterprises	

### **2.3.1 Forestry regulation and administration**

Despite ongoing reforms, the government remains the most important entity involved in the forestry sector. Not only do government bodies own all forestlands, undertake forest utilisation and implement management (see below), government entities are also responsible for overseeing forestry sector activities and ensuring the achievement of national standards.

To achieve effective oversight of forest utilisation in such a large country, the government operates a complex and extensive hierarchy (see Figure 5 below). There are five levels of forestry administration, including the State Forestry Administration (SFA) (formerly known as the Ministry of Forestry) at the centre, provincial and prefecture forestry departments, county forestry bureaus and town and township forestry stations. Each of the major players within the forestry administration is described briefly below.<sup>7</sup>

**Figure 5 Diagram of SFA structure and lower levels of government authorities**



The SFA is the highest government department responsible for forestry affairs. Created in 1999 to replace the Ministry of Forestry, its main functions are to implement forestry policies and regulations issued by the State Council. Major areas of work for the SFA in recent years have been afforestation and the expansion of China's resource base, forest utilisation control and forest protection. Unlike the old Ministry of Forestry, the SFA is no longer responsible for forest industries. It has, however, gained more responsibility for promoting environmental services.

The SFA has about 200 staff and is split into ten departments, namely: the Administrative Office, Department of Afforestation, Department of Forest Resources Management, Department of Protection of Wild Animals and Plants, Bureau of Forest Public Security, Department of Policy and Law, Department of

7. It should be noted that while the SFA is the principle government institution responsible for forestry, other central institutions with interests in forests include the Ministry of Agriculture, the Ministry of Water Conservancy and the State General Environmental Protection Agency. In certain areas, mandates overlap and conflicting regulations and/or guidelines have been issued.

Development Planning and Financial Management, Department of Science and Technology, Department of International Cooperation, and the Department of Personnel and Education. It also draws on linked central forestry bodies such as the Chinese Academy of Forestry, Forest Economics and Development Research Centre and the Institute of Forest Survey and Planning.

To implement its mandate, the SFA works with provincial (including municipalities and autonomous regions, e.g. Inner Mongolia), prefecture, county and towns/township authorities. All forests are managed according to a centrally determined Annual Allowable Cut system and the Forest Law (1998). The Law, however, allows for significant flexibility in interpretation and provincial regulations may be introduced to suit local conditions, with approval from the SFA (Li Jinchang *et al*, 1988; Young, 1998).

It should be highlighted that while the SFA supervises the implementation of central government forestry laws and policies, it does not have the authority to enforce these policies and laws directly (see Figure 5). This lack of administrative authority is often reinforced by a lack of financial power. While local authorities receive some project funds from the SFA, they depend on local treasuries as well as their own revenue from local charges and taxes to cover recurrent costs, such as staff salaries.

In certain instances, however, the central government, through the SFA, will fund large-scale programmes such as afforestation or infrastructure development. Moreover, the SFA has technical supervisory powers that enable it to recommend action where lower levels of government are failing to implement national policies and laws. In addition, the SFA controls the State Forestry Technical Extension Centre, which also supervises provincial technical extension entities. Ultimately, enforcement is implemented through local level executives that, in turn, direct the local Forestry Department (provincial-level) or Forest Bureau (county-level).

### **Recent reforms**

While this centralised administrative and technical extension system continues to function in the face of government liberalisation initiatives, notable changes have occurred in recent years. Prior to the establishment of the SFA, the Ministry of Forestry had lost control over markets and prices of raw and processed forestry products in the 1980s. In addition, provincial and lower level authorities have gradually reduced their direct involvement in forest utilisation and management.

While in some areas the SFA's functions have been curtailed, in others they have increased. Most notably, the SFA retains key regulatory and monitoring roles, though these must be implemented through lower level authorities. As responsibility for forest utilisation and management have been decentralised to non-governmental actors, forestry departments have had to intensify their supervision of implementation of management standards. Significant resources are now channelled towards implementing a harvest quota system, controlling

illegal logging and preventing the conversion of forests to agriculture. Moreover, in order to raise regulatory effectiveness, new laws and regulations have been passed, e.g. the Forest Law (1998), Law of Water and Soil Protection (1991), Law of Wild Flora and Fauna Protection (1997), Law of Land Management (1999). In addition to reinforcing the growing private sector role in forestry development, the laws attempt to clarify and strengthen government powers (see Section 2.4 below).

However, reform has not been uniform around the country. In some cases, local level changes, especially with respect to forestry taxation and tenure systems, have strained central control. As broader reforms to increased private sector participation in forestry take effect, the SFA will face a number of challenges in adapting to its changing role.

## **2.3.2 Forest ownership**

### **Collectives and the state**

Official forest land in China is either owned by the state or by collectives. Table 3 sets out the breakdown in ownership of forest area and volume; natural forests and plantations; and economic and bamboo forests. In terms of standing volume, state forests (which are concentrated in the northeast and southwest) account for the lion's share with 68 per cent of the total, but collectives own 58 per cent of the forest land. Collectives dominate the area and volume of plantation forests, while state forests have traditionally been primarily composed of old-growth natural forests.



The relative importance of collectives has been growing over time. For almost four decades (1940-1980) state forests were major suppliers of timber to the economy. Since the early 1980s, however, state forests output has declined dramatically. Zhang Lei (1998) reported that between 1984 and 1988, the north-eastern state forest region (including Heilongjiang, Jilin, Liaoning and Inner Mongolia) lost an area of 277,000 hectares and a stocking volume of 17.79 million cubic meters per year. The decline in forest resources is the direct result of over-harvesting and a lack of investment in forest regeneration (see Section 2.3.3).

State forests are owned by the central government on behalf of the citizens of China. Local townships and villages (i.e. collectives) own collective forests. The central government devolved state forest utilisation and management responsibilities to state forest enterprises (including state forestry industry bureaus and state forest farms), while collectives have traditionally retained direct control of their forests. However, these responsibilities are beginning to shift (see Section 2.3.3 below).

### **Plantations and private tree tenure**

China's plantation forest covers 30.4 per cent of its forest area, the largest share of any country in the world. In addition to large-scale plantations, according to a national inventory in 1989-1993, there are about 2.5 billion trees and 45

**Table 3 Forest ownership – distribution between state forests and collectives 1994-1999**

Tenure	Volume of standing forest (million m <sup>3</sup> )	Area land with forests (million hectares)	Area and volume of timber-forest				Area of economic forests (million hectares)	Area of bamboo forests (million hectares)
			Total		Plantation			
			Area (million hectares)	Volume (million m <sup>3</sup> )	Area (million hectares)	Volume (million m <sup>3</sup> )		
State	7,641	63.89	62.01	7,124	7.70	378	1.59	29.00
Share (%)	68%	42%	48%	71%	26%	37%	8%	7%
Collective	3,665	89.75	67.19	2,961	21.44	635	18.63	3.93
Share (%)	32%	58%	52%	29%	74%	63%	92%	93%
Grand total	11,306	153.63	129.20	10,085	29.14	1,013	20.22	4.21

Source: SFA (2000)

million hectares of agroforestry systems located outside the officially recognised state forest areas (Huang *et al*, 1997, cited in Yaoqi Zhang *et al*, 1998).

While the government owns most large-scale plantations, the smaller woodlots and individual trees are often privately owned. Private tree ownership has been permitted since 1956 when individuals or groups were given the right to own planted trees in degraded or vulnerable areas, such as along watercourses and roadsides, in household plots and villages. Individuals who plant trees have the right to sell and bequeath them when they die.

Both government and private tree planting has been strongly supported since the 1970s through a variety of national campaigns and market-based incentives. Important schemes are listed in Table 4. In addition to these programmes listed, the government has set out a number of new initiatives in its Ninth-Five-Year Plan.

**Table 4 Overview of main afforestation programmes since the 1970s**

Name of programme	Years	Coverage (area)	Targets	Achievements to date
National Greening Campaign:the National Compulsory Tree-Planting Campaign	1987-current			1987-1997, 27.9 billion trees planted
Three-Norths Shelterbelt Development Programme	1978-2050	551 counties in 13 provinces; 40.6 million hectares (50 per cent northern China)	Afforestation of 35.08 million hectares by 2050	25.67 million hectares planted by 1999
Shelterbelt Development Programme along the Upper and Middle Reaches of the Yangtze Rivers	1989-2000	271 counties in 12 provinces	Afforestation of 67.05 million hectares	1989-1999, 4.8 million hectares planted
Coastal Shelterbelt Development Programme	1991-2000	195 counties in 11 provinces	Afforestation of 3.56 million hectares	1991-1999, 1.08 million hectares planted
Farmland Shelterbelt Development Programme in Plain Areas	1988-2000	918 counties in 26 provinces	Set standard	1988-1999, 850 counties reached standard
Taihang Mountain Afforestation Programme	1990-2010	110 counties in 4 provinces	Afforestation of 4 million hectares	1990-1999, 3.28 million hectares planted
National Programme on Combating Desertification	1991-2000	598 counties in 27 provinces	Control desertification in 7.186 million hectares	1991-1999, desertification controlled in 8 million hectares

As a result of government measures to promote private tree planting, by 1985 households were estimated to be responsible for over 50 per cent of the increase in forest area (Li Jinchang, 1988). With the government's stated aim of raising forest cover to 19.4 per cent by the year 2010 through plantation establishment, the private sector is set to become a major stakeholder in China's forestry sector.

### Natural forests and the private sector

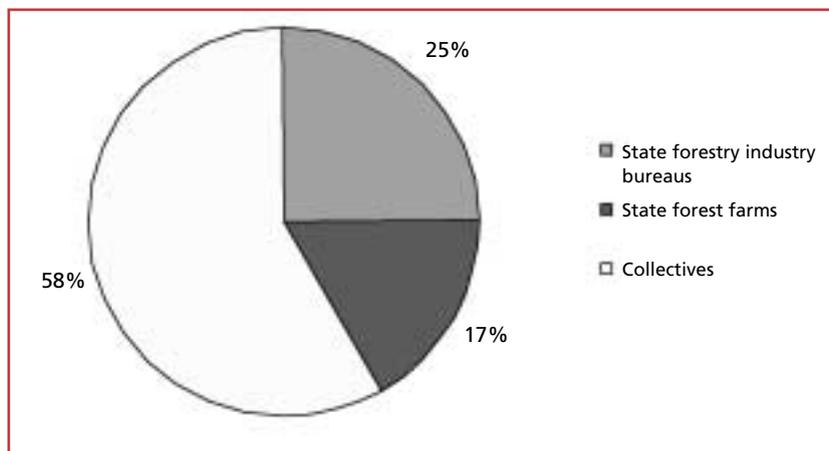
The private sector is not normally permitted to own trees in natural forest areas. However, with the extension of the Household Responsibility System to forest lands in the early 1980s, individuals, households and groups ('co-operatives') may be awarded exclusive rights to standing trees. A variety of contractual arrangements have emerged between responsible public authorities and private entities. These are described in Section 3.

### 2.3.3 Forest utilisation and management

Responsibility for forest utilisation and management is split between state forestry industry bureaus (or enterprises), state forest farms and collectives. The breakdown in forest area between these institutions is given in Figure 6.<sup>8</sup>

State forestry industry bureaus, which currently number 135, were originally set up in the 1940s to manage forest production from the large nationalised natural forests. The bureaus are a type of state enterprise with responsibility for harvesting, forest management and processing activities. In addition, they have significant social responsibilities, e.g. health and education of their staff. The forestry industry bureaus are mostly located in the northeast and southwest regions and account for 25 per cent of the forest area. For several decades, state forest areas have been over-harvested resulting in declining forest stocks. Based

**Figure 6 Breakdown of forest area by responsible authority (1994-1999)**



Source: Lu Wenming (1999); SFA (2000).

8. In addition to defined state forest areas, trees are distributed amongst farm plots in agricultural collectives throughout China. See above on plantations and the private sector.

on Liu Yongmin (1999), over-harvesting in the northeastern state forest region amounted to 20 million cubic meters per year. Zhang Lei (1998) predicted that by 2000 the number of depleted state forest industry bureaus would reach 90, over 65 per cent of all bureaus. Today, much of the remaining natural forest area is protected and/or inaccessible, and the bureaus manage large areas of plantations. Central and provincial governments jointly control the bureaus and, on average, each one employs over 10,000 permanent staff.

State forest farms, which account for 17 per cent of the total forest area, were established later. The forest farms, which number about 4,200 today, aimed to increase forest cover through afforestation and were given responsibility for managing smaller secondary forests. State forest farms are spread all over the country, with the highest number located in the south. They are normally controlled by county governments. But in some cases, e.g. in Heilongjiang and Inner Mongolia, state forest farms are directed by forestry industry bureaus.

Forestry collectives were introduced in the 1950s by bringing together individual private forests and woodlots that had not been allocated to forestry industry bureaus or state forest farms. Numbering over 150,000, forestry collectives are concentrated in the south and come under the management of the centrally controlled 'People's Communes'. Accounting for 58 per cent of the forest area, they represent the largest category of publicly owned forest.

Although ultimately answerable to the central government, forestry collectives have considerable autonomy in organising production and are responsible for their own income generation. State forest farms and bureaus, in contrast, have traditionally been managed by government employees who earn a regular salary. However, as part of broader government efforts to decentralise funding and to promote self-financing, forestry enterprises are being gradually weaned off central financing. Between 1985 and 1987 the old system where bureaus



**Over-harvesting in state forest areas has led to serious reductions in timber stocking and, in many cases, undermined the viability of state forest industry bureaus**

returned all profits to the Treasury was replaced with one where only a share of the profits are handed over in the form of tax payments. In 1991, the government rationalised the sector by merging 84 bureaus in northeast China and Inner Mongolia to form 4 state owned corporations (Yaoqi Zhang *et al*, 1998). Plans to modernise the forestry industry bureaus, however, may be curtailed by the recent ban on logging in large areas of natural forest under the Natural Forest Protection Programme. It is already expected that logging operations in 65 of the 135 bureaus will be halted.

### **Timber extraction**

In 1999 total recorded production of commercial timber was 52.36 million m<sup>3</sup> about a third of which was from state forest farms and the rest from collectives (including private households that have leased collective forests), and state forestry industry bureaus.<sup>9</sup>

#### *State harvesting operations*

Timber extraction is generally regarded as inefficient. Not only are state bureaus rapidly depleting their harvestable stock (see discussion on state forest bureaus above), but plantations are also poorly managed and their yields are low (Ministry of Forestry, 1995). Overall, the state forest industry is thought to be making losses (Sun Changjin, 1998). China's forested area covers only 60 per cent of the total land set aside for forestry. It is estimated that about 14.09 million hectares of additional land are suitable to grow trees for timber.

With the decline of timber resources, state forest regions have suffered serious economic hardship. In Yichun City, Heilongjiang, historically one of the most important timber producing regions, for example, timber harvests fell from 7.5 million cubic meters in 1959 to 2.4 million cubic meters in 1996. Forestry employment in the city rose from 160,000 to 544,000. The consequence was falling income for forest workers and serious delays in payment. In Tongbei Forest Bureau of Songhuajiang Forest Region, Heilongjiang, in 1998 employees had not been paid for 48 months (Chinese Society of Forest Economists Survey Team, 1998). In Da-Xing-An-Ling Forest Region, another major timber production area in Heilongjiang Province, 75 per cent of employees were not paid on time. Social services traditionally supplied by state forest bureaus were also hampered. For instance, in Tongbei education was seriously curtailed and 60-70 per cent of students did not attend school (Dai Wanchun and Zheng Xuehui, 1998).

#### *Private sector participation*

The organisation of forest use has changed dramatically since the late 1970s when all forests were used and managed by state farms, state forestry industry bureaus or collectives. Liberalisation under the Household Responsibility System has been the main driver behind a dramatic increase in private sector participation (see Section 3 for a history of reform in forest utilisation rights).

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9. Recorded figures are thought to overlook a large volume of illegal extraction, perhaps as high as 30 per cent of the recorded figure (Liu Jinlong, pers. comm. May 2001).

### Box 1 Shareholding co-operatives – regrouping household plots

Shareholding co-operatives have evolved to overcome problems of forest land fragmentation and inefficiencies associated with decollectivisation. Rather than individual households managing tiny (often only 0.03 hectares) and frequently dispersed plots, co-operatives bring groups of farmers together as joint forest rights holders to invest in a single system of forest management (Kong Fanwen *et al*, 1998). Co-operatives allocate members shares to reflect individuals' contributions of land, labour, cash or other capital. A household's claim on the entity's profits is linked to its 'shareholding'.

Co-operatives' key advantage over household production is that they can spread the costs of inputs, machinery, transport and marketing over larger volumes. At the same time as seeking to generate economies of scale, cooperatives are designed to be small enough for households to jointly manage production. Thus, unlike collectives, households retain management authority, rather than handing over responsibility to a separate entity.

In practice, co-operatives are not always easily distinguished from collectives. In some instances, cooperatives have been introduced by collectives to give the impression of reform whilst maintaining the *status quo*. Recent surveys by Xu Wei (1995) and Kong Fanwen *et al* (1998) highlight how such efforts by collectives to maintain control result in poor incentives for forest management and a lack of long-term commitment by the farmers.



Collectives have been most keen to experiment with new forms of contractual relationships and have devolved considerable responsibility to individual households and groups. While collectives have been authorised to extend the Household Responsibility System to forest lands, the details of the contractual relationships between the collectives and households (e.g. what rights should be devolved, whether the collective should monitor households and households' obligations) are not guided by the state. As a result collectives have developed their own models and have provided a testing ground for alternative approaches (see Section 3). State farms have also introduced a degree of private sector autonomy in forest use by allocating plots to farmers to manage for timber as well as NTFPs. For the most part, however, they continue to organise forest production centrally, as do state forestry industry bureaus (Bruce *et al*, 1995; Koppelman *et al*, 1996).

Given the state of flux, it is hard to find up-to-date information on the private logging sector. It is made up of a mixture of individuals, households, informal household groups and larger shareholding co-operatives (see Box 1 for a more detailed description of cooperatives). Moreover, households specialise in a number of activities including nursery production, planting, conservation, harvesting, forest by-product processing and forestry transportation (Yaoqi Zhang *et al*, 1998). A few have even entered into joint ventures with international companies (see Section 5).

Despite the difficulties of accessing accurate data, in Section 1.1 it was highlighted that as early as 1985 over 50 per cent of the increase in forest area

was thought to be contracted to private entities. By 1995 almost all collective households were thought to be involved in some form of contract tenure arrangement. Moreover, there is evidence of considerable growth in foreign investment, with the government recording inflows of US\$900 million and US\$1 billion for 1997 and 1998, and over US\$2 billion for 1999.

### *Controlling the private sector*

In the mid 1980s concern about deforestation led the central government to introduce a system of harvesting certificates for forests over the whole country. Now, even when an area has been handed to private operators, a harvesting certificate must be obtained from the local forestry department prior to felling trees. Transport certificates have also been introduced to control the transport of all forest produce. Harvesting certificates are issued subject to certain conditions relating to forest management and are not transferable (Articles 31-35 of the Forest Law 1998). Controls on forestry extraction have been tightened further in response to the devastating floods in 1998 (see discussion of Natural Forest Protection Programme in Section 2.4 below).

### **Forest management**

Forest management has traditionally been the responsibility of the government and undertaken by agencies that oversee collectives, state forestry industry bureaus and state forest farms. Because forest use activities have generally received a larger budget than forest management, management has been neglected. Between 1950 and 1978, an average 29 per cent of government investment in forestry went to silviculture, equivalent to just 0.2 per cent of total national investment.<sup>10</sup> Low investment has undermined the quality of forest stands. In state farms, about 50 per cent of forests are exhausted or nearly exhausted.

Increased private sector involvement in forest use has weakened the government's ability to ensure forest management from the centre. To the extent that households are required to undertake regeneration or management as part of their contract with the collective (e.g. in wastelands), they will be involved in certain tasks. However, given the low skill level in forestry, low disposable incomes and the traditional neglect of forest management, many households undertake only minimal management.

To reverse the lack of investment, the government has introduced forest management standards. The system of harvesting certificates introduced in 1986 requires those wishing to harvest timber (be they individuals, groups or state owned enterprises) to produce plans outlining the harvesting method, where cutting will take place and regeneration activities. All cut forests must be replaced within two years of felling. Logging certificates are issued in compliance with the centrally determined Annual Allowable Cut.<sup>11</sup>

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10. Aying Liu (1996).

11. Articles 29-35, Forest Law (1998).

New requirements for regeneration have increased the advantages to households of forming co-operatives or associations to share the costs of purchasing inputs and undertaking physical work. Greater co-operation should help to ease financial constraints and may promote forest management investment above that required by the government. There are an increasing number of cases where households form associations to contribute to fire protection, resource monitoring, the supply of seeds and seedlings, exporting and marketing, technical advice and training.

### **Protecting forests' environmental benefits**

In recognition of the values associated with forests' environmental functions (see Section 2.2), the government had set aside large areas of forests from logging in the form of protection and special purpose forests and has supported large-scale afforestation projects. The government has also set targets for both protected areas – according to the Tenth Five-year Plan (1999) these are to cover 7.5 per cent of the national territory by 2005 and 8 per cent by 2010 – and afforestation (see Section 2.2). Following the floods of 1998, the government also announced the imposition of a logging ban in most natural forests around the country (see Section 2.4).

For the most part forest protection has been a government venture and attracted little private sector interest. Yet, as protected areas grow and the issue of financing conservation becomes more urgent, the government is exploring options for attracting private sector investment. These efforts are reviewed in Section 6.



### **2.3.4 Forest product marketing and processing**

A growing number of households and co-operatives have begun to process their own output for sale. In 1990, 98,000 households were involved in some form of processing. Larger processing facilities are also being established by co-operatives and private enterprises.<sup>12</sup>

In what follows, we look in more detail at the legal and policy context for increased private investment in forestry.

## **2.4 History of increasing private sector participation – key legal and policy milestones**

Since China began to liberalise its economy in the late 1970s, it has experienced rapid social and economic development. Over time, China has moved from a system where social and economic activities were largely controlled by the government, to a situation where the private sector plays a significant role. While reform has progressed step-by-step, the cumulative change has been significant. Below, the most important pieces of legislation and government programmes

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12. Koppelman *et al* (1996), p.88.

driving these changes are highlighted. To place recent reforms in context, the discussion begins with a brief overview of land reforms undertaken with the establishment of the People's Republic of China in 1949.

### **2.4.1 Land reform in context – nationalisation and collectivisation from 1949**

Land reform was a major objective of China's newly installed leadership in 1949. Perhaps the most significant reform introduced at that time was the Land Reform Act of 1950, which permitted the government to nationalise all forestry enterprises and confiscate feudal forest land in mountainous areas for distribution to farmers. Along with their new parcels of forests, farmers received ownership certificates. In effect, two systems of forestry ownership were established: state-owned forest land and individually-owned mountain forest land. The transfer of forest land ownership and management rights to households resulted in significant increases in productivity.

Only three years after the Land Reform Act, China initiated its policy of collectivisation. In forest areas and mountainous regions, the era of cooperatives and 'people communes' began in 1958. A dramatic shift in farmer attitudes resulted as the shareholding system, under which farmers owned forests and were free to keep the fruits of their initiative, gave way to centralised ownership by the collectives and the introduction of distribution systems determined by work and needs. Forest farms run by communes, production brigades and teams began to emerge. Even though communes – or team-managed forest farms – experienced rapid development through the 1970s, numerous problems arose. One of the main stumbling blocks was that the forest farms' land titles to mountain forest land were unclear. Furthermore, the replacement of merit-based payments with salaried work in production teams seriously blunted farmers' enthusiasm for production. The planned economic structure impeded advances in productivity, hampered efforts to increase investment in new forests, delayed economic diversification, and generally resulted in poor economic performance. By the end of the 1970s, the collective forestry system was in urgent need of restructuring.

### **2.4.2 The 'three fix' policy (1981)**

In March 1981, the State Council issued its 'Resolution on Issues Concerning Forest Protection and Development', also known as its 'three fix' policy, marking the beginning of a long legislative and policy process aimed at encouraging private sector participation through the issuance of increasingly secure resource rights. The 'three fix' policy sought to transfer responsibility for forest planting and management to households by:

- Clarifying rights to forests, with an emphasis on mountainous areas;
- Delimiting private plots; and
- Establishing a forestry production responsibility system.

This reform represented an extension of the Household Responsibility System used successfully in agriculture and aimed to provide households with adequate security and rights to encourage forestry investment.

### **2.4.3 Forest Law (1984, amended 1998)**

The key legal document guiding forest resources management is the Forestry Law of the People's Republic of China, which was first issued in 1984 and amended in 1998. According to this Law, forest resources are divided between state and collective forests. State forest land is owned by the state and managed by state forest enterprises (including state forest industry bureaus and state forest farms), while the collective forest land is owned and managed by rural collectives. While forest land ownership is retained by the state or collectives, the Law reinforced the earlier 'three fix' policy by allowing for private use rights to trees.

Amendments introduced to the Forest Law in 1998 stipulate that timber forests, economic forests, fuelwood forests and their use rights are transferable, though conversion of forests to non-forest uses is prohibited. Resource rights may last for up to 70 years, and are renewable. It also set out a range of government financial incentives for private investment in management (e.g. cheap loans, tax breaks – see discussion below) and its intention to set up Forest Environmental Benefit Compensation Funds to encourage forest protection.



Transferability of forest land use rights has provided critical flexibility in resource allocation and boosted productivity by allowing less able and labour-constrained farmers to sell on their rights to others who have the necessary skills and resources. This flexibility has been particularly important in regions that have seen significant out-migration since it has permitted farmers to sell forest land on to those with spare labour capacity. In some cases, rights are being sold back to collectives and state forest farms.

### **2.4.4 Auctions of the 'Four Wastelands' (1993)**

The government's decision to permit the auctioning of barren forestlands (referred to as the 'Four Wastelands') to private operators for afforestation was a key prerequisite for its subsequent Forest Law Amendment of 1998 (see above).<sup>13</sup> The Four Wastelands include uncultivated barren hills (sloping land), valleys, riverbanks and wilderness and cover about 5.6 per cent of China's land area.<sup>14</sup> By allowing auctions, farmers were able to compete for long-term utilisation and management (though not ownership) rights over barren land, rather than depending on administrative allocation. Moreover, the policy reinvigorated efforts to clarify use rights.

In 1996, 3.7 million hectares of 'wasteland' had been auctioned. Since the passing of the Forest Law Amendment, the practice of selling forest land

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13. 'Decision on Several Issues Concerning Establishment of the Socialist Market Economic System', Third Plenary Session of the Fourteenth Communist Party Council Committee, 1993.

14. Figure based on National Forest Resource Inventory, 1994-1998.

through a public bidding process has been extended to stocked lands. Immature, middle-aged and mature standing stocks of trees are auctioned.

#### **2.4.5 Liberalising timber market – an iterative process**

Prior to 1978, the domestic forest product market was dominated by the state. About a quarter of total timber production was organised under a centrally planned system called the Unified Procurement System, administered by the then Ministry of Forestry, and the rest was used locally. Under the Unified Procurement System, state and collective farms sold forest products to state processing enterprises at prices set centrally. Although prices were linked to costs of production, they did not take account of most forest management and were normally well below market prices.

Since 1978, the market has been gradually liberalised and private producers have been increasingly permitted to sell some or all of their output freely. In 1985, the Unified Procurement System was officially abolished. However, the government re-imposed controls in 1987 following rapid deforestation. Since then, the state has gradually released its grip and now only requires state farms to sell a set quota of logs at set prices. Sales additional to quotas can be sold freely. Collectives have been able to sell freely since 1993. Moreover, the prices paid by the government for timber have been gradually increased to meet free market prices. Where the government demands extra logs, it pays above quota prices. By 1993, the government accounted for only 10 per cent of timber purchases, down from 81 per cent in 1980. Much of this was timber for the military, disaster relief, the coal industry and railway construction and is expected to be eliminated in the near future (Yaoqi Zhang *et al*, 1998; Waggener, 1998).

In addition to unwinding the Unified Procurement System, the SFA and the Ministry of Internal Trade are pushing for improved integration of regional and national timber markets. So far, five regional markets have been established and in 1996 the Beijing National Timber Exchange Market was set up. By 1997, the Beijing market saw 6.8 million cubic metres traded, 80 per cent of which was logs (Waggener, 1998). Despite these advances, in many rural areas markets are relatively undeveloped and most trade occurs through forest department depots where prices are influenced by government ‘guidelines’ relating to maximum and minimum prices. It is also important to stress that even where the free market dominates, it is not entirely free as the government still regulates the size of harvests (see Section 2.3.3).

Liberalisation on the domestic market has been mirrored in the international market. Although the government still administers a system of export certificates, most restrictions over the number issued for timber products have been reduced and those that do exist tend to be imposed to protect specific species from over-extraction.

Import tariffs have also been reduced in line with China’s Asian-Pacific Economic Community commitments, its attempt to improve its chances of

joining the World Trade Organisation and its recent policy of promoting timber imports to fill the gap in supply created by the introduction of the Natural Forest Protection Programme. Prior to January 1999 tariffs on timber and other forest products ranged from 1 per cent to 22 per cent and a total of 14 different rates were applied. In 1999, rates have been eliminated for some roundwood, sawn timber and lumber products and where tariffs are still charged the average rate has fallen by 9.3 per cent (Chanjin Sun, 1999).

#### **2.4.6 Afforestation programmes throughout the 1980s and 1990s**

Alongside various legislative initiatives, China has invested in a number of programmes to expand its forestry resources. Since 1978 ten forestry programmes have been launched, targeted mainly at safeguarding and generating forest environmental benefits such as watershed protection, soil erosion control and biodiversity (see Table 4, Section 2.3.2 for the main programmes). In total, the ten programmes cover 7.1 million hectares, accounting for about 2.7 per cent of China's forest land area. By 1999, the programmes had established a total of 38.39 million hectares of plantation.

While these have traditionally been implemented in a top down manner, there is a clear shift in more recent programmes to generate increased private sector investment. This shift is notable in the three most recent large-scale forestry programmes: the Natural Forest Protection Programme, 'Transforming Farmland into Forests and/or Grasslands Programme' and the Great West Development Programme. In all three, private resource tenure is encouraged, and those who plant trees in barren areas are awarded rights to these resources. Brief descriptions of each are provided below.

##### **Natural Forest Protection Programme**

In the wake of widespread flooding of the Yangtze and Yellow Rivers in 1998, the SFA proposed the Natural Forest Protection Programme as a large-scale scheme to protect over 95 million hectares of natural forest by 2010. The central aim of the programme is to protect valuable forest environmental services, most notably watershed protection services. The programme has two major components: natural forest protection and afforestation.

Most funds are being channelled to the upper reaches of the Yangtze and Yellow Rivers, where 61 million hectares of natural forests will be conserved. In some areas logging bans will be implemented, while in others restricted harvesting will be permitted. On average, timber harvesting volumes will fall by 12.39 million m<sup>3</sup> each year between 2000 and 2010. This compares with total production of 64 million m<sup>3</sup> in 1997. In addition, 8.67 million hectares will be planted. The ultimate aim is to raise forest cover from its current 16.6 per cent of land area to 21.24 per cent by 2010, well above the targeted forest cover of 19.4 per cent set out prior to the Natural Forest Protection Programme.

In addition to its work in the upper catchments of the Yangtze and Yellow Rivers, forest harvesting in the northeast and Inner Mongolia will be severely restricted and 33 million hectares of natural forest will be conserved. In total reforestation, either through natural regeneration or artificial planting, of 30.97 million hectares has been targeted in 17 provinces by 2010.

The State Council approved the programme in 2000 and has committed to spending US\$11.6 billion (96 billion RMB) over 10 years. Six hundred to seven hundred thousand loggers are expected to be trained in tree planting and forest management (China Daily, 1999). As the source of timber supply shifts from natural forests to planted forests, private entities will become a growing force in the sector. According to the Natural Forest Protection Programme the government will

*“vigorously encourage private involvement in contracting for forest protection and management, and gradually set up a new model of Natural Forest Protection Programme implementation which is market-economy-oriented and participated with multidisciplinary stakeholders, including private sectors”.* (SFA, 2000)

### **Great West Development Programme**

The Great West Development Programme was launched in 1999 to speed up development in western, more marginalised, parts of China. Over the last 20 years of reform, the gap between the west and east has widened, with western incomes amounting to only 70 per cent of the national average (China Council for International Cooperation on Environment and Development, 2000). Over 90 per cent of the 80 million Chinese living below the poverty line live in the west (Kynge, 2000b). The Programme aims to spend US\$8.4 billion (70 billion RMB) on four key sets of tasks, as follows:

- accelerating infrastructure development, with an emphasis on water resources;
- strengthening the ecological environment with a focus on tackling desertification, soil erosion and worsening floods;
- promoting industrial development; and
- improving science, technology, education.

The Natural Forest Protection Programme in the upper-Yangtze River and the mid- and upper Yellow River is incorporated into this Programme.

