

A Policy Analysis
Of the China Forest Ecological Benefit Compensation Fund/Scheme

Draft Version 2

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Table of Contents

1. Background.....	2
1.1 The Changing Role of Forests in the National Economy	2
1.2 The Shortage of Capital and Structural Imbalances in Realizing Forests' Ecological Benefits.....	2
1.2.1 The Shortage of Capital	2
1.2.2 The Decreasing Share of State Budgetary Finance in Ecological Forestry	3
2. Theoretical and Legal Basis	4
2.1 Theoretical Underpinnings.....	4
2.1.1 Theory of Specialized Forest Management	4
2.1.2 Compensation Theory for Public Goods.....	5
2.2 The Legal Basis	5
3. The Process of Establishing the Forest Ecological Benefit Compensation Scheme (FEBCS) in China	5
3.1 The Process.....	5
3.2 Local Initiatives.....	8
3.3 The Environmental Policy Objectives of Setting Up a National FEBCS	10
3.4 The Development of Zoning for Specialized Forest Management	10
4. The Pilot Implementation of the FEBSF	11
4.1 The Principles for Pilot Implementation and the Selection of Pilot Sites.....	11
4.1.1 The Selection of Pilot Sites	11
4.1.2 The Principles for Pilot Implementation.....	12
4.2 The Contents of Pilot Implementation.....	12
4.2.1 Contents	12
4.2.2 The Scope and Structure of the Pilot Implementation.....	13

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4.3 The Relationship between FEBSF and Other State Forestry Programs	16
.....	
5. International Experiences and Lessons in Compensating for Forests’	
Ecological Benefits	17
6. Reflections and Recommendations	19
6.1 Reflections on the FEBSF and its Pilot Implementation	19
6.2 Improving the FEBSF	21
6.3 Developing alternative mechanisms for financing environmental	
services	22

1. Background

1.1 The Changing Role of Forests in the National Economy

Worldwide, the use of forest resources has gone through the three progressive stages of exploitation, massive deforestation and forest conservation. In the earlier history of the People’s Republic of China, high demand for timber led to exploitation of forests mainly for timber, ignoring their ecological functions. This pattern continued up till early 1990’s. Since then, serious ecological degradation has been manifested in soil erosion, desertification, grassland degradation and frequent ecological disasters. It is estimated that each year direct economic losses caused by various forms of natural disasters are as high as 200 billion Yuan. Ecological degradation has become a major obstacle to the socioeconomic development in China, and forest loss is believed to be closely associated with ecological degradation. Consequently, forest conservation has gained increased attention. In particular, the Natural Forest Protection Program and the Sloping Farming Lands Conversion Program signify a fundamental transition from valuing solely forests’ economic benefits toward valuing their economic, ecological and social benefits. It was against this general context that China’s Forest Ecological Benefit Compensation Scheme (FEBCS) was developed.

1.2 The Shortage of Capital and Structural Imbalances in Realizing Forests’

Ecological Benefits

1.2.1 The Shortage of Capital

While the awareness in China over the importance of forests’ ecological benefits to the social well-being has become strong, the quantity and quality of ecological forests that provide such benefits has long been far from adequate. This has much to do with the lack of investment. In the ten years between 1988 and 1997, fixed capital investment in forestry totaled 41.77768 billion Yuan. For instance, during the same period state investment in ecological forestry (including key projects, nature reserves and forest parks) totaled only 2.37919 billion Yuan, accounting for a mere 5.7% of total forestry investment.

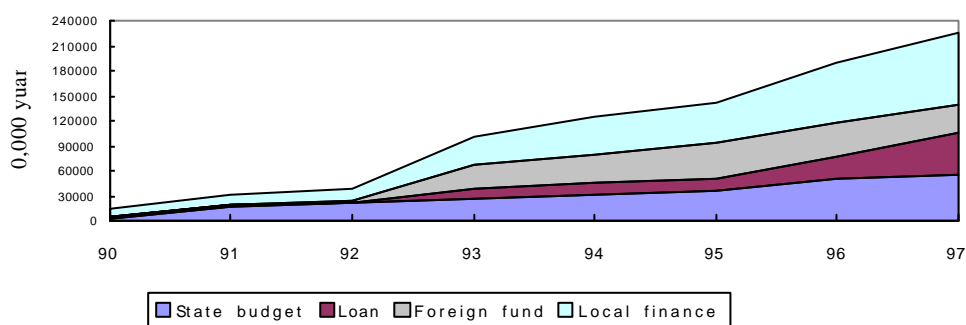
Specifically, investments in ecological forestry have been mainly made in the day-to-day maintenance of ecological forests and in large-scale ecological forestry

programs. The annual budgetary allocations of the government and various forms of ear-marked specialty funds have provided funding for the management of ecological forests. Each year some 0.65 billion Yuan of funds would be made available to ecological forestry farms for maintenance. This falls far short of what is needed for well managing all the ecological forests in China as a much large portion of ecological forests are located outside forestry farms. Likewise, large-scale ecological forestry programs have been financed by public finance and have been grossly under-funded. Take the example of the Three-North Shelterbelt Program. The second phase (1986-1995) had a planned budget of 18.95 billion Yuan, but actual investment was only 13.646 billion Yuan, with a gap as large as 6 billion Yuan. The lack of adequate and reliable capital input has become a major bottleneck to the development of ecological forestry in China.

1.2.2 The Decreasing Share of State Budgetary Finance in Ecological Forestry

Another major trend is the decreasing share of state budgetary allocation in ecological forestry development. Prior to 1993 public finance has played a major role in ecological forestry programs. After 1993, the growth of public fiscal investment has slowed down to 20% per annum, whereas other forms of investment have reached a 25% growth. In 1991 state fiscal investment in ecological forestry was 177.82 million Yuan, accounting for 51.1% of 347.77 million of total ecological forestry investment. In 1997 state budgetary allocation in ecological forestry was 556.96 million Yuan, accounting for only 22.8% of 2,442.83 million Yuan of total ecological forestry investment. This is a decrease of some 55.4% by state public finance (see Graph 1.)

Graph 1. Structural Changes in Capital Investment in Key Ecological Forestry Programs 1990-1997
Unit: 0,000 Yuan



Data source: Forestry Statistical Yearbook 1992-1997

Take again the example of the Three-North Shelterbelt Program. According to the statistics of the State Forestry Administration (SFA), by the end of Year 2000 a total of 7.267 billion Yuan (excluding labor inputs by farmers) investment was completed. This is equivalent to 87.99% of planned investment. Among the completed investment, only 3.769 billion Yuan or 51.9% was state input. It is estimated that farmer in-kind (labor) contribution to the third-phase of the First Stage of the Three-North Shelterbelt Program amounted for 43.957 billion Yuan, far above the

state investment level. Since 1999 state investment in key ecological forestry programs has jumped, including the Natural Forest Protection Program (total planned investment 96.2 billion Yuan) and Sloping Farming Lands Conversion Program (7.45 billion Yuan has been spent). However, these investments focus on establishing new forests, or on restructuring the state logging industry. It remains a challenge to provide an incentive for managing and maintaining forests on the day-to-day basis for ecological protection.

