

Current Status, Future Trend and General Policies of Forestry in China

Ming Cheng · Sheikh Ali Ahmed · Su Kyoung Chun · Jong In Kim

Current Status, Future Trend and General Policies of Forestry in China^{*1}

Ming Cheng^{*2} · Sheikh Ali Ahmed^{*3} · Su Kyoung Chun^{*3} · Jong In Kim^{*4}

ABSTRACT

Based on data collected by the State Forestry Administration (SFA) and other databases, this paper describes the current status, future trend and general policies in China's forestry. Forestry sector plays an important role in GDP growth of China. As a result forestry industry value output is increasing day by day. There is huge gap between demand and supply of timber projected in 2010. As a result it is necessary to develop fast growing, high yield forest following some specific policies. The ultimate goals of forestry are to construct or improve industry infrastructure, overall upgrade of forest industry structure, income improvement of forest employees and peasants, policies renewal and technology improvement, acceleration of forest processing with high-tech.

Keywords : China forestry, timber demand and supply, general forest policies, future trend.

*1 Received : 2006. 5. 29.

*2 College of Material Science and Technology, Beijing Forestry University, Beijing 100083, China

*3 Department of Wood Science & Engineering, College of Forest Sciences, Kangwon National University Chunchon 200-701, Republic of Korea

*4 Division Quality Control and Standardization Team, Korea Forest Research Institute, Seoul, 130-712, Korea
[Corresponding author: Jong In Kim (E-mail: jikim99@foa.go.kr)]

1. Introduction

According to the fifth national forest resources inventory (1994-1998), China's forests cover an area of 153.63 million hectares, which includes bamboo and economic forests; fruit, rubber and oil seed trees. The stocking volume is estimated at 11.27 billion cubic meters. About 263 million hectares or 27 percent of the total land area, are set aside for forestry. Against most measures, China is forest-deficient and has only 0.1 hectares of forest per capita, considerably less than the world average of 0.6 hectares (FAO 1997). China's forest product output has been falling short against increasing demands. China is one of the world's largest timber importers, and the only major net timber importer among developing countries (WWF 2002). In 2000, imports of timber and related products reached US\$14.25 billion, with US\$7.61 billion for timber products and US\$6.64 billion for pulp and paper. Forest products are now the largest imported commodity in China. The objectives of this paper is to give a clear idea about the forestry status in China based on accumulated data.

2. Current Status of China's Forestry

2-1 Current status of forest resources

2-1-1 Forest area

According to an announcement made by

the State Forestry Administration (SFA) in June 2000, the land used for forestry in China is 263.395 million hectares, of which forest area is 158.941 million hectares, till 2003 the number increased to 174.91 million hectares, ranking fifth in the world followed by Russia, Brazil, Canada and the United States in terms of forest area. This was founded on the fifth national survey on forest resources. However, China's per capita forest area is only 0.128 hectares, about one fifth of the world average. China's forest coverage rate is 16.55 percent, about 60 percent of the world average. In comparison with the results of the fourth survey covering the period from 1989 to 1993, forest area has increased by 13.703 million hectares and with an average annual increase of 2.734 million hectares. In comparable terms, net increase in forest coverage rate is 1.43 percent. Reserved areas for man-made forests are 46.667 million hectares, ranking first in the world in terms of both growth rate and scale of man-made forests. Man-made forest area has increased by 10.25 million hectares and with an average annual increase of 2.05 million hectares. Net increases of man-made forests accounted for 74.8 percent of the net increase in forest area. Net increases in economic forests accounted for nearly 50 percent of the net increase in man-made forests.

2-1-2 Forest stock

Total growing stock of standing trees nationwide is 12.49 billion cubic meters.

Forest stock is 11.27 billion cubic meters, ranking seventh in the world. However, per capita forest stock is only 9 cubic meters or about one eighth of the world average. In comparison with results of the fourth survey, stocks of live standing trees has increased by 540 million cubic meters and forest stock has increased by 600 million cubic meters which is 4.5 percent and 5.6 percent respectively. Though national man-made forest area is 29.4 percent of the total forest area, man-made forest stock is only 9.0 percent of the total forest stock. Average annual growth of forests is 457.525 cubic meters, keeping ahead of the annual average consumption of 370.752 cubic meters.