In order to achieve the goals, the State Council introduced a set of preferential policies at the end of 2000, ranging from cheap loans, subsidies, tax breaks, domestic and foreign investment incentives, technical assistance and other in-kind benefits. To encourage planting in barren areas, tax exemptions were introduced for the agriculture special product tax on top of more generous land tenure terms including longer contracts for 50 years, the right to transfer resources and the right to pass resources to children.

## Transforming Farmland into Forests or Grasslands

Also known as the ‘Grain for Green Programme’, the Transforming Farmland into Forests or Grasslands scheme was initiated in 2000 as a key element of the Great West Development Programme. The scheme aims to tackle growing ecological degradation in western areas. The private sector, especially farmers, is the key player in implementation of the programme.

The first year of the programme was a trial period covering 18 provinces. A total 376,667 hectares of farmland were targeted for conversion into forest or grasslands, and 467,333 hectares of barren areas were planted. It is expected that increased vegetation cover will reduce erosion and gradually improve water quality. In terms of financing, the Central Government allocated a total of US\$229 million (1.9 billion RMB) for this program in 2000. The funds are used to provide incentives for landholders to participate in the scheme. Payments are made in the form of grain as well as cash. In the middle and upper reaches of the Yellow River, farmers are given 1,500 kg of grain for participating, while in the upper reaches of the Yangtze River they are awarded 2,250 kg of grain plus US\$36 (300 RMB) per hectare converted. Local forestry authorities also provide seedlings or grass seeds free of charge.

## 2.5 Summary

China’s huge size and its vast forest resource make it an essential component of any global effort to promote sustainable forestry. Not only is China a major producer and consumer of forest products, but it houses vast reservoirs of biodiversity and plays a critical role in maintaining valued environmental services. Yet, to date most in the outside world has only a superficial understanding of China’s forestry sector and the tremendous reforms underway. Even within China, keeping track of change in such a diverse country is a major task. In certain cases, local authorities have pushed forward rapidly, while in others reform has been subject to a number of policy reversals and resistance.

Notwithstanding local level diversity, taken as a whole China’s step-by-step reform programme amounts to a dramatic shift in stakeholder rights and responsibilities in the forestry sector. As households, communities, private companies and shareholding cooperatives emerge as a driving force in forest development, the government (in all its guises) is having to change shape and adjust to new responsibilities. While effective regulation remains key, it is increasingly critical that the government develops new tools to manage and channel private energy towards socially and environmentally beneficial forestry.

Innovative solutions are already emerging. The challenge is now to analyse the existing wealth of experience and draw out key lessons that allow policy makers to build on success and check failure. In what follows, an attempt is made to identifying trends and lessons. An effort is also made to highlight relevant international experience. It must however be stressed that this report only represents a start of what will necessarily be long process of evaluation and lesson learning.

# Making the most of forest tenure reform and contracting out<sup>15</sup>

The launching of ‘decollectivisation’ of forest tenure in the early 1980s set in train a gradual, though significant, process aimed at increasing the prominence of private participation in China’s forestry sector. An extension of China’s Household Responsibility System, decollectivisation of forest tenure involves contracting collectively or state owned forests to rural households and communities to use, manage and protect. A principal goal of the reform is to give farmers incentives to invest in forest resources.

While the central aim of decollectivisation is straightforward, its implementation has involved experimentation across regions and over time. Contracting to households has gone furthest in collective areas, but state forest farms and forest bureaus have also introduced a variety of contracts as a means of providing for employees during times of economic hardship. Contracting arrangements have varied in length of tenure, method of allocation (e.g. auctions, per capita allocation), transferability and the numbers involved.

The different arrangements associated with contracting forest land and their dynamic nature are widely accepted to have profound impacts on farmers’ behaviour and social welfare. The question of exactly how tenure impacts on private forest management, however, remains a topic of hot debate.

Central governmental research agencies including the Chinese Academy of Forestry, the Forest Economics and Development Research Centre, and the Chinese Academy of Social Sciences have produced numerous surveys and reports. Researchers at provincial level have also been keeping track of tenure change over the years. While extremely interesting, these studies have often been *ad hoc* and lacking in analytical rigour. The central objective of this chapter is to synthesise previous work on forest tenure and to draw out critical insights on how tenure arrangements affect private behaviour.

The section begins with a review of changes to forest tenure over time. It goes on to examine the current status of reforms, focusing on China’s southern collective region where reform has been ongoing for longest. Following an assessment of the drivers of reform, an effort is made to point to emerging ‘best practice’ in contract design. Impacts of new tenure arrangements on the welfare of rural households and emerging challenges to the wider adoption of successful strategies are also highlighted.

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15. This section is based on Xu Jintao *et al* (2001).



Information for this analysis was drawn from published reports, workshop proceedings, legal documentation and government regulations. The literature review is supplemented by field data collected from Sichuan Province on wasteland auctions, Yunnan and Anhui Provinces on impacts of forest land tenure change and the northeast forest region on state forest tenure change.

## 3.1 A history of forest tenure reform

The recent history of forest tenure can be divided into four periods: the Min-Guo period (pre-1949), forest redistribution and collectivisation (1950-1956), communisation (1956-1980) and decollectivisation (post-1980). Important features relating to forest land tenure of each period are noted below.

### 3.1.1 Min-Guo period: Pre-1949

Three forms of ownership existed in the Min-Guo period (after the end of feudal Qing Dynasty and before the founding of the People's Republic of China), namely: state, public and private forests. A large majority of forests was under state ownership, including large areas of 'safety forests' located along major rivers and preserved for their role in conserving water resources, controlling flooding, and protecting historic sites. Public forests included forests owned by provinces, counties, townships and public corporations. Private forests were those formed through private investment on privately-owned land. Private landholdings tended to be large-scale and dominated by wealthy families.

### 3.1.2 Forest redistribution and collectivisation: 1950-1956

With the founding of the People's Republic of China, land tenure underwent drastic change. These changes may be split into two phases. The first between 1950-1952 saw the confiscation of forest holdings and reallocation to poor households. The second between 1953-1956 involved the initiation of collectivisation.

#### **Confiscation and redistribution: 1950-1952**

The 'People's Republic of China Land Reform Law' (1950) claimed forests, barren land and barren mountains for the state. Forests owned by landlords, forest enterprises, rented-out by rich peasants, or occupied by special groups such as religious groups were confiscated and redistributed to poor farmers. All rights, including utilisation and management, were transferred to the new owners (Jingzhou County Forestry Bureau, 1993). Forest land owned by ordinary farmers and small forest owners was not subject to confiscation (Liu Dachang, 1998).

#### **Emergence of collectives: 1953-1956**

While the policy of redistributing forestlands had already had dramatic impacts for rural communities, the government changed tack in 1953. Rather than allocating ownership rights to poor peasants the state took control. Apart from small subsistence plots and scattered wood, all private forestlands were forcibly

merged into small-scale cooperatives. Forest owners were provided with a fixed compensation payment.

### **3.1.3 Communitisation: 1957-1980**

Between 1957-1961 the nation embarked on what is widely known as its 'Great Leap Forward', a mass mobilisation campaign mounted by the government to develop its industrial and agricultural base. All resources were directed towards supporting this strategy. The rural economy was organised into large-scale communes to maximise the productivity of rural resources to support industrialisation. Both state forests and emerging collectives were targeted for 'communitisation'. Forests were viewed as key natural resources that could be drawn down to support industrial development. The country entered its first wave of forest degradation.

From 1961 to 1965, private plots were restored, and farmers were once again permitted to own trees around houses and in private plots. However, this policy change did not last long. The Cultural Revolution, which was initiated in 1966 and lasted for ten years, led to the re-establishment of communes and the reclamation of all private plots. All private production was banned. Forests underwent rapid destruction.

### **3.1.4 Decollectivisation: 1980-present**

Decollectivisation in China's rural areas started in 1978. The early success of the Household Responsibility System in raising agricultural productivity led to its extension to forestry through the passing of China's 'three fix' policy in 1981 (see Section 2.3). This policy represented a new phase in the history of forest tenure. Rural households once again were awarded private rights to forests used for subsistence purposes, also known as 'self-keeping plots'. These rights were contracted to farmers permanently and could be inherited.

In addition, the 'three fix' policy introduced 'responsibility forest land', or forests owned by the state or collectives that could be contracted to households for forest utilisation and management. Interested farmers were required to sign a contract with the collective or state forest authority to be allowed to operate on the land. In the early 1980s contract periods ranged from 5 to 15 years. Contracts specified benefit-sharing arrangements, which also varied. In some cases, the farmer was permitted to keep production over a specified quota. In others, the farmer gained ownership over forest resources grown on the land. In general, the greater the farmer's input the higher the share of rewards.

Reforms have been given a boost in recent legislation, most notably in the 1993 'Decision on Several Issues Concerning Establishment of the Socialist Market Economic System'. This Decision introduced the possibility of auctioning 'Four Wastelands' (uncultivated barren hills, valleys, riverbanks and wilderness) to private operators for afforestation (see Section 2.3). The Forest Law Amendment (1998) is clear in its support for contracting out by collectives and state forests. It states:

*“Trees planted by farmers in their yard, private plots and private hill plots belong to the farmers. Collectives or individuals who contract state or collective owned barren hill and barren land for afforestation will own the forests.” (Clause 27).*

Critically, the new Forest Law lengthens the period over which forest land may be allocated to a private entity to 70 years and grants permission for the transfer of utilisation and management rights (Clause 15). However, while rights for forest land may be transferred, land cannot be converted to agriculture without permission.

## 3.2 The current status of forest land tenure reform

Decollectivisation was introduced first, and has gone furthest, in the southern collective forestry region. More recently, state forests have also made tentative moves to increase local household involvement in forestry (see Box 2). Given the early stage of household contracting in state forests, the remainder of this section focuses on experiences in China’s southern collective region.

### Box 2 Forest land tenure reform in state forests

As highlighted in Section 2.3.2, state forests are primarily concentrated in the northeast and southwest. Major suppliers of timber since the 1940s, in the last two decades state forests have been in decline due to over-exploitation and poor management. In the northeast region, for instance, forest resources were reportedly depleted in 31 out of 82 state forest bureau areas by 1995 (Liu Jun, 1996). Overall, an estimated 65 per cent of state forest bureaus are close to running out of timber (see Section 2.3.3).

The first state forest bureau to explore tenure reform was the Shanghulai Division of the Taoshan Forestry Bureau in Heilongjiang Province. In 1983, the Shanghulai Division sought to contract out forest use rights to promote forest investment by forest workers. Every worker was awarded an area of land to grow trees. In addition to the regular salary, workers received an annual bonus for each tree alive beyond the 80 per cent survival rate. This simple reform transformed the stagnant afforestation work in the Division. Survival rates of planted trees reached 90 per cent in the following five years.

Yet, the reform was short lived. In 1988, shrinking budgets and high monitoring costs associated with the scheme led to its abandonment. Apart from one scheme in Sandaotong Division of Fangzheng Forestry Bureau (also in Heilongjiang Province), all other forestry bureaus that had adopted similar schemes halted them in the late 1980s.

Since 1998, with the launching of the Natural Forest Protection Programme, state forests are once again experimenting with private participation in forestry. The Natural Forest Protection Programme has led to the drastic scaling back of state forests’ timber operations and called on forest industry bureaus to invest in forest protection and management for environmental services. In response, a

'Management and Attending Responsibility System in Forest Resources' was established in Bamiantong, Suiyang, Linkou, Fangzheng and Qinghe Forestry Bureaus in Heilongjiang Province.

Under the Management and Attending Responsibility System operational districts are split into plots of 50-200 hectares. Contracts, normally lasting 10 years, are then signed between forest bureau divisions and workers for the rights to manage the forest plots. Allocation of management plots is generally done administratively, but in a few cases it is determined through auctions. The workers' main task is to tend the forests and plant trees. Timber is passed directly to the state forest bureau for processing. In return for their forest management activities, workers (contractors) are paid a management stipend. The workers can also utilise the forest to grow and collect NTFPs, as long as timber growth is not affected. The authority imposes a 'resource compensation fee' on the contractors, based on the estimated value of NTFPs. To reduce encroachment and theft of forest resources, the Management and Attending Responsibility System emphasises involvement of farmers living around the forest areas (Wang Qianjin and Zhiming Mu, 1999).

While it is still too early to assess the scheme's success, preliminary data gives reason for optimism. In Qinghe Forest Bureau, 109,000 hectares (over 75 per cent of its forest land) was allocated to almost 2,500 households under the management system. It is estimated that income per worker rose an average six-fold as a result of the scheme. In Fangzheng Forest Bureau, which has adopted the Management and Attending Responsibility System to follow on from its earlier contract scheme (see above), tree survival rates have increased from less than 5 to 97 per cent, and forest coverage has risen from 18 to 80 per cent since 1985 (Wang Qianjin, 2000).

Data on the current extent of contracting out of forest land by collectives is hard to come by. Where it exists it is often anecdotal and/or poorly defined. In this study, information from scattered sources has been compiled for 8 southern provinces in the mid-1980s. The results are presented in Table 5.

**Table 5 Contracted forests in the southern collective forest region (1986)**

Province	Area of collective forest land (million hectares)	Area of households managed forest land (million hectares)	Household managed forests (%)**
Zhejiang	5.73	4.37	76%
Anhui*	3.79	2.80	74%
Fujian	8.19	2.65	32%
Jiangxi	9.27	8.58	92%
Hubei	7.04	5.75	82%
Hunan	11.14	8.33	75%
Guangdong	9.27	8.17	88%
Yunnan	20.31	11.17	55%
<b>Total</b>	<b>74.76</b>	<b>51.81</b>	<b>69%</b>

Source: Survey data and Ministry of Forestry (1986)

\*1982 data \*\* includes both self-keeping and responsibility plots

It is important to distinguish between ‘self-keeping plots’ allocated for subsistence needs, and ‘responsibility plots’ allocated for production for sale. The former tend to be smaller scale, ranging from 0.05 hectares to 0.23 hectares per capita, while the latter may involve thousands of hectares per capita. The literature often mixes the two, compounding data problems.

From Table 5 we can see that contracted plots in the southern collective region accounted for an average 69 per cent of collectively owned forest land in the mid-1980s. However, the degree of contracting out varies considerably between regions. While Jiangxi, Guangdong, Hubei, Zhejiang and Hunan Province allocated between 75-92 per cent of the collective forest land, others did so only modestly (e.g. Fujian Province which allocated only 32 per cent).

Other estimates put forward by the Ministry of Forestry support the picture portrayed in Table 5. By 1984 the Ministry of Forestry estimated that about three-fourths of counties and four-fifths of villages in China had implemented the basic tenants of the ‘three fix’ policy. In the southern collective forest region an estimated 11.33 million hectares of forest land, or 13.6 per cent of total collective forest land in the region were distributed to 50 million households as self-keeping plots. An additional 40 million hectares of forest land and hilly-land are estimated to have been contracted out to rural households as ‘responsibility hilly-land’. Together self-keeping and responsibility plots covered over 50 per cent of collective forest land and 90 per cent of the region’s barren land designated for forestry use. The number of farmers specialising in forestry reached 4 million in the mid-1980s (Ministry of Forestry, 1984; Wang Youchen and Zhang Xiaojing, 1998).

It should be stressed that, because the reform process is dynamic, the above figures relating to the mid-1980s may not reflect current levels of contracting out. While most evidence points to a rapid expansion of forest land contracting out, there are examples of reform being halted or even curtailed (see Box 3).

Where contracts for forest land have become more attractive, greater numbers of actors are competing for forest use rights. Alongside private individuals and households, local forest administrations and state forest bureaus have become major buyers of rights to standing forests. In Qiandongnan Autonomous Prefecture, Guizhou Province, for instance, the local forestry bureau made 64 purchases of forests by 1994, equal to 68 per cent of total transactions. State organisations outside the forest sector made 11 purchases, while individuals made 18 purchases. Forest processors are also increasingly keen purchasers of forest use rights to guarantee their raw material supplies. This has become particularly apparent with foreign processors operating in China (see Section 5 on company-community deals). Higher levels of competition for forest tenure has raised returns to suppliers of tenure rights. Consequently, collectives are now competing with cooperatives, households and private individuals in offering rights to degraded and planted forest land.

### Box 3 Extension and curtailment of contracting out schemes in collective forest areas

In many areas contracting out of forest lands to private households has been widely praised for raising productivity, increasing forest stocks and improving welfare. In others, it is blamed for increasing deforestation and worsening social inequalities. Different experiences with contracting out have in turn underpinned different levels of enthusiasm for implementation.

#### Reinforcing private sector participation

In Youxian District of Mianyang City, Sichuan Province the authorities have been forthright in their support of contracting out. By the end of 1982, the district had allocated most of the collective forests as self-keeping plots. As soon as the tenure was arranged and boundary agreed upon, the households were issued forest land-right papers. The allocation was viewed as final and subsequent calls for redistribution to take account of population change have been resisted. The trees on self-keeping plots are owned by farmers (though the land is still collectively owned) and are inheritable and transferable. A collaborative forest guarding system was established. Contrary to expectations, contracting out led to reduced theft of timber and NTFPs (Liang Yiyan, 1995).

#### Policy reversals

Local authorities that have decided to reclaim forests allocated to households under the Household Responsibility System often point to two main problems. Firstly, where forest plots have been allocated according to household size (a common approach), changes in household numbers leads local forestry officials to reclaim forests for redistribution. A second justification for reversals in tenure reform is increased illegal logging and forest destruction. When reforms were first implemented in the collective forestry areas between 1984-1988, the region suffered severe deforestation due to surging illegal cutting. Local officials reacted by reversing reforms and taking back forest land use rights (Huan *et al*, 1998). In Jiangshan City, Zhejiang Province, for instance, 'responsibility' forest land fell by more than 20 per cent after the 1987-1988 readjustment of forest tenure arrangements (Zhejiang Department of Forestry, 1988). The area of self-keeping plots in Hubei Province dropped from 5.7 million hectares to 4.7 million hectares, or by 18 per cent.

#### Something in between...

In Shangbai Village of Zhejiang Province experimentation with contracting out of forest land to households in the early 1980s was reversed in 1988 when the villagers decided to lease the same land back to the village authorities. Farmers found that the forests were of poor quality and production costs were too high to justify investment. Households that had originally received 30 year leases, sub-leased forests to the village authorities on an annual basis. In return for access to the forests, the village authorities pay farmers US\$45 (RMB 375) per hectare per year and give farmers 40 per cent of the net returns from forest production (Shangbai Village field survey, August 1999).

## 3.3 Key drivers for change in collectives

The adoption of Household Responsibility System in the agriculture sector since 1978 has prompted increasing demands for collectives to distribute forest land to local farmers. Villagers see contracting out as an opportunity to raise income. Local authorities, boosted by their positive experience in the agriculture sector, associate contracting out with higher levels of productivity, increased government revenue and poverty alleviation. Gradually, enthusiasm is also spreading to processors interested in securing their raw material supplies through contracts with local households. The scale and the speed of tenure change vary to reflect local interests. The main drivers for reform are set out below.

### 3.3.1 Rural livelihood support

Contracting out offers rural households the prospect of earning a higher and more diversified income. The benefits are greatest where forests are grown on degraded land and households can supplement their agricultural produce<sup>16</sup>. By investing in timber and NTFPs alongside agricultural production, farmers may also reduce the risks associated with crop failure.

### 3.3.2 Improving productivity

Local leaders' interest in contracting out stemmed from pressure from the centre for improving forest management efficiency and raising afforestation investment and survival rates. Contracting out in the agriculture sector was credited with significant increases in productivity and it was felt that forestry would also benefit.

### 3.3.3 Inadequate conservation finance

The government's focus has recently broadened from raising forest productivity to increasing private investment in conservation and the production of forest environmental services. This shift is evident in the Natural Forest Protection Programme and the Great West Development Programme. The extension of contracting out schemes is a major element of both programmes since it is viewed as a mechanism for generating additional finance for conservation (see Section 6).

### 3.3.4 Processors desire to secure raw material supplies

While the majority of private investors have been individual households, private enterprises are of growing importance. Forest-based processors, e.g. paper mills, have shown particular interest, viewing forest investments as a relatively cheap approach to securing their fibre supply base (see Section 5).

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16. It should be noted, that households that depend on degraded lands for livelihood benefits may suffer where degraded lands are contracted to specific individuals (see discussion in Section 3.5).

## 3.4 Emerging 'best practice' in contracting out

Contracting arrangements in China's collective forestry sector have allowed the government to retain ownership of forest land, while encouraging private investment by devolving use and management rights. Approaches to contracting out forest land have evolved as local authorities and the private sector have gained experience. Despite the lack of up-to-date data on contracting out, a number of insights as to emerging 'best practice' have been gained through a literature review and field visits undertaken for this project. Key advances include the adoption of more attractive benefit-sharing terms in contracts, the promotion of contract transferability, the introduction of auctions to allocate plots, and the lengthening of contract periods. The general thrust has been to make contracting more attractive for forestry investors. Each of these features is briefly outlined below.

### 3.4.1 More balanced benefit-sharing agreements

In the early years of contracting out, households were offered limited benefits. In return for being given exclusive rights to the trees or NTFPs in an area, contractors were required to produce a given quota for the collective at a set price, or pay a fee. If a quota was required, any excess production could be sold on the free market and this was the main incentive for increased productivity. Where fees were paid, the operator could keep the profit. However, since forest land allocated to private entities in the early years tended to be barren and require significant up-front investment, the deals on offer were often unattractive.

In the late 1980s and 1990s, collectives began modifying contractual terms to generate greater enthusiasm. Today, not only are production targets and financial payments for barren land increasingly waived, but collectives are often willing to transfer rights to standing young and middle-aged forests. In the 1990s, regulations have been drafted in Fujian, Sichuan and Qiandongnan Autonomous Prefecture of Guizhou Province to guide the transfer of rights to standing trees.

With the establishment of a market for forest land use rights (see Section 3.4.2 below), benefit-sharing arrangements must be increasingly competitive. Prices for forest rights depend on a number of factors including whether the land is barren or includes trees, the distance from markets and transport links, quality of the land/timber, species type and terrain (Jiang Yayun, 1992). Competition has also increased as sellers other than collectives enter the market. Individuals growing trees on contracted hilly-land have been known to sell their rights to standing trees at prices ranging from US\$2,700 to \$5,400 (22,410 to 44,820 RMB) per hectare, or US\$12 (100 RMB) per cubic metre. Rural cooperatives are also active sellers of rights to recently established plantations (see Box 1 in Section 2.3.3 for a description of co-operatives).

### 3.4.2 Contract transferability

The amendments to the Forest Law in 1998 introduced the possibility of transferable forest land rights. While in some cases use right transfers are limited within administrative areas, e.g. within a particular village or township, trades are increasingly permitted outside local boundaries.

Transferability was introduced in an effort to ensure an efficient allocation of forest resources and low-cost production. Where forest land is allocated administratively, e.g. on a per capita basis, transferability permits farmers to re-contract their forest parcels to more productive entities. Transferability also encourages greater efficiency by reversing forest fragmentation associated with decollectivisation. This has been particularly important where small plots have been uneconomic and where land is degraded or remote. For instance, in Xioning County in Anhui Province, farmers have been allocated more than 10 plots of forest land, ranging from 0.03 to 0.2 hectares. Unless plots can be consolidated, the costs of plantation, harvesting and management will exceed any likely revenue (Kong Fanwen *et al*, 1998).

In addition to permitting the creation of viable forest plots and maximising productivity, transferability provides a critical mechanism for managing investment risk since it permits farmers to sell rights in the face of unexpected shocks. Similarly, where new investment opportunities emerge, farmers are not tied into forestry, but can sell their rights for cash to invest elsewhere. Transferability, thus, raises private investment in forestry by both raising potential returns and lowering associated risks.



### 3.4.3 Auctions to allocate plots

Local level experimentation with auctions have their legal roots in the Communist Party Council Committee's 1993 '*Decision on Several Issues Concerning Establishment of the Socialist Market Economic System*', which allowed for auctioning of 'Four Wastelands' to promote afforestation (see Section 2.4). The growth in implementation of auctions, however, is less a result of the new legislation, than of a growing recognition of their advantages. Auctions are thought to counter problems of inefficient administrative land allocation and associated forest fragmentation by allocating use rights to the highest, and thus most efficient, bidder. Auctions have also been favoured by collectives as a tool for maximising revenue from the sale of use rights.

Examples of auctions are found scattered in official reports, newspapers, journals and informal documents. No national survey has been undertaken and no attempt has yet been made to bring the information together. The best overview is provided by the Ministry of Water Resources (1997) for wasteland auctioning. Its results are summarised in Table 6.

From Table 6 we can see that auctions have been implemented in at least 15 provinces. By 1996, 3.1 million rural households purchased 3.8 million hectares

of wasteland through auctions, yielding US\$95.2 million (790 million RMB). In total, auctions have resulted in the planting of 1.9 million hectares, over 50 per cent of the auctioned land. Some of the earliest written records on auctions exist for Sichuan Province. Box 4 outlines Lushan County's experience in introducing auctions.

<b>Province</b>	<b>Area ('000 hectares)</b>	<b>Price (US\$)</b>	<b>Number of purchasing households</b>	<b>Area planted ('000 hectares)</b>
Shanxi	990		315,000	327
Sha'anxi	498	6,867,470	180,000	134
Yunnan	482	14,615,663	426,061	198
Inner Mongo	396	1,781,253	234,500	104
Hebei	347	6,144,578		208
Heilongjiang	333			
Henan	200	4,819,277	39,360	
Liaoning	145	7,313,976	105,000	100
Shandong	133			64
Gansu	140			
Guizhou	92	2,336,627	12,550	
Ningxia	1	47,880	24,092	0
Sichuan	7	301,205	4,000	
Jiangxi	10			
Jilin	5		7,700*	
<b>Total</b>	<b>3,768</b>	<b>95,180,723</b>	<b>3,060,000</b>	<b>1,900</b>

\*Including other forms of acquisition  
 Source: Ministry of Water Resources (1997)

**Box 4 Auctions in Lushan County, Sichuan Province**

In 1996 Sichuan passed its 'Provincial Management Regulations Regarding the Transfer of Timber and Wastelands'. The declaration gave official sanction to the rapid spread of auctions being used to allocate forest use rights in the province. In total, about 270,000 hectares of wasteland were tendered for afforestation in Sichuan between 1992 and 1995.

Lushan County has been a local leader in introducing auctions for forestry rights in Sichuan. As in other counties, the early years of decollectivisation involved the administrative allocation of forest land to local households. In general, recipients paid a flat annual rent or a share of profits. In the early 1990s, however, auctions were increasingly used to allocate wastelands that had not yet been contracted to households, or to allocate lands that have been reclaimed by collectives due to the failure of contractors to utilise the land. Auctions involved collectives calling for bids from potential buyers. Bids have been in the form of offers of an up-front payment or annual rentals.

In Lushan County, use rights to about 5,000 hectares of forest land had been auctioned between 1993 to 1998. Collectives owned most of the land, though a significant portion was state-owned. Fifty per cent of rights to forest land was allocated for 10-40 years. Longer-term rights of between 70-100 years were also allocated, but only in about 2 per cent of cases and concentrated in remote mountainous areas. Prices recorded in auctions ranged between US\$0.004 per hectare and US\$4.01 per hectare (0.03 - 33.3 RMB/hectare), reflecting variations in expected profits associated with use rights. The lowest prices were paid for wasteland in poor condition, located some distance from transport links, while the highest prices were paid for mature forest lands. The two parties generally share costs associated with carrying out the transaction.

Since being allocated, a healthy trade for forest land rights has evolved. Sellers include cooperatives, town governments and local forest farms. Buyers include farmers, non-farming individuals, cooperatives and private companies. Table 3-1 and Table 3-2 provide an overview of the stakeholders involved in transactions for use rights and the types of land traded between 1993 and 1998.

**Table 3-1 Buyers and sellers of forest land use rights in Lushan County (1993-1998)**

Classification		Number	Percentage
Sellers	Village or household group	80	98
	Town government	1	1
	Town forest farm	1	1
	<b>Subtotal</b>	<b>82</b>	<b>100</b>
Buyers	Farmer	52	63
	Non-farmer individual	28	34
	Companies	2	2
	<b>Subtotal</b>	<b>82</b>	<b>100</b>

**Table 3-2 Land types involved in rights transfers 1993-1998**

Land type	hectares	Percentage
Forested land	1,006	23
Open forest	125	3
Shrub land	510	11
Wasteland	2,814	63
<b>Total</b>	<b>4,455</b>	<b>100</b>

While the largest share of use rights trading involved parcels of less than 10 hectares, a few trades involved large plots. Twelve households purchased use rights to more than 65 hectares and another 3 purchased use rights for almost 700 hectares. Foreign companies are increasingly leasing forest land for the plantation of forests for timber and NTFPs. Between 1996 and 1999, over 6000 hectares of barren mountain have been developed.

While auctions have grown in prominence, their success depends on the existence of a number of prerequisites. It is important that an adequate number of bidders participate to avoid collusion. Where too few buyers exist, they may negotiate to hold down their bids. Sufficient information and access to financing must also exist so potential bidders can assess the value of the use rights and have the means to participate in the bidding process. It is not clear that these conditions are always met in China.

### 3.4.4 Lengthening tenure

Forest use rights are allocated for periods that range from less than 10 to over 70 years. In general, the lower the value of use rights, the longer the tenure required to attract investment. For degraded wastelands, tenures tend to be longer than 50 years, while rights to standing forests will last for 20-50 years. Tenures are also longer for remote lands that suffer from higher transport costs. For instance, in Banliu village, Yunnan Province, standard tenure lengths of 40-70 years are extended to 70-100 years when remote mountain forestlands are contracted (see Box 6, Section 3.5 below). This is also the case in Lushan County, Sichuan Province (see Box 4 above). In some cases, authorities lengthen tenure duration by permitting automatic tenure renewal as long as rights holders abide by government regulations.

Despite a lack of up-to-date information, this section has made an attempt to highlight four elements of emerging ‘best practice’ in contracting out in China’s southern collective regions. This assessment is preliminary and aims to provoke discussion and further research into how different tools are being used in different localities to promote private investment in forestry and their varying degrees of success.

## 3.5 Impacts of tenure reform in collective forests

It is extremely difficult to produce a single evaluation of the impact of forest tenure reform in China. Not only do approaches to decollectivisation differ significantly between sites, but impacts will also vary according to local historical, physical and socio-economic contexts. National-level evidence that contracting out of forest lands has improved land-use productivity, e.g. an estimated 30 to 50 per cent of wastelands have been successfully forested following allocation to private households (Ministry of Water Resources, 1997), are of limited value. Yet, little energy has been devoted to more detailed analysis. One study that stands out for its efforts to quantify tenure reform impacts in the forestry sector was undertaken by Huang *et al* (1998). This study is briefly outlined in Box 5.

Given the limitations of aggregate data, in what follows the discussion focuses on lessons from one village in Yunnan Province: Banliu Village. Information was collected through face to face interviews with farmers who have contracted forest land as well as with farmers who have not participated in contracting

### Box 5 Results from an econometric analysis – impacts of contracting out forest land

Huang, Rozelle and Qiao (1998) conducted an econometric analysis based on data from 28 villages in Yunnan Province in 1996 to uncover the impacts of forest land reform on the patterns of forest production and land use. Nine out of 28 villages initiated forest land reform in 1982. Village leaders allocated 269 hectares of collectively owned forest land to farmers (including both 'self-keeping' plots and responsibility forest land), accounting for 30 per cent of the total forest land of these 9 villages. This initial reform then was expanded to other villages in the province. The share of collectively managed forest land declined from 94 per cent in 1982 to 45 per cent in 1983.

The analysis shows that willingness to invest in afforestation varies significantly by forest tenure type. In general the greater the area contracted to private households, the higher afforestation rates. Moreover, the greater the level of control and rights over income, the higher the increases in forest area. Critically, contracting out was found to reduce the speed of agricultural expansion into forest areas.

schemes. In total over 150 farmers were interviewed. Insights relating to economic, social and environmental impacts are highlighted. The aim is to provide an indication of potential impacts and highlight areas for concern.

#### 3.5.1 Description of survey location

Banliu Administrative Village is located in Guanglu Township, Yao An County, Yunnan Province. Its total land area is about 1,000 hectares, 69 per cent of which is forest. There are five sub-villages under Banliu Administrative Village: two mountain sub-villages Dachong and Damaichong; and three low lying sub-villages Yantun, Banliu and Huayi. Banliu's total population is just over 2,000, including 572 farm households. The principal income sources of valley farmers include tobacco production, off-farm activities and animal husbandry. Mountain dwellers' income is mainly generated from tobacco, animal husbandry and NTFPs. In 1993, per capita net income was US\$52 (450 RMB) and each individual received an annual grain ration of 424 kilograms.

Banliu village introduced transferable forest use rights in its barren areas in August 1994. Within 45 days, 147 hectares of barren mountain land and low quality forest land had been allocated to over 15 per cent of farm households. Plot sizes ranged from 0.2 hectares to 14 hectares per household and prices paid varied from the US\$9-253 (75-2,100 RMB) per hectare. Tenure duration also varied depending on the location and the quality of the land. For most areas tenure lasted between 40-70 years, but in more remote mountainous locations rights were granted for up to 100 years.