2. Theoretical and Legal Basis

The search for a reliable funding mechanism to finance regular ecological forest management in China began from the ecological benefits they would generate. The proposed compensation mechanism for forests' ecological benefits has its theoretical underpinnings in the theories of Specialized Forest Management and of compensating for the provision of public goods, and is grounded in relevant legislative frameworks.

2.1 Theoretical Underpinnings

2.1.1 Theory of Specialized Forest Management

Forests are known to have multiple functions of economic, ecological and social dimensions. However, these economic (timber) and ecological functions would be at their best play only when forests are spatially specialized for a specific function. Therefore, there is a need to maintain some forests specifically for providing ecological benefits while managing other forests primarily for timber production. Commercial logging in these ecological forests would not be desirable. While this is a widespread practice world over, China has started to promote this practice as a governmental policy only recently and named it Specialized Management.

As early as 1979 the Forest Law of People's Republic of China (trial implementation) stipulated that forests in China would be classified for five types, namely timber forest, protection forest, economic forest, fuelwood forest and special-use forest. Clearly this technical classification does not facilitate the development of corresponding management patterns for each of these forest types. The need to better develop the ecological functions of forests has prompted the adoption of Specialized Forest Management and a different way of classifying forests. In Outlines for Forestry Economic Systems Reforms issued in 1995 the former State Systems Reforms Commission and former Ministry of Forestry proposed formally the idea of Specialized Forest Management. That is, according to the primary benefit to be generated, a forest would be classified as either ecological forest or commercial forest and managed accordingly. Ecological forests would be managed primarily for their ecological benefits, and its management financed mainly by public fiscal investment of state and substate governments. Commercial forests, mainly producing timber, would remain to be financed and managed as a commercial business for their market value.

This new classification is the biological basis for the proposed FEBCS. There are

altogether 4 billion mu of forestlands in China. According to the principle of specialized management, 0.86 billion mu that are outside of the scope of the Natural Forest Protection Program and located in the origins of large rivers or in the vicinities of large reservoirs shall be classified as key protection and special-use forests. The protection of these forests needs to be strengthened by new and effective financing arrangements such as the FEBCS.

2.1.2 Compensation Theory for Public Goods

The benefits produced by ecological forests would include air purification, water conservation, soil erosion control, sand and desertification prevention, wind protection, and biodiversity conservation. These benefits are generated throughout the lifespan of a forest. For the large part the valuation of these benefits is not currently being realized through market transactions. However, generating these ecological benefits would require financial and other forms of investments. This market-failure creates a need for alternative ways of compensating for the provision of forests' ecological benefits.

The Pigouvian tax of the classic welfare economics proposes state intervention via taxation. Due to the positive externalities generated by forests' ecological benefits, Pigouvian tax would translate into a fiscal subsidy to forest owners. Even though this theory has never been acknowledged explicitly, it is what is being practiced under China's FEBCS.

2.2 The Legal Basis

In April 29, 1998, the Decisions on the Revision of the Forest Law of the People's Republic of China was passed by the Second Meeting of the National People's Congress. Clause 8 of the Decisions stipulates: "A forestry fund system shall be established. The state shall set up the Forest Ecological Benefits Compensation Fund, to be used for the planting, tending, protection and management of forest and tree resources in Protection and Special-use Forests specializing in the provision of ecological benefits. Forest Ecological Benefits Compensation Fund shall be used strictly for its designated uses and shall not be used for other purposes. The details shall be worked out by the State Council." This circular has provided for the first time a legal framework for establishing a FEBCS in China, and specified state budget as the primary source of capital for such compensation.

3. The Process of Establishing the Forest Ecological Benefit Compensation Scheme (FEBCS) in China

3.1 The Process

The process of establishing FEBCS has been a lengthy one, starting from late 1980s and ending on November 23, 2001. This decade-long process has witnessed the evolution and selection of alternative schemes. It can be roughly grouped into the following four phases:

a) Phase I (1989-1994): Ideas emerging and refining

Starting from the late 1980s and early 1990s, a deepening appreciation of the value of forests' ecological benefits has resulted in discussions of establishing the FEBCS. In 1992 the State Council, in reissuing the Notifications on the Key Issues of Economic Reforms in 1992 prepared by the State Economic Systems Reforms Commission, proposed that "the stumpage fee system and the FEBCS be established, and the utilization of forest resources be paid for." In 1993 the State Council, once again in the Notifications on Strengthening the Tree-Planting and Greening Work, proposed "reforming the investment mechanism for tree-planting and greening, and gradually adopting the FEBCS".

Overall the discussions in Phase I focused on ideas and local initiatives. In 1992 nine ministries including the former Ministry of Forestry, Ministry of Finance, the State Planning Commission and State Tax Bureau carried out a survey over the status of ecological forest management in the 9 provinces (autonomous regions) of Beijing, Shanxi, Shaanxi, Anhui, Jiangsu, Zhejiang, Sichuan, Guizhou and Guangxi. In 1993 the Ministry of Forestry drafted Rules on Collecting Forestry Ecological Compensation Fee but was not submitted to higher-level government due to its provisional nature. While discussions were held widely, no consensus was reached during this phase over the source of compensation finance and standards of compensation.

b) Phase II (1994-1997): The fee scheme

The development over the setting up of the FEBCS was speeded up by mid-1990s. In 1994 the Development Research Center of the State Council and Research Office of the Central Committee of the Community Party proposed, in the Urgent Proposals on Increasing Agricultural Investments they drafted together, that "collecting certain amounts of forest ecological benefits compensation fee from those units and individuals directly benefiting from forests' ecological benefits". In early 1995 a task force was established by the Ministry of Finance and Ministry of Forestry to continue studying the FEBCS. On December 27, 1996 the Ministry of Forestry formally submitted to the State Council Preliminary Provisions on the Collection and Management of Forest Ecological Benefit Compensation Fund (review version). This document proposes a scheme for setting up the FEBCS by collecting fees from units and individuals benefiting from forests' ecological benefits according to the principle of whoever benefits pays. The units and individuals were tentatively defined to be large state reservoirs, travel agencies and other businesses in the tourism industry.