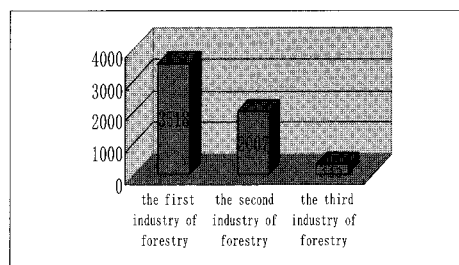
2-1-3 Composition of forest resources

Categorized by purpose, timber forest area accounts for 77 percent of the total forest area and 71 percent of the forest stock. Shelter forests account for 17 percent of the total forest area and 22 percent of the forest stock. Fuel wood forests and special-purpose forests respectively account for three percent of the total forest areas, and one and six percent of the forest stock. Categorized by tree species, the proportion of coniferous trees to broadleaf trees is 52 to 48 in terms of forest area, and 56 to 44 in terms of forest stock respectively.

2-2 China's Industrial structure of the forest sector

2-2-1 Industrial structure of the forest sector

In 2004, the total output value of the forestry sector amounted to RMB 689.22 billion Yuan, accounting for one percent of the GDP. Its contribution to the 7.1 percent GDP growth in the year was 0.06 percentage points, the total output value of the forestry sector increased by 17.61 percent over the proceeding year to RMB 103.19 billion Yuan.



〈Fig.1〉 Distribution of three main industry of forestry (2003). Source: *State Forestry Administration (SFA)*.

In 2003, the primary industry (mainly referring to afforestation industry), secondary industry (mainly referring to forest products) and tertiary industry (mainly referring to forest-related services including forest tourism, R&D and education) constituted 60.0, 34.2 and 5.8 percent of the total output value respectively. Overall, the forestry sector has shown the following characteristics:

2-2-2 Growth momentum of the primary industry remained strong

In 2004, the primary industry generated an output value of RMB 388.75 billion Yuan, an increase of 10.50 percent over 2003.

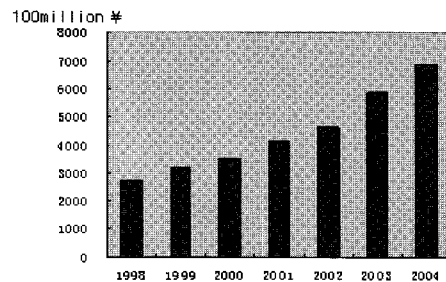
2-2-3 Output value of the secondary industry continued to increase.

In 2004, the secondary industry generated an output value of RMB 256.11 billion Yuan, an increase of 27.58 percent over 2003. Its industrial structure, regional distribution and ownership structure all experienced changes. In terms of the composition of output value, timber and bamboo felling and transportation business, with an output value of RMB 13.6 billion Yuan, accounted for 13.2 percent wood processing and bamboo, rattan, palm and straw products, with an output value of RMB 51.96 billion Yuan, accounted for 57.2 percent of the total output value of the secondary industry. In terms of regional distribution, state-owned forestry zones in the Northeast and Inner Mongolia have kept their absolute advantage in felling and transportation business and timber processing showed great growth potential; felling and transportation in the southwest regions dropped significantly, but forest-related chemical industry remains in a dominant position; collective forest farms in the south are production bases for pulp, paper and man-made board. And large and midsize export-oriented wood processing, furniture manufacturing and forest-related chemical industries are growing rapidly in the southeastern coastal areas. State sectors still play a leading role in forest industries, with state-owned enterprises making up 97.9 percent of the total number of enterprises in the forestry sector. However, its growth is starting to decline. Output value of the state

sector as a share of the total output value of the forestry sector dropped from 77.4 percent in 1998 to 73.4 percent in 1999 and 73 percent in 2000, until 68 percent in 2004, while the share of collective, joint venture, joint stock companies, foreign