#### 3.5.2 Economic impacts

One of the principal aims of forest tenure reform is to raise productivity and local incomes. In Banliu Village, those farmers who bought rights to barren land

generally invested significant resources in planting trees. There was a considerable increase of labour and capital input in forestry. Sixty-four of 88 contractors afforested their land and on average each household planted almost 4,000 trees. Sixty-six per cent of the households invested up to US\$60 (500 RMB) and 74 per cent invested up to 200 working days. Where households did not invest, they could sell their rights to others. By 1996, 12 rights holders had decided to sell their land rights. In addition to tree planting, contractors have invested in forest management. Five Forest Conservation and Development Groups were created with the help of Yunan's Academy of Social Science. While details of income from the sale of forest products is not yet available – trees have not yet been harvested – farmers expect future income streams to be large enough to justify their labour and time inputs.

### 3.5.3 Social impacts

A number of social benefits appear to be associated with tenure reform in Banliu Village. Twenty-four per cent of non-participating households interviewed expected to benefit from new employment associated with reforesting barren lands, e.g. work including digging ponds, tree planting, forest guarding. Farmers also pointed to diversification in their income base and reduced vulnerability to shocks as key. Farmers who are participating in contracting out have also gained new skills in forest enterprise development. At the village level, Banliu Village earned US\$3,904 (32,400 RMB) from its sale of forest use rights. The money was used for public welfare.

But the picture is not only positive. Negative impacts are also identified in interviews. Three that stand out include:

- Lost customary rights to resources – where forest land was previously treated as a common pool resource, those farmers who have not been allocated land have in some cases lost access to forests for grazing, firewood collection and other domestic uses. Forty-one per cent of non-participating households interviewed pointed to lost customary rights as a serious concern.
- Increased inequality – while land may have been inefficiently used under collective management, equality was high. Under new systems of contracting out, land is more efficiently used, but only 15 per cent of farmers received land. Less entrepreneurial or disadvantaged members of a community have tended to be marginalised by the process. Seventy-seven per cent of the non-participating farmers expected participating households to gain more than them as a result of contracting out.
- Increased opportunities for misappropriation – by introducing a new source of income for local authorities, contracting out introduces new opportunities for rent seeking.

### 3.5.4 Environmental impacts

While environmental impact assessments have not been carried out, contracting out is widely perceived to have improved watershed protection and soil fertility. Seventy-eight per cent of non-contracting households interviewed identified beneficial environmental spin-offs from reforestation of barren lands as a key reason for their continued support for contracting out. Reduced water and soil erosion and the associated positive spin-offs for their agricultural production were specifically highlighted.

It is worth noting that perceived environmental benefits are not always rooted in scientific evidence. Afforestation may pose potential dangers to the environment, which are not widely appreciated. For instance, Liang Yuyan (1999) points out that some ecological services, e.g. water quality, may be lost where barren land is developed. International evidence also suggests a need for caution (see Annex 2).

In sum, there is broad backing for decollectivisation of forest land in Banliu Village, with 85 per cent of those interviewed indicating their support. On balance the benefits of an improved ecological environment and increased income are thought to outweigh the costs. The 13 per cent who objected to the policy indicated their main problem was that it would lead to greater inequality. It is significant that those who held this opinion were mostly low-income households.



## 3.6 Constraints to reform in collectives

Forest land tenure reform has rarely been a smooth process. Not only have positive impacts often been offset by negative repercussions, but a number of factors have been blamed for slowing or blocking the introduction of forest land contracts. In what follows, key constraints to successful contracting out are listed. The list is based on a general review of the literature and field surveys. The results of interviews with farmers in Banliu Village, Yunnan Province are set out in Box 6.

### **Box 6 Constraints associated with decollectivisation in Banliu Village, Yunnan Province**

Constraints identified by farmers interviewed in Banliu Village differ between households who have participated in contracting out efforts and those who have not.

For participating farmers, the main constraints cited by valley inhabitants include: the distance of allocated land from their homes, lack of finance for the initial purchase, a lack of labour to undertake necessary forestry work, and unresolved boundary disputes. Mountain villagers also pointed to a lack of finance, labour shortages and excessive distances to plots as key constraints. In addition, they identified the lack of information available on the potential benefits associated with rights purchase, e.g. the spin-offs for grazing and the low profits associated with barren land development.

Non-participating villagers indicated similar constraints to investing in forest rights, including:

- labour shortages (31 per cent of those interviewed);
- more profitable alternatives (24 per cent);
- low returns from investment in barren lands (22 per cent);
- long distances to the contracted land (17 per cent).
- a lack of information on rights sales (12 per cent); and
- a lack of finance (11 per cent);

The reasons given for not purchasing forest land use rights varied according to household income levels. Low-income households emphasised the lack of finance as the main obstacle. Middle-income households pointed to the low expected returns of barren mountain development and labour shortages. More wealthy farmers emphasised the existence of other, more profitable, opportunities and the long distances involved.

Source: Zheng Baohua (2000)

### 3.6.1 Unsettled forest land boundary disputes

Given the number of past attempts at tenure reform (see Section 3.1), it is not surprising that there are significant boundary and property rights disputes.

When forest resources were under collective management, tenure disputes were rare. However, with the introduction and extension of contracting out, disputes have re-emerged as people seek control over higher quality land. Such disputes are blamed for causing deforestation in several areas. The extent of forest tenure disputes in 13 provinces in 1996 is set out in Table 7. The table also highlights how the number of settled tenure disputes is less than newly registered disputes each year.

### 3.6.2 Conflicting objectives

An important constraint to the success of contracting out has been the fact that the government has tried to use land reform to achieve two often conflicting objectives: equality and efficiency.

As highlighted in Section 3.3, key drivers behind decollectivisation have included the desire to raise rural welfare and the need to improve forest land efficiency. To achieve the former, self-keeping and responsibility lands have often been allocated on a per capita basis. However, this approach has not allowed for discrepancies in household productivity and provides little incentive for more efficient producers to specialise in timber production. Moreover, the small size and scattered nature of forest plots is frequently uneconomic.

To promote forest productivity, from the late 1980s local authorities began to permit forest rights transfer, and in some areas shareholding co-operatives were promoted (see Box 1, Section 2.3.3 for a description of shareholding co-operatives). In many instances, authorities reclaimed allocated forestlands that were not being utilised, and reallocated these areas to farmers that had proved

**Table 7 Forest tenure disputes in 1996**

Province	Status	No. of disputes	Area (hectares)	Disputed area as % of total	Cross- boundary disputes		Within province disputes	
					No.	Area (hectares)	No.	Area (hectares)
Liaoning	Settled	17	121	0.075	5	686	17	121
	Unsettled	94	3,279				89	2,593
Anhui	Settled	41	401	0.5	28	2,823	41	401
	Unsettled	215	16,932				187	14,109
Fujian	Settled	370	13,016	0.7	38	1,572	332	11,444
	Unsettled	461	39,645				435	37,001
Jiangxi	Settled	3	115	0.03			3	115
	Unsettled	34	3,310				34	3,310
Henan	Settled	51	587	0.2			51	587
	Unsettled	104	2,879				104	2,879
Hunan	Settled	2,863	11,433	0.7	43	468	2,820	10,964
	Unsettled	3,477	45,084				130	10,315
Guangdong	Settled	1,525	3,144	0.8	5	145	1,520	3,000
	Unsettled	2,375	63,424				51	6,131
Guangxi	Settled	3,132	8,879	0.4	18	2,426	3,114	6,452
	Unsettled	707	25,653				141	6,039
Hainan	Settled	1	5	0.02			1	5
	Unsettled	12	274				12	274
Sichuan	Settled	3,592	4,194	1.7	11	17,000	3,592	4,194
	Unsettled	17,303	203,467				17,292	186,467
Guizhou	Settled	817	2,372	0.2	3	57	814	2,314
	Unsettled	468	3,843				27	767
Yunnan	Settled	94	3,427	0.06	11	3,033	94	3,427
	Unsettled	94	4,360				83	1,327
Shaanxi	Settled	14	307	0.01			14	307
	Unsettled	7	513				7	513
<b>Total</b>	<b>Settled</b>	<b>12,520</b>	<b>48,000</b>	<b>0.5</b>	<b>107</b>	<b>4,669</b>	<b>12,413</b>	<b>43,332</b>
	<b>Unsettled</b>	<b>25,351</b>	<b>412,664</b>				<b>430</b>	<b>49,439</b>

Source: Ministry of Forestry (1997)

themselves effective forest managers. In the northern collectives, auctioning of wastelands has been a popular method for re-allocating forests. Re-allocation has often involved the introduction of new and clearer requirements for rights-holders (e.g. the clear designation of allowable land uses, required tree survival rates) to provide incentives for improved management.

While forest rights transfer has boosted productivity, it has also reduced equality. The challenge facing the government today is as much about finding an acceptable and explicit balance between efficiency and equality, as it is about designing a system that achieves this balance.

### 3.6.3 Local-level implementation failure

Townships and villages implement central policy. Decision-making is inevitably affected by local political, cultural, economic, social and environmental factors. The result is often an *ad hoc* application of central policy. While there are clear advantages of policies that take account of local realities, *ad hoc* implementation also complicates efforts to spread successful approaches.

In the southern collective areas in the mid-1980s, for instance, insecurity resulting from frequent changes to local tenure undermined early efforts to promote private investment through contracting out. Instead, households who were handed forest land often deforested their plots in an effort to maximise their returns before the land was confiscated. A ban on the issuance of new contracts in 1986 further undermined faith in reforms. In the less forested north, a more enthusiastic approach to reform and a more credible commitment to private rights have led to a rapid expansion in forests. Between 1977 and 1988 forest cover doubled (Runsheng Yin and Newman, 1997). More recently measures to ensure secure tenure have permitted an easing of the ban on new contracts and renewed enthusiasm for reform.

Of the many factors leading to local failure in implementation, two stand out:

- Lack of local capacity. Even where local officials are well-intentioned and aim to implement central directions, they may lack the technical or physical capacity.
- Resistance from powerful individuals/groups. Reform tends to be especially difficult in forest rich regions where a shift in the current system threatens those who currently control forest resources. For instance, in areas where forests represent a major source of government income, tenure reform may be perceived as a threat to government authority and be resisted.

### 3.6.4 Unfavourable investment climate

Even if tenure reform has been correctly implemented, where it is set within an unfavourable investment climate it may fail. In addition to the insecure

tenure highlighted above, factors that undermine private interest in contracting out include:

- high taxation;
- a lack of finance for investment;
- a shortage of labour for implementing forestry activities;
- a lack of information on the costs and benefits of contracting; and
- unfavourable natural conditions, e.g. poor soil fertility, steep terrain, remoteness from markets.

Farmers in Anhui Province highlight the importance of low returns to forestry in undermining the success of contracting out (see Box 7).

#### **Box 7 Getting the investment climate right – two counties in Anhui Province**

Shexian and Shitai Counties of Anhui Province have been enthusiastic supporters of contracting out. Survey results show that farmers in Shexian County manage 92 per cent of forest land, and in Shitai County the figure is 78 per cent. State and collective forest together account for 7 per cent of the land area in Shexian and 5 per cent in Shitai.

However, private participation in forestry has not always been a success. In Gaoshantan Village in Shexian, for instance, many of the households allocated barren forest land in the early 1980s, have failed to afforest their land. In Zhangtian, a village in Shitai County, farmers who had been allocated forested land chose to harvest all the timber and not invest in reforestation.

In both of these villages tenure insecurity has not been a major limitation for investment. Rather, farmers have simply not been in a situation where forestry investment represented a profitable activity. Compared with alternative investment options, forestry requires a longer wait and lower returns. Poor soils and a lack of finance for purchasing necessary inputs, e.g. seedlings, have been key constraints. The viability of forestry *vis a vis* alternative land use options needs to be carefully considered before launching contracting out initiatives.

### **3.6.5 Overlapping mandates**

A number of government departments and local authorities have an interest in determining the allocation of land and resource rights. The result can be confusion and heightened tenure insecurity. For instance, in some places farmers have several land certificates each issued by different departments, e.g. the Forestry Department, Agriculture Department, and the State Land Administrator. Where different departments are giving out conflicting signals, contracting out is likely to fail.

### **3.6.6 Lack of market participation**

While markets for forestry use rights have expanded rapidly in certain localities, in others markets remain limited. In Qian Dongnan Prefecture (Guizhou Province), for instance, an average of only two transfers per county were completed annually, with a total transferred area accounting for merely 0.5 per cent of the prefecture forest land. Low levels of participation result from numerous factors, including those already highlighted, and is important where authorities wish to introduce auctions in forest use rights. For instance, in Luliang Prefecture, Shanxi Province, the annual plan for afforestation in 1993 was 16,000 hectares. Contracts were awarded by auction, but a lack of bidders meant that the take up was low and actual afforestation only reached 4,000 hectares.

### **3.6.7 Lack of balance between risks and rewards**

The allocation of forest tenure rights to private entities, involves the transfer of management and harvesting risks from collectives to the contractors. Risks are particularly high for forestry, as opposed to agriculture, due to the long time period involved in production. In the early years, the terms on which transfers of forest rights were made failed to reflect the new allocation of risk and were often heavily weighted against private operators. The small size of plots, short period of tenure and poor quality of land undermined incentives for households to take on the risks associated with forest production. As indicated in Section 3.4, this barrier to reform has been gradually addressed.

### **3.6.8 Restrictive harvesting quota scheme**

The current harvesting quota system limits the attractiveness of forest use rights since farmers have limited ability to reap rewards from adopting more productive forestry techniques. Even if they improve productivity and shorten required forestry rotations, they may not be allowed to harvest their trees (Hu Xiaoyi, 1995).

Not all households suffer from all these constraints. In Banliu village, Yunnan for instance, Box 6 highlights how low-income households suffer more from a lack of finance, while middle and upper-income households identify the low expected returns of barren mountain development, labour shortages and the long distances involved as the key constraints to investment. Prioritising which constraints to tackle first will require an assessment of their relative importance in specific localities.

## **3.7 Summary**

Efforts to contract forest land use rights to private households has been a critical component of broader economic and social reforms underway in China since the late 1970s. However, reform has not been smooth or uniform. Forest tenure varies from province to province, from county to county and even from township to township. Moreover, efforts to ‘decollectivise’ forestry come

against a backdrop of frequent policy reversals and high levels of tenure insecurity. This insecurity poses one of the most difficult challenges for policy-makers wishing to promote increased private investment.

Decollectivisation has gone furthest in the southern collective regions. By 1986 collectives had contracted an estimated 69 per cent of forest land in 8 provinces to households for use and management. Positive impacts for forestry yields, employment, income, and the environment are widely praised - and with some justification. Field data from Banliu Village, Yunnan Province, points to significant increases in private investment in forestry where households have been contracted barren lands by collectives. Positive knock-on effects for employment and the environment underpin village enthusiasm for tenure reform.

But not all collectives have been equally enthusiastic, and a number have even stalled or reversed reforms. In some cases collectives have recoiled from reforms they perceive to threaten their authority. In others, early efforts to hand responsibility for forests to local households failed to generate predicted gains. A particular concern is negative spin-offs for equality and marginalisation of less productive households.

Even where collectives have been keen to promote contracting out, a number of constraints have frequently blocked progress. Insecure tenure associated with unsettled boundary disputes, overlapping and conflicting government mandates, an unfavourable investment climate (due to high taxation, remoteness to markets, expensive finance, etc.), inadequate local implementation capacity, restrictive harvesting quotas are some of the factors undermining success.

While constraints are formidable, this chapter draws attention to four advances in contracting out that offer potential ways forward. These include:

- Introducing more balanced benefit-sharing terms in contracts to encourage private investment;
- Allowing contract transfers so that households may move in and out of forestry more easily;
- Promoting auctions to allocate forest land use rights to the most efficient producer and to maximise revenue for the contracting authority; and
- Lengthening the period over which forest land may be contracted and thus the security and planning horizons of contractors.

Data limitations make it difficult to draw out specific lessons from experience with decollectivisation. Constraints and 'best practice' guidelines identified in this section are tentative. The challenge facing policy-makers is to build a better understanding of variety of experiences found in China and those factors that underpin success.

# Rethinking forestry taxation<sup>17</sup>

Forestry taxation in China is generally thought to be a major barrier to private sector participation in forestry management. Not only is the taxation system burdensome, often accounting for over 60 per cent of timber sales prices, but it is composed of a complex array of different charges levied by authorities at all levels of government, in and outside the forestry sector. More fundamentally, forestry taxation systems fail in two critical ways. Firstly, they lack any clear rationale that links their level to the resource value and, secondly, they take no account of their impact on private incentives.

The need to tackle the negative impacts of the forestry taxation system on private investment has become increasingly pressing as China moves towards a market economy. The system needs to be modified to encourage private investment in forest utilisation, management and protection. It must do this without undermining its role in providing revenue for forestry and other forestry-dependent government authorities. How best to achieve these apparently contradictory objectives is the source of heated debate.

Recognising the urgent need for reform, the SFA and, more recently, the central government have launched initiatives to control spiralling levies. While the SFA is encouraging forestry tax breaks, the central government is exploring a fundamental set of reforms to tackle the underlying cause of high taxation, namely government overstaffing.

As efforts to tackle excessive taxation get off the ground, it is time to draw lessons from local experimentation with charging systems. Moreover, reforms to forest tenure and the introduction of auctions may offer a possible way forward for a system that links charges to the resource value, thereby providing incentives for sustainable forestry. At the same time, auctions may offer a mechanism for maximising revenue.

Forest taxation has been the subject of abundant research. The Chinese Academy of Forestry, the Forest Economics and Development Research Centre and the Chinese Academy of Social Sciences have produced numerous surveys and analytical reports. Local governments have also undertaken a number of investigations. These studies provide a strong foundation for systematic, and policy relevant, research.

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17. This section is based on Lui Jinlong *et al* (2001).





**Excessive and poorly targeted forestry taxation systems in many parts of China increase incentives for land managers to convert forests to other uses**

This section aims to provide an overview of results from a review of the existing forestry taxation systems in China's southern collective forestry areas. The region is characterised by significant variation in taxation and charges, making it a useful starting point for research. The section starts with an overview of the current situation including an explanation of the administrative structure, current taxes, charges and fees and recent efforts at reform. The discussion highlights key problems with the current system, before assessing what these problems mean for economic, social and environmental performance. Underlying causes for the current difficulties are then considered. Potential ways forward are discussed in Section 8.

Research has been carried out by a multidisciplinary team drawing on experts in four institutions: the Chinese Academy of Forestry, the Forest Economics and Development Research Centre, the Chinese Academy of Social Sciences and Beijing Forestry University. The research has synthesised previous research on forestry taxation and charging systems and collects case study material through supplementary field work. Three types of forest area were selected for field surveys: a mountainous forest area (Huaihua Prefecture of Hunan Province, Xiushui County of Jiangxi Province), a hilly agricultural area (Linxiang County of Hunan Province, Yongxiu County of Jiangxi Province) and a mixed area with mountain forests and agricultural lands (Yueyang County of Hunan Province, Fengyi County of Jiangxi Province).

## 4.1 The current state of affairs – an evolving forestry taxation system

China's fiscal system was centrally managed through a unified system of income and expenditure until the 1980s. Since 1984, alongside broader economic liberalisation, government revenue collection has been decentralised. The State Council has issued a series of policies allowing local governments and sector authorities – including forestry – to collect charges. Accordingly, local and sector taxation systems have emerged and there has been an explosion in fees and charges around the country.

While revenue collection has been devolved to local authorities, expenditure remains centralised. The result has been increasing central budget deficits, alongside the proliferation of local charges. To deal with this imbalance, the central government has cut back its allocations to the regions, and local level authorities have been required to become self-sufficient. Many services traditionally provided by the central government have been taken on by local authorities. Basic education, family planning, training and infrastructure development are common examples (Hu Leting, 1999).

While aligning local expenditure more closely with revenue, this reform has reinforced the spread of local charges. A strategy aimed at regaining control of local level taxation is currently under discussion and being piloted in Anhui Province, located in the southern forest collective area. The current forestry taxation system and proposed reforms are outlined below.

### 4.1.1 Understanding the administrative structure

China's forestry taxation system can be broken down into three components:

- *taxes* – these feed into the general budget from designated collection entities at all levels of government from the centre to counties;
- *charges* – forestry fees collected by local forestry authority, managed by local fiscal authorities and earmarked for spending on forestry; and
- *fees* – collected by a number of local authorities such as county education committees, county forestry departments and township governments.

It should be stressed that while local authorities gain increasing revenues from contracting out schemes (see Section 3), this is not currently viewed as part of the forestry taxation system in China. This may be because those earning the revenue (i.e. collectives and state forest enterprises) are not managed by the SFA. This stance should be reconsidered as governments seek to modify the taxation system to provide incentives for good practice.

## **Taxes**

Taxes have traditionally been the major form of revenue for government. They are set centrally and collected through a network of fiscal authorities established at provincial through to county levels that are answerable to the central treasury. Three types of taxes exist: (1) central state taxes include domestic consumption tax, customs duties, and Value Added Tax; (2) local taxes include the agriculture tax (including Special Agricultural Products Tax – see below), a Supplementary Education Tax, an Urban Maintenance and Construction Tax; and (3) shared taxes which are split between the centre (75 per cent) and local authorities (25 per cent). Taxes are not specific to the forestry sector (i.e. they are charged on producers in all sectors), but are a major component of foresters' tax burden.

## **Forestry charges**

Forestry charges have proliferated in recent years. Only Provincial People's Congresses and the State Council are authorised to establish charges, whether for forestry or other uses. This means that some charges apply nationally, while others apply within the province they have been introduced. Until 1996, revenue from charges was administered by the sector authorities who collected the funds. This system is being reformed to regain control of charges and to streamline management of government funds. Revenue is now fed into the local government budget. In theory, these funds are still available for use by the sector, but applications must be made.



## **Local fees**

In addition to the general taxes and forestry charges described above, rural households are increasingly asked to contribute to broader social objectives of local governments. Local fees are not specific to the forestry sector, but add to the overall burden on those who manage forests. For instance, townships collect a range of fees, such as the Rural Education Additional Fee, the Family Planning Fee, and the Rural Road Construction Fee. Village authorities add their own, e.g. village administration fees, social welfare fees, and village development fees. While these fees are generally collected on a per capita basis, in forest communities they are often charged on the production of forest products.

Charges and fees tend to be unregulated and are currently the target of a government fiscal reform strategy aimed at streamlining taxation and reducing unauthorised levies.

### **4.1.2 Current taxes and charges**

Since 1994, the following taxes and charges have been levied on forest land, standing forests, and forest products from either plantation or natural forest.

## 1. Special Agricultural Product Tax

In 1994, the State Council issued a provision requiring the imposition of a Special Agriculture Product Tax on income from forest products. The tax was set at 8 – 10 per cent for logs, bamboo cane, natural resin, tree oil, and 10 per cent for lacquer and natural rubber. The Special Agricultural Products Tax is levied on producers and/or buyers by local fiscal authorities and must be paid within 30 days of harvesting and/or selling. Funds are kept for local expenditure.

While the tax is meant to be collected based on actual income, the difficulty of ascertaining ‘actual income’ has led to the use of ‘official prices’ multiplied by recorded yields. The official prices aim to reflect average market prices and are regularly updated.

The Special Agricultural Products Tax may be waived or reduced in the following circumstances: (1) where forest products are used in research, (2) where forest products originate in newly developed wasteland, (3) where producers are poor as defined by the national legislation, and (4) where producers have been affected by a natural disaster.

## 2. Other taxes affecting forestry

*Value Added Tax.* The state fiscal authority collects Value Added Tax on a certain percentage of added value calculated as sales revenue minus the raw material cost. Ordinary taxpayers pay 13 per cent for raw logs and bamboo cane and 17 per cent for processed products. For certain categories of taxpayers, e.g. small-scale enterprises with annual turnover of less than 1 million RMB (US\$120,000), the rate is as low as 4 per cent of sales revenue (production costs are not deducted). Value Added Tax revenue is shared by the central government (75 per cent) and local government (25 per cent).

*Income Tax.* A 33 per cent Income Tax is imposed on domestic and foreign enterprises. Reductions and exemptions are available in certain cases. Township forestry technical stations and harvesting operations are exempt, and where enterprises process wood waste, rates can fall to 5 per cent. Foreign investors are eligible for tax breaks and complete exemptions in certain circumstances. Reductions tend to be to between 15-30 per cent and last for a limited period, e.g. ten years. Tax breaks normally require central approval.

*Supplementary Education Tax.* In addition to the Value Added Tax, another 3 per cent is collected on the estimated value added from enterprises and individuals involved in the timber and bamboo business to provide local finance for education.

*Urban Maintenance and Construction Tax.* A certain percentage (7 per cent for city, 5 per cent for county and townships, 1 per cent for others) of Value Added Tax is collected from enterprises and individuals involved in the processing and sale of timber and bamboo. This money is kept by local fiscal authorities to fund urban infrastructure development.

### **3. Forestry charges approved by SFA**

The following charges were approved by SFA and apply throughout China.

*Afforestation Charge.* 12-15 per cent of revenue from log and bamboo cane sales is collected from the bamboo and timber collection enterprises. Revenue is used for afforestation and technical extension.

*Maintenance and Upgrading Charge.* 8-10 per cent of sales revenue from raw logs and bamboo cane enterprises is collected. This charge is used by the local forestry authority to replace and upgrade depreciating equipment used in state forestry enterprises, invest in infrastructure improvement like roading, and protect forests.

*Forestry Protection and Construction Charge.* This charge was introduced in 1994 at a rate of 5 RMB (US\$0.60) per cubic meter of lumber sold. The charge is paid by timber businessmen and approved timber-trading enterprises to cover costs of implementing forest protection, management and the construction of forestry roads. Rural collectives and farmers are exempt.

*Forest Quarantine Charge.* A charge of 0.2 per cent of the value of timber, seeds, and bamboo, and 0.8 per cent of seedling value, is imposed to finance the government's forest quarantine system. The quarantine system includes publicity and education campaigns, technical training, labour costs, equipment for quarantine testing, communication equipment and the control or treatment of quarantined items.



### **4. Forestry charges approved by provincial People's Congresses**

In addition to charges imposed by the SFA, provinces have the right to introduce their own charges. A list of provincial charges is provided in Table 8 alongside details of other charges.

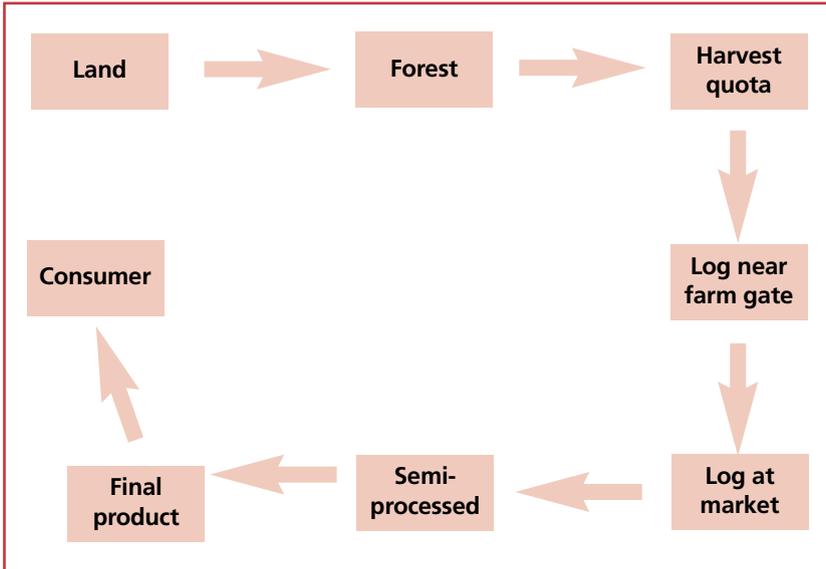
**Table 8 Forestry charges implemented in China**

Charge	Location	Rate/ value	Basis	Collector	Who pays?	Exemptions	How collected	Revenue sharing ratios (provincial: prefecture: county authority)
<b>Key features of forestry charges approved by SFA</b>								
Afforestation charge	All provinces	12-15%	Sale price by the timber collection company	County forestry bureau	Forestry farmer or forest farm	Subsistence products	Township or county forestry authority	1-2:1-2:6-8
Maintenance and upgrading charge		8-10%						1-2:1-2:6-8
Protection and construction charge		5 RMB (US\$0.60)	Per cubic metre solds		Timber trader/middleman			1-2:1-2:7
Quarantine charge		0.2%, 0.8% for seedlings)	Market value		Timber trader/middleman			20-25:15-20:60
<b>Key features of forestry charges approved by provincial People's Congress</b>								
Forest Restoration fee	Fujian and Guizhou Provinces	3-5%	Sale price	Endorsed road check point	Middleman	If sold in province	Road check point	100% by provincial forestry authority then with 30% returning back to check point
Insect and disease control and prevention	Jiangxi Jiangxi	4-5 RMB (US\$0.48-0.60)/m <sup>3</sup> , <0.2 RMB (US\$0.02)/bamboo cane		County forestry bureau	Middleman	Products used domestically	Township or county forestry authority	15:15:70 shared among prefecture, county forestry bureau and forest farm
Fire protection fee		2 RMB (US\$0.24)/m <sup>3</sup>			Farmer or forest farm			1:2:7 among provincial, prefecture, county forestry bureau
Administrative fee for forest enterprise		0.6 RMB (US\$0.07)/m <sup>3</sup> , 0.05 RMB (US\$0.01)/bamboo cane			Middleman			100% by provincial forestry authority

### 4.1.3 Collection point for taxes and charges

While all forest charges must be levied on logs at the point of sale, there are a number of points at which taxes can be collected in the forest product supply chain (see Figure 7).

**Figure 7 Potential points along the forest products supply chain for imposing taxes and charges**



Having clear rules about where taxes are levied is important to avoid double taxation. However, this is not always the case in China. The Special Agricultural Products Tax, for instance, tends to be levied at two points: on logs near the forest as well as at the market. Value Added Tax, Income Tax, Supplementary Education Tax, and the Urban Maintenance and Construction Tax are levied on logs as well as semi- and fully processed products

### 4.1.4 Efforts to minimise the tax and charge burden

China has initiated two efforts to reform its taxation and charging system in recent years. The first was specifically focused on providing additional incentives for forest investment. The second attempts a major more profound overhaul of local level charges and fees, affecting all sectors. Both initiatives are briefly described below.

#### **An SFA initiative**

In 2000, the SFA announced a new charging policy to encourage increased investment in forestry development. Provincial forestry authorities were granted permission to deduct forestry charges by a certain percentage. Box 8 illustrates how provinces have taken up this option with different degrees of enthusiasm.

In addition to official tax reduction schemes, a number of unofficial initiatives have emerged to reduce tax disincentives to investment. For example, in Wuyishan County of Fujian Province and Muchuan County of Sichuan Province, to encourage a Hong Kong investor to invest in *paulownia* plantations, local officials agreed to provide free land and to pay forestry taxation and charges on 50 per cent of the final harvest (Field survey, Liu Jinlong, 1999).

### Box 8 Providing incentives for forestry investment by reducing forestry charges

Guangdong Province has gone the furthest in taking advantage of the new policy to promote private investment in forestry. In 1997 it introduced a new provision for encouraging foreign enterprise to invest in afforestation. Foreign investors wishing to establish plantations may delay payment of 50-70 per cent of the Afforestation Charge and Forestry Maintenance and Upgrading Charge until after replanting the harvested areas. The incentive increases for foreign enterprises that reforest an area greater than 33,300 hectares to feed into pulp-making or other timber processing activities. In this case, companies are repaid up to 85 per cent of the charges (Pang Shangde, pers. Comm., 2000).

A number of other provinces and lower level authorities have also recognised the power of tax exemptions and reductions for attracting private investment, both domestic and international:

- In Jiangxi Province, the forestry authority is piloting a scheme aimed at reducing the charge burden by lowering by half the price base used for calculating charges. The scheme targets forest products extracted during thinning operations to provide incentives for managing young and middle-aged plantations.
- In Xiushui County of Jiangxi, the local forestry authority introduced a policy of tax deductions in 1996 to encourage forest enterprise development. The policy offered forestry charge exemptions in the first year of any forestry processing investment, followed by 50 per cent deductions in year two. In addition, all forestry charges on final products were eliminated.
- In Huaihua Prefecture of Hunan Province, the forestry authority has attempted to eliminate all unofficial (i.e. illegal) forestry charges.

While well intended, these incentive schemes have a variable record of success. In Jiangxi, reductions in provincially-set base prices have been more than offset by increases by lower level authorities. Prefecture authorities often set forest product charging price bases up to 10 per cent higher than that approved by the provincial authority, while county level forestry authorities impose base prices of about 20 per cent above the official level. Xiushui County of Jiangxi has had greater success. By 1997, 90 hardwood processing enterprises had been registered with the forestry bureau, representing an annual processing capacity of over 24,000 m<sup>3</sup>. In Huaihua Prefecture, while the number of unofficial forestry charges declined sharply immediately after the province initiated its scheme, new unofficial charges re-emerged later.