The fee collection scheme proposed is as follows:

- ◆ For state reservoirs larger than 100 million cubic meters in capacity, 0.5% on water selling revenue excluding agricultural use water;
- ◆ For travel agencies 1% on taxable revenue;
- ◆ For organizations and individuals in business in scenic spots/zones, forest parks, nature reserves, vacation villages, urban gardens and parks and hunting ground

1% on revenue;

- ◆ For scenic spots/zones, forest parks, nature reserves, vacation villages, urban gardens and parks 10% surcharge on admission charges;
- ◆ For enterprises involved in the production and selling of hunting guns 20% on the supplier price of hunting guns (5% on producers and 15% on distributors);
- ◆ Maintaining the importing and exporting management fee on wild fauna and resource protection management fee on terrestrial wild fauna.

Except for the last item above, fees shall be distributed at the ratio of 4:6 between state and local government coffers and be collected respectively. It is further proposed that the forest ecological compensation fund is a special-use fund to be managed by the public fiscal system. Its designated use shall be for the protection of ecological forests and wildlife, and for the direct financial loss associated with restricted utilization of ecological forests and wildlife damages on agriculture and injuries on human life. It was estimated that a total of 587 million Yuan shall be collected under this scheme, and the duration of collection for this scheme was made temporarily at 3 years.

This scheme clearly tries to apply the principle of whoever benefits pays. However its weaknesses are obvious. First, the scope of fee collection under this scheme covers a wide range of sectors and industries which make it a challenge to coordinate; Second, the total amount that can be collected falls far short of what is needed; third, it is difficult to implement and the transaction cost shall be high. Due to these weaknesses this scheme was not approved by the State Council and the Ministry of Finance.

c) Phase III (1998-1999): The surcharge on governmental-fund scheme

In spite of the disapproval of the fee scheme, efforts continued. In particular, the decisions on revising the Forest Law of the People's Republic of China approved by the National People's Congress in 1998 gave for the first time legal recognition of the idea of forest ecological benefit compensation. On November 2 of 1999 SFA submitted to the State Council Ways to Set Up and Manage the Forest Ecological Compensation Fund (Review draft) and proposed collecting 3% on all governmental funds. Ecological forests defined in this document are similar to those defined in the previous fee scheme. Government funds include road maintenance fee, railroad construction fund, electricity development fund, Three-Gorges Program development fund, highway development fund, infrastructure development fund for the civil aviation industry, surcharge on post and telecommunications, initial installation fund on municipal telephones, airport construction fee, port construction fee, power supply charge, municipal infrastructure development fee and surcharges on urban public services.

Further, it was proposed that fees collected from state governmental funds shall be the budgetary revenue of the central government, and be used specifically for developing key national ecological forests including national-level nature reserves, state forestry

farms and nurseries and protected natural forests that are not covered under the Natural Forest Protection Program. Fees collected from local governmental funds shall become local fiscal revenue and be used for financing ecological forests designated by provincial, municipal and autonomous regional governments. In 1997, governmental funds approved by the central government totaled 212.8 billion Yuan. After subtracting funds in agriculture, forestry, water and education sectors, there is some 150-160 billion Yuan that can be taxed. That is, some 4-5 billion Yuan can be collected a year. The duration for this scheme was proposed for 5 years.

This scheme represents a redirection of in the collection of capital and makes the government the major investor in developing ecological forests. It avoids the shortcomings of the previous scheme in terms of limited capitalization capacity and high collection cost. However, it is essentially a scheme of setting up a fund on the basis of multiple funds. Without formal budgetary allocations from public fiscal system, this scheme is inevitably an expedient arrangement. In addition, it can hardly meet the requirement of forestry investment in terms of long term, stable and sustainable funding, and it is at odds with the prevailing practice of streamlining the public fiscal system by eliminating rampant fees and funds. Due to this and other reasons, this scheme also failed to win the approval of the State Council.

d) Phase IV (2000-present): The state budgetary allocation scheme
Previous failed attempts have helped to make the idea of establishing a FEBCS in China clearer and more practical. The recognition that only budgetary allocations can provide the type of stable, reliable and long term funding for ecological forestry became widely accepted. In 1999 Chinese government initiated a number of major forest conservation programs that have a total budget of over 100 billion Yuan. However, these programs have their own objectives and are restricted in time and geographical locations. They therefore cannot provide funding for the day-to-day management of ecological forests.

In July 2000 the SFA once again proposed to the Ministry of Finance that a Forest Ecological Benefit Compensation Fund (FEBCF) be established. In January 2000 the Ministry of Finance agreed to the proposal and asked the SFA to inventory ecological forests and prepare for pilot implementation. On November 23 of the same year the Ministry of Finance and SFA together proclaimed that, starting from the same day, pilot implementation for the Forest Ecological Benefits Subsidy Funds (FEBSF) would begin in 24 state-level nature reserves and 658 counties of 11 provinces, with a total investment of 1 billion Yuan applying to 0.2 billion *mu*. This marks the outcome of a decade-old process and begins the involvement of budgetary funding in compensating for ecological forestry.

3.2 Local Initiatives

Parallel to the national process, local governments in various locations began to experiment with alternative schemes of FEBCS and made breakthroughs since 1996.

Notable examples are:

a) Guangdong Province

Located along the East coast, Guangdong has a relatively advanced economy and a healthier local fiscal coffer. To strengthen the development of ecological forestry, Guangdong Provincial government stipulated in 1998 Provisions on the Development, Management and Compensation of Ecological Forests in Guangdong Province. It specified that no less than 30% of total annual forestry finance shall be used on ecological forestry, and additional funds shall be collected from water user fees and government funds on soil erosion control. Also, some key ecological forests are included for budgetary allocation on capital constructions. The compensation rate for ecological forest owners is 2.5 Yuan/mu/year. This is one of the first provincial scale FEBCSs in China.

b) Hubei Province

Located in the middle reaches of the Yangtze River, Hubei has a large agricultural economy and faces the challenge of controlling soil erosion and preventing natural disasters. In 1999 Hubei had 525 thousand ha of ecological forests accounting for 14.7% of total forestry lands. In the past the development of ecological forests has, due to lack of state investments, relied upon free farmer labor inputs or finance raised by the forestry department. About 1/3 of the debt in the forestry sector has been related to planting of ecological forests. On January 1 of 1999 Hubei Provincial Forestry Bureau started implementing Preliminary Provisions on the Use and Management of the FEBCF in Hubei Province. The FEBCF would be capitalized by fees collected from these six sectors, namely drinking water, hydropower, scenic tourism, river transportation, mining in timberlands and economic forest products. The nature of their FEBCF was defined as extra-budgetary finance, with a distribution ratio of 3:1:6 amongst provincial, prefectural and county governments.

c) Xinjiang Autonomous Region

Located in the dry NW China with large deserts, Xinjiang has a fragile ecological environment with a poor 1.87% forest coverage rate. In 1997 a provincial FEBCS was established. Funds have been collected from monthly salaries of employees in government departments, institutions and enterprises. Starting from the 300-700 Yuan/month category, 1 Yuan/month would be collected. The rate would increase quickly to 40 Yuan when monthly salary reaches 4,000 Yuan or above. Additional funds have been collected from crude oil, nonferrous minerals, scenic zones and forest parks.

Clearly these local initiatives share a certain characteristics. In general funds are raised from two sources, namely local budgetary allocation such as in Guangdong. This is possible in regions with a relatively healthy fiscal coffer. The other more widespread source is charges/fees collected on beneficiaries (organizations, enterprises and individuals) of forest ecological benefits according to the whoever-benefits-pays principle, such as in Hubei and Xinjiang. The collection of

FEBCF is usually carried out by various levels of fiscal departments and specifically used for ecological forest construction and wildlife protection by the forest department. Reports on the outcomes of implementation from these regional schemes are scanty, however.

3.3 The Environmental Policy Objectives of Setting Up a National FEBCS

While a large number of documents have been prepared in the decade-long process, there are few explicit and detailed expressions of the environmental objectives for the FEBCS. There are however implicit environmental objectives that can be detected from these documents, such as:

- ◆ To promote the development and management of ecological forests;
- ◆ To protect wild plants and animals;
- ◆ To improve the ecological environment.

Clearly, improving the ecological environment can be an objective, whereas promoting ecological forest management and protecting wildlife are more or less means to realize the objective of environmental improvement.

3.4 The Development of Zoning for Specialized Forest Management

Specialized Management is the technical foundation for establishing the FEBCS, and the FEBCS provides guarantee to the implementation of Specialized Management.

As mentioned before, Specialized Management was proposed back in late 1970s and early 1980s. It was formally proposed as a policy instrument in 1995. In 1999 SFA issued the Circular on Undertaking Zoning for Specialized Management and provided for the first time operational principles, methodologies and procedures. To date, Yunnan and Guangdong Provinces have completed the zoning process. Work is fully under way in provinces of Hunan, Anhui, Liaoning, Fujian, Jilin, Guangxi, Helongjiang, Hubei, Henan, Qinghai, Xinjiang and Ningxia.

In 2001 parallel to setting up the FEBSF the demarcation of state ecological forests was carried out. On March 9, 2001 the SFA published Provisions on Confirming State Ecological Forests (Preliminary). It stipulates that ecological forests shall include protection forests and special-use forests, and state ecological forests shall be those proposed by SFA according to Article 8 of the Implementation Rules of the Forest Law and approved by the State Council. Specifically, they are forests, trees and forestlands located in:

- ◆ The upper reaches of rivers: for rivers longer than 500 km, watersheds in the major courses and within 20 km range for primary tributaries, and for rivers longer than 1,000 km watersheds within 10 km range for secondary tributaries.
- ◆ Major river watercourse and their watersheds along both banks of their primary and secondary tributaries: for rivers longer than 500 km major courses, primary tributaries and within the first mountain ridge or within 2000 m range in flat areas in their natural terrain; for rivers longer than 1,000 km secondary tributaries, within the first mountain ridge or 1000 m range in flat areas in their natural

terrain.

- ◆ Within the first mountain ridge or 1000 m range in flat areas in their natural terrain surrounding key lakes and reservoirs with over 100 million cubic meter capacity.
- ◆ Within the first mountain ridge or 1000 m range in flat areas in their natural terrain along ocean coast.
- ◆ Natural forests in dry and desertified regions and sandy shrub vegetation with over 0.2 degrees of closure, oasis shelterbelt plantations in desert region, as well as wild and sand protection shelterbelts within their 2 km range.
- ◆ 500 m under the snow line and within 2 km range of glaciers.
- ◆ Hilly lands over 36 degrees with poor soil, exposed rocks and being difficult to regenerate or restore after logging.
- ◆ Within the first mountain ridge or 100 m in flat areas along with state railroads, highways including express ways and other national defense roads.
- ◆ Within 20 km range of borderlines and inside military restricted areas.
- ◆ Nature and humanity heritage sites and other sites of special conservation value approved by the State Council.
- ◆ National-level nature reserves and other nature reserves that protect Class I and Class II wildlife and its habitats.
- ◆ Natural forests under protection by the Natural Forest Protection Program.

State ecological forests need to be proposed by county governments or county-level state forestry farms or nature reserves, to provincial governments, and submitted by provincial governments to the SFA under the State Council. In key forestry regions designated by the State Council, this shall be proposed to SFA directly by state forestry enterprises or institutions. After approval by the State Council SFA shall publicize forests approved, and local governments shall register these forests in the tenure card and demarcate accordingly these forests on site.

4. The Pilot Implementation of the FEBSF

Pilot implementation has been pursued because there is recognition that subsidizing ecological forests is a complex undertaking. There is however no timeline given to the length of the FEBSF to be implemented on a trial basis. There is also no mentioning in the government document when full implementation of the FEBSF would begin.

4.1 The Principles for Pilot Implementation and the Selection of Pilot Sites

4.1.1 The Selection of Pilot Sites

The first group of forest sites for pilot implementation has been selected by SFA, together with the Ministry of Finance. A total of 200 million mu of protection and special-use forests in 685 counties (units) and 24 national-level nature reserves in 11 provinces have been selected. These 11 provinces are Hebei, Liaoning, Helongjiang, Anhui, Fujian, Jiangxi, Shanxi, Hunan, Guangxi, Xinjiang and Zhejiang.

The principles for site selection are:

- a) Ecological representation and regional importance;
- b) Geographic location, resource endowment and site conditions;
- c) Status in forest zoning, with preference given to provinces where zoning for Specialized Management has already been completed.

4.1.2 The Principles for Pilot Implementation

Some of the major principles proposed for pilot implementation are:

- ◆ Uniform planning and prioritization: forests that are contiguous in large patches and have ecological significance shall be selected;
- ◆ Rational distribution and no overlapping: forests that are receiving major state investment such as regions under the Natural Forest Protection Program shall not be chosen;
- ◆ Division of responsibilities and sharing of cost: Cost sharing between state and sub-state governments shall be undertaken according to the principle of fiscal devolution. The responsibility for tending key ecological forests rests with local governments, while the state government assumes the responsibility of providing financial subsidy. ***This subsidy is neither the investment in tree-planting and tending, nor the full compensation of all the losses to result from restrictions on commercial logging. Rather, it subsidizes the key factors which affect the management and protection of key protection and special-use forests.*** Other factors such as loss of budgetary revenue, loss of profit by forest management units and reduction in worker social welfare shall be addressed by local fiscal means.
- ◆ Respect owner will: Full respect of owner/manager will shall be exercised in selecting pilot sites and no coercion shall be allowed.