## Central government rural taxation reform

Since 1999, the central government has been undertaking a review of rural taxation policy. The aim is to identify ways to reduce the tax burden and to eliminate the proliferation of local level charges and fees. Reforms – commonly referred to as the “tax-for-fee” reforms - have been piloted in Anhui Provinces and three counties of other provinces in 2000. Three components of these reforms stand out:

- the reduction, elimination or conversion of fees and charges into taxes;
- the centralisation of tax and charge collection with authorised fiscal departments; and
- the reduction in government overstaffing.

The Anhui pilot is briefly outlined in Box 9 below. In December 2001, the government announced its plans to extend reform to a third of its provinces in 2002 (*Economist*, December 2001).

### Box 9 What rural taxation reform might mean for forestry – a case study in Anhui Province

Anhui Province has hosted a pilot effort to explore the feasibility of reforming the rural taxation system in China. The pilot aims to unify the rural taxation system by streamlining the complex system of taxes and charges, and reduce the overall tax burden of farmers. At the same time, the rural government has been downsized to reduce the fiscal burden.

Key elements of the reform include:

- abolishing all administrative and service charges and government funds collected directly from the farmers;
- abolishing livestock tax;
- abolishing the policy of compulsory labour for community development;
- ensuring that the Special Agricultural Products Tax is only collected once, either from the producer or buyer;
- reforming the collection and expansion of village funds; and
- increasing the agricultural tax to 7 per cent of the agriculture product value.

Source: Liu Jinlong *et al* (2001)

While the SFA and central government’s efforts to counter the heavy forestry taxation system are commendable, few seek to shift fundamentally the focus of taxation and charging away from revenue generation towards providing incentives for sustainable forestry. This would require that levies be linked to resource value (see Annex 3). By coincidence, changes underway in forest tenure (see Section 3.4.3) may offer a significant opportunity to do just this. Auctions used to allocate forest use rights generate revenue that may be used in place of the harmful array of forestry charges currently collected. This issue is returned to in Section 8.1.1.

## 4.2 Identifying problems with forestry taxation system

Many researchers have sought to draw attention to the problems with China's forestry taxation and charging system (e.g. Zhang Xiaojin, 1999; Xie Chen, 1999; Xu Zhencun, 1998). In what follows, an attempt is made to synthesise the key challenges highlighted in the literature and those brought out during the field work undertaken for this study. Although the discussion focuses on China's southern collective forestry area, it offers useful insights for the whole country.

### 4.2.1 Excessive taxes and charges

Forestry taxes, charges and fees frequently amount to over 50 per cent of the product value, resulting in low profitability for forestry producers (Li Mingfeng, 1999; Xie Chen, 1999; Zhang Xiaojin, 1999). Table 9 illustrates data on forestry taxes and charges (including unofficial or illegal charges) from field surveys in Hunan and Jiangxi provinces. Local level charges make up the largest component, accounting for up to 70 per cent of the total tax burden.

Form of taxation	Forestry area		Mixed forestry and agriculture area	Hilly agricultural area	
	Huaihua pref. Hunan	Xiushui county of Jiangxi	Lingxiang county of Hunan	Yueyang county of Hunan	Yongxiu county of Jiangxi
Taxation	25%	21%	16%	16%	18%
Legal charges	23%	30%	26%	22%	29%
Illegal charges	2%	7%	3%	0%	11%
<b>Total</b>	<b>50%</b>	<b>58%</b>	<b>45%</b>	<b>38%</b>	<b>58%</b>

Source: Liu Jinlong *et al* (2001)

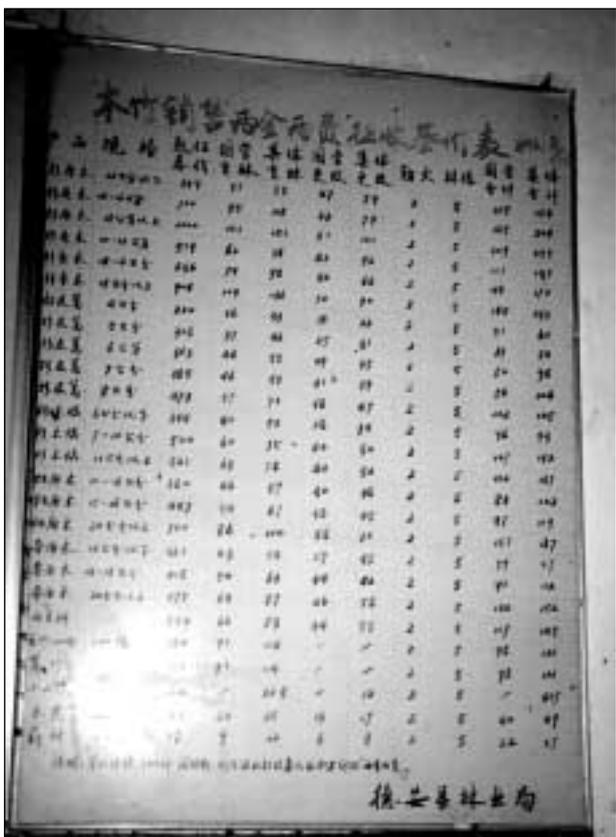
Rooted in past models of economic development, state and local governments have viewed forest exploitation as a means to generate revenue for industrialisation. The focus of the taxation and charging system on raising revenue for the public purse has meant that implications for incentives on sustainable forest management have been neglected. Far from promoting improved forestry, the current system exacerbates poor forest management by undermining the viability of those practising sustainable forestry, whilst encouraging illegal extraction. A central problem is that no effort is made to ensure charges and taxes reflect resource value (see Annex 3). The negative impacts of the forest revenue system for the environment are discussed in more detail in Section 4.3.3 below. Box 10 provides a useful illustration of the dangers.

**Box 10 Forestry taxation and charges undermine sustainable forestry – the case of Jingfa Forestry Cooperative in Yongxiu County**

In the 1980s Yongxiu County was famous for advances in developing a new approach to forestry co-operation. The Jingfa Forestry Cooperative, in particular, is viewed as a 'model' forestry cooperative for the rest of China. The model is based on the contracting out of barren forest land for afforestation to local households.

Despite its early success and widespread admiration, private investment in afforestation has dwindled. The main culprit is high taxes and charges. Between 1985, when the cooperative was set up, and 1998, planting has fallen from 3,000 hectares a year to 549 hectares. The importance of taxation is most clearly reflected in the choice of tree crop planted. Whereas in 1985 timber trees represented 87 per cent of the total planted, by 1998 timber only accounted for 68 per cent. Cash crops, e.g. fruit trees, have risen in importance from 12 per cent in 1985 to 32 per cent in 1998. While timber plantations attracted the standard high taxes and charges, cash forests were eligible for lower agricultural product rates, e.g. 10 per cent of Special Agricultural Products Tax and zero forestry charges. In a few cases, farmers actually destroyed timber forests to make room for cash forests.

Source: Liu Jinlong et al (2001)



Forestry fees published in Jiujiang Prefecture, Jiangxi Province

## 4.2.2 Proliferation of unofficial charges and manipulation of existing charges

While Chinese law specifies that authorities below the provincial level cannot introduce charges, in practice a large number of forestry charges are imposed by lower bodies. These additional charges compound the problem of excessive charges. A good illustration of the enormity of this problem is provided for Jiangxi Province in Box 11 below.

### Box 11 The proliferation of unofficial charges in Jiangxi Province

Jiangxi Province, located in south-east China, covers an area of 16,690,000 hectares, 78 per cent of which is classified as hilly and mountainous and 63 per cent as forest land. Over 85 per cent of the forest land is managed by collectives. Actual forest cover is 53 per cent, with timber stocking of 276 million m<sup>3</sup> and annual commercial log production of 2.64 million m<sup>3</sup> in 1990s.

#### The introduction of new charges

In addition to the large number of legal taxes (e.g. Special Agricultural Products Tax, Value Added Tax, Income Tax), national forestry charges (e.g. Afforestation Charge, Forestry Maintenance and Upgrading Charge, Forestry Protection and Construction Charge) and provincial forestry charges (e.g. the Forestry Insect and Disease Prevention Charge, Forestry Fire Protection Charge and the Administrative Charge for Forestry Enterprises), a host of unofficial charges are imposed by individual counties. Fifteen charges were recorded during field trips to Jiangxi. Details of these are set out in Table 12-1.

#### Base price determination

The Jiangxi forestry department released a set of 'guide' prices for different qualities of log. In addition to introducing unofficial charges, county authorities are known to increase the base price used for calculating official forestry charges. In 1998, for instance, the provincial forestry department set a base price for Chinese fir at US\$45.78 (380 RMB)/m<sup>3</sup>. The prefecture forestry bureau increased this price to US\$48.19 (400 RMB)/m<sup>3</sup>, while county forestry bureau increased it even further to US\$54.22 - 72.29 (450-600 RMB)/m<sup>3</sup>.

#### Resulting increased tax evasion

To avoid stifling charges and taxes, forest producers employ a number of strategies for tax evasion. These include under-reporting actual levels of harvesting and the misclassification of forest products to take advantage of exemptions, e.g. extraction for scientific research, damage by natural calamity.

#### Involvement of officials

Moreover, officials often support producers to evade taxes and charges. Official bribery is common. Those responsible for collecting charges assist log producer and traders to forge applications for charge exemptions and deductions. They may also agree not to report over-harvesting. For instance, in 1998 in one county of Jiangxi Province, the county forestry authority reported to the provincial forestry authority a log harvest of only 200,000 m<sup>3</sup>, but actual extraction amounted to 420,000 m<sup>3</sup>.

While revenue from forestry charges is a key source of sustenance for forestry authorities, particularly for county forestry bureaus, it is staff from these same

authorities who turn a blind eye to over-harvesting and other tax evasion strategies. There are two possible explanations for this apparently perverse behaviour. Firstly, officials recognise that if all taxes and charges were actually collected, few private households or enterprises would invest in forestry, leading to a total collapse in government revenue. Secondly, while the forestry authorities as a whole might be worse off, individual officials gain from bribery.

Source: Liu Jinlong *et al* (2001)

**Table 12-1 Unofficial forestry fees in Jiangxi Province**

Charge	Rate and basis	Collector	Rationale
Flood control and protection fee	1.5% of sale price	County taxation bureau	Flood control infrastructure
Forest sector administrative fee	13 RMB (US\$1.57)/ m <sup>3</sup>	Prefecture forestry bureau	
Harvest plot design fee	1% of sale price	County forestry bureau	Expenses for designing
Certificate fee	1-1.5 RMB (US\$0.12-0.18) per certificate	County forestry bureau	Quarantine certificate, etc.
Bamboo development fee	0.1 RMB (US\$0.01) per bamboo cane	County forestry bureau	Promoting bamboo development
Biogas promotion fee	2 RMB (US\$0.24) / m <sup>3</sup>	County authority	Promoting biogas development
Log measurement fee	2-5 RMB (US\$0.24-0.60)/ m <sup>3</sup>	County forestry bureau	Expense for measurement of log
Industrial and commercial fee	2-5 RMB (US\$0.24-0.60)/ m <sup>3</sup>	County industry and commercial department	Revenue of the department
Township fee	5-10% of sale price	Township government	For rural road construction, etc.
Village fee	About 5% of sale price	Village committee	For village expense
Sales permission fee	2 RMB (US\$0.24)/ m <sup>3</sup>	County forestry bureau	Revenue of the department
Infrastructure development fee	5 RMB (US\$0.60)/ m <sup>3</sup>	County authority	Investing in key local infrastructure
Electrical power development fee	5 RMB (US\$0.60)/ m <sup>3</sup>	County authority	Investing in rural line construction for electric power
Forestry enterprise administration fee	6 RMB (US\$0.72)/m <sup>3</sup>	County forestry bureau	Administrative costs of forestry enterprise
Social security fee	40 RMB (US\$4.82) / m <sup>3</sup> Chinese fir; 45 RMB (US\$5.42)/ m <sup>3</sup> pine log sold outside Xiushui County	State forest enterprise	To finance pensions for retired staff

In addition to introducing illegal charges, the Jiangxi example outlined in Box 11 highlights how local forestry authorities push up the government's take by manipulating official charges. In Jiangxi, they have done this by raising the base price on which charges are calculated. In other locations, authorities are known to bring forward the date at which charge is collected or, in the case of Value Added Tax, underestimate the input costs and therefore inflate the value added on which the tax is imposed. Rather than paying charges and taxes when forests are harvested or products sold, some authorities are requesting payment as a precondition for the award of harvesting certificates. Early collection of taxes and charges has forced households to take out loans from local banks. In the case of early income tax or Value Added Tax payment, a fixed value may be agreed, irrespective of whether the enterprise is profitable. Box 12 below outlines such practices in Hunan Province. In other areas tax exemptions are not respected.

### **Box 12 The manipulation of official charges – a case study in Huaihua Prefecture, Hunan Province**

Forestry charges and taxes are frequently manipulated by county authorities to raise revenue from the forestry sector. To shed light on specific practices employed, interviews were held in 2001 with forest farmers, log merchants, timber processors and forestry officers in five counties (Huitong, Qingzhou, Dongdao, Yuanling and Chenxi Counties) of Huaihua Prefecture. Results from these surveys are presented below.

#### **Altering the base price**

Overestimation of the base price for calculating taxation and forestry charges is common. Table 13-1 compares base and market prices used for determining taxes in Chenxi County. On average, base prices are 39 per cent above market prices, significantly raising the tax burden. Over time, base prices have risen quickly. Table 13-2 below shows how between 1992-1999 in Qingzhou County the base price for taxation increased by 550 per cent and the base price for charges rose by 150 per cent. The discrepancy is due to the fact that the base price for taxes is determined by the county taxation bureau, while the base price for charges is set by the county forestry bureau and pricing bureau.

#### **Premature tax collection**

Value Added Tax and Income Tax are frequently levied prior to the issuance of transport certificates. Since this is too early to be able to calculate value-added or income, the authorities use 'rules of thumb'. In the case of Value Added Tax, a charge of 6-7 per cent of expected sales revenue is imposed. In the case of income tax, timber merchants are requested to pay US\$2.41-16.27 (20-135 RMB)/m<sup>3</sup> depending on the quality of the timber.

#### **Unofficial penalties**

Where timber is sold across prefecture borders, officials are known to levy additional charges at border checkpoints. For instance, a timber company in one county of Huaihua Province exports about 12,000 cubic meters per year of raw logs to another prefecture. The logs are transported by water. An additional charge was levied on the timber company worth US\$14,217 (118,000 RMB) a year, equivalent to US\$1.18 (9.83 RMB)/m<sup>3</sup>.

**Table 13-1 Market price versus base price for tax collection – the case of Chinese fir in Chenxi County, Hunan Province**

Timber types	Quality (length and diameter at base)	Market price (US\$/m <sup>3</sup> )	Base price (US\$/m <sup>3</sup> )	% differences
Lumber	8-12 cm	19.28	28.43	48%
Log	5m, 14 cm	24.10	35.66	48%
Log	5m, 16 cm	27.71	40.00	44%
Log	5m, 18cm	31.33	45.78	46%
Log	5m, 20cm	42.17	54.46	29%
Lumber	2-3.8 m, 8-12 cm	20.48	29.88	46%
Lumber	2-3.8 m , 14-18 cm	28.92	42.89	48%
Lumber	2-3.8cm, 20-24 cm	40.96	60.24	47%
Lumber	2-3.8m, 26 cm	54.22	64.58	19%
<b>Average</b>		<b>32.13</b>	<b>44.66</b>	<b>39%</b>

**Table 13-2 Trend in base prices for charges and taxes in Qingzhou County, Hunan Province**

Unit: RMB/m <sup>3</sup>				
Year	Base price for taxes (US\$)	% change	Base price for charges (US\$)	% change
1992	6.02		21.69	
1993	8.19	36%	19.28	-11%
1994	18.07	121%	30.12	56%
1995	18.07	0%	30.12	0%
1996	24.10	33%	30.12	0%
1997	24.10	0%	36.14	20%
1998	36.14	50%	50.60	40%
1999	39.16	8%	54.22	7%
<b>Overall (1992-1999)</b>		<b>550%</b>		<b>150%</b>

### 4.2.3 Variations between localities

While provinces have the right to introduce new charges, lower levels of government must implement state and provincial instructions. As already highlighted, counties have introduced a range of unofficial charges as well as manipulating set official charges to suit their needs. One mechanism for doing this has been to alter the base price used for taxation and charge calculation. In addition, authorities may simply charge higher rates.

Table 9 in Section 4.2.1 above illustrated the variation in the burden of taxation, legal charges and illegal charges between counties in forested areas, agricultural areas and hilly areas. Taxation rates in forestry counties are 3 – 9 per cent higher than in hilly agriculture areas. Unofficial charges in forestry

counties also tend to be higher than in hilly areas. This may be partly due to the fact that in counties where forestry represents a major form of government income, taxes and additional charges are imposed to maintain government administrations. The fact that higher rates of taxation may undermine the economic base for forestry and ultimately reduce the authorities' tax revenue is a long-term implication that tends to be neglected. Local authorities are more concerned with short-term financing crises.

In other cases, in more forward-looking localities, authorities have actually reduced official rates in order to attract greater investment. Again, taxation reduction and exemption policies are variable.

Variations in taxation and charging rates result in a misallocation of resources since investors will be more influenced by the local tax and charging systems than by local costs of production.

#### **4.2.4 Low efficiency in collection**

The costs of administering tax and charge collection can be enormous. Authorities exacerbate this problem by not pooling the collection activity. Just taking the costs for forestry authorities, in some counties over 50 per cent of manpower and resources is assigned to the collection and management of forestry charges (Chen Yingfa, 1995). In extreme cases, the charges collected fail to cover the salaries of staff responsible for collection. Box 13 highlights useful examples of the size of resources devoted to tax and charge collection. It should be noted that the high level of tax and charge evasion associated with increasing rates (see Box 11, Section 4.2.2) has served to raise the costs of collection.

#### **Box 13 Paying for tax and charge collection – is the expense worthwhile? Examples from Jiangxi Province**

As in many forested provinces, forestry authorities in Jiangxi view forest revenue generation as a priority. The importance attached to this aspect of their work has increased further with efforts by the central government to decentralise financing and promote self-sufficiency amongst local government entities. The result has often been a growing imbalance in spending by authorities, with a disproportionate share channelled to tax and charge collection, and a shrinking amount channelled to activities related to overseeing forest management and protection.

This trend is clearly evident in Xiushui County. In 1992, the Xiushui Forestry Bureau spent 24 per cent of its budget on administration, including forest revenue collection. By 1999, that share had risen to 66 per cent, leaving only 4 per cent for forestry infrastructure development and 29 per cent for afforestation.

A similar story is found in Fengyi County. Rather than being reinvested in forest management and protection, the majority of forestry charges are used to mitigate shortages in general government funds. In 1985, the staff salary only

took about 20 per cent of the total revenue from forestry charges. In 1999, however, the share had risen to 78 per cent of the total revenue of US\$278,873 (2,314,647 RMB).

In Lujiao Township Forest Station all revenue is either spent on staff and office maintenance (76 per cent), transferred to the provincial and prefecture Forestry Departments (22 per cent), or paid into a pension fund for retired staff (2 per cent).

While more resources are channelled to revenue collection, performance has often been poor. In Yongxiu County, for instance, only 65 per cent of the expected taxes and 11 per cent of charges was actually collected (see Table 14-1).

Source: Liu Jinlong *et al* (2001)

Unit: US\$							
Location (township)	Logs harvested (m <sup>3</sup> )	Expected revenue		Actual Revenue		Revenue capture (% of expected)	
		tax	charge	tax	charge	tax	charge
Sanxiqiao	13	1,415	1,411	819	120	58%	9%
Zhajin	6	643	536	525	90	82%	17%
Yaicheng	2	213	178	129	24	61%	14%
<b>Total</b>	<b>21</b>	<b>2,271</b>	<b>2,126</b>	<b>1,473</b>	<b>235</b>	<b>65%</b>	<b>11%</b>

#### 4.2.5 Misuse of forestry revenue

According to existing government regulations on forestry charges, revenue must be used for designated purposes. Yet we have seen from Section 4.2.4 how income is frequently diverted to cover staff salaries rather than forestry development. In addition, revenue is channelled to a range of unintended uses inside and outside the forestry sector. Two main categories of misallocation can be identified:

- Transfer of funds to higher-level forestry bodies; and
- Transfer of funds to general expenditure, which is in turn channelled to a range of local and national uses, e.g. infrastructure development, education, health, etc.

Box 13 above highlights the large share of forest revenue channelled to staffing and on to higher level forestry authorities by Lujiao Township Forestry Station, Yueyang County. Box 14 below provides another example of the misuse of forestry funds for Jiangxi Province.

#### Box 14 Misuse of forestry revenue – example from Jiangxi Province

A review of Xiushui County's forest revenue system highlights the difficulty of ensuring that forestry charges are channelled to financing their intended purposes. According to county statistics, between 1992-1998, US\$5.6 million (46.4 million RMB) had been transferred from the county to the local fiscal authority, but none of this was reinvested in forestry development. In the same period, the county forest bureau transferred US\$3.8 million (31.3 million RMB) to provincial and prefecture level forestry authorities, and in return received only US\$2.1 million (17.2 million RMB) for local forest development. Given the importance of Xiushui County's forests for the protection of the Xiuhe River watershed, the lack of investment in the area is likely to have damaging consequences.

In Yongxiu County of Jiangxi Province a similar failure to keep hold of forestry revenue for local forestry spending is found. Only 13 per cent of forestry charges are channelled to their intended uses. The remainder has been allocated as follows:

- County fiscal authority (10 per cent);
- Transferred to provincial forestry authority (12 per cent);
- Transferred to state forest farm (49 per cent);
- Staff salaries (2 per cent); and
- Office maintenance (13 per cent).

Source: Liu Jinlong *et al* (2001)

## 4.3 Impacts of forestry taxation system

### 4.3.1 Economic impacts

#### Reduced income

High taxation and charging necessarily reduce take-home pay for forest producers and middlemen. Between 1987 to 1999, the price of pine logs in Jinzhou County of Hunan Province increased from US\$43 (360 RMB) per cubic meter to US\$67 (555 RMB). However, taxation increased from US\$18 to US\$41 (152 RMB to 342 RMB), resulting in a reduction in producer revenue from 55 per cent to 38 per cent of sales price (Xie Chen, 2000).

#### Reduction in the value of leased forest land and stands

High levels of taxation indirectly hurt households by denting their land asset values. Where households have paid for forest land tenure rights, increases in taxation reduces the value of these stands and the price at which owners can sell their forest use rights. In remote regions, forest land rights can be critical forms of household capital, in some cases making up over 80 per cent of assets (Qing Hui and Shu Wen, 1996). Reduction in the value of use right can have major repercussions for well-being. In Yongxiu County of Jiangxi Province, for instance, heavy taxation reduced the value of forest land tenure rights by 70 per cent within a decade.

## Constrained forest industrialisation

Low returns to forestry, compounded by high levels of taxation and charges, have undermined incentives for private investment and forest sector development. Forest product processors and foreign investors are losing interest in planting forest for raw materials. The problem is likely to become more serious with China's accession to the World Trade Organisation and the reduction in tariffs on imported forest products. As domestic prices are driven towards international levels, Chinese producers will find it increasingly difficult to compete.

## Increased illegal harvesting, reduced government revenue and increased corruption

In the short-term government revenue collection is threatened by increasing illegal logging, under-reporting and corruption. To avoid forestry charges and taxes, producers are not declaring extraction. In some counties in Jiangxi Province, harvesting was 50 per cent above the approved limits. Timber dealers and the processing companies are thought to consume several times over the approved harvest quota. High taxation also encourages rent seeking, with timber dealers, processors and individuals attempting to bribe forestry officials for harvesting approval. Box 15 below highlights the problems facing authorities in Hunan Province.

### Box 15 Challenges facing officials in Yueyang County of Hunan Province

In Qunhe Village, Yueyang County, the village collective owns 2 plots of 15 year old slack pine. The plots cover 13.4 hectares, but only 2 hectares contain harvestable quality wood. The remainder has been seriously degraded. In 1999, the village sold harvesting rights to a cooperative of five farmers for US\$3,400 (28,000 RMB). The cooperative negotiated with township forestry authorities for a harvesting permit. In due course they were awarded a permit for 340 m<sup>3</sup> of timber.

Charges associated with extraction were as follows:

- US\$6.63 (55 RMB)/m<sup>3</sup> for the Afforestation Charge, Maintenance and Upgrading Charge and the Forestry Protection and Construction Charge;
- US\$0.30 (2.5 RMB)/m<sup>3</sup> for the Quarantine Fee, and
- US\$18.07 (150 RMB)/plot for the design of a harvesting plan.

The total charges came to US\$2,392 (19,850 RMB). Added to the co-operative's harvesting and transport costs of US\$5,084 (42,200 RMB), storage and various other costs (e.g. market administration fee), total production costs come to over US\$7,500 (62,250 RMB). The market price of slack pine at the point of sale (i.e. the local railway station) was US\$26.50 (220 RMB)/m<sup>3</sup>. Overall, the cooperative has lost about US\$1,205 (10,000 RMB).

In practice, however, the cooperative is reportedly extracting over 500 m<sup>3</sup>, significantly above its permitted volume. This allows it to cover its costs. While the authorities are aware of the over-harvesting, they have not prosecuted the cooperative as they depend on the revenue to pay their staff.

Source: Liu Jinlong et al (2001)

## 4.3.2 Social impacts

### Increased rural-urban inequality

Forestry revenue is collected from rural areas and reallocated to urban residents. Because rural areas tend to be poorer than urban centres, this reallocation is regressive and worsens income inequalities. Between 1992-1998 in Xiushui County of Jianxi Province over US\$5.54 million (46 million RMB) was collected by the county fiscal authority. Most of this money was spent on forestry administration in townships and channelled to non-forestry activities in urban areas. About US\$ 3.73 million (31 million RMB) was transferred to the prefecture and provincial forestry authorities with only about US\$2.05 million (17 million RMB) returning to the county forestry authority for forestry development. Revenue collected by the county forestry bureau was spent on staff, most of who reside in cities.

### Increased poverty in forestry areas

Forests tend to be located in remote areas, which are also home to 80 per cent of the nation's poorest people. Declining forest stocks and recent government programmes aimed at limiting natural forest extraction (e.g. the Natural Forest Protection Programme) have led to negative implications for poor communities due to increased unemployment and lower incomes. In 1999 more than 70 per cent of the state forest enterprises, many of which are the main source of income in remote regions, were in deficit. The experience of Fenyi Fangshan Forest Farm is illustrative.

The Fenyi Fangshan Forest Farm used to be a 'flagship' farm with a long history of good forest management and high economic returns. With 1,630 hectares of forests, its income came to US\$720,000 (6 million RMB) in 1999. Half of this was immediately taken in taxes and an additional US\$120,000 (1 million RMB) went to pay various other fees. The accumulated unpaid salaries to its staff come to more than US\$360,000 (3 million RMB), and the Forest Farm has US\$361,000 (3 million RMB) in bank debts. But, its remaining standing volume of mature forests is only 20,000 cubic meters. Fenyi's situation is clearly unsustainable and, unless it is bailed out by external funding, it will ultimately have to close, leading to serious local unemployment and social dislocation.

### 4.3.3 Environmental impacts

The low economic returns expected from afforestation (see Section 4.3.1 above) undermines incentives for private investment. In Yongxiu County, Jiangxi, plantation establishment by the Jingfa Forestry Cooperative declined from 3,000 hectares in 1985 to 549 hectares in 1998 (see Box 10, in Section 4.2.1). In Xiushui County of Jiangxi Province, since 1992 investment by forestry departments, bureaus and commercial enterprises has dropped dramatically. In 1999, only US\$13,000 (109,000 RMB) was invested in afforestation by commercial enterprises. The proportion of enterprise investment to total

investment in afforestation reduced from 13.3 per cent in 1994 to 4.7 per cent in 1999. In the 1990s, no individual farmer and private enterprise invested in afforestation in Xiushui County.

The current forestry taxation and charging system also undermines incentives for natural forest management. High taxation and charging mean that income from thinning young and middle-aged forests falls below costs. In south China, there are large areas of forests that require tending, and high taxation represents a major constraint against improving quality of plantation forests. In the counties examined, there has been a loss in natural forest resource. In Xiushui County of Jiangxi, for instance, standing volume in natural forests declined from about 3.5 million cubic meters in 1982 to only 0.9 million cubic metres in 1999.

Given China's severe and growing environmental problems (e.g. water and soil erosion, desertification, water shortage), the loss of forests is of great concern. The area affected by soil erosion in Xiushui county of Jiangxi Province has increased by 5.6 times over the past 45 years, resulting in widespread loss of property during the 1998 floods. To the extent that forestry taxation and charging contributes to the decline in forest resources, reform should be a priority.

## 4.4 Underlying causes

High taxation and charging in the forestry sector has persisted for a number of reasons. Four underlying causes are briefly outlined below.



### 4.4.1 Forestry viewed as a source of government revenue

Forestry has long been viewed as a source of government revenue for development. Since 1949, the forestry sector provided a solid income stream for public finance. For much of the 1950s, output from the forestry sector ranked second of all industrial sectors. The forestry sector contributed to China's economic development and industrialisation by providing valued raw materials at low prices fixed by the government (Li Yucai, 1996). Forestry was classified as a mining sector, there to be exploited rather than regenerated.

In the 1980s, the gradual liberalisation of forestry prices had profound impacts. In the southern collective forestry areas, forestry was viewed as a 'great bank'. Authorities at all levels of government, squeezed by reduced central budgetary allocations, attempted to levy increasingly onerous charges on the forestry sector. Reflecting the mood of the day, new slogans emerged such as 'enrich the country with the help of forestry', 'promote education with the help of forestry' and 'improve water and soil conservation with the help of forestry'. Forestry was seen as the source of considerable wealth.

However, increased charges and taxes are taking their toll. Today, forestry is in decline, with state forest enterprises plagued by unsustainable debts and a collapse in private investment in many parts of the country. Natural forests have been rapidly depleted.

#### **4.4.2 Lack of priority given to reinvestment in forestry development**

Since 1949, investment in forestry by the state has been consistently low. Between 1970-1995, forestry investment represented only 0.69 per cent of total state public expenditure. Between 1991-1995, it was estimated that public investment covered just 50 per cent of actual needs.

To counter the lack of attention awarded to forestry by the central government, there has been a major drive to earmark revenue generated by the forestry sector for forestry development. Known as budgetary hypothecation, budget earmarking (e.g. through a Forestry Fund) is an emerging international phenomenon.

But, implementation of earmarking has proved slow. Funds raised through forestry charges have remained vulnerable to expropriation by local fiscal authorities. This is particularly true since the 1996 reform that reversed the separation in forestry income collection from the centrally administered fiscal system. Forestry charges are once again fed into a central pool, though the funds are supposed to be returned to forestry bodies. In 1992 in Xiushui County, Jiangxi, 94 per cent of forestry funds collected in the name of various forestry charges was reinvested in afforestation and forest management, but in 1999, the percentage was down to 33 per cent.

#### **4.4.3 Public forest ownership as justification for expansion of taxation and charging**



Despite the rapid spread of contracting-out of forest land to households throughout China's southern collective area, forest land remains publicly-owned (see Section 3). Government authorities, thus, often view output from forest land as a joint product, involving public land combined with household labour and material inputs. The contribution of public land to the production process has provided government authorities with a justification to expand charges.

While the idea of profit-sharing is acceptable, in collective areas this would justify charging by collective authorities. Charges by other government agencies would not qualify. Moreover, forest rights are already contracted out to households in return for a share of output or up-front payments.

#### **4.4.4 Government overstaffing**

Overstaffing in China's forestry sector is well documented. As employee numbers have grown, forestry authorities have taken on significant social welfare functions. The rising costs of fulfilling new social obligations has been a driver behind the introduction of unofficial charges and the manipulation of existing charges to raise resources.

A good example of the links between overstaffing and the rising forestry taxation burden is provided in Xiushui County, Jiangxi Province. In 1998

Xiushui State Forestry Group sold US\$1.77 million (14.7 million RMB) worth of products. The Group has 2,798 staff, including a large number of retired officials. By the end of 1998, the Group had accumulated debts of over US\$9.6 million (80 million RMB). For the Group to be able to pay its retired staff, a new forestry charge was introduced: the Social Security Fund for the Retired. The charge is worth US\$4.82 (40 RMB)/m<sup>3</sup> of Chinese fir logs and US\$5.42 (45 RMB)/m<sup>3</sup> from pine logs sold outside the county.