4.2 The Contents of Pilot Implementation

4.2.1 Contents

a) Beneficiaries

For state fiscal subsidy, the beneficiaries are defined as organizations, collectives and individuals who manage key protection forests and special-use forests, including state forestry farms, state nurseries, nature reserves in the forest sector, collective forestry farms and others.

b) Coverage

State fiscal subsidy only subsidizes the expenses of tending key protection forests and special-use forests; eligible expenses include: a) management and tending staff expenses, mainly salaries and other labor costs of patrolling staff; b) expenses on forest fire protection, forest public securities and forest insect and disease control expenses, mainly the construction of small-scale fire protection facilities, fire extinguishing facilities, operation facilities for forestry public securities, and cost on monitoring and controlling forest insect and diseases; c) forest resources monitoring cost; d) forestry road maintenance expenses. The management and tending staff are

forest guards, forest public security staff, and management staff at state forestry farms, state nurseries and nature reserves in the forestry sector.

c) Standards

Current standard of subsidy is for 5 Yuan/mu/year for state fiscal subsidy to key state-designated ecological forests. The breakdown of this subsidy shall vary across regions according to economic conditions, resource endowment and management status. As a rule of thumb, staff expenses shall be no less than 70% of the total subsidy, and other expenses shall be no more than 30%. Average size per tending person shall be 3,000 mu.

d) Total subsidy

During pilot implementation the total subsidy shall be 1 billion Yuan per year.

e) Application and funds management

The application for subsidy shall be filed by March 31 each year. The application shall be filed by provincial finance department together with the forestry department to the Ministry of Finance, and copied to SFA. The decision shall be made by the Ministry of Finance in consultation with the SFA. Awarding decisions shall be sent back to provincial finance departments, with provincial forestry departments being notified concurrently.

The funds will be transferred via various finance departments. For organizations, collectives and individuals at the county level or below, the funds will be further dispersed via county forestry departments upon auditing.

Strict control will be exercised over the dispersment of funds, based on staff size and compensation standards approved and dispersed regularly. Files shall be established, and targets established to ensure accountability. For expenses on fire prevention, forestry public security, and forest disease and insect control as well as forestry roads maintenance, receipts-based reimbursement shall be pursued.

f) Restrictions on forest use in ecological forests: commercial logging in protection and special-use forests shall not be allowed.

4.2.2 The Scope and Structure of the Pilot Implementation

a) Funds Dispersment in 2001

Table 1. Funds Dispersed for Pilot Implementation in 2001

Units: 0,000 Yuan; 0,000 mu

<i>Provinces</i>	Amount	Acreage
Hebei	9,500	1,900
Liaoning	10,500	2,100
Helongjiang	12,500	2,500
Anhui	6,000	1,200

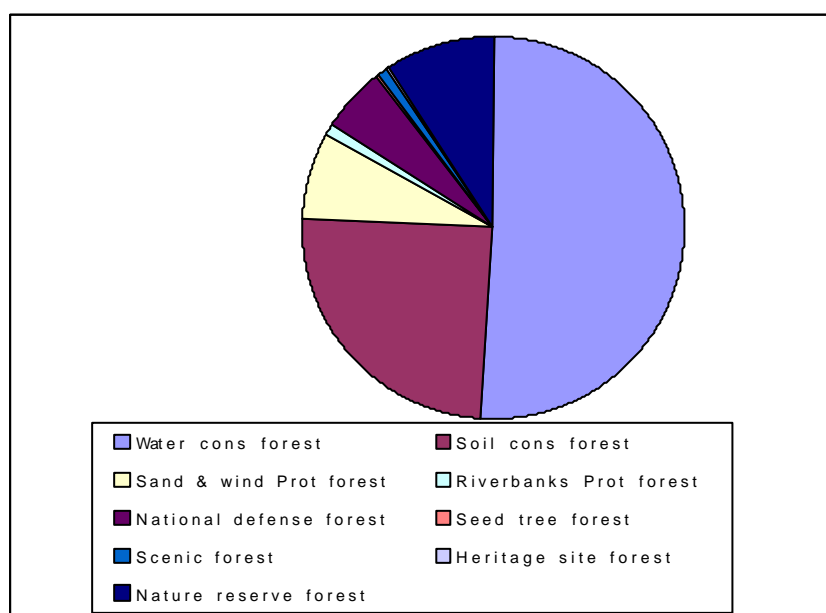
Fujian	6,500	1,300
Jiangxi	9,500	1,900
Shandong	4,000	800
Hunan	15,000	3,000
Guangxi Autonomous Region	17,500	3,500
Xinjiang Autonomous Region	7,500	1,500
Zhejiang	1,500	300
Total	100,000	20,000

b) The Structure of Forest Type, Forestlands and Ownership under Pilot Implementation

◆ Forest Type

There were 168.38 million mu of key protection forests, accounting for 84% of total acreage under pilot implementation; and 31.62 million mu of special-use forests, accounting for 16%. Among key protection forests, 61% was for water conservation forests, and 29% for soil protection forests, and 10% for sand control and riparian protection. Among the 31.62 million mu of key special-use forests, national defense forests accounted for 34%, nature reserves accounted for 59%, and others (e.g. seed tree forests, scenic forests and memorial forests) accounting for 7% (see Graph 2). This reflects the emphasis on key protection forests in funding priorities, especially water and soil conservation forests.

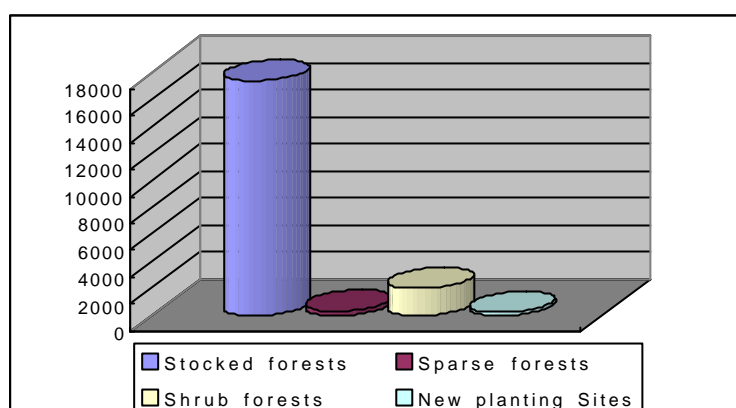
Graph 2. Forest Types Structure in Pilot Subsidy Project



Among the 168.38 million mu of key protection forests, 145.876 million mu or 87% are stocked forestlands, sparse forests account for 2%, shrub forests account for 10%, and newly planted sites account for 1%. Also, 89% of the key special-use forests being subsidized are stocked forests. This is depicted in Graph 3 below.

Graph 3. Composition of Forestlands under Pilot Implementation Subsidy

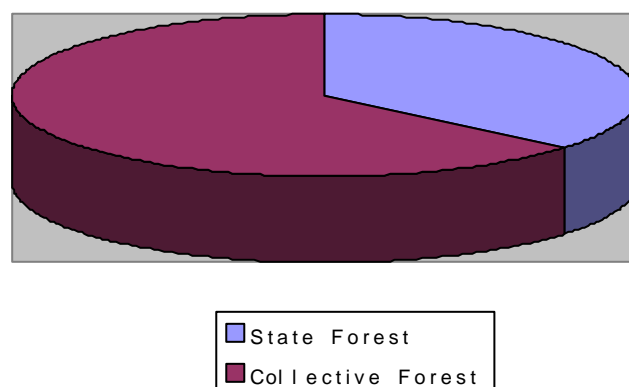
Unit: 0,000 mu



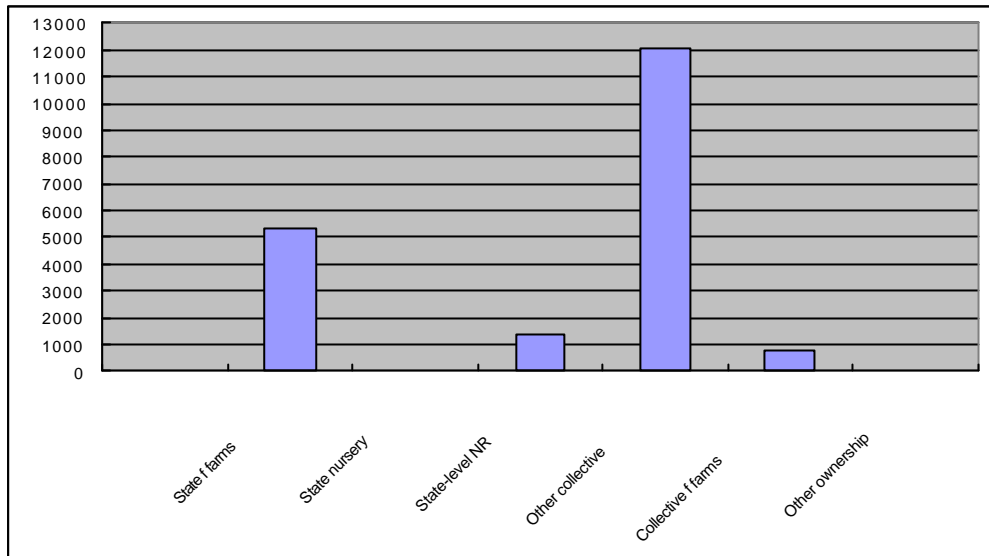
◆ Forest ownership structure

A disproportionately large share of forests under pilot implementation are state-owned. 36% or 71.761 million mu are state forests, while the rest 64% or 128.239 million mu are collective-owned. Private and other ownership forests accounted for nil. As shown in Graph 4, among a total of 42,762 forest management units being subsidized, 1,456 units or 3% are state-owned, the rest 97% or 41,306 are collective. This suggests that collective forests are much smaller in size per forest management unit. Among state units, most are state forestry farms and nature reserves, accounting for 74% and 19%, respectively. Among collective forests, however, collective forestry farms accounted for only 6% of total collective pilot forests (see Graph 5). That is to say, the majority of collective forests being subsidized are household managed forests.

Graph 4. Ownership Structure of Pilot Forests in 2001



Graph 5. Detailed ownership structure of pilot implementation forests



d) The Status of Pilot Implementation

Field visits by the lead author were taken to Hunan, Jiangxi and Zhejiang Provinces during the preparation of this paper. Overall this proposal of pilot implementation appears to have been well-received by local governments. For sites visited, work has already been finished in designating and zoning ecological forests according to the Principle of Specialized Management. These ecological forests are being classified as state, provincial or county ecological forests. Pilot implementation by the state government will only finance state ecological forests. Local governments will provide financing for subsidizing sub-state ecological forests designated for their own jurisdictions. Funds for 2001 transferred from the state government are still being held by Provincial departments by March 2002, however.

Farmer receptiveness also appears to be high. There has been some competition among local authorities for the opportunity to have their forests zoned as state ecological forests. As a general practice, the 5 Yuan/mu/year subsidy has been divided between forest management units and local forestry departments at the ratio of 7:3. That is, 3.5 Yuan/mu/year would go to forest management units including farmers, and 1.5 Yuan/mu/year would be kept by local forestry departments for general forest protection such as fire, insect and disease control and resource monitoring. This 1.5 Yuan/mu/year subsidy retained would be further divided between provincial, prefectural and county governments.

There are concerns that the 5 Yuan/mu/year rate is too low, and there is an alternative proposal for 10 Yuan/mu/year. There are also significant degrees of uncertainty and ambiguity regarding the length of this program and the nature of the subsidy, amongst target beneficiaries.

4.3 The Relationship between FEBSF and Other State Forestry Programs

Since the reform era began, China has initiated a total of 17 key forestry programs in

ecological environment reconstruction. In Year 2000 the State further streamlined these programs into 5 new programs. These are a) Natural Forest Protection Program for the protection and restoration of natural forests, b) Sloping Farming Lands Conversion Program for soil erosion control; c) Three-Norths and the Middle and Lower Reaches of the Yangtze River Key Shelterbelt Program for shelterbelt forest development; d) Wind and Sand Control Program in Beijing and its Vicinities for desertification control; e) Wildlife and Nature Reserve Construction Program for wildlife and wetland conservation.

Clearly these programs have their own environmental objectives, target beneficiaries, scope, and timeline. The requirement for financing is enormous but the financial input from the state all have time limits. Also, the instability of program-based finance would affect the long-term care and tending of forests to be established. Finally, the fluctuations in fiscal revenue of the government, particular for programs that are largely based on annual state treasure bonds issuance, would make their funding flows vulnerable. The FEBCS, on the other hand, is expected to become a regular financing mechanism for the day-to-day management of ecological forests that provides a stable cash flow toward the management of ecological forests.

5. International Experiences and Lessons in Compensating for Forests' Ecological Benefits

In compensating for forests' ecological benefits, there are mainly two types of arrangements, namely public fiscal payment and market-based instruments. It is believed that fiscal arrangement are prone to a number of shortcomings, such as high transaction cost, low efficiency in fund use and ambiguity in target beneficiaries.

According to prevailing theories, market-based compensation would require clearly defined tenure for the ecological forest, measurable benefits/value of the benefits, and low transaction cost. This implies a relatively well-developed market infrastructure as the basis for such transactions.