## 4.5 Summary

In many ways, China has made significant strides in promoting private investment in forest management. The rapid spread of decollectivisation, the introduction of longer and more secure forest use rights, and the liberalisation of the timber markets are all testament to the advances achieved. But, reform of China's outdated forest revenue system lags behind. As progress continues elsewhere, the lack of reform of the taxation and charging system represents a serious bottleneck.

The problems with the existing taxation system are not hard to identify. Taxes and charges are excessive and fail to encourage re-investment in forest establishment and management. There is a lack of control over local-level charges and the implementation of national taxes and charges is characterised by manipulation and rent-seeking. Low levels of efficiency in collection and the diversion of revenue away from the forestry sector create even greater pressures to raise rates.

Combined, these problems represent perhaps the single most serious threat to efforts to improve forest management. Already, the taxation and charging system is blamed for a number of damaging economic, social and environmental consequences. In the longer term, high taxes and charges threaten to starve the sector of investment and lead to its ultimate decline. Rather than higher taxes and fees increasing government revenue, lower taxation and charges are essential to securing the forest sector's health and thereby maintaining the government's forest revenue base. Most importantly a link between charges and resource value needs to be established.

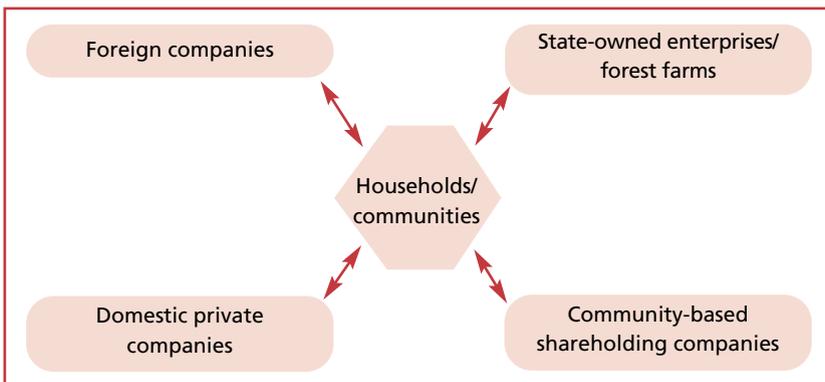
To tackle these problems successfully, an understanding of the underlying causes of its persistence is needed. This section emphasises that ingrained perceptions of forests as a resource to be mined, the tensions inherent in distributing forest rents, and the struggle of government institutions to stave off bankruptcy must all be dealt with as part of a broader strategy to bring down taxes and charges.

# Promoting company-community deals – letting the private sector take the lead<sup>18</sup>

Closely intertwined with broader government decentralisation and forest resource contracting-out initiatives (see Section 3), newly empowered communities are being sought out by forestry companies wishing to negotiate deals for access to forest resources. Under pressure to balance their books and promote afforestation, local authorities have been key players in bringing together local people and companies.

Deals between companies and communities come in a variety of forms ranging from informal agreements to written contracts, such as outgrower deals or joint ventures, which are legally binding. Deals may represent simple business transactions, or may offer the basis for longer term and more flexible ‘partnerships’ between companies and communities. Critically, contracts must be negotiated through a government intermediary since households require government approval for the transfer of land use rights. In general, arrangements involve combining households’ access to raw materials with companies’ access to capital for investment. To help conceptualise emerging deals in China, Figure 8 sets out four broad groups.

**Figure 8 Visualising four types of company-community deals**



Linkages between companies and communities are increasingly prominent in the forest sector, especially in the case of the supply of raw materials for processing. However unlike taxation and land tenure there has been little research on the development of these deals. This section sheds light on a number of issues, including:

18. This section is based on Lu Wenming *et al* (2000a)



- Emerging features of deals;
- Drivers behind the emergence of deals; and
- Constraints restricting the conclusion of beneficial deals.

Based on this discussion, potential ways forward are explored in Section 8.

This section investigates two sets of deals between a foreign company, the Asia Pulp and Paper Company Ltd. and local communities in Guangdong Province. Box 1 provides a brief account of other deals found in China's forestry sector. The lack of written material on company-community linkages has meant that this work has drawn heavily on primary data collection. In what follows a brief background is provided to set the scene.

## 5.1 Company-community deals – an emerging phenomenon

### 5.1.1 Foreign companies linking up with local households

Since the late 1980s, a number of large foreign companies have invested in plantation development in China, especially in south-eastern coastal provinces that are characterised by a favourable investment climate and natural conditions. By the end of 1999, it was estimated that Guangdong Province was far ahead of any other region, attracting foreign investment worth US\$280 million. In total 3.26 million mu (217,000 hectares) was afforested with fast-growing timber species and a further 34,000 mu (2,300 hectares) of orchards planted. Projects mainly involved the establishment of fast-growing and high-yielding timber and pulp-wood plantations, though there was also interest in fruit trees such as *longan* and *litchi*.

Restrictions on foreign investment and private land ownership, mean foreign companies have gained access to forest land by forming agreements with local communities, which are in turn approved by government. Three types of foreign business ventures are recognised in Chinese law. These are: Chinese-foreign equity joint ventures, Chinese-foreign contractual joint ventures and foreign-capital enterprises. Chinese-foreign equity joint ventures are partnerships where each party puts in equity and shares in the profit. In the case of Chinese-foreign contractual joint ventures the local partner is contracted by the foreign entity and does not contribute to equity. The third category of foreign investment refers to foreign direct investment with no Chinese equity or contractual arrangement. Normally, provincial bodies (including autonomous regions) deal with applications for joint ventures, but approval must also be obtained from the Ministry of Foreign Economic Relations and Trade (Young, 1998).

Where there are no questions over tenure and where local communities are willing partners, joint ventures are thought to enhance forest management by increasing access to finance, technology and improving supervision. For this reason communities are increasingly encouraged by local government to enter

deals. In some cases incentives for foreign investment are given in the form of exemptions from taxes and fees (see Section 4.1.4) and the granting of priority access to utilities, e.g. electricity and water (Young, 1998). Moreover, although compliance with forest management regulations and extraction limits is required, where new trees are planted, the local government may award foreign investors greater freedom.

Examples of companies pursuing deals in China's southern regions identified by this study include:

- Singapore-based Asia Pulp and Paper Co. Ltd.;
- Thailand-based Soon Hua Seng Group;
- Hong Kong-based Sino-Wood Partner Co. Ltd.; and
- Japan Princes Co. Ltd.

Recently, more companies from Japan, USA, Canada, Australia, Korea, Taiwan and other south-eastern Asian countries have approached local authorities to discuss potential investment in afforestation or paper and wood-based panel projects. In this study, a detailed assessment is undertaken of two of Asia Pulp and Paper's subsidiaries in Guangdong Province.

### 5.1.2 Domestic companies explore new relationships with households

Just as foreign companies are seeing the attractions of establishing long-term relationships with households to secure raw material supplies, domestic timber and forest product processing companies have negotiated deals with raw material suppliers. For their part, households are interested in establishing a long-term and secure market.

Ideally, deals are formalised through contracts that set out details on rights and responsibilities of partners, agreed prices, quantity and quality of material to be delivered. In practice, there has sometimes been ambiguity. In general, households commit to selling their forest products to the company in return for a secure market. Households may also benefit from technical assistance provided by the processing company (or on their behalf by government) to help ensure an adequate quality of inputs. In certain cases, companies may also return a share of their profits to households. These approaches to benefit-sharing aim to align suppliers' interests with the processors.

#### Box 16 A range of deals between companies and households in China

In addition to those company-community arrangements listed in the main text, three other types of deals between private enterprises and communities are worth describing briefly. These are:

- Deals between state enterprises/forest farms and households;
- Community-based shareholding companies; and
- Cooperative arrangements between producer households.

#### State enterprises and communities

With the spread of private contracting of forest land, many households are in a

position to sub-contract rights to forest resources. In addition to domestic and foreign companies, state enterprises are keen to do business. This is particularly true for processing companies and state forest Farms that have either run out of trees, or been required to protect their natural forests. State Forest Farms are known to pay rent of between US\$11-14 (90-120 RMB) per hectare. During the contracted period (often between 30-40 years), state farms manage and develop the forest land and have no contact with the household. In many cases households pool their forest land to ensure an economically viable plot size. For example in Yunan County, Tongle Forest Farm rented over 38,000 hectares of mountainous forest land for afforestation with high yield commercial trees. The area has been contracted for 40 years at a rate of US\$11 (90 RMB)/hectare/year. The rent was paid to households as a lump sum of US\$434 (3,600 RMB)/hectare at the start of the contract.

### **Shareholding relationships**

In addition to land leases, state forest enterprises have formed new relationships with households. The Yong-an Forestry Joint Stock Group Co. in Fujian Province offers a good example of one type of new deal emerging – the joint stock company.

Set up as a government enterprise in 1992, the Yong-an Forestry Joint Stock Group Co. became the first forestry company to be listed on the Chinese stock exchange in December 1993. In addition to the original shareholders, the Yong-an Forestry Chemical Factory and Sanming Commercial Company bought shares in the company. Company employees and other individuals own US\$3.7 million (30.4 million RMB) of stock. In December 1996, 'Yong-an Forestry' was listed on the Shenzhen Stock Exchange. In total 1,861,000 type A stock was sold to the public, and 890,000 allocated to staff. The company was valued at just over US\$7.6 million (63 million RMB). By June 2000, the total stock for Yong-an Forestry had reached US\$10.1 million (167.2 million RMB) and shares had been issued for US\$7.1 million (59.2 million RMB).

Between 1993 and 1999 the company had increased the area of forest land under its control from 5,600 hectares to 93,300 hectares. This area is either contracted from households and collectives, or contributed to the company as a form of equity investment. In the latter case, households gain a share in the company and a portion of its profits. Individuals enter into deals with the company where they believe their income will increase from more professional management, higher technology and greater access to finance.

### **Cooperative arrangements**

The Jingfa Forest Co-operative of Yongxiu County, Jiangxi Province offers an interesting example of a local group of households acting together to perform forestry activities. Unlike the company-community deals already described, this Co-operative does not involve outside capital. Instead it was set up by a group of farmers in the early 1980s to overcome the high costs associated with managing fragmented forest plots. Under the arrangement farmers continue to manage their own contracted land, but receive support from their joint Co-operative in fire prevention, technological advances, marketing and transporting, road building as well as welfare, e.g. pensions. In return farmers agree to pay 10 per cent of their gross revenue to the Co-operative.

## 5.2 Deals between Asia Pulp and Paper and local communities in Guangdong Province

Case studies undertaken in Qingyuan City and Shaoguan City, Guangdong Province are described below followed by an assessment of their key features. Table 10 summarises the key features for the cases reviewed.

### 5.2.1 Brief description

A subsidiary of the Sinar Mas Group, Asia Pulp and Paper is the second largest pulp and paper producer in Asia. Registered in Singapore and listed on the New York Stock Exchange, it has assets worth US\$14 billion world-wide including over 600,000 hectares of plantations and 20 pulp and paper mills. According to Morgan Stanley Investment Bank, Asia Pulp and Paper is one of the two least-cost papermaking companies in the world.

Asia Pulp and Paper began exploring opportunities for investing in processing facilities and forest plantations in China in the early 1990s. With a rapidly expanding economy and inadequate investment in paper production, it identified China as a key investment target. By 2010, paper consumption in China is expected to expand to 50 million tonnes, a massive potential market. In addition, the rapid spread of household contracting of collective forest land in China (see Section 3) offered foreign investors new opportunities for negotiating raw material supplies.

In 1995, the first deal between Asia Pulp and Paper and a local community was struck in Guangdong Province. Since then Asia Pulp and Paper has established five operations spread through Guangdong Province, Guangxi Autonomous Region and Hainan Island. On March 28, 2000, the Asia Pulp and Paper signed a new agreement in Anhui Province for US\$1.7 billion worth of investment. US\$1.2 billion will be used to build a six million tonne pulp, medium density fibreboard and particleboard factory. The remaining US\$500 million is to be used to establish a 670,000 hectare plantation.

In total Asia Pulp and Paper plans to establish 1.3 million hectares of fast growing *Eucalyptus* and *Acacia* plantations throughout China. By May 2000 it had afforested 65,300 hectares costing US\$48.7 million (404 million RMB). The largest share of this investment has been in Guangdong Province which has 26,700 hectares planted. Of this, 14,700 hectares is in Shaoguan City and 12,000 hectares is in Qingyuan City. In what follows we examine in more detail the emergence of deals between Asia Pulp and Paper and local communities in Qingyuan and Shaoguan. In Table 10 background information about these two cities is given.

#### Deals with local communities in Qingyuan City

In June 1995 Asia Pulp and Paper reached agreement with Qingyuan Forestry Company (owned by the Qingyuan Forestry Bureau) to set up a joint venture – the Golden Qingyuan High Yielding Plantations (Paper Material) Base Co. Ltd.

**Table 10 Background information on Qingyuan and Shaoguan Cities, Guangdong Province**

Category	Qingyuan City	Shaoguan City
Government administrative status	Prefecture – responsible for 9 counties and Yinghong Comprehensive Economic Area	City – responsible for 6 counties, 2 county level cities and 3 county-level districts
Population	3.73 million (80% of which is rural)	3.03 million
Land area	1.9 million hectares	1.9 million hectares
Share forest land in administrative area (%)	53%	68%
Forestry administration	Qingyuan City Forestry Bureau, which oversees 9 county forestry bureaus	Shaoguan City Forestry Bureau through its 11 county forestry bureaus.

The aim of the new company was to establish and manage plantations in order to supply a planned medium density fibreboard factory in Qingyuan City and other Asia Pulp and Paper pulping mills. A total 333,000 hectares were to be established over several phases, starting with 39,000 hectares.



This joint venture has involved a large number of stakeholders. First contact was made with the provincial authorities when Asia Pulp and Paper was exploring options for investment. The Guangdong Provincial Forest Department then linked Asia Pulp and Paper with the Qingyuan Forestry Bureau, which in turn facilitated negotiations between Asia Pulp and Paper, Qingyuan Forestry Company, lower levels of government and landholding households.

The result of these discussions has been a series of formal and informal contracts between Asia Pulp and Paper and key actors. All these contracts stem from the joint venture between Asia Pulp and Paper and Qingyuan Forest Company, which sets out in detail the two signatories' responsibilities, rights and rewards. At Qingyuan Forest Company's end, key responsibilities include: the provision of the land use rights for the afforestation areas required by Golden Qingyuan; handling of procedures concerning the examination and approval, registering and business licensing of Golden Qingyuan; assistance to Golden Qingyuan to coordinate relations with local governments and communities; assistance to Golden Qingyuan to obtain state preferential tax policies and preferential bank loans, and enrolment of staff. Asia Pulp and Paper is responsible for investing on schedule, daily operation and management of Golden Qingyuan and staff training.

To fulfil its obligations under the above joint venture, Qingyuan Forestry Company has organised contracts between the new company, Golden

Qingyuan, and a range of other stakeholders. The most important of these has been contracts with the farmers and local communities who own the use rights of the forest land. This was achieved with the help of township governments and forestry bureaus at the county (city or district) level. These agreements underpin future supplies of wood to planned processing factories and are detailed below in Section 5.2.2.

While supply ultimately comes from households' land, in most cases the company has hired workers from outside the area to undertake tree planting and management. It is felt that by hiring external staff, the company reduces risks associated with theft and other disrupting behaviour (Lu Wenming, pers. Comm., 2001).

The local forestry bureaus and other relevant government departments have facilitated negotiations and brought households together with Asia Pulp and Paper.

### **Deals with local communities in Shaoguan City**

As with Asia Pulp and Paper's investment in Qingyuan City described above, Asia Pulp and Paper has formed a joint venture with the local Shaoguan Forestry Company to form the Golden Shaoguan First High Yielding Plantation (Paper Material) Base Co. Ltd.. The agreement targets the establishment of 400,000 hectares of fast growing plantations to feed new pulping mills. In its first phase, 40,000 hectares will be planted and Asia Pulp and Paper will invest US\$30 million.

The deal is based on the same principles of benefit-sharing and division of responsibility as in the Qingyuan agreement. Negotiations benefited from input by the Shaoguan Forestry Bureau, the Qujiang Forestry Bureau and its subordinates, and the township governments. It is highly dependent on raw material supply agreements reached with households (see Section 5.2.2 below).

The main difference between this agreement and that in Qingyuan is that a higher proportion of field workers is contracted locally. The result has been a more harmonious relationship between Golden Shaoguan and local communities than experienced in Qingyuan.

### **5.2.2 Drawing out key features of deals**

Case studies in Guangdong described above point to preliminary lessons on deals between forestry companies and communities. These are outlined below. Table 11 summarises this information.

#### **Type of deals**

The cases reviewed involved two forms of contract between companies and communities:

- Raw material/semi-processed product supply contracts where households produce raw materials themselves for delivery to company, e.g. Asia Pulp and Paper in Shaoguan City

- Land leases where company contracts forest land for establishing plantations and harvesting products. Households may be paid to provide labour, but the raw material production is the responsibility of the company, e.g. Asia Pulp and Paper in Qingyuan City

However, deals are often multifaceted and the above categories necessarily simplify. For instance, Asia Pulp and Paper's investments in Guangdong involve a multi-layered set of contracts between itself, local authorities and households. The above merely reflects the deal between the company and local suppliers. However, a range of other relationships is formed that support these contracts. In Qingyuan, Asia Pulp and Paper's relationship with the local authority is rooted in a joint venture between itself and the Qingyuan Forestry Company. This new entity, the Golden Qingyuan High Yielding Plantations (Paper Material) Base Co. Ltd., has then formed formal supply contracts with local households via local forestry bureaus. This approach is also adopted in Shaoguan City.

## **Terms of agreement**

### *Duration*

Supply contracts between the new joint ventures and households last around 70 years. The aim is to provide a long enough period to encourage investment in regenerating degraded lands.

### *Benefit-sharing*

The issue of equity lies at the heart of benefit-sharing arrangements that seek to balance the relative risks and costs born by the partners with an appropriate share of rewards. Where this balance is misjudged, deals are likely to fall through.

In Guangdong, the multi-layered relationships between Asia Pulp and Paper, local authorities and households are reflected in complex benefit-sharing arrangements. In Qingyuan and Shaoguan, Asia Pulp and Paper has negotiated to two main forms of payments:

1. direct investment in land of at least US\$750 per hectare (or US\$50/mu) – this may be in the form of cash and in-kind investments, and
2. a profit-sharing agreement where Asia Pulp and Paper keeps 70 per cent of profits, and the remaining 30 per cent is handed to the Qingyuan Forestry Bureau to be distributed to participating government agencies and households. The city forestry bureaus have been responsible for distributing the 30 per cent share, and in both Qingyuan and Shaoguan 25-26.5 per cent is passed on to collectives and households contributing land, with the remainder kept by the government to cover its costs of acting as an intermediary and service-provider.

In addition to direct payments by Asia Pulp and Paper, the company contributes to the forestry authorities in the form of taxes and charges. In some instances, it also has agreed to pay an additional US\$9.04 (75 RMB) per hectare for forest protection work by officials.

### *Stakeholder roles*

*Company:* Companies are often the main drivers behind the emergence of deals with households. Responsibilities differ tremendously depending on the type of deal agreed. Longer-term agreements between Asia Pulp and Paper and local households involve larger commitments and inputs from the company. Not only does the company commit to paying market prices for wood, but it invests in upgrading land, establishing plantations and harvesting wood. It also provides capital, new technology and manages the operations.

*Community:* The main contribution of local communities is in the form of providing access to forest land. In some cases collectives contract forest land directly to company, in others households sub-contract their land use rights (with the approval of the collective). In addition, depending on the agreement, local communities provide labour for planting, tending and harvesting plantations. Because the state ultimately owns the land, communities may be in a weak position to bargain for a role in partnerships.

*Government:* The government is the critical player in establishing working relations between companies and communities since communities require government approval before they can establish links with foreign enterprises. Their involvement is, however, fraught with contradictions. This is not surprising, given the conflicts often inherent to their increasingly complex mandates. Forestry authorities are charged with three principal goals: (1) creating a favourable investment climate, (2) protecting forests environmental services and (3) maximising local communities' welfare benefits. Achieving these goals is always going to involve a difficult balancing act, and at times certain goals will be compromised in favour of others.

Based on the case studies reviewed here, in practice, different government bodies play different roles in supporting partnership arrangements. Five principal functions include:

- *Providing an enabling policy framework.* The provision of a clear and secure policy framework, backed up by effective monitoring and enforcement, is key. Fiscal incentives also attract foreign investment. Guangdong Province's success in attracting investors is in part linked to its system of tax and charge reductions and exemptions.
- *Facilitation of negotiations.* Different levels of government are involved in facilitating negotiations between households, collectives and investors.
- *Supporting implementation.* Supervising planting and forest management, technical support to farmers, advice, etc.
- *Regulation and monitoring.* Government retains its regulatory functions assigned to it under the Forest Law. Many of these functions provide critical support to emerging partnerships, e.g. investment in fire prevention, control of pests and disease.

**Table 11 Features of emerging deals between companies and local communities in Guangdong Provinces**

Location	Stakeholders Company	Stakeholders Community	Type of deal	Year contract signed	Role of government	Terms of agreement (benefit- sharing, duration, etc.)	Comments
Qingyuan City, Guangdong Province	Golden Qingyuan High Yielding Plantations (Paper Material) Base Co. Ltd – joint venture between Asia Pulp and Paper and Qingyuan Forestry Company	Collective and rural households	Long term forest land lease	1995	Active supporter and participant in negotiations and implementation of agreements	<i>Area:</i> 39,000 hectares in 1 <sup>st</sup> phase. Planned total of 333,000 hectares. Planted 12,000 hectares to date <i>Contract duration:</i> 70 years. <i>Benefit-sharing:</i> Company buys woods at world market prices for pulp and splits profits as follows: 70% to company; 25-26.5% collectives/households; 3.5-5% local government <i>Tax liability:</i> tax paid by company, though awarded discounts: Afforestation charge reduced by up to 80% in first 4 years. Special Agricultural Products Tax refunded in first rotation.	The forest land contracts agreed between company and communities provide the basis for plantation establishment and raw material supplies to planned medium density fibreboard factory in Qingyuan City and other Asia Pulp and Paper pulping mills. However new tensions have emerged as the government is backtracking over concerns that the factories will worsen water quality. Shaoguan City, Guangdong Province Golden Shaoguan First High Yielding Plantation (Paper Material) Base Co. Ltd – joint venture between Asia Pulp and Paper and Shaoguan Forestry Company Collective and rural households Long term forest land lease and raw material supply contracts 1995 Active supporter and participant in negotiations and implementation of agreements
Shaoguan City, Guangdong Province	Golden Shaoguan High Yielding Plantations (Paper Material) Base Co. Ltd – joint venture between Asia Pulp and Paper and Shaoguan Forestry Company	Collective and rural households	Long term forest land lease and raw materials supply contracts	1995	Active supporter and participant in negotiations and implementation of agreements	<i>Area:</i> 40,000 hectares in 1 <sup>st</sup> phase. Planned total of 400,000 hectares. Planted 14,700 hectares to date <i>Contract period:</i> 70 years. <i>Benefit-sharing:</i> Company buys woods at world market prices for pulp and splits profits as follows: 70% to company; 25- 26.5% collectives/households; 3.5-5% local government <i>Tax liability:</i> tax paid by company, though awarded discounts: Afforestation charge refunded to company, Special Agricultural Products Tax reduced.	Relationship between government and Asia Pulp and Paper is more harmonious than in the case of Qingyuan, mainly due to higher level of local employment. However, there is also tension over the construction of processing factories due to potential implications for local water quality.

## 5.3 Identifying the benefits

There are a number of attractions for communities, investors and government entities in establishing relationships. Ultimately the most fundamental driver for deals is the extension of contracting out in the forestry sector and the decentralisation of forest land use rights to households (see Section 3). Without contracting out, households would not have a role to play in dealing with foreign enterprises, and negotiations would be left entirely to collectives.

From the **communities' perspectives**, the following benefits may be highlighted<sup>19</sup>:

- *Increased income.* Deals offer a new source of income, which is particularly valuable where they involve the regeneration of degraded lands since the opportunity costs (i.e. what could otherwise be earned) of this land are low. In the Guangdong cases between 25-26.5 per cent of profits are returned to landholders and 3.5-5 per cent is paid to government authorities.
- *More reliable income.* A major difficulty with the removal of centralised control over prices has been that farmers are more vulnerable to changing market conditions. While there are clear efficiency arguments in favour of floating prices, where markets are segmented, as is often the case in rural China, fluctuations may be excessive and have harmful social implications. Long-term contracts with companies offer communities a mechanism for managing their exposure to such risks. Yet, they cannot insulate themselves completely. In the case of Asia Pulp and Paper, for instance, income varies with profitability.
- *Rural employment.* Locals are employed to establish and manage forestry operations. Since work is in degraded areas, where unemployment tends to be higher, this is particularly valuable. Of course, the level of employment is limited where companies use external workers, as in the case of Asia Pulp and Paper's deal in Qingyuan City.
- *Devolving marketing responsibility.* In addition to reducing exposure to market fluctuations, by establishing a long-term supply contract with companies, households can pass the responsibility for marketing to the company. Transaction costs for individual farmers to market their forest produce are high (e.g. costs of getting information on prices, searching for potential buyers, negotiating transactions) and, due to the small scale of farmer plots, cannot be spread over large volumes. By selling directly to a processor that then markets the final produce to consumers, households minimise their marketing costs.
- *Reductions in forest fragmentation.* Household contracting of forest land has many attractions as outlined in Sections 3.5. However, it has also introduced challenges. A prominent problem has been the fragmentation of forest land

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19. These benefits are associated with the experience of Asia Pulp and Paper in Guangdong as well as the broader literature on partnerships in the agriculture sector. See Lu Wenming *et al* (2000a)

and the high costs of managing small plots. Company-community deals offer a mechanism for consolidating forest land into more economically viable units. By bringing households together to supply a single company, costs of forest management may be shared and economies of scale reaped.

- *Technical support and training.* Longer-term deals have involved investment in training and support to households involved in forest planting and management. In many cases households are lent modern equipment and inputs to improve efficiency.
- *Improved productivity and higher efficiency.* Where forest land is fragmented, production tends to be inefficient as the application of capital and new technology is not viable. In addition to forming more economical blocks of forests for management, company-community deals inject financial resources into forestry and involve the introduction of higher levels of technology that raise productivity. In Guangdong Asia Pulp and Paper's heavy investment in research and development and its application of the latest techniques in tree breeding and management, e.g. GIS systems, have already had results. Stand growth has increased from 2.55 m<sup>3</sup>/year/hectare prior to Asia Pulp and Paper's investment to today's 15 m<sup>3</sup>/year/hectare. The average timber output has increased from 34.5 m<sup>3</sup>/year/hectare to 90 m<sup>3</sup>/year/hectare.
- *Improved local infrastructure.* Large-scale investments in afforestation in Guangdong by Asia Pulp and Paper have led to associated investments in improving the local transport and communications infrastructure.
- *Strengthened social capital.* Where deals lead to the formation of new cooperative arrangements to provide a unified front in negotiations with companies they may be an important spur to social institution strengthening. Such associations may form a basis for future joint initiatives. For instance, professional associations may be formed to provide households with information, to help coordinate production and marketing and even provide short-term financial assistance. In certain cases more closely-knit cooperatives may be formed where households effectively pool their land, labour and other inputs and share profits. Such shareholding cooperatives are already emerging in other parts of China (see Box 1, Section 2.3.3).

From the **company's perspective**, long-term contracts also offer a number of advantages<sup>20</sup>:

- *Secure wood supplies.* Perhaps the most powerful catalyst has been the scarcity of cheap and reliable forest resources in a world of rapidly expanding demand. With the Government of China, like other nations, becoming increasingly protective over natural forest resources, forest-based companies are turning to planted forests. Since companies cannot buy forest land in China, they have a choice of contracting forests directly or forming alliances with households who have already gained forest land use rights. Both forms

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20. See footnote 17.

of arrangements with local households have their own attractions. The obvious advantage of direct contracting is that the company gains control over raw material supplies and organises inputs by hiring labour. However, in taking on direct control, it also takes on the risks, e.g. forest fire, damaged crops, etc. Moreover, where leases are not negotiated or managed in a participative manner, local discontent may introduce new problems.

- *Guaranteed wood quality.* In addition to offering companies greater control over supply, long-term contracts offer companies the security to invest in improving forest management techniques and raising product quality.
- *Reduced production costs.* Alongside securing wood supplies, companies are interested in minimising costs. China offers relatively cheap labour and land costs. When combined with companies' technological expertise and capital resources, there is potential for offering a globally competitive product. Moreover, by entering into partnership arrangements with local communities, companies may devolve some of their risks of raw material supply to households.
- *Fiscal incentives.* Guangdong has offered tax breaks and exemptions to attract foreign investment. From 1997, Asia Pulp and Paper was refunded 50-70 per cent of the afforestation charge to reflect its investment in tree planting. In addition, it paid less than half the Special Agricultural Products Tax, and in mountainous areas it is exempt.

As we have seen **government authorities** can play a catalytic role in getting deals off the ground. From their perspective, company-community agreements are attractive for a number of reasons:

- *Offering new and increased financing for forestry.* The growing pressure on official budgets at all levels of government has been highlighted throughout this report. This is a major driver behind government interest in promoting increased private participation in forestry. Company-community deals offer an attractive way of overcoming small-scale producers' inability to increase their investment in forestry without compromising social welfare.
- *Achieving afforestation targets.* Moreover, since authorities continue to be required to achieve high levels of afforestation, private investment in degraded land regeneration helps authorities meet these targets.
- *Environmental benefits.* Land consolidation for afforestation offers greater environmental benefits in the form of carbon sequestration, reduced soil erosion and water conservation. Asia Pulp and Paper's estimates of the environmental benefits associated with *Eucalyptus* plantations are set out in Table 12.
- *Social welfare benefits.* A major advantage of company-community deals is that they ensure communities benefit directly from increased investment in forestry. By targeting rural areas with degraded land, the deals help counter growing inequality between urban and rural areas, a key concern of the government.

**Table 12 Impact of Asia Pulp and Paper's plantations on natural environment**

Items	Production of oxygen	Capability of CO <sub>2</sub> absorption	Water conservation	Reduction of soil erosion
Impact	28.5 tonnes/hectare/yr	37.5 tonnes/hectare/yr	2,010 m <sup>3</sup> /hectare/yr	300 m <sup>3</sup> /hectare/yr

## 5.4 A preliminary assessment of constraints

Ten constraints to company-community deals were picked up by research for this report. Each is briefly described below.

### Lack of tenure security

Forest land ownership is often unclear, particularly in degraded mountainous regions (see Section 3.6). Not only does this make company agreements with landholders risky, but even where *de facto* rights exist, authorities lack the capacity to enforce them and prevent illegal extraction. However, prospects of deals with companies may in fact boost local community efforts to secure their tenure rights where local authorities wish to attract private investment<sup>21</sup>.

### Dispersed nature of forest land

The division of forest land into small household plots means that companies wishing to invest in large-scale afforestation must negotiate with a wide range of stakeholders. The government has a crucial role to play in overcoming this difficulty by acting as a go-between and organising households wishing to

#### Box 17 The risks of inadequate consultation with households – an example from Asia Pulp and Paper's 'partnership' in Guangxi Autonomous Region

Land used for afforestation by a newly formed Asia Pulp and Paper joint venture is provided by households. In principle, the use rights to land are obtained through consultation with communities by local government agencies and agreement is confirmed in the form of a signed contract. However, in recent years, some local authorities have been known to sell or transfer the land use rights of farmers without obtaining their full consent. In certain cases officials have resorted to issuing administrative orders. The result has generally been a breakdown in agreements.

Asia Pulp and Paper investments in Guangxi's forestry sector have been plagued by this problem. Dissatisfaction of landholders has been expressed in a number of ways, including farmers physically pulling up planted seedlings in their forest land.

The risks of not ensuring full consent of landholders for investors are high. Clear, mutually acceptable procedures are needed for gaining consent and the transfer of land rights. Flexibility in dealing with specific needs will also reduce risks of future problems.

21. The ability of deals to strengthen local community tenure security has been highlighted as a major benefit of deals in other countries, such as South Africa (Mayers et al, 2001).

participate. Nevertheless, the risks that some community members may not wish to participate, or may decide to renege on agreements rises the larger the numbers involved.

### **Excessive or inappropriate government intervention**

There are cases where government intermediaries have used excessive force in generating community participation. Authorities are often keen to attract private investment to secure their own positions. Their incentives for deals may override their concern for ensuring equitable arrangements. By pushing through unwanted deals, authorities risk their future failure. A good illustration of this problem is provided for Guangxi Autonomous Region in Box 17 below.

In addition to the above, government regulations relating to harvesting quotas needs to be reviewed as they represent inflexible and counterproductive tools for ensuring adequate forest management. Not only are harvesting limits excessively restrictive for high-yielding forest plantations, but the bureaucracy involved in obtaining harvesting permits is costly.