In practice, a number of interesting instruments such as carbon offset trading and bio-prospecting deals have been widely employed. Carbon offset trading is a transaction process in which the emitting party of CO₂ (a company or a country) pays the forest owner or management unit for the carbon offsets their forests generate. This market-based process is founded on the willingness to pay for controlling global climate change. Carbon benefits are being generated by forests in two ways: absorbing carbon dioxide via growth and storing carbon in biomass. Sequestering carbon via tree planting is believed to be a quick and cost effective way to absorb carbon dioxide. According to the estimation of the FAO, carbon sequestration by tropical forests would cost some 2-10\$/ton, whereas reducing carbon emission by switching to alternative fuel would typically cost 137 \$/ton. Further it is estimated that the marginal economic cost of carbon in causing global climate change would be around 25-35\$/ton.

Carbon offset transactions could eventually form a market for trading. This would allow countries to maximize their carbon reduction strategy according to their resource endowments, technology and the nature of their economic activities. Since 1992 there have been reports of 25 cases of forest-based carbon trading. Australia, US and Canada are among the pioneering countries. In November 1997 the Kyoto Protocol established a Clean Development Mechanism to promote carbon trading. There is estimation that global carbon trading market would reach some 1 billion US dollars in the next decade. In 1997 the World Bank established a Prototype Carbon Fund that has an initial capital of 150 million US dollars. To promote carbon trading, this fund plans to pay for some 20-25 \$/ton for carbon offsets. In spite of the difficulty of measurement, high political transaction cost and risks, carbon trading provides a market-based instrument for financing ecological forests development.

Forest-related bio-prospecting has mainly been practiced between the pharmaceutical industry and old-growth forest management units. To meet its demand for gene utilization, the pharmaceutical industry is willing to pay the management units of old-growth forests for the access to these forests. This practice started with the case of a drug called Feukemia extracted from the Rosy Perwinkle tree of old-growth forests. In this instance biodiversity has been given a market value. To promote such transactions, the US led the establishment of an International Biodiversity Collaboration Group. Proceeds collected from such trading have mostly been used for promoting the protection of old-growth forests. In 1982 Merck & Co., the largest pharmaceutical company in the world, conducted a bio-prospecting deal worth 1 million US dollars with the Nigerian National Old-growth Forest Protection Bureau. Clearly, as long as the tenure arrangement for the forest is well defined, bio-prospecting constitutes one market-based approach for financing forest conservation.

For historical and political reasons, ecological forests in China have mostly been owned by the state and collectives. However, there is certain ambiguity and insecurity in such tenure arrangement. Furthermore, it is rather difficult to quantify ecological benefits of these forests. Therefore, realizing forests' ecological benefits via market instruments remains at its explorative stage for the most part. International experiences would be valuable to further efforts of developing market-based instruments in China. In addition, the global forest ecosystem is an open system, and many ecological benefits provided by forests are global instead local benefits. In today's world of increasing globalization and integration, China will need to seriously consider internalizing these external benefits provided by forests via market-based mechanisms. Some of these benefits such as bio-prospecting and carbon sequestration would be candidates for global transactions.

6. Reflections and Recommendations

6.1 Reflections on the FEBSF and its Pilot Implementation

The FEBSF initiated by the Ministry of Finance and the SFA in November 2001 is a major step forward toward financing ecological forestry in China. It starts an era in which forests' ecological benefits are recognized by the state and the society at large in financial terms. The effectiveness and efficiency of the FEBSF in the pilot implementation are however too early to judge, and there appear to be a number of aspects that can be improved upon.

a) The Nature of the FEBSF

FEBSF is not a compensation arrangement to forest owners or landholders for benefits forgone or cost incurred by maintaining their forests for ecological protection; rather, it subsidizes owners/managers for managing their forests as ecological forests. Subsidy is different in nature from compensation. Therefore, it is important to note that the FEBSF is not the ideal FEBCS the forestry sector has been promoting. In its original design, FEBCS would provide a mechanism for the realization of the market value of the environmental benefits of ecological forests. However, FEBSF is just a subsidy scheme; it is intended for encouraging or enhancing the practice of ecological forest management. While a subsidy may subsidize for certain key inputs in managing ecological forests, it should be regarded as an expedient arrangement practiced when the state's ability to pay for the environmental services ecological forests generate is limited. In addition, there has simply been no employment of market-based instruments or mechanisms in the execution of the FEBSF.

It is interesting to note the evolution from FEBCS to FEBCF and to FEBSF. There are mainly three types of expenses/investments in ecological forestry: planting, tending and lost revenue resulting from restricted forest use (opportunity cost). While the FEBCS is designed to be an institution for compensating all three types of investments, the FEBCF is designed as a public fiscal arrangement to realize such compensation. FEBSF nevertheless can be viewed as a reduced fiscal compensation scheme, i.e., only the investment on tending will be SUBSIDIZED. The design, execution and assessment of the FEBSF should all be done against this framework.

To pursue the whoever benefits pays principle under the FEBCS and FEBCF, the challenge is to identify beneficiaries of the ecological benefits, quantify the benefits in monetary terms and make them pay. To meet this challenge, the first order of task is to raise enough money for the FEBCS and FEBCF. That explains why FEBCS has developed for so long without success, and also explains why under FEBSF the first order of task is not collecting money but spending money well.

b) Environmental Objectives of the FEBSF

The effectiveness of any program should be judged against its objectives. In the case of FEBSF, however, there appears to be no explicit expression of *objectively*

measurable environmental objectives. Correspondingly, there is no mentioning of measurable outputs and indicators for successful implementation. This makes it necessarily difficult to design for project implementation and monitoring and to measure the success or failure of the FEBSF. For instance, relevant government documents have stated improving the ecological environment in China as the broad objective/goal for the FEBSF. From this broad objective, one cannot justify that providing subsidy is the most effective way of securing forest's ecological services. This is a serious shortfall in the design of the FEBSF.

b) Target beneficiaries of FEBSF

Global experience indicates that, to make any compensation program effective, there should be a strong perception that the landowners are really providing a service in exchange for the payments. In the current development, forestland owners/managing units do not appear to be adequately aware of this; there is a lack of understanding of the commitment the landowners are making when receiving the FEBSF regarding their rights and responsibilities in land use. This lack of understanding may make voluntary participation in pilot implementation deceiving or misleading. Consequently, it may sow seeds for conflicts, violations or widespread changes in forestland use in the future when the opportunity cost of participating in the FEBSF increases (e.g., a significant increase in timber tax burden resulting in the rise in profitability of timber production, making timber production an attractive alternative land use).

The other issue is whether state-owned forests should be subsidized by the state or would it be managed more effectively by adequate operational financing from the state.

c) The rate of subsidy

There is no clear reasoning why the rate of subsidy is set at 5 Yuan/mu; or 75 Yuan/hectare². According to certain non-official sources, planting takes some 235.3 Yuan/mu, whereas tending would cost at least 10 Yuan/mu/year. Whether the 5 Yuan/mu/year standard currently being implemented is adequate to encourage ecological forest management requires further research. Adding to the difficulty of determining the rate of subsidy is the lack of clearly expressed environmental objectives and outputs for the FEBSF.

d) The Cost of Implementation

The funds disbursement process designed for pilot implementation appears to be quite cumbersome. The chain of funds movement is particularly long, and at the grassroots level funds will have to be transferred from the fiscal department to the

² Indirectly speaking, this rate was set as a result of the bargaining between SFA (representing sectoral interest) and the Ministry of Finance (representing state interest). Total budget for the pilot was capped at 1 billion Yuan by higher level leaders at the State Council, whereas the Ministry of Finance thought 0.2 billion *mu* is a reasonable scale for the pilot. Clearly the willingness and ability of the state in paying for the environmental services of ecological forests is key to this bargaining and consequently the determination of the rate of subsidy.

forestry department, before reaching the final target beneficiaries. This may reduce the efficiency of fund utilization, increase transaction cost, and even open a door for corruption.

e) Monitoring and Evaluation

It is not clear how the built-in incentive structure would affect the cost and efficiency of M&E. In particular, since all forestry departments from the Provincial level down would share part of the subsidy, the forestry departments as an implementation and M&E entity would have a strong incentive to arrange the largest possible ecological forests under their jurisdiction. This may in turn make effective M&E difficult. On the other hand, the 30% of the FEBSF that goes to resource monitoring and protection is more or less resource expended on “lubricating” the administrative system.

f) Efficiency of Subsidy

Forest landholders appear to be making a free choice in deciding whether to have their forests listed as key state ecological forests. However, this may be misleading. There is no assurance that such a free choice is real. This is because of a number of reasons:

First, landholders particularly farmers have very limited use rights of their forests (e.g. widespread tenure ambiguity, insecurity or disputes, limited logging rights and transportation rights, extremely heavy taxation on commercial timber production);

Second, there is a long time lag for most forests before they reach commercial production and landholders are inclined to receive the subsidy now, leaving the hard decision between commercial use and ecological protection for the future;

Third, many regions are required to be zoned as ecological forests as they fall into the state designed ecological forest zones;

Fourth, many of the forests are being used as multiple purpose forests such as self-use timber, non-timber forest products and grazing. Designating these forests as ecological forests cannot and would not change this practice of multiple-use. In addition, there are considerable uncertainties over the length of the subsidy program and therefore the sustainability of the subsidy.

For these reasons, it is over optimistic to judge right now that the FEBSF is a cost effective and sustainable way to secure the environmental services of ecological forests. The other potential problem, as many other subsidy programs that have worked world over have experienced, is the danger of developing addiction to subsidies by landholders. However, the welfare benefits to farmers are real, as close to 50% of the FEBSF is being distributed to farmers or their collectives. This is important in today’s China as the entire fiscal and tax system is heavily skewed against the rural sector and farmers.

6.2 Improving the FEBSF

Many challenges remain in the implementation of the pilot of FEBSF. Some of the more important improvements that can be made include the following:

- a) Further clarification of the nature of the FEBSF as a fiscal subsidy scheme and devising corresponding environmental objectives and measurable outputs for the program.
- b) Expand the source of finance for the FEBSF to develop additional funding sources such as local fiscal co-financing. It is interesting to note that provinces that have developed co-financing schemes are located both in the more affluent coastal zones and the more economically underdeveloped inland regions. This suggests that all local governments should have certain fiscal capacity to finance some ecological forestry, as long as there is adequate political will. In addition, it is hoped by the forestry sector that the FEBCS be established eventually. Budgetary allocation for compensating the forest management units may remain for the large part a low cost way to finance ecological forest development. In addition, there has been discussion in the forestry sector that an Ecological Benefit Tax be established to generate adequate and sustainable revenue for implementing the FEBSF/FEBCF. This proposal should be studied and explored.
- c) Strengthen pilot program implementation. The first order of priority is to speed up the pace of specialized management zoning. Unless forests are zoned properly, there would be no basis for implementing the FEBSF. Further, there is a need to expand the pilot implementation and to incorporate multiple beneficiaries such as private forest managers in the pilot. Also, it is necessary to more clearly define program target beneficiaries and their obligations so that real voluntary decisions in project participation can be made (this may involve establishing a reasonable incentive mechanism to induce local farmers to make informed choice between ecological and economic use of their forests). There is a need to significantly enhance monitoring and implementation, particularly in fund management and forest resource monitoring in terms of forest acreage and quality changes. Finally, the project execution capacity of the forestry sector needs significant improvement.

6.3 Developing alternative mechanisms for financing environmental services

A number of factors dictate that fiscal subsidy may be an appropriate scheme for promoting ecological forestry in China. These factors include limited ability of the state government to pay for environmental services, a general underdevelopment of market institutions and the high transaction cost of measuring the environmental benefits ecological forests generate. However, market-based approaches can still be pursued. One approach is to introduce market competition in accessing the resources provided by the FEBSF. Another approach is to develop market-based instruments for some environmental services with certain special characteristics.

One type of environmental service that can be traded in the market is water conservation. The other type is the aesthetic or recreational value provided by ecological forests. Both types of services are enjoying rising consumer demands in

China today. That is, the willingness of their consumers to pay is increasing. On the other hand, they all have clear beneficiaries in a certain limited geographical locality. That is, the biophysical links for such environmental services are clear and measurable with reasonable cost. Examples include the benefits provided by forests around a lake or reservoir for hydropower generation, fisheries, tourism and drinking water. Market transactions between forest owners and the beneficiaries in power, fishery, tourism, municipal citizens or agriculture would be feasible. There have been some successful cases of such transactions in China. The role government can play is to study such cases and develop a regulatory framework to facilitate such transactions.

Another environmental service that has high potential for market-based trading but largely under-studied is carbon sequestration by forests. It is surprising for the authors to notice that there is no mentioning of CO₂ sequestration in the government documents of FEBSF regarding the benefits of ecological forests. Unlike many other forest benefits, carbon sequestration is not only a national benefit but also a global benefit. There is significant progress in the international arena in developing a global market for carbon. Given the large size of ecological forests to be protected or established in China, these benefits particular the carbon benefit may be enormous and have great market potentials. While it is too early to judge the market value of the carbon benefits China's forests can generate, efforts should be spent to raise the awareness of forest owners over such a benefit. For the Chinese government, it should be well informed so that wise decisions can be made in China's negotiations regarding global carbon emission control. Given the fact that few studies have been done in this field in China, there is urgent need for China to initiate research to study the biophysical links for carbon sequestered by forests, and to prepare for a carbon accounting exercise. In limited instances, pilot projects can even be initiated, assuming there is demand for carbon credits from offshore corporations.