### **Excessive taxation**

Heavy taxation is a crucial factor blocking the development of company-community agreements. With taxation and charging coming to as much as 50 per cent of market prices, China is an unattractive investment destination when compared with rates as low as 2-5 per cent in other forested countries such as Indonesia, Brazil and New Zealand. This problem was stressed in Section 4. Whilst in the cases reviewed here foreign investors have received tax breaks and exemptions, companies frequently complain that these are insufficient.

### **Inadequate environmental protection**

The local forestry authorities' capacity to oversee forest management is constrained by falling budgets and overstaffing. Inadequate funds are channelled to carrying out field inspections and making sure forest management standards are implemented.

There is also a lack of investment in research to update government regulations for fast-growing plantations. While under certain circumstances reforestation may offer significant water quality benefits (see Section 5.3), this is not necessarily the case. The actual impact will depend largely on the forest management and harvesting techniques adopted, as well as the species. Where heavy machinery is used and soil kept clear of under-storey vegetation, plantations may actually raise soil erosion and reduce water quality. Also reforestation may have negative effects for dry season flows. Evidence collected on *eucalyptus* plantations' impacts on the hydrological cycle in several parts of the world has indicated a reduction in dry season flows (Hamilton and King, 1983; Bosch and Hewlett, 1982). Their extensive root system is extremely effective in drawing down groundwater supplies during droughts, thereby

reducing supplies available for other uses (See Annex 2 for a discussion of forest-water linkages).

### **Inequitable relationships and a lack of legal protection for parties**

The balance of power in establishing company-community deals is often unequal. Companies are frequently the only buyers of forest land use rights and, therefore, have considerable power over the price paid. Households in contrast are rarely unified, lack negotiation skills and often have little access to information about potential returns, reducing their ability to bargain. Furthermore, communities that enter long-term deals with companies have little protection if the companies decide to pull out of an agreement or renege on certain conditions.

On their side, companies are also exposed to opportunistic behaviour. For instance, where households get offered a better deal they may renege on their commitment to supply the company. While companies have the option of taking legal action to prevent this, generally speaking the costs involved in pursuing those who fail to comply with contracts outweighs the potential benefits.

### **Lack of fair valuation of community inputs**

Linked to the above constraint is the need for standardised and fair procedures for valuing household land and labour inputs in deals involving the transfer of land use rights. In agreements where households receive a share of company profits based on the share of their inputs, the valuation process is extremely important. Currently, valuation approaches vary, are overly complex or too simplistic. In the case of Asia Pulp and Paper's investments in Guangdong a flat share split of 30:70 was decided, irrespective of the quality of the land involved. The result is that the company will only invest in the highest quality land. By altering the share split according to the land's productive capacity, such perverse incentives could be removed.

### **Conflicts between agreements and forest laws**

Field research has thrown up worrying inconsistencies between provincial laws dealing with foreign investment in forestry and contracts between companies and communities. A particular area of concern relates to the duration of contracts. For instance, Article 18 of Guangdong's "*Administrative Methods on Afforestation Using Foreign Funds in Guangdong*" (1997) is clear:

*"the duration for foreign funded afforestation projects is limited to 30 years. If there is a need for extension when the contract expires, ... duration can be extended to 50 years after approval."*

In 1999, this regulation was updated to take account of demands for longer contracts with the passing of "*The Notification on Implementing Administrative Methods on Afforestation Using Foreign Funds*". This law

stipulates that with the approval from the provincial government, where foreigners invest in pulp and paper processing in China, they may be awarded forest land use rights for up to 60 years. However, in contracts drawn up with Golden Shaoguan and Golden Qingyuan, forest land use rights are allocated for 70 years, and are renewable.

### **Policy reversals and inadequate internal government coordination**

Where the government is attempting to encourage private investment, investors (both households and companies) require a secure policy environment in which to operate. Where the government is constantly changing policies, it raises the risks for investors. A good illustration of the potential problems are illustrated in Guangdong where government backtracking threatens Asia Pulp and Paper's planned investments (see Box 18).

Part of the problem in Guangdong lies with the lack of coordination between the city and provincial forestry authorities. Whereas the city forestry bureaus have agreed the contract with Asia Pulp and Paper, they did so before gaining the full consent of the provincial government. As in the case of landholder participation, full consultation with key government stakeholders is a key part of designing a successful company-community deal.

### **Lack of adequate links to markets**

While the government sees company-community deals as an attractive mechanism for generating investment in forestry in degraded areas, many of the areas where forestry would maximise benefits for social welfare and the

#### **Box 18 The need for a stable policy environment – Guangdong versus Asia Pulp and Paper**

When Asia Pulp and Paper initiated its investment in reforesting large areas of degraded lands in Qingyuan and Shaoguan Cities, it did so on the understanding that the raw materials produced would feed its proposed pulp and paper and medium density fibreboard factories. However, two years after the initial contract was signed and afforestation initiated, the provincial authorities are reconsidering whether they will in fact allow Asia Pulp and Paper to construct its processing mills.

The key issues of concern for the authorities are environmental. Shaoguan and Qingyuan cities are located in the upper reaches of the Beijiang River, one of the major branches of the largest river in Guangdong, the Pearl River. The provincial authorities believe that the proposed factories will use enormous amounts of water and cause heavy pollution, thereby threatening water supplies to people dependent on these rivers.

Government backtracking has meant that Asia Pulp and Paper has cut back its afforestation strategy and in the last two years planting has virtually halted. The originally planned plantation area for the first phase was 79,000 hectares. To date, only 27,000 hectares has been completed.

environment are far from markets that provide incentives for private investment. This conflict is already clear given that the greatest experience with such deals is in coastal areas such as Guangdong Province, rather than inland western regions.

## 5.5 Summary

In the context of the government's Natural Forest Protection Programme and Great West Development Programme and the associated commitments to plantation establishment, company-community deals may offer a valuable opportunity for generating much needed private investment in forestry.

On the face of it, such deals offer clear win-wins. Not only do deals allow capital-rich companies to access land and raw materials for their businesses, but landholding communities receive much needed financing for investment and access to new forest technologies. For poor rural households, increased and more reliable income associated with long-term contracts has the potential to significantly boost their existing asset base and wellbeing.

When we take a closer look at emerging deals, a more complex set of costs and benefits emerge. Based on an investigation of long-term contracts negotiated by the multinational, Asia Pulp and Paper Company Ltd., in Guangdong Province, this section has raised a number of concerns. Perhaps the most important relates to the fact that deals are not between companies and communities, but between companies and local governments. While the governments' central role in negotiating and managing deals offers potential benefits for communities by reducing transaction costs in concluding deals, it also alters the balance of power and distribution of rewards. It is not always clear how much consultation takes place with communities, or whether the government's involvement improves outcomes for local livelihoods.

Given the tremendous potential for company-community deals to benefit all involved, it is crucial that more research is undertaken to identify successful models and highlight potential pitfalls in negotiating deals.

# Encouraging private financing of forest environmental services<sup>22</sup>

China's forests provide a wide range of products that benefit society. Some are tangible such as timber, firewood, fruit and nuts, while others, namely environmental services, are less tangible. While tangible products may be bought and sold in markets, benefits provided by environmental services, e.g. biodiversity conservation, watershed protection, carbon sequestration, are generally unvalued by markets. In economic terms, environmental benefits are referred to as externalities, or products external to the market system. A serious implication of the failure of markets to capture environmental goods and services is that private individuals have little incentive to invest in these benefits.

As in most countries, the government of China has traditionally been the lead entity responsible for the protection of forests' environmental services. Since the founding of the People's Republic of China, the government has been active in establishing protected areas. In 1956 there was only one protected area in China. By 1999 this number had increased to 1146, covering over 88.1 million hectares. Government investment in natural protected areas rose from US\$3.53 million (29.3 million RMB) in 1991 to US\$16.1 million (133.9 million RMB) in 1998. In addition, since 1978, many large-scale ecological forest programmes have been implemented including the 'Three-North' Shelterbelt Development Programme, the Yangtze River Shelterbelt Development Programme, the Coastal Shelterbelt Development Programme, and the Taihang Mountains Afforestation Programme (see Table 4 in Section 2.3.2). In 1998, the Natural Forest Protection Programme was launched with an explicit aim of protecting over 95 million hectares of natural forest by 2010.

Despite these significant efforts, the trend of environmental deterioration in China has not been reversed. During the 8th Five-Year Plan (1990-1995), environmental investment amounted to only 0.8 per cent GDP, rising only slightly to 0.85 per cent GDP in the first four years of the 9th Five-Year Plan. To reverse serious degradation, it is estimated that this rate should be at least 1.3 per cent GDP (State Environmental Protection Agency, 2000). However, far from increasing spending, strains on government finances means that the government is cutting back. In light of its most recent commitments under the Natural Forest Protection Programme and the Great West Development Programme, there is a need to look outside the public sector for additional finance. In line with a broader drive to increase private participation in forestry, the natural target is the private sector.

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22. This section is based on Liu Can *et al* (2001)



The importance of involving private households and organisations in forest management and protection, and the need for beneficiaries to pay for forests' environmental services, is highlighted in the government's 'Forestry Action Plan for China's *Agenda 21*'. The document emphasises the need to collect: "...*compensation fees for forest ecosystem benefits against organisations and individuals which directly gain income derived from the environmental benefits of various beneficial forests.*" In addition to providing a new source of finance for forest management, payments for environmental benefits provide incentives for investment in the supply of environmental benefits. This point is recognised by the government and reflected in its plans to introduce Forest Ecological Benefit Compensation Funds, as set out in the amended Forest Law 1998.

The government's plans involve the Forest Ecological Benefit Compensation Funds acting as an intermediary responsible for collecting compensation fees for forest environmental services from beneficiaries and paying compensation to the providers of the services. While progress has been made in establishing the legislative and regulatory framework for setting up payments systems, experiences on the ground have been limited. Although the SFA has allocated funds to a central Forest Environmental Benefit Compensation Fund, only one county in Jiangxi Province has passed legislation to establish such a fund at the local level. Nevertheless, there is also some *ad hoc* evidence to suggest that in some places markets for forest environmental services are emerging of their own accord in response to local concerns for the environment and financial shortfalls.

Drawing on research undertaken by the Forest Economics and Development Research Centre and the Policy Research Centre for Environment and Economy of the State Environmental Protection Agency, this section explores the emergence of environmental payments systems in China. The section starts with a brief overview of existing examples of payments systems, before examining payments schemes for individual forest environmental services including watershed protection, biodiversity conservation, landscape values and carbon sequestration. The section ends by touching on the main challenges facing the spread of payments mechanisms.

## 6.1 Forest environmental services – a history of market neglect

Ecologically, forest resources play a critical role in stabilising the life-support system that enables human existence. Three broad forest functions may be identified:

- *productive functions* – the production of tangible forest products such as timber and NTFPs which human's consume or sell;
- *environmental service functions* – the protection of critical life-supporting environmental services such as water quality protection, flood control, aquatic habitat preservation, biodiversity conservation, carbon sequestration; and
- *social welfare function* – the provision of cultural and social benefits that are integral to the well-being of forest-based societies;

It is well-known that many of the environmental services provided by forests have no market prices and, therefore, do not tend to enter into private sector decision-making. Forest managers do not, for instance, receive compensation for capturing carbon, maintaining scenic beauty or preserving biodiversity resources.

Consequently, forest managers have little incentive to manage forests to provide environmental services. Economists refer to these un-marketed benefits of forests as ‘externalities’ to reflect the fact that they are external to the economic system. They are also called ‘public goods’ since it is the public sector that has to pay for their provision on behalf of its citizens. Yet, where governments are not capable of investing adequately, these public goods are likely to be under-supplied with serious consequences for human welfare.

In China, there has been a growing official recognition of the serious challenge posed by forest degradation. The drive to generate greater private investment in forests, highlighted in earlier sections of this report, reflects in part the government’s effort to raise financing for the protection of forests’ environmental services.

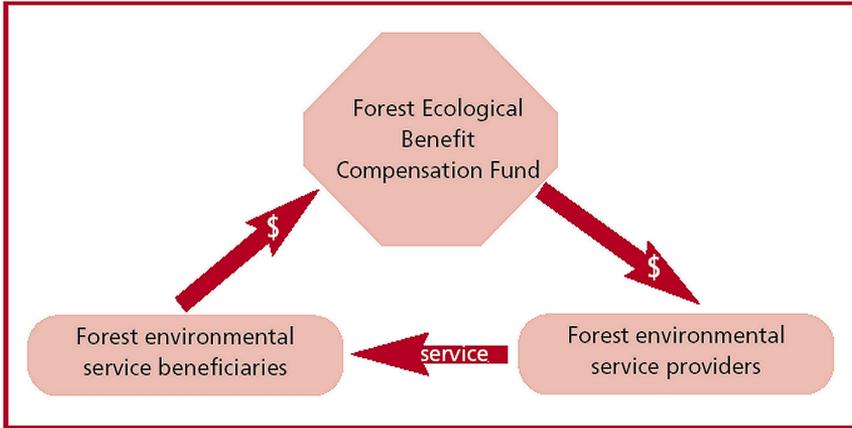
However, a key element in any strategy aimed at increasing private investment in environmental service supply is a system of rewards tied to service provision. While tenure reform has helped link farmers’ efforts with their forest productivity, rewards are associated with increased production of commercial products, such as timber and NTFPs. For farmers to actively promote reforestation for watershed protection, biodiversity conservation and other environmental services, the rewards must be directly linked to provision of these services.

## 6.2 Payments for forest environmental services – an emerging picture

Through the 1990s the need to introduce a payment system for forest environmental services was widely recognised, as reflected in a number of central policy documents listed in Table 13 below. The focus of these policies has been on the government collecting charges from beneficiaries and reallocating funds to forestry. But implementation has been patchy. A critical problem has been ensuring that revenue from charges is channelled back into forestry.

The government’s most recent initiative to promote payments for environmental services was set out in its revised Forest Law (1998). This policy has moved closer to being implemented with the presentation of ‘*Operational Measures for Compensations on Forest Ecological Benefits*’ (2001). According to the new measures all entities, be they public or private, who generate direct economic benefits from ecological functions of forests are required to pay for these services and the funds raised will be earmarked for investment in maintaining the forest environment. Money will be channelled through new ‘Forest Environmental Benefit Compensation Funds’. A stylised diagram of the role of the Funds is set out below in Figure 9.

**Figure 9 Stylised diagram of the role of a Forest Ecological Benefit Compensation Fund**



To initiate the establishment of a central Forest Environmental Benefit Compensation Fund, seed funding of about US\$1.8 million (15 million RMB) was provided in 2001. This increased to US\$241 million (2 billion RMB) in 2002. However, these sums fall short of the resources that would be needed if payments for environmental services are to become a reality. For example, one estimate has put the value of environmental services per hectare at US\$1,000 in 1992 prices (Hou, 1994). This central allocation represents seed money for getting local authorities to set up their own funds and generating their own finance for environmental service protection.

**Table 13 Summary of central government policies and statements relating to payments for forest environmental services**

Date	Issuing organisation	Policy/Statement	Key features
Sept 2000	The State Council	The Decision on Converting Land to Forestry and Pasture	The government will pay landholders to convert degraded land into forests or pasture. Payments are in-kind and cash and include: <ul style="list-style-type: none"> <li>● 2250 kilograms grain/hectares in the upper reaches of Yangtze River,</li> <li>● 1500 kilograms grain/hectares in the middle and upper reaches of the Yellow River,</li> <li>● US\$2.41 (20 RMB)/year</li> </ul> The scheme will last for 8 years.
1998	The State Council	The Forest Law of the People's Republic of China	Established Forest Environmental Benefit Compensation Fund to finance payments for forest environmental benefits. Funds are collected through payments of beneficiaries and earmarked for spending on provision of these services.

1996	The State Council	The Key Tasks and Policies in Rural Areas – 9 <sup>th</sup> Five Year Plan	To build the system of charges for forest environmental benefits and a mechanism to invest in environmental forests.
1995	State Committee for the Restructuring the Economic System and the Ministry of Forestry	General Guidance for Economic Reform of Forestry	Established forest classification system and stated that environmental forests [define] be funded by government, but based on charges levied on beneficiaries of services
1994	The 16th meeting of the Standing Committee of the State Council	Agenda 21 – Forestry Action Plan for China	Target of establishing a system of forest environmental fees
1993	The State Council	Circular on Further Enhancing the Works of Planting and Greening	To reform financing for planting and greening, by introducing charges for forest environmental services
1992	The State Council	Circular on the Main Points of the Economic System Reform in 1992	To establish the system of forest pricing and forest ecology benefit compensated fees.
1992	The General Office of the Central Committee of the Congress of the Communist Party Committee and the State Council	Report on the situation of attending the World Conference on Development and Environment of 1992	Need to introduce charges for resource use in accordance with the 'polluter/beneficiary pays' principle and to research environment taxes.
1983	The State Council	Decisions on Environmental Protection	Set out a number of funding sources for the environment, including: 7-8% charges on capital construction projects; charges of 7% on technical innovation projects; taxes on municipal construction and maintenance work; 80% of emission charges; government loans to enterprises for the environment; special environmental funds established by various government agencies

**Source:** State Forestry Administration, the State Environmental Protection Agency and the State Council of China

Local implementation of central directives has varied. The most enthusiastic support has been forthcoming where forest resource degradation is having clear impacts on local welfare. In 1992, Wuyuan County of Jiangxi Province established one of the earliest county-level Forest Environmental Benefit Compensation Funds. The Fund, which receives income from various charges including levies on hydropower companies, is considered to be a 'model' county for Forest Environmental Benefit Compensation Funds. The main purpose of this fund is to finance 'micro nature conservation zones' widely established in the county.

The laws highlighted above essentially establish a regulatory system whereby fiscal authorities collect charges that are earmarked for spending on forestry. In what follows we turn to specific examples of payments systems being set up for watershed protection, biodiversity conservation, and landscape beauty. No efforts have yet been made to compensate forest owners for their carbon sequestration services, yet several studies have tried to examine what level of payments might be needed if compensation schemes were to be introduced.

### **6.2.1 Paying for watershed protection services**

Water pricing is common throughout China. In the more advanced instances, prices are set to cover costs of provision. However, in general only a limited set of costs is considered, i.e. the cost of transporting and distributing water to consumers. The cost of protecting the hydrological cycle through land management is not taken into account. Yet, land management is thought to be critical to the maintenance of clean water supplies and dry season flows.

De-linking land management, including forest management, from water planning has proved costly. Soil erosion, worsened by deforestation on steep slopes, farming in marginal land and other harmful land-based practices, has had negative implications for the hydrological system and water supplies. In particular, resulting sedimentation is widely blamed for waterway siltation, reducing dam capacity and increasing flooding. The total area of soil erosion in China in the 1950s was 1.16 million square kilometres (Hu Tao, 1994). By 1992, according to the Chinese Academy of Science, this area has increased to 3.75 million square kilometres (Zhou Xin, 1996), about 39 per cent of the total area of the country. While there is no hard data to indicate what share of this soil erosion may be directly attributed to poor land management, it is certainly key.

The importance of forests in controlling soil erosion, and thus water quality and supply, is highlighted for Miyun County, Hebei Province in Table 14 below. Over the four years considered, forest land on average reduced soil erosion by 85 per cent.

Beijing Forestry University measured the impact of forests on water quality directly. They found that forested land produced water quality of state standard I and II, while deforested land produced water of state standard III or worse. In addition Carbonaceous Biochemical Oxygen Demand content is 45.7 to 56.8 per cent lower in forested areas, and nitrogen oxide levels were 25.8 to 31.6 per cent lower in

**Table 14 Soil erosion with and without forests 1991 to 1994 in Miyun Reservoir watershed**

Year	Rainfall (mm)		Soil erosion in forest land (tonnes/km <sup>2</sup> )	Soil erosion in non-forested land (tonnes/km <sup>2</sup> )	% higher soil erosion in non-forested land
	Amount	Frequency			
1991	528.4	31	20.40	105.91	419%
1992	527.8	30	823.90	926.20	12%
1993	389.3	44	14.95	570.90	3719%
1994	684.5	45	107.31	181.85	69%
Average	532.5	37.5	241.64	446.215	85%

Source: Miyun Reservoir Watershed Station (1995)

forested areas. Furthermore, the researchers found that water quality under natural forest cover is better than that under plantation (Wang Lixian *et al*, 1999).

Based on an economic valuation of forest resources in Miyun watershed, Liu Can (1998) found that forests are worth US\$0.21 (1.76 RMB) per hectare. A separate valuation study by Zhongwei Guo *et al* (2000) estimated the water flow regulation benefits associated with watershed protection in Xingshan County, Hubei Province, part of the Yangtze River watershed. Benefits were estimated in terms of increased productivity of the Gezhouba hydroelectric power plant. The estimated increase in power generation associated with watershed protection amounted to US\$608,000 (5.05 million RMB)/year, equivalent to 42 per cent of China's annual income from forestry in 1994. When the Three Gorges Dam is completed this is expected to rise by 220 per cent.

While the data highlighted above presents a positive picture of forests, it is important to stress that these studies are 'one-offs' and considerable scientific uncertainty remains about the role of forests in maintaining hydrological cycles. A number of studies have highlighted the negative side-effects of forests for erosion control and dry season flow. Annex 2 provides a brief overview of scientific evidence relating to forest-water linkages.



**In Xingguo County, Jiangxi Province, afforestation lay at the heart of efforts to tackle worsening soil erosion, sedimentation and declining water quality. The picture above depicts the situation before tree planting in the area**

Notwithstanding scientific uncertainties, the view that land management and forestry are important for water supplies is gradually influencing policy. Local governments have demonstrated their willingness to raise funds for improved land management and forestry by charging water consumers. Box 19 below summarises case studies of a variety of initiatives aimed at investing in forestry.

## Box 19 Getting to grips with forests' role in maintaining high quality water supplies – a variety of local government payment schemes

### **Miyun County, Beijing Municipality**

Miyun County lies to the north-east of Beijing. Over 80 per cent of the county's population are rural and involved in farming. Miyun County is rich in water resources, housing 14 rivers, including the large Chao and Bai Rivers. To make use of its vast water resources, 24 reservoirs have been constructed. The largest one is Miyun Reservoir, completed in 1960. The Miyun Reservoir currently supplies over 80 per cent of Beijing's water. Approximately 56 per cent of water flowing into the Miyun Reservoir comes from the Chao, Bai and Chaobai Rivers which originate in Chengde Prefecture, Hebei Province.

The reservoir, however, is threatened by increasing siltation and pollution. Annually, the average rate of soil erosion is 1200 –1600 tonnes/km<sup>2</sup>. In addition, heavy use of fertiliser and pesticides in surrounding farmlands has raised pollution. Direct negotiations between the recipients of this water in Beijing and Tianjin Municipality and the suppliers in Fengning County (Chengde Prefecture) have resulted in the establishment of an Environmental Forest Compensation Fund. The fund receives US\$120,000 (1 million RMB) from Beijing and US\$48,000 (400,000 RMB) from Tianjin every year. In addition, US\$0.02 (0.2 RMB) per cubic metre of water consumed (equivalent to about 12 per cent of total charges) is transferred to forestry protection. These funds are used to pay farmers to manage forest resources.

### **Yao County, Shiangxi Province**

In Yao County, 10 per cent of the revenue from a water resource fee collected by the Department of Irrigation and Department of Soil and Water Conservation is channelled to the Forestry Department to protect critical watersheds.

### **Xingguo County, Jiangxi Province**

In 1980 serious soil erosion affected 85 per cent of the county, an area of 190,000 hectares. As 96 per cent of the forestlands in the area have been contracted out under the Household Responsibility System, households have been given support to plant and manage trees for soil conservation. Over 50 per cent of the amount invested to date, however, has come from household and private sources. Private industry is forced to contribute through fees. The metallurgic industry pays 0.5 per cent of sales revenue, the chemical industry 3 per cent of sales, coal enterprises US\$0.01 (0.1 RMB)/tonne output and hydropower companies US\$0.0001 (0.001 RMB)/kilowatt output. The result of this investment has been dramatic. By 1999 the area affected by serious soil erosion had dropped by almost 80 per cent, to 41,000 hectares.

### **Qujiang County, Guangdong Province**

Qujiang County has abundant water resources, including the Zhen River, Lian River and Nan River, key tributaries of the Bei River. While forests are known to reduce total river flows, they are also attributed with increasing dry season flows and raising water quality, critical functions for hydroelectricity and water supply enterprises. Recognising the valuable function of forests, water supply and hydroelectricity enterprises have agreed to pay farmers US\$0.001 (0.01 RMB) per tonne of water, and US\$0.0005 (0.005 RMB) per Kilowatt electricity respectively.

### **Liaoning Province**

To cover the costs of upstream forest management, charges are levied on a number of large industrial users of water. Fees vary according to beneficiary as follows:

- US\$0.0012/tonne of water is levied on urban water supply companies, as well as industrial and mining enterprises,
- US\$0.0001/tonne is charged on agricultural water users,
- US\$0.0012 per kilowatt-hour is levied on hydropower stations; an additional 20 per cent is levied on revenues from admission tickets to forest scenic spots;
- US\$0.0001 per tonne is levied on inland water transport enterprises.

In total, approximately US\$1.6 million (13 million RMB) is collected annually and this is spent on forest and water resource management. To date about US\$5.7 million (47.2 million RMB) has been collected.

### **Guangxi Zhuang**

#### **Autonomous Region**

Hydropower companies were required to pay US\$0.12 (1 RMB) per kilowatt per year of electricity to finance forest planting and management in the region. A total of about US\$120,000 (1 million RMB) is raised annually and channelled to local forest land holders.

### **Inner Mongolia**

#### **Autonomous Region**

Linhe County collects US\$0.90-1.81 (7.5-15 RMB)/hectare is levied on farmers that benefit from forests protection services to pay for forest planting and management.

### **Xinjiang Uygur Autonomous Region**

The government levies a compensation fee from beneficiaries of forest environmental services, including governmental departments and enterprises. This fee provided revenue for an additional 0.5 per cent investment in 1997-2000 over existing government spending in the region in 1996.

Source: Survey results

What is immediately clear from these case studies is the central role of government bodies in driving payments for forest watershed protection services. However, it is important to distinguish between regulatory authorities, service providers and state enterprises since each has different reasons for pushing payments schemes. Where water supply entities are negotiating payments with upstream landholders, e.g. Beijing and Miyun County, the agreed payment will tend to reflect demand and supply conditions. This is important since it means that prices will move towards an efficient level at which marginal benefits from improved water quality equal marginal costs of supply. In cases where charges are imposed by a central body without consideration of marginal costs and benefits for suppliers and beneficiaries, the outcome is likely to be less satisfactory. By allowing beneficiary groups to negotiate directly with suppliers, the government may promote a more effective payment system.

While major private water users rarely take the initiative to pay for improved land management in China, Unilever set a valuable precedent in 2000 with the launching of its 'Clean Water and Green Mountains for China' initiative. This is briefly described in Box 20.

**Box 20 Private enterprises begin to recognise their debt to nature – Unilever establishes its 'Clean Water and Green Mountains for China' initiative**

Unilever – a major multinational producer of consumer durables – estimates that world-wide it consumes 0.1 per cent of total water extracted for use each year. In recognition of its major role as a water user, it runs a 'Water Care' programme which aims to *"ensure that [Unilever's] activities and those of [their] suppliers, customers and consumers achieve a sustainable balance...so assuring the ability of future generations to access sufficient quantities of clean water."*

As part of its programme aimed at securing clean water supplies, Unilever manages a number of local level initiatives. In June 2000, it launched its 'Clean Water and Green Mountains for China' initiative. The initiative represents a long-term commitment by the company to pay US\$845,000 (7 million RMB) a year towards reforestation and soil and water conservation efforts in water stressed areas of China.

In its first year, Unilever planted 500,000 trees, and made a contribution of US\$60,000 (500,000 RMB) towards the establishment of a China Environmental Protection Foundation. Initially efforts have focused on planting in the Inner Mongolia Plateau, an area which plays a critical role in supplying Beijing city's water. Planting is also planned for Shaanxi and Hebei provinces as well as in municipalities of Beijing, Shanghai, Hefei and Chongqing. In 2001, tree planting is expected to reach 1 million trees. Planting is directed by Unilever working with the new China Environmental Protection Foundation, and advised by a number of individuals and organisations including Green Earth Volunteers, the State Environmental Protection Agency, the SFA.

Source: Unilever (2001); China Online (2001)

## **6.2.2 Paying for biodiversity conservation – China's medicinal herb industry**

Forest biodiversity refers to the variety of ecosystems, species and genes. In global terms, China has the highest biodiversity in the Northern Hemisphere, but 15-20 per cent of its wild animals and plants are endangered. While China has established an extensive protected area system, an estimated 30 per cent of nature reserves lack funding. Preserving China's biodiversity is extremely important for the maintenance of environmental systems that underpin human well-being. Not only is diversity thought to be critical for providing a natural resilience against shocks, but it is argued that biodiversity provides a basis for evolutionary processes that allow species to change and adapt over time.

While all of society benefits from biodiversity protection, some groups benefit more directly through their commercial exploitation of genetic material. China's vast, and rapidly expanding, medicinal herb industry is a critical commercial beneficiary. In total about 10,000 medicinal herbs are known, and 1,000 of

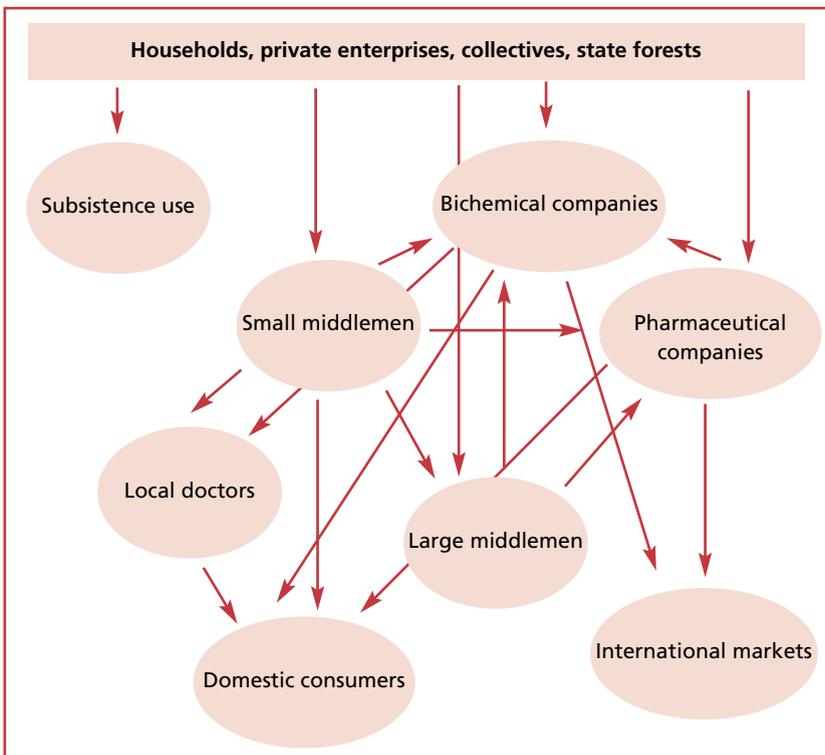
these are commonly used. Many of these find their way into mainstream drugs used alongside western medicines. About 80 per cent of drugs used in China are based on indigenous plants. Not only is the domestic market for herbs huge, but exports are also growing rapidly. As a result overall production has expanded at an estimated 9 per cent per annum over the last 20 years. In 1987, total output reached 650 thousand tonnes (China Customs, 1988).

While medicinal herbs are frequently cultivated outside natural forests, they originate in natural forests. For many, cultivation is not an option since plants perform poorly outside their natural environment. As a result, 80 per cent of medicinal plants are sourced from the wild. In volume terms the share is 60 per cent (Shang-An He and Ning Sheng, 1997).

In addition, natural forests represent a reservoir of undiscovered medicinal uses. By 1990, 10 medicinal plants had shown promise for their anticancer and anti-HIV compounds (Zhun, 1991). The significant potential for new drugs is indicated by the high rate of recent discovery. Between 1979 and 1990, forty-two new Chinese medicinal preparations appeared on the market (Song, 1992).

The destruction of natural forests poses a threat to the medicinal herb industry. This threat comes from within and outside the sector. Where medicinal plants

**Figure 10 China's medicinal herb market – identifying the key stakeholders and inter-relationships**



are already discovered, extraction has meant that for most species, stocks are exhausted within 10-20 years (Shang-An He and Ning Sheng, 1997).

The government's Institute of Medicinal Plant Development, a World Health Organisation Collaborating Centre of Traditional Medicine under the Chinese Academy of Medical Sciences, is responsible for tackling this problem by protecting and enlarging medicinal plant resources, most notably natural forests. Notwithstanding the Institute of Medicinal Plant Development's efforts, it lacks the resources to protect the vast areas of natural forests that are under threat. Given the lack of central government funding, China's medicinal herb sector represents an obvious source of additional investment.

Figure 10 above illustrates the key stakeholders involved in China's medicinal herb market. Individuals are the main source of medicinal herbs, but private entities, collectives and state farms also get involved. Medicinal herbs are either used at home or sold. Sales may be to processors, e.g. pharmaceutical and biotech companies for further analysis and processing, to state medicinal stores or to middlemen. There are over 600 industrial plants producing over 4,000 composite drugs. By 1992 the total value of sales was US\$1.3 billion (11 billion RMB), double the value of 1990 sales. In recent years there has been a growth in deals between biochemical and pharmaceutical companies and farmers. Total export value in the early 1990s was US\$100-200 million (China Customs, 1999).



Purchasers and suppliers of medicinal herbs rarely invest in forest protection. Households tend to source their wild material from natural forests through open access arrangements. However, as supplies of wild products have come under threat, there are emerging examples of payments by beneficiaries.

#### **Box 21 Chinese Medicines and private forest resource management in Jiangxi Province**

Jiangxi Province is an important producer of Chinese medicinal herbs. A forest resources survey undertaken in the 1980s indicated that there were about 694 species of medicinal herbs in 1,751 village forest farms. In 1994 the production of medicinal herbs was 87.7 thousand tonnes, about one-third of which came from forest areas. Recently, sales of medicinal herbs topped US\$48.2 million (400 million RMB) per year. Large volumes of medicinal herbs come from forest plantations, but natural forests also remain important. About 25 per cent of output goes to international markets, 30 per cent to other provinces and 45 per cent is consumed locally.

Production of medicinal herbs is extremely profitable and explains the rapid expansion of the sector in recent years. An economic analysis of medicinal herb production from plantations in Jinggangshan Prefecture, Jiangxi Province estimated rates of return of up to 10 per cent a year.

Given its profitability, it is not surprising that producers are concerned with ensuring a future for their new businesses. Most households invest part of their profits in forest resource management and new plantations. In addition, the local government is investing in protecting biodiversity for future medicinal products.

In Jiangxi Province, for instance, medicinal herb production is a big business and suppliers have chosen to invest in forest protection and reforestation to guarantee future supplies. This case is briefly outlined in Box 21 below.

On the buyer end, some of the larger biochemical and pharmaceutical companies have directly invested in forest protection to secure a higher quality Chinese herbs. For instance, in Sichuan Province, Huizhou Biochemical Company invests in forest protection to ensure continued supplies of high quality herbs to their processing facilities.

Government authorities are also becoming more proactive in getting medicinal herb collectors to pay for access to biodiversity. This approach has been adopted in Shixing County and Wongyuan County of Guangdong Province where farmers are charged an annual fee of US\$1.80 (15 RMB) for permission to collect medicinal herbs. This money goes towards wages of forest guards and other forest management activities.

While the medicinal herb sector is a clear beneficiary that could pay for forest biodiversity, other sectors benefit from the exploration of forests' biological reserves for genetic and other material that may be commercialised (otherwise known as bioprospecting). An indication of the potential breadth of actors involved in the bioprospecting sector is provided by an example of a foreign horticulture company that has been channelling a share of its profits from a joint venture in China to conservation. This case study is outlined in Box 22.



#### **Box 22 Payments for biodiversity protection in the horticulture sector**

Pippa Horticulture Company Ltd. was established in 1994 as a joint venture between a Canadian horticulture company, Piroche Plants Inc., and Nanjing Botanical Garden Service Station. The aim of the new company was to develop and introduce new plant species for landscaping, forestry and horticulture. The company is managed by a Board of three, including one from the Nanjing Botanical Garden and two from Piroche Plants. Piroche Plants contributed 90 per cent of the start-up capital (i.e. \$900,000), and Nanjing Botanical Garden contributed 10 per cent mainly through in kind contributions.

Pippa Horticulture sells its seedlings to Piroche Plants in Canada for testing. Piroche Plants agreed to pay two times the costs of collection and provision of seedlings. Between 1996-98 over 100,000 seedlings had been tested and 2-3/10,000 offered a success. From Pippa's profits, it allocates 20 per cent to conservation; 10 per cent to Piroche Plants, 10 per cent to Nanjing Botanical Garden, 10 per cent to staff and 50 per cent is retained.

Source: ten Kate and Laird (1999)

### **6.2.3 Paying for forest landscape beauty through ecotourism**

Large-scale ecotourism is a relatively recent commercial activity in China. The rapid growth of foreign and domestic visitors to scenic forest spots has highlighted the value attached to landscape beauty services. In 1999 China's 1,002 forest parks attracted over 58.6 million visitors (SFA, 1999b). Ninety-

eight per cent of these visitors were domestic. Foreign travellers mainly came from the USA, France, Britain, and Germany. Russians and Koreans also pay visits to forest parks in the north.

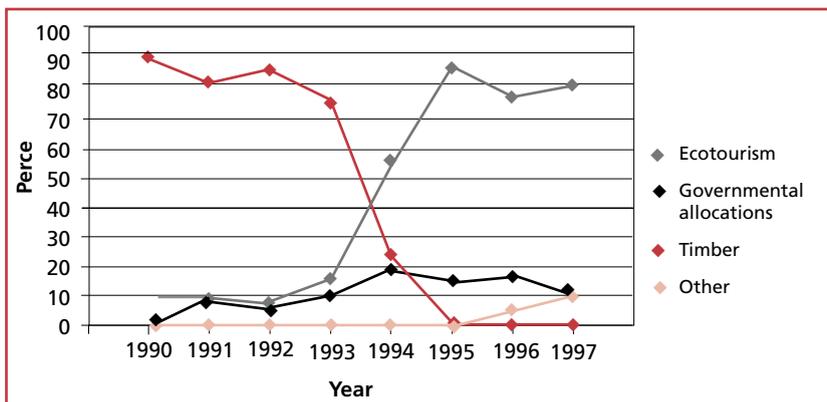
The expansion in ecotourism has led to a dramatic increase in forest park revenue. The total revenue in 1999 was US\$116,000 (962,000 RMB). Figure 11 below highlights how a forest park in Changhai Mountain has offset its shrinking timber revenue and government budget with revenue from park entrance fees. Box 23 describes three cases of protected areas raising revenue for forest protection from ecotourism.



**China's forests are increasingly prized for the peace and quiet they offer urban dwellers wishing to escape their busy city life**

The fact that people are willing to pay, often substantially more than they are charged, for the forest experience has begun to attract private interest. Between 1996-1999, four Forest Parks have listed in the Chinese stock market, raising over US\$100 million in capital through Initial Public Offerings (Sun Changjin, 2001).

**Figure 11 Breakdown of revenue base for Changhai Mountain National Park 1990-1997**



Source: Liu Can (2000)

### Box 23 Marketing landscape value – the development of forest-based ecotourism in China

#### **Yunmeng Mountain National Forest Park**

Yunmeng Mountain National Forest Park is located in north-west Miyun County in Beijing Municipality. The forest park was established in 1973 following serious flooding in the area. To establish the park, local communities were moved into surrounding areas. Since 1993 the forest park has invested in the development of ecotourism as a way of generating income for forest protection. This has been particularly important since those communities forced to move out of the area have threatened the parks protected status by using the forest to collect firewood and NTFPs.

To date, the rapid growth in ecotourism from about 5,000 to 100,000 a year and the increased income for the local economy has led to a transformation of communities' views of the Park. Rather than using fuelwood, local people are purchasing coal and gasoline. In 1998, per capita revenue in Wang Village was about US\$60.24 (500 RMB). From the authority's perspective, ecotourism revenues have allowed it to increase its investment in Forest Park management. By 1999, annual revenue had risen to over US\$181,000 (1.5 million RMB) from a base of zero in 1993. Between 50 per cent and 72 per cent of the revenues were channelled to forest protection between 1994 and 1998.

#### **Qingchengshan National Natural Park**

Qingchengshan Municipality in Sichuan Province has channelled 25 per cent of its revenue from admission tickets to the Qingchengshan National Natural Park to forestry protection since the mid 1980s. Between 1988 and 1991, the forestry department earned just over US\$60,000 (500,000 RMB). With this money it has hired 54 local people to protect forests. There are four forest protection groups, three forest protection stations, one team enforcing the forest law and three fire protection groups.

#### **Yulongxueshan Scenic Zone**

LiJiang City, Yunnan Province has experienced rapid growth in forest-based tourism in recent years. Revenue is high enough that landowners are choosing to maintain forests intact, instead of logging. For instance, annual revenue at Yulongxueshan Scenic Zone reached US\$6 million. Government spending on maintaining the zone is only a hundredth of this (Sun Changjin, 2001).

## 6.2.4 Carbon sequestration – a potential new market

Carbon pollution has been a hot topic of debate since the signing of the Kyoto Protocol under the United Nations Framework Convention on Climate Change in 1997. With growing scientific evidence that the build up of greenhouse gases (most notably carbon) is a major cause of rising global temperatures, governments have committed to reducing their emissions<sup>23</sup>. In Kyoto, governments of western nations signed up to binding reduction targets. To reduce the costs for participating countries to meet their emission reduction targets, the Kyoto Protocol introduced 'flexibility mechanisms'. Essentially these mechanisms

23. Scientific thinking on climate change is usefully summarised by the Intergovernmental Panel on Climate Change. See recent reports on their website: [www.ipcc.ch/](http://www.ipcc.ch/).

introduced different opportunities for trading emission reductions. One option is known as the Clean Development Mechanism, which permits countries with emission targets to purchase emission offsets from non-participating countries. Forests are identified as a crucial source and store of carbon<sup>24</sup>.

While China has not signed up to any greenhouse gas targets, it is obliged under the Kyoto Protocol to seek to control its emissions. Given its high economic growth rate (10 per cent a year between 1981-1997) and associated rapid increase in energy consumption (especially coal), this obligation takes on particular importance for the global community. China may also choose to sell carbon offsets to western countries that have exceeded their quotas through the Clean Development Mechanism. While keen on the sale of emission reduction credits associated with improved environmental technology applied to polluting industries, to date China has been amongst those opposing the inclusion of forest-based carbon offsets.

Notwithstanding the political hurdles, a few studies have been undertaken to examine the potential value of China's forests for carbon sequestration. Deying Xu's (1995) evaluation of the prospects for supplying carbon sequestration through afforestation, forest protection/management and agroforestry stands out. He also considers the costs and benefits of alternative scenarios for carbon sequestration. Despite formidable data gaps, the author finds that the net benefits from carbon sequestration through afforestation, agroforestry and management in many regions of China are potentially significant. Key aspects of this investigation are set out in Box 24.

#### **Box 24 Potential carbon sequestration from China's forests – costs and benefits**

In Deying Xu's (1995) study of carbon sequestration in China's forestry sector, he seeks to evaluate what current afforestation and forest management plans mean for carbon sequestration and the costs and benefits of undertaking the scheme.

Estimates of the supply of carbon sequestration are based on potential areas available for afforestation and agroforestry. These areas are clearly set out by the government for 5 regions in China. The government defines areas available for planting as consisting of shrub and wild land, cut over land, burnt areas and sandy wastelands. Agroforestry can be extended in dry cropland areas. In total, the area available for afforestation under existing government plans amounts to 110.5 million hectares, the area for forest protection/management to 19.2 million hectares and the area for agroforestry to 70.6 million hectares.

The author goes on to estimate how much carbon will be sequestered under current government plans. In making these estimates, the author makes several key assumptions, as follows:

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24. There has been considerable indecision as to whether forests will be permitted for trading under the Clean Development Mechanism. Following a recent political compromise in Bonn (July 2001) and subsequent clarifications in Marrakech (November 2001), agreement has been reached to permit afforestation and reforestation under the Clean Development Mechanism, but to exclude natural forest protection in the first commitment period which ends in 2012.

- the growth rate of trees in degraded areas (at 60 per cent of productive lands) based on annual increment data from forest inventories
- the increased growth rate in open forest areas through silvicultural techniques such as thinning (30 per cent increase)
- the use of forest products, levels of carbon in forest products and their life span
- levels of litter accumulation based on assumptions of litter fall and decomposition rates (assumed to be a proportion of stem growth rate for each case)
- levels of soil carbon (based on estimates for Thailand and India)

These assumptions are made for each region and type of forest being considered. In the north-east region, for instance, 80 per cent of the afforested area is made up of *L. gmelini* and 20 per cent is *P. korainsis*. Together this area is 19.5 million hectares. In addition 18.4 million hectares are used for agroforestry and 3.3 million hectares for forest management to increase growth rates. Within this region assumed wood increment rates are 6.7 m<sup>3</sup>/hectare/year, 3.2 m<sup>3</sup>/hectare/year, 1 m<sup>3</sup>/hectare/year and 2.1 m<sup>3</sup>/hectare/year for afforested *L. gmelini*, afforested *P. korainsis*, agroforestry and management areas respectively. Given a ratio of litter accumulation and estimated wood density, the author works out a carbon increment/hectare/year.

With estimates of carbon increments/hectare/year, the author then calculates the total level of net carbon sequestration under five scenarios of afforestation: 20 per cent of the total area in each region afforested, 40 per cent, 60 per cent, 80 per cent and 100 per cent. The total supply for each scenario is then compared with total energy sector carbon emissions in 1988. According to this information, a 20 per cent afforestation level would sequester 3.3 times the carbon emissions for 1988. A 100 per cent afforestation level would sequester 16.3 times the emission level.

### Costs and benefits

The author spends considerable effort estimating the costs and benefits and net present value of different forms of forest carbon sequestration activities, where the benefits are in the form of returns to timber sales in perpetuity based on assumed rotation lengths. The author does not consider potential returns to carbon sequestration from the sale of carbon offsets, or other income from NTFPs. Costs include establishment, tending, thinning and overhead costs.

Even excluding carbon sequestration benefits, economic benefits outweigh costs. The range of positive net present value is \$0.01/tonne carbon for afforestation with *P. tablaeformis* in the north to 12.59/tonne of carbon for agroforestry in the south. The only cases where negative returns are recorded are for forest management in the north, north-west and north-east and afforestation in the north-west (Spruce), north-east (*L. gmelini*, *P. korainsis*). The net present value for these alternatives range from a low of -\$1.72/tonne of carbon for plantations of *P. korainsis* in the Northeast to -\$0.16/tonne of carbon for plantations of *L. gmelini* in the north-east.

With respect to what this means for a potential market for carbon offsets, payments could make a critical difference to the viability of forestry in a number of cases, thereby generating additional (i.e. additional to what would otherwise occur without payments) carbon offsets. This is particularly true if we also take account of opportunity costs associated with foregone income from other non-forestry land uses, a key element of landholders costs not examined by the author. Taking opportunity costs into account will reduce the land area in which forestry is an attractive proposition to farmers. Payments for the carbon offset benefits may transform this calculation and generate increased interest.

## 6.3 Emerging challenges

The discussion above has illustrated how both central and local governments are increasingly taking on board the need to invest in forest environmental services. This has often translated into the imposition of new charges on beneficiaries of environmental services, and the use of these funds to protect forests. While in most cases payments have been imposed by a central agency, payments are increasingly negotiated between the beneficiary and the service provider, i.e. landholders. The emergence of locally driven payments systems will reflect more precisely demand and supply conditions and result in payments that achieve a more efficient level of investment in forests. Yet, the expansion of local level payments systems faces a number of challenges. Some of the more important constraints are highlighted below.

### 6.3.1 Demand-side constraints

#### **Low environmental awareness**

Low environmental awareness is the most important limitation to negotiated payments systems. Based on a national survey undertaken by the State Environmental Protection Agency and Ministry of Education in 1998, only about 20 per cent of the population are environmentally aware, far below awareness levels in developed countries. Based on the same survey, 43 per cent of respondents believed the environment to have improved over the past 5 years, 23 per cent thought there was no change and only 25 per cent believed the environment to have worsened. These views emphasise the lack of appreciation of environmental challenges facing the country.

#### **Low ability to pay**

Even where people are aware of the environmental challenges facing the country, low incomes reduce their ability to pay for solutions. For many, environmental improvements are seen as ‘luxury’ goods that they cannot afford. At the same time few can afford the consequences of environmental deterioration associated with forest loss, including degraded soils, deteriorating water quality or increased floods. Unfortunately, the risks they run by not investing in forests (where forests are proven to provide these valuable services – see Annex 2) are only made clear when it is too late. Recent flooding in the Yangtze and Yellow Rivers has been critical in raising awareness and shifting public willingness to pay.

#### **Lack of mechanism for beneficiary participation**

The government’s centralised approach to imposing charges for environmental services has often bred resentment. In the watershed protection cases for instance, many agencies forced to pay for water services believe this is just another excuse for raising taxes to prop up an overstuffed government (see Section 4 on excessive taxation and charging). By combining an awareness-raising campaign with a scheme to involve beneficiaries in negotiations with

forest service providers, there is likely to be greater acceptance of the need to pay. Moreover, by involving beneficiaries in finding solutions, they will be more inclined to calculate how environmental services contribute to their businesses, thereby providing a sounder foundation for determining payment levels.

### **Environmental protection as the government's responsibility**

Even where people recognise the benefits they gain, many believe that the provision of environmental services is the responsibility of the government. This is based on a history of government control over environmental issues and grandiose government schemes.

### **6.3.2 Supply-side constraints**

#### **Difficulty of excluding non-payers**

The lack of measures to exclude non-payers from consumption of environmental services is a fundamental constraint to setting up payment systems. Unless service providers can exclude non-payers, it is difficult for them to convince anyone to pay. The main driver for payments exists where forest resources become so degraded that beneficiaries offer to pay for forest protection. Even in these situations, government involvement has tended to be important in facilitating negotiations and co-ordination of beneficiaries.

#### **Pressure on government budgets**

The central role of the government in imposing environmental charges and channelling the revenue to forest protection has introduced opportunities for rent seeking. Given the growing pressure on government resources, especially for paying staff salaries, the incentive to redirect funds to other needs is high. These risks are made worse by the failure of authorities to establish stand alone Forest Environmental Benefit Compensation Funds.

#### **Lack of participation of suppliers**

The case of Yunmeng Mountain National Forest Park described in Box 23 above highlights the need for local communities that are providing environmental services to benefit from new sources of revenue. Unless the government passes on payments, local people have little reason to invest in supporting the park.

#### **The difficulty of defining the appropriate payment**

The lack of a standardised formula for calculating the charge level has led to a proliferation of approaches. Few authorities undertake objective valuation of environmental services as a basis for setting fees (Kengen, 1996). Where valuation is undertaken it tends to be done by researchers and not fed into the planning process. Moreover, these studies have adopted a variety of techniques. The result has been confusion and reduced credibility in estimates provided.

## High transaction costs

Transaction costs are associated with the process of paying for forest environmental services, e.g. valuing the services, negotiating payments, setting up the institutional mechanism to arrange payments, monitoring and enforcing deals. As with any new system, these costs are high and in many cases viewed to be higher than the potential benefits from introducing payments.

## 6.4 Summary

Despite a number of recent legislative initiatives raising the profile of forest environmental services and highlighting the need to introduce payments for these services, implementation has been slow. Ambitious plans for natural forest protection and plantation establishment under the Natural Forest Protection Programme and Great West Development Programme should serve to focus minds and force the question of payments for environmental services onto policy-makers agenda. Financing implementation of these plans, as well as sustaining finance is one of the most difficult challenges facing the government.

Getting beneficiaries of environmental services to start bearing a larger share of the costs of service provision offers one potential solution. This is clearly acknowledged in the government's establishments of a central Forest Environmental Benefit Compensation Fund in 2001. But efforts to expand this initiative to the local-level have been slow.

While implementation of Forest Environmental Benefit Compensation Funds are taking time to get off the ground, a number of local initiatives to introduce payments for environmental services are emerging. This section has drawn attention to examples of payments for forests' watershed protection, biodiversity conservation and landscape beauty services. Not only are regulatory authorities introducing requirements that beneficiaries pay, but state and private enterprises threatened by the loss of key services are increasingly offering to finance improved land management and forest protection.

The introduction of payments for environmental services faces a number of challenges. Factors limiting willingness to pay include a low environmental awareness, low ability to pay, the lack of a mechanism for involving beneficiaries in decisions about payments, and a widespread feeling that it is the government's responsibility to look after the environment. These constraints are compounded by supply-side restrictions relating to the non-excludable nature of environmental services, lack of supplier participation in devising payment schemes, difficulties in valuing the environmental service and high costs associated with implementing payment systems. While constraints are formidable, the greater the pressure for payments the more energy will be devoted to finding solutions.

The analysis in this section has been restricted by a lack of written material. The need for a more thorough review of experiences in China, and an evaluation of ways forward is becoming urgent.

# Forest certification – a new market-based policy tool?<sup>25</sup>

Third party forest certification has come to prominence around the world in the 1990s as a market-based instrument for promoting sustainable forestry. Generally, the term ‘certification’ refers to a procedure in which a third party provides written assurance (a certificate) that a product, a process, or a service complies with specified requirements. In the forestry sector, environmentally conscious consumers wishing to ascertain that the timber they purchase comes from sustainably managed sources, have been the major driving force behind growing interest in certification.

Two main approaches to forest certification have emerged: that developed by the International Organisation for Standardisation (ISO) called the environmental management system ISO 14001, and that developed by the Forest Stewardship Council (FSC) called FSC certification. ISO 14001 evaluates companies’ environmental management systems and procedures for improving their standards. FSC goes a step further and evaluates forest management performance against clear standards that define quantitative and qualitative objectives. Moreover, FSC certification involves a labelling scheme and thus generally represents a key element of company marketing strategies. In addition to ISO and FSC, there are at least thirteen national and two regional certification programmes (the African Timber Organisation and Pan-European Forest Certification), some of which have been developed under the aegis and following the procedures of the FSC.

FSC certification has received the greatest attention in recent years and a growing number of Western European and North American importers are demanding FSC certified products. Despite the media hype, however, only a small proportion of the world’s forests is certified. In total, April 2001, about 21 million hectares of forests in over 30 countries had been certified by FSC accredited bodies. This represents about 5 per cent of the total world forest area. The certified forest area, however, is increasing at a rapid pace.

In terms of breakdown in supply of FSC certified products, European forests are the dominant source accounting for over 70 per cent of certified area in August 2000. North America accounted for a further 12 per cent, with Latin America, Africa and Asia accounting for a combined 16 per cent. Within the developing world, Asia is by far the smallest contributor offering only 1 per cent of the

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25. This section is based on Lu Wenming and Xu Bin (2000b)



certified area, followed by Africa's 5 per cent. In terms of ownership category, large-scale industrial and government sources dominate with 59 per cent and 26 per cent of the certified area in 2000 respectively. Non-industrial private, communal and group sources are the smallest contributors with 7 per cent, 2 per cent, and 5 per cent of the FSC certified area respectively. In terms of types of forests certified, boreal and temperate forests dominate over tropical and sub-tropical, natural (81 per cent in August 2000) over plantation and conifer over broadleaf (Bass *et al* 2001).

In China, while the forest export sector is significant (e.g. furniture exports accounted for US\$ 2.7 billion in 1999, over 6 per cent of the total export value for all sectors), those facing demands for certified products is relatively small. As a result very few forestry producers have heard of forest certification and no forest area has been certified to date. Yet, as demand of FSC certified forest exports expands, forestry operators in China are coming under pressure to take note. Indications that some are taking this threat seriously are emerging. By November 2000, 6 forestry companies began sourcing certified timber from abroad to achieve Chain of Custody certification and at least three more had applied. On 29 January 1999, one forest management unit in Northeast China applied to Société General de Surveillance to become FSC certified, while in summer 1999, a number of other operators inquired about the FSC certification.

In parallel to exporters' efforts to learn more about FSC certification, the Chinese government has initiated its own investigations. While there is no national forest certification scheme at present, China is actively developing Criteria and Indicators, and is the member of the International Tropical Timber Organisation Process, Montreal Process and newly formed Dry Asia Process. A series of Criteria and Indicators, at national level, sub-national levels and forest management unit levels, have been identified and many are being reviewed and tested.

Within this context, the government has shown interest in a forest certification process that supports work on Criteria and Indicators. The extent to which a Chinese certification scheme will take account of ISO 14001 and/or FSC principles and criteria is not yet clear.

This section summarises results of the most comprehensive piece of research undertaken on forest certification for China to date. The research was based on an extensive review of literature and primary data collection through field visits and telephone interviews with:

- processing companies (including 5 with Chain of Custody certification, 2 are applying for Chain of Custody certification, and 1 is applying for ISO 14000 Environmental Management System certification)
- 16 companies which have not yet applied for certification
- 12 forest management units

The section starts with a brief overview of the current efforts to implement certification in China, before exploring different options for certification and their relative costs and benefits.

## 7.1 Forest certification in China – the current state of play

Certification is not an alien notion in China. ISO 9001 and ISO 9002 certificates are widely recognised by consumers and the general public as symbols of companies' management quality. There are many internationally recognised quality certification bodies in China. Environmental Management System certification based on ISO 14000 is also gradually gaining acceptance as a measure of companies' management systems as they relate to the environment. There are a number of internationally recognised Environmental Management System certification bodies in China. The need for an environmentally safe food certification system has recently come to the fore due to consumer concern over food safety. In response, the Government has formulated a Criteria and Indicators scheme for food.

### 7.1.1 The extent and key features of forest certification to date

Compared to these broader developments, forest certification is relatively undeveloped. While data on companies that have achieved ISO 14000 Environmental Management System is not readily available, Table 15 lists all those companies that had obtained, or were seeking, FSC Chain of Custody certification as of the end of November 2000. A total of six processing companies have been certified by FSC-accredited bodies for Chain of Custody, and at least three more are applying with two of them to be certified soon.

In terms of forest management, a number of forest management operations have shown an interest in certification and by April 2001, the following operators had made firm progress:

- Tieli Forest Industry Bureau in Heilongjiang Province was the first forest management unit to apply for FSC certification in China. While an application was made in January 1999, a lack of clear government support at that time meant the assessment was not carried through.
- In Zhejiang Province a forest management unit applied to FSC accredited certification body SmartWood for forest management certification in early 2001. Following a pre-assessment visit in April 2001, this is likely to become the first case of forest management FSC certification in China.
- In Guangdong Province, an application was made for FSC certification by Société General de Surveillance in early 2001. A pre-assessment visit was undertaken in April 2001.

<b>Certificate No.</b>	<b>Company name and address</b>	<b>Certifiers</b>	<b>Main certified products</b>
0755/6236/0099 SGS-COC-0099	Zhongyang Timber Co. Ltd., Shenzhen, Guangdong	Société General de Surveillance	Pine toilet seats, wooden home flourishing goods, wooden furniture, wooden components
0755/6491/0158 SGS-COC-0158	CCG Asia Co. Ltd., Hong Kong	Société General de Surveillance	Wooden wax frames, wooden decorative lamps
0755/6392/0222 SGS-COC-0222	DECORAN Technique Co. Ltd., Shenzhen, Guangdong	Société General de Surveillance	Wooden toilet seats, wooden toilet goods
0755/6659/0257 SGS-COC-0257	Jinghua Building Materials Co. Ltd., Nanan, Fujian	Société General de Surveillance	Rubberwood tables
	Xiamen Shangmao Home Flourishing Industry Co. Ltd., Xiamen, Fujian	Société General de Surveillance	Small wooden furniture
SCS-C-00110 2/99	Disi Timber Co. Ltd., Zhuhai, Guangdong	Scientific Certification Systems	Wooden toilet seats, small kitchen cabinets, wooden bath goods, chairs
Have applied	Lin San Li Timber Co. Ltd., Shanghai	Société General de Surveillance	Small wooden furniture
Have applied	Linhai Timber Co. Ltd., Linhai, Zhejiang	Société General de Surveillance	Small wooden furniture
Planning to apply	Xiaoxing Furniture Co. Ltd., Shanghai	Société General de Surveillance	Small wooden furniture

- A forest management unit in Jiangxi Province has applied ISO 14001 Environmental Management System certification.
- Two other forest management units under Sichuan Province Forestry Bureau are being supported by World Wide Fund for Nature to explore FSC certification.

The lack of awareness about forestry certification is rooted in the fact that the drivers behind forest certification lie in China's export markets, mainly in Europe and the US, which affect only a tiny proportion of producers. Box 25 offers a brief account of the importance of demand for forestry certification. Figure 4 in

### Box 25 A growing demand for forestry certification

Certification emerged in the early 1990s in response to growing disillusionment with government regulation, international initiatives and consumer boycotts aimed at tackling rapid deforestation in tropical forests. Driven by an alliance of non-governmental organisations, most notably the World-Wide Fund for Nature, and large retailers, certification was seen as a positive market-based approach to promoting sustainable forestry.

The major powerhouse behind certification has been retailers in Europe and the US, with the UK retailers (dominated by the large DIY chains including B&Q and Homebase) being the most proactive. In 1995 a UK World-Wide Fund for Nature 1995+ Buyers Group was established as a focal point for market pressure for FSC certified wood supplies. In 2000, this group claimed to represent 20 per cent of UK wood imports. In Western Europe as a whole about 5 per cent of the wood market is certified, and in the US the share is closer to 1 per cent, equivalent to about US\$500 million/year. These shares are growing rapidly, with estimates by PriceWaterhouseCoopers for the US range between 100-150 per cent growth per annum.

More recently demand has been expanding rapidly through the creation of Global Forest and Trade Networks, established in 14 countries throughout the world. These Networks include buyers and other stakeholders interested in promoting certification. In addition to those located in Europe and North America, Networks have been set up in Russia, Australia and Brazil and work is in progress in Bolivia, East Asia, South East Asia, and West Africa. The Network is expected to comprise 1,000 companies in all major markets by the end of 2001.

Source: Bass *et al* (2001)

Section 2.2 highlighted how China's forest product exports represent only a tiny share (on average 1.20 per cent) of its total production. The share going to environmentally conscious markets is even smaller.

Nonetheless, exports of processed forest products have grown quickly in recent years. Accounting for almost 67 per cent of the total export value in 1999, furniture products are an important growth area, rising by 145 per cent between 1995 and 1999. These products are also the most exposed to demand for certification in the US and Europe. In 1999, 58 per cent of furniture exports went to the US, the UK and Germany. Moreover, of the 15 per cent of exports going to Hong Kong, a majority is re-exported to environmentally conscious markets in the US, Germany and the UK.

Given this export picture, it is not surprising that all of the companies that have achieved FSC Chain of Custody certification are furniture exporters. Three of these companies are foreign owned, including B&Q and IKEA, and three are joint ventures. At present, there are no domestically owned companies that have been certified. The certified companies are all in economically developed coastal regions such as Guangdong, Fujian and Hong Kong where there can get easy access to certified imports. As processors have become FSC certified, they are keen to source certified raw materials from within China to cut costs.

## **7.1.2 Emerging service sector – establishing accredited forestry certifiers**

At present, all companies that have gone through Chain of Custody certification were certified by foreign-owned FSC accredited bodies. Five of certifiers were accredited by Société General de Surveillance and one by Scientific Certification Systems. Of the six timber companies certified, three were certified by Société General de Surveillance in Shanghai, while bodies based outside China certified the other three. Moreover, Société General de Surveillance in Shanghai is authorised to conduct only Chain of Custody certification, not forest management certification. China also has bodies offering ISO 14001 certification, but none are involved in forestry.

## **7.1.3 Establishing nationally relevant forest management standards**

China has not yet developed a national forest certification scheme. Nor has the FSC set up a Working Group to discuss national criteria for China as has happened in other countries where forest certification is developing. Nevertheless, the World Bank/World-Wide Fund for Nature Alliance is sponsoring the Chinese Academy of Forestry to set up an informal multi-disciplinary National Working Group on Forest Certification. Key tasks will involve holding discussions, networking, undertaking research and sponsoring a media campaign to disseminate information on FSC certification.



## **7.1.4 Growing government support**

As exporters have become eager to learn about FSC certification, the government has shown more interest. In particular, the SFA has begun to recognise the potential spin-offs of forestry certification for government efforts to promote sustainable forestry by establishing Criteria and Indicators for forest managers.

The clearest expression of the government's interest was through its joint sponsorship of an 'International Workshop on Sustainable Forest Management and Certification' in Beijing on July 8-10, 1999. The workshop, which was co-sponsored by the World Bank and World-Wide Fund for Nature, explored the current state of forest certification in both domestic and overseas arenas. In addition to raising officials' and private enterprises' awareness of forest certification, it also put forward proposals for follow-up activities. Some of the most notable include:

- Examine the implementation of pilot studies and impacts;
- Investigate international experiences; and
- Enhance the role of the government in facilitating the research and pilots.

Since the workshop, the government has agreed to help establish a National Working Group on Forest Certification, supported by World-Wide Fund for Nature.

## 7.1.5 World-Wide Fund for Nature as a key player

World-Wide Fund for Nature is an active supporter of FSC certification throughout the world. In China, it has sponsored a number of initiatives to spread awareness of certification since 1996. These include:

- the translation and publication of ‘Guidelines for Forest Certification’ in 1996;
- the convening of an ‘International Workshop on Sustainable Forest Management and Certification’ with the SFA in Beijing in 1999;
- the sponsorship of the Chinese Academy of Forestry to support the establishment of an informal National Working Group on Forest Certification in China;
- the translation and publication of ‘Certification: The Future of the World’s Forests’ in 2000; and
- the sponsorship of a series of newspaper articles introducing forestry certification and its international progress.

## 7.2 Assessing the potential benefits and constraints

Drawing on international experience as well as case study work, it is possible to identify potential attractions and hurdles associated with the introduction of a forest management certification scheme in China.

### 7.2.1 Potential benefits

#### Economic benefits

- *Raise efficiency of state forest enterprises.* By introducing a sound management and operational system, certification should raise enterprise efficiency and accelerate reforms aimed at ensuring enterprises are self-sufficient.
- *Reduce dependence on imports of certified forest products.* Currently Chain of Custody certified processors cannot access certified inputs within China and are forced to import their raw materials.
- *Expand/maintain export markets and potential price premium.* As demand for certified forest products increases in key foreign markets, certification offers producers an edge over non-certified rivals. In certain cases, where supply of certified products is particularly scarce, producers may be able to attain price premia.
- *Reduce transaction costs due to lower risks for buyers.* Certification offers a stamp of approval that is internationally recognised. This reduces risks for buyers who are uncertain of the quality of produce they are purchasing. By lowering risks, certification may allow producers to capture a higher return.
- *Increase access to finance.* In addition to lowering risks for buyers, certification lowers risks for lenders and may allow producers greater access to finance at a lower cost.

- *Increase long-term timber supply.* By ensuring forest management is sustainable, certification aims to provide a guarantee that forest products will be available into the longer-term.
- *Strengthen human resource development.* Training in sustainable forestry and management should improve labour skills and capacity.

### **Environmental benefits**

The central purpose of forestry certification is to promote sustainable forestry. It aims to do this in a number of ways including:

- Providing incentives for sustainable forestry through market advantages, e.g. market access and price premium.
- Improving capacity and techniques for implementing and monitoring sustainable forestry.
- Strengthening forestry research.
- Increasing financial and technical donor support for sustainable forestry.
- Spreading best practice through demonstration effects.
- Supporting national policy for sustainable forestry.
- Protecting biodiversity and environmental services.

### **Social benefits**

For forest management to be sustainable, key stakeholders need to be supportive. FSC certification emphasises stakeholder consultation and participation in the development of sustainable forestry standards. Moreover, it stresses the need to guarantee local people's traditional rights to the forests, such as collecting fruits, fuelwood, constructing materials and medicinal herbs as well as recreational and cultural values.

## **7.2.2 Emerging challenges**

Based on interviews and field visits to companies, a number of challenges that constrain the development of forest certification processes in China are apparent. These are briefly described below:

### **Lack of domestic demand of certified timber products**

Domestic knowledge of, and demand for, certified forest products is virtually non-existent. Consequently, merchants have little incentive to demand certified produce from their suppliers. With almost 99 per cent of local forestry output being consumed domestically, the lack of domestic interest in certification represents a major constraint to wider adoption.

### **Export market for certified products is relatively small**

In addition to the lack of knowledge or demand for certified products at home, the majority of China's exports of forest products are not going into markets that demand certified products. Although almost 60 per cent of exports of

furniture products, the largest forest-based product, go to the USA, UK and Germany, it is important to remember even in these 'environmentally conscious markets', demand for certified products represents a small proportion of overall demand, e.g. 1 per cent in the US.

### **Lack of knowledge about certification among producers**

Very few of those interviewed for this research, including government officials and timber processing exporters, had heard of forestry certification. There is also little information available on forest certification to disseminate. Unless companies and officials recognise the importance and potential for certification, there will be little progress in its adoption.



**Finding qualified Chinese foresters to monitor forest management systems in the field is extremely difficult**

### **Inadequate capacity to implement**

There is a serious lack of financial and technological capacity amongst producers to implement sustainable forestry and, thus, certification. Capacity constraints are especially severe amongst collectively managed and state-owned forests as well as smaller household run enterprises.

In addition, there is a lack of local service providers, e.g. certifiers, to facilitate certification. While foreign providers have filled this gap to date, they are relatively expensive and for most make the procedure uneconomical.

### **Lack of national criteria**

China has not developed its own forest certification criteria, nor has FSC set up any national criteria for China. This represents a fundamental constraint to progress, though one that is beginning to be tackled.

### **High costs**

Cost of becoming certified may be split into two categories, as follows:

- *Direct costs* – Direct costs cover the costs of forest assessment, auditing and annual reviewing. These are heavily dependent upon the feasibility and ease of assessments by the certification bodies. This, in turn, is influenced by the extent to which the local forest management unit has effective and transparent management systems in place. Effective management systems reduce the amount of field assessment and validation required, thus reducing the direct costs of forest certification. For many forestry activities, good environmental management is also a very important factor. Some forest certification costs are site-specific and depend upon the size and complexity of the forest management

unit, extent of biodiversity within the forests, diversity of the social environment, and the degree to which activities are documented in clear systems. Based on international experience, for a medium size company with about 150 staff, the direct costs come to US\$4,600 for the initial assessment and administrative fee. For each review every six months, costs are US\$3,600 for surveillance visit and reporting, and US\$350 for surveillance, giving a sub-total of US\$3,950.

- *Indirect costs* – Indirect costs are associated with implementing new forest management systems, e.g. costs of long-term forest management planning, codes of forest operation, training, forest management and forest regeneration. Indirect costs vary among forest management units according to forest types and management performances.

Both the direct costs and the indirect costs are expected to be higher in China than elsewhere. Given that there is no local certification body, companies have to engage foreign certification bodies, which implies greater costs for travelling, translation of paperwork, etc.. Moreover, because forest management tends to be far below the standards necessary for FSC, greater initial investment will be required. The high costs of forest certification represent a principal obstacle for its adoption in China.



## 7.3 Summary

Forest certification is a new concept for many in China. Unlike forest taxation and tenure reform, forest certification does not hold prospects for major shifts in forest management in the near term. However, it does offer policy makers with a new tool and one that could neatly complement reforms in other areas. Over time, its ability to influence private behaviour and promote improved forest management is likely to grow.

Given low levels of domestic experience, this section has drawn on international experience, especially with FSC certification. However, two key features of China's situation set it apart from other countries. Firstly, demand for certified Chinese timber is very small. Domestic demand is virtually non-existent, and exports to environmentally conscious markets well below 1 per cent of total Chinese production. This fact immediately undermines the likelihood that certification will be a market driven phenomenon in China, at least in the near term. Secondly, China does not have a powerful domestic non-governmental movement seeking to kick-start demand. If certification is to become a force for change, the government will have to play a central role.

Given the essential role of government in getting forest certification off the ground, this section offers a preliminary assessment as to whether such an initiative would be worthwhile. On balance the section argues that potential benefits from the introduction of forest certification in China could be significant and further investigations are warranted.

# An array of policy opportunities

This report has outlined critical changes underway in China aimed at increasing private participation in sustainable forestry. For each set of reforms, key constraints and challenges have been emphasised. In this section we look in more detail at potential ways forward and mechanisms for overcoming constraints and spreading lessons from successful experiences.

A number of policy options are considered, each varying with regard to the ease and speed with which they may be implemented, and the likely magnitude of their impacts. Whereas some options aim to reinforce existing government policy, others will require the passing of new laws. The proposed actions are split into three categories:

- Establishing a fair balance between risks and rewards;
- Investing in social and environmental benefits; and
- Learning lessons from experience and dissemination of guidance.

The policy options put forward are a result of wide consultation and, in certain cases, are already being acted upon (e.g. forestry taxation and certification). It should be stressed, however, that the listed policy options are only a ‘first cut’, and further consultation is essential to help prioritise and transform these recommendations into action.

## 8.1 Establishing a fair balance between risks and rewards

A key theme running through the analysis of options for increasing private investment in sustainable forestry is that of balancing risks and rewards. By transferring responsibilities for forest establishment and management to households and private entities, the government is also transferring risks associated with investing in a long-term production process and rejuvenating degraded lands. Unless the rewards from investment match the risks to compensate investors for their financial, labour and material inputs, few will invest.

In several areas the necessary re-balancing of risks and rewards to promote investment is not emerging. Drawing on earlier sections of this report, the following four factors stand out for undermining private incentives:



- Excessive and complex taxation and charging;
- Unsettled forest land boundary disputes and insecure tenure;
- Inflexible tenure contract conditions, e.g. short duration, restriction on transfer, and restrictive harvesting quotas (especially for plantations); and
- Uncertain and contradictory government policy.

These constraints differ in their significance, their complexity, and the ease with which they may be tackled. Moreover, the relative importance of each factor varies between localities, making it impossible to offer a single recommendation. Notwithstanding these caveats, in what follows four broad areas for reform are set out, supported with specific suggestions for action. A critical next step will require consultation to prioritise these recommendations and to identify lead actors for moving forward.

### **8.1.1 Reducing the taxation and charging burden**

The high level of taxation and charging in the forestry sector represents a serious barrier to investment. It is essential that taxes and charges are reduced and simplified, and, above all, are given clear justification. Two potential justifications for forestry charges and taxes may be identified. They should either represent a payment for access to a public resource (i.e. land and/or forests), or they should represent a payment for a particular service provided by the government.

In the case of payments for access to forest land, charges effectively act as an access ‘price’. As with any good or service, prices provide important signals to producers and consumers as to a item’s scarcity and costs of production. They provide sellers with feedback on what consumers are willing to pay for an item, and consumers with a sense of producers’ willingness to accept. The higher the price the more value attached to the item by both buyers and sellers.

In China little attention is given to the potential role of setting an appropriate price for forest resource use in the promotion of sustainable forestry. In addition to a fee associated with contracting forest land, foresters are confronted with an array of charges and taxes based on income, extraction and sales. The result is a confused set of signals for forest managers, a lack of appreciation of the value of the resource and powerful incentives for illegal extraction. There is an urgent need to restore a link between charges and the value of forest access rights. This is likely to mean both a consolidation of the taxation and charging system, as well as a reduction in the tax and charge burden. Perversely, a reduction in the tax and charge burden may increase government revenue by encouraging investment in forest development and discouraging illegal extraction.

Setting up a revenue system that links forestry charges and taxes to resource value is a challenge. Annex 3 sets out how resource value may be derived from forest product prices, and associated problems. Given the difficulties of estimating resource value, governments around the world have tended to use proxies. Two approaches include (Landell-Mills and Ford, 1999):

- Linking charges to the final forest product price by charging a percentage of the sales price. The percentage is rooted in an approximation of the contribution of the resource to the final product value.
- Introducing auctions for the resource rights, thereby allowing the resource value to be directly determined by demand and supply.

While auctions represent the most effective way of determining an efficient level of charges, they require a number of preconditions to work effectively. There must be an adequate number of bidders to prevent collusion and price rigging. Bidders must have enough information about the resource (e.g. soil productivity, standing volume, forest maturity, climate and growth potential) as well as the market to be able to formulate realistic bids. Also, the government auctioning the forest land must have enough information to set a floor price. This should be determined by the costs to the government of providing the resource. In wastelands the floor price could be as low as zero, but where standing forests are contracted out the floor price would reflect the investment in forest establishment and management to date. Given China's growing experience with auctions for forest land use rights (see Section 3.4.3), there is already a pool of knowledge on which the government can draw. The central challenge is identifying how to link taxation and charging reform with advances in auctions for forest land.

In addition to levies that seek to reflect the value of forest land access rights, charges may also be justified to finance specific services delivered to forest managers. Most of today's taxation and charging system fall into this category. Yet, it is clear that the level of services delivered is inadequate and inefficient, resulting in excessively high charges and declining investment in the sector. For charges and taxes to be brought down and simplified, overstaffing in forestry authorities and local governments must be tackled. This is not merely a matter of reducing staff numbers, but one of re-deploying staff to more productive activities, either within the government or outside. As highlighted in Section 8.2 below, a key feature of this transformation will involve re-directing staff and resources towards monitoring and enforcing forest management and protection regulations and away from administrative tasks of revenue collection. In effecting the transformation, numerous issues associated with retraining, education, organisational change management and support in finding alternative employment will need to be addressed.

It is worth noting that the government already appreciates the urgent need for reform to the forestry taxation system and a pilot investigation of rural taxation has been underway in Anhui and other provinces (see Box 9, Section 4.1.4). Based on work for this study, the SFA has asked the research team to prepare further work on forestry taxation and charges for the whole country. The Chinese Academy of Forestry will be coordinating this project. In addition the Ford Foundation and the Food and Agriculture Organisation's Regional Office for Asia and Pacific are considering sponsoring further work on forestry taxation and charging reform.

### 8.1.2 Raising tenure security

Tenure security is essential to the success of efforts to contract out forest land to the private sector, and to efforts to promote company-community deals. The persistence of boundary disputes represent a major obstacle to ensuring security. Disputes constrain households and companies taking on forest land and, where land has been allocated to households in spite of ongoing disputes, the result may be forest destruction rather than investment.

While the problem of boundary disputes is rooted in China's history of changing land tenure, it is made worse by overlapping official mandates and the proliferation of contradictory land certificates. Any effort to raise land security must involve the coordination of government departments involved in allocating land use rights, the development of a reliable central land rights registry, and the strengthening of the dispute resolution mechanisms. Monitoring and enforcement systems will also need improving to ensure that households can defend their rights where challenged.

### 8.1.3 Raising tenure flexibility

With forest investment taking years before it yields returns, it is critical that forest land tenure is crafted to generate adequate rewards to offset costs of investment, including time spent waiting for returns to materialise. Short-term forest rights, which cannot be transferred to third parties and which are associated with restrictions on harvesting offer few incentives for investment. Making forest contracts more flexible would go a long way towards raising private investment. Three policy options include:

- *Lengthen tenure.* Tenure periods must take account of average forest rotations and provide an incentive to re-invest for the future. In general, the longer the tenure duration, the longer the household's planning horizon<sup>26</sup>.
- *Expand transferability.* Rights transferral is critical to lowering risks faced by households since it permits rights holders to sell these rights in difficult times, or when new investment opportunities arise. Unforeseen financial difficulties may require immediate access to cash that is difficult to find when assets are tied up in forests. Equally, the emergence of new investment opportunities may have to be forgone where assets are locked up in forests. Unless individuals can sell their forest use rights, they will be unable to respond to changing events<sup>27</sup>. Transferability is also credited with enhancing forest productivity by allowing the consolidation of fragmented forest land and specialisation by productive households. In developing a system of transferable rights,

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26. Key prerequisites for investment are that tenure is secure and that forestry yields positive returns. Also, it is worth noting that where rights are renewable and transferable, the importance of long-term tenure is less since the right's holder has an incentive to maintain the value of the resource for future sale.

27. Another option is for rights' holders to liquidate (i.e. clear-cut) their forests, although this is illegal. Transferability would reduce temptations to do this.

however, attention must be given to potential negative implications for equity, arising from land speculation and/or the accumulation of rights by a concentrated group.

- *Revisit harvesting quota system.* While regulation of forest harvesting is a key tool for ensuring forests are managed sustainably, it is important that regulation be kept in line with improving knowledge of forest dynamics and technology. Particular attention must be given to restrictions on harvesting in fast-growing plantations.

#### **8.1.4 Raising transparency and certainty in policy-making**

Overlapping mandates between authorities, the failure of local authorities to implement policies set out by central government, and potentially conflicting government objectives (especially with respect to objectives of maximising forest productivity and maintaining equality) all contribute to an uncertain and at times contradictory policy environment. Uncertainty undermines incentives for long-term investment in forestry by households and companies.

To raise confidence in policy-making and minimise conflicting messages, greater efforts must be made to make decision-making more transparent and inclusive. Clear channels of communication are needed between different levels of authorities, as well as between government agencies and non-governmental actors, e.g. households, shareholding entities, collectives, and companies.



## **8.2 Investing in social and environmental benefits**

The above measures seek to promote investment and increase productivity in forestry. The result is likely to be raised local income, not just for investors, but for all those that supply resources, labour inputs and services to forest producers. In addition, environmental benefits may ensue. However, social and environmental gains will not be equally spread and in some cases forestry investment may have negative spin-offs. In Sections 3-7 a number of social and environmental constraints were identified alongside the many benefits from efforts to increase private investment in forestry. Those that stand out include:

- Fragmentation of forest land associated with contracting out of forest land and the allocation of plots on a per capita basis;
- Inequitable relationships between households and private companies and a lack of legal protection for local communities in deals with companies;
- Lack of willingness to pay for environmental services; and
- Low capacity and resources within forestry authorities to promote and manage participation and enforce regulations relating to forest protection.

Below, policy options are put forward for tackling these constraints.

### **8.2.1 Supporting consolidation of un-viable forest plots**

Forest fragmentation undermines local welfare where forests become too costly to manage for either productive or environmental reasons. The problem persists where authorities do not permit rights transfer between individuals that would allow more productive households/groups to manage larger areas, and less productive households to sell their rights and invest elsewhere. In certain localities authorities are responding to this problem by permitting limited rights transfers and/or encouraging individuals to pool their plots and form cooperative systems for forest management. These efforts should be investigated as a basis for devising 'Best Practice' guidelines, and supported where they are found to be successful. Care will be needed to take account of potential negative equity spin-offs.

### **8.2.2 Supporting community ventures**

Company-community deals offer local communities a way to gain as a group from improved productivity and higher levels of company investment. The cases reviewed in this study suggest that government can play a critical intermediary function in co-ordinating community positions in negotiations and providing access to information and skills that will allow communities to negotiate fair shares of profits. However, officials' roles in brokering deals also make them powerful stakeholders, and it is not always clear that their decisions reflect communities' wishes. It is critical that future support for company-community deals is associated with efforts to increase consultation, transparency and information sharing. Moreover, greater emphasis needs to be placed on developing communities' negotiation skills and clarifying their tenure rights so they may deal directly with companies.

Four specific recommended activities include:

- Strengthen community knowledge about options for contracts with companies, risks involved and potential benefits (e.g. through training programmes, workshops, publicity campaigns involving the newspapers, radio, etc.);
- Make long-term contracts more flexible to allow communities and companies to reassess their participation at certain points within contract period;
- Introduce laws that allow effective and affordable legal enforcement of contracts signed between companies and communities; and
- Introduce standardised approach/checklist for evaluating community land and labour inputs to ensure communities get a fair share of rewards.

### **8.2.3 Promoting payments for environmental services**

Forests generate valuable environmental services. Private actors who invest in forests should be compensated for the services their forests provide. The

government already channels considerable funds towards the protection of these forest services. With the introduction of Forest Environmental Benefit Compensation Funds, more effort will be made to ensure that beneficiaries of environmental services pay into funds that are transferred to service providers. While the details of how such Funds will work have yet to be finalised, they offer an opportunity for creating incentives for private investment in sustainable forestry and protection.

A major challenge facing efforts to introduce Forest Environmental Benefit Compensation Funds relates to the issue of financing. Ensuring sustainable income for the Funds should involve efforts a mix of regulatory and incentive approaches. A broad set of measures may include:

- efforts to educate beneficiaries of the importance of environmental services to their welfare, and threats to continued provision of these services;
- consultation on fair systems for raising funds to pay for the maintenance of these services; and
- clear and effective enforcement systems to ensure non-payers are penalised.

#### **8.2.4 Building forest authority capacity for social and environmental responsibilities**

Local level forestry authorities are widely perceived to be overstaffed. Their resources are also inappropriately directed towards administrative tasks such as revenue collection, rather than activities relating to forest management and protection. While overstaffing must be urgently tackled if problems of excessive taxation and charging are to be dealt with (see Section 8.1.1), it is equally important that investments are made in retraining staff to take on new roles. Capacity must not only be built in strengthening technical skills relating to forest management, but attention must also be given to improving social skills to allow officials to enhance participation in policy making and implementation.

### **8.3 Learning lessons from experience and dissemination of guidance**

While this paper has shed light on key issues relating to private investment in sustainable forestry in China, it has also highlighted the inadequacy of existing data and policy analysis. Critically, the research has emphasised a lack of attention to drawing out lessons in best practice based on local level experimentation, and communicating these lessons to others implementing policy. The government is faced with two key tasks:

1. The systematic analysis of local experimentation in a range of areas relating to private participation in forestry; and
2. The dissemination of clear guidance on implementing policy recommendations to practitioners.

Specific recommendations are set out below.

### 8.3.1 Additional research

While this report provides a basis for guidance on a number of issues, more systematic research is necessary. The following issues need to be prioritised:

- *Transferability of forest rights and auctions.* Work is urgently needed to bring together a wealth of experience on contracting out of forest rights, recent efforts to permit rights transfers and the introduction of auction in allocating rights. Attention is particularly needed on impacts for equity and how to balance equity and efficiency objectives.
- *Company-community deals.* Research on alternative approaches to negotiating and finalising deals between companies and communities is critical. Sample contract designs would be helpful, as would clear guidelines for support by local authorities.
- *Forest Environmental Benefit Compensation Funds.* Research on the optimal design for funds, mechanisms for ensuring participation of key players, guidance on setting environmental service charges and systems for maximising links between beneficiaries and service suppliers would be extremely useful.
- *Forestry certification.* Uncertainty still surrounds the best approach and costs and benefits of certification for China. As part of broader government efforts to develop Criteria and Indicators, a strong case can be made for exploring links with internationally recognised third-party certification schemes. Such links would bring international experience in establishing national certification criteria through multi-stakeholder consultation and the prospect of using export market-promoting labels.

### 8.3.2 Guidance material to officials

A common problem facing authorities attempting to implement central directives is the lack of guidance material available for thinking through the best approach for their area. Guidance needs to clearly set out objectives of new measures, and options for achieving these objectives. Given the diversity in economic, environmental and social conditions around China, no single approach will be sufficient. The costs, benefits and prerequisites for success for alternative approaches should be highlighted and supported by examples of how measures have been made to work in different situations. Guidance would be most successful where backed up by training courses, seminars, exchanges to areas that have piloted measures and regular newsletters providing emerging examples of implementation. Reflecting research priorities noted above, 'Best Practice' guidelines are urgently needed in five key areas:

- Implementing contracting out in different situations;
- Extending auctions for allocating forest land rights;
- Restructuring local taxation systems;

- Promoting company-community deals; and
- The introduction of local level Forest Environmental Benefit Compensation Funds.

### 8.3.3 Dissemination and awareness raising

In addition to targeted guidance material for officials, broader campaigns to raise public awareness about specific forestry issues are needed. For instance, schemes aimed at generating payments for forest environmental services depend on increasing appreciation amongst beneficiaries about how they benefit from forests. Educational campaigns should be both broad-based, e.g. through national and regional television, radio and newspaper articles, and targeted at key groups, e.g. hydropower companies and water supply utilities.

## 8.4 Next steps

The list of policy options is long. Attention must now be given to prioritising areas for reform and developing detailed steps for achieving targets. Stakeholder consultation in determining priorities will be important to building support for reform.

As part of the process of mapping out next steps, it will be critical to take account of the ease with which different reforms can be implemented. In general, the more far-reaching a reform and the greater the number of people affected, the more difficult implementation. Delays are likely where clearly defined and powerful groups feel threatened. In many instances, it may be preferable to start with those reforms that already enjoy wide support, and can be implemented relatively cheaply. Early success can help to build momentum for tackling more difficult reforms.

This is not to say that reforms need to be tackled one at a time, but that initiatives could be staggered to take account of likely hurdles. In many instances, one set of initiatives will provide a basis for further efforts. Additional research and investment in the development of Best Practice guidelines are a clear prerequisite for moving forward on promoting changes in forest tenure, forest taxation and charging, company-community deals, forest certification or payments for environmental services.

At the same time, Best Practice guidance depends on building experience through field-testing. Given its size and the enthusiasm for local initiatives, China provides a conducive environment for piloting potential reforms on a small-scale before extending successful experiences to wider areas. Indeed, this is the preferred method already being adopted for moving forward with taxation reform. The challenge is keeping track of ongoing experiments and ensuring the capacity to analyse these experiences to draw out lessons.

As a first step in a prioritisation exercise, this report should be disseminated to key stakeholders in China, including national-level policy-makers, provincial and local forestry authorities, research institutes, donors, non-governmental organisations, companies and local level communities. Feedback from these groups should be encouraged and a workshop held to provide a forum for discussion. While the authors of this paper make no claims to having identified all reforms needed to help raise private participation in sustainable forestry, it is hoped that by setting out potential ways forward, this paper will stimulate discussion.

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# Annexes

## Annex 1 Key stakeholders involved in China Country Study

Responsibility	Researchers and Institutions
<b>Coordination and external advisors</b>	
In-country co-ordination	Lu Wenming, Professor, Chinese Academy of Forestry
IIED coordination	Natasha Landell-Mills, Research Associate, IIED
In-country technical advisor	Sun Changjin, Research Centre for Ecological and Environmental Economics
External technical advisor	Gill Shepherd, Research Fellow, Overseas Development Institute
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## **Annex 2 Forest-watershed linkages – disentangling fact from fiction<sup>28</sup>**

One thing is clear from a review of the literature on forest-watershed linkages: the evidence is mixed and generalisations are risky. Uncertainty surrounding linkages is partly a result of poor measurement techniques and partly a reflection of complex natural relationships. The impacts of forests for water flows, quality erosion, sedimentation, water table levels and aquatic productivity depend on a number of site-specific features, including terrain, soil composition, tree species, vegetation mix, climate and management regimes. Moreover, the extent to which forests offer benefits depends on the alternative land use and management regime employed. Below three commonly highlighted benefits are examined against emerging scientific evidence.

### **Maintenance of dry season flows**

The conventional view that forests act as ‘sponges’ soaking up water and releasing it gradually over drier periods is not always supported by the evidence. Rather, forests have two opposing impacts on base-level flows: (1) forests tend to increase infiltration, soil retention and reduce runoff allowing for groundwater recharge; and (2) forests use water in evapo-transpiration thereby reducing groundwater recharge. The net effect will vary by location, tree species, the alternative land use and its associated management regime. On balance, apart from in Cloud Forests, the evidence links deforestation with increasing water tables and greater dry season flows (Hamilton and King 1983, Bosch and Hewlett 1982).

### **Flood control**

In theory, forests may help to reduce flooding by reducing the volume of water flowing overland during high-intensity storms. Infiltration and interception would work to lower runoff. The evidence supporting these claims, however, suggests that a relationship may only exist in smaller catchments of less than 50,000 hectares. In larger catchments, flooding occurs sequentially in basins as the storm passes over, allowing for averaging out of flood waters. In prolonged and heavy storms even large catchments will flood, but this is likely to occur whether forested or not (Bruijnzeel and Bremmer 1989 cited in Chomitz and Kumari 1996). Moreover, even in smaller catchments the extent to which forests soak up excess water during rainy periods depends on the forest use and forest type.

### **Erosion control**

Theory tells us that high infiltration rates associated with natural and mixed forests will reduce surface runoff and thus erosion. Moreover trees roots help to bind soil thereby reducing the susceptibility of soils to erosion, especially on

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28. This Annex is taken from Landell-Mills et al (forthcoming)

steep slopes. Finally, trees help to reduce the impact of rain on soils and reduce the level of particle dislodgement. In practice, establishing relationships between forest cover and erosion is extremely difficult due to the difficulties of separating out land use change impacts from other factors and poor measurement techniques. Measurement is complicated by the fact that erosion occurs in three forms: sheet erosion, gully/channel erosion and landslides/mass movement, which are all affected by land use changes in different ways.

Notwithstanding these measurement problems, for the most part forests are found to be less important than ground cover in controlling sheet erosion. Where trees crops are weeded and cleared, they provide far less protection and are 160 times more prone to erosion than natural forests. Soil composition, climate, raindrop size, terrain and slope steepness are also key determinants of erosion. How forests are used is also critical. Several studies have shown how different logging regimes will produce different levels of soil erosion.

### **Conclusion**

In summary, forests do not offer a universal panacea for the loss of watershed protection services. The success of forest-based solutions will depend on a range of site-specific factors. Apart from externally determined factors such as climate, terrain, and soil composition, the ability of forests to improve water quality and flows will depend on the forest management regime, including level of roading, and alternative land uses. In many cases, forests may be best incorporated as a key component of a larger watershed protection strategy involving other physical measures such as contour bunding, terracing, check dams, etc.

## Annex 3: Forest charging systems that promote sustainable management

A large literature discusses forest revenue systems and their relation to forest management. A key focus of this literature is the potential of charges based on the resource value to encourage sustainable forestry. Detailed discussions can be found in Grut *et al* (1991), Gray (1983), Hyde *et al* (1991), Paris and Ruzicka (1991) and Repetto and Gillis (1988).

### Defining resource value and why it is important

Most of the literature assessing the links between resource value and forest management, focuses on the value placed on standing trees, known as the 'stumpage value'. The principal thrust of the literature is that private users of state-owned forests should pay for the resource they are accessing. Where no payment is made the resource is treated as a free good, undervalued and overexploited. Moreover, where the resource has no value, few will invest in its maintenance.

In the case of standing trees being handed over to private operators, as is increasingly common in China, the stumpage value can be imputed from the market price of logs. The procedure is as follows<sup>29</sup>: first the volume of commercially valuable timber in a given area is assessed, based on a pre-felling inventory. This volume is multiplied by the market price of logs, adjusting for size and species composition. From this amount the estimated costs of extraction are deducted, including a profit margin for the most efficient harvester. Where the logger undertakes forest management, these costs should also be deducted. The residual value after these deductions represents the maximum amount that an efficient harvester should be willing to pay for the standing timber.

Where barren land is contracted to private households or companies for forestry, the same principles apply. The land has a resource value that reflects its contribution to the forest product, and can be derived from the final product price. The decomposition of resource value is represented pictorially below.

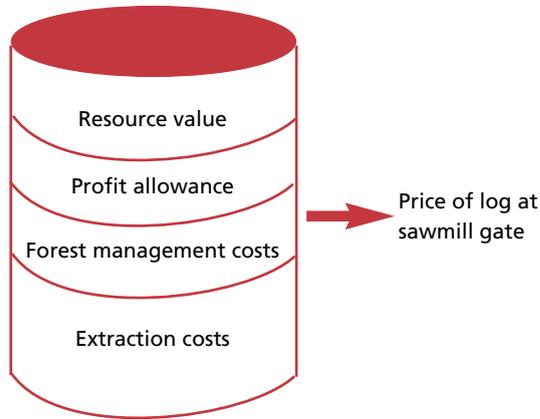
Most governments attach charges such as royalties and area fees to contracts awarded for access to forest resources on public lands. In China a range of payments are collected depending on the local rules. However, these payments are rarely based on a transparent assessment of the resource value. In many instances charges are deliberately set low to encourage forest sector development. Critics argue that by effectively subsidising forestry production, setting charges too low will:

- depress market prices of timber and subvert their role as a signal of resource scarcity, thereby reducing incentives to use timber efficiently and lowering investment in forest management;

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29. A detailed methodology for calculating stumpage value may be found in Gray (1983).

## Representation of resource value



- exacerbate existing market imperfections which fail to account for the environmental benefits provided by forests; and
- reduce government income which could be used to support forest management activities or other public investment.

## Difficulties with implementing stumpage value-based charges

Implementing a revenue system that reflects resource values is not straightforward. The main challenges facing policy makers are how to calculate the resource value, how to design a revenue system that captures resource value without introducing perverse incentives, and whether the forestry administration has the capacity to implement the new system.

### *Measuring resource value*

As illustrated by the picture above, resource value is derived from forest product prices. However, in a world where log prices vary between regions, species and timber quality, and production costs vary with distance to market, local site conditions and forest management requirements, calculating the resource value can be difficult. Moreover, accurate calculation of resource value requires that the costs of production be estimated for the most efficient producer. Collecting data on costs of production from households is time consuming and depends on producers willingness to divulge this information.

One way of circumventing the difficulty of calculating resource value is by auctioning access rights to barren land or standing trees. This allows resource values to be determined by the forces of supply and demand. Auctions, however, face their own challenges and are generally thought to be effective only if there is a sufficient number of bidders to prevent collusion and if bidders have enough information about the resource to make realistic bids.

### *Designing a resource value revenue system*

Even where resource value can be calculated with a high degree of accuracy, the design of charges to capture resource value has important implications for incentives. For example, whereas a charge levied per unit volume or per tree extracted would encourage the maximum utilisation of each tree harvested, a charge per unit area will encourage the maximum utilisation of each hectare of forest. The former may lead harvesters to extract only the most valuable species, known as 'high-grading', while the latter may undermine other forestry regulations, such as minimum size class restrictions.

### *Forestry administration capacity*

Ultimately the success of any revenue system will depend on government's ability to enforce it. A particular threat is that of illegal logging (Hyde *et al*, 1991). Where charges are raised, loggers have a greater incentive to evade government officials, and government monitoring costs will rise. As a result, higher charges can undermine sustainable forestry and reduce revenues if more producers cheat the system. In China, however, where a resource-based revenue system is combined with the consolidation of the broader taxation and charging system, the overall charging burden could fall. The main capacity concern in China may thus relate more to technical ability to implement auctions or calculate resource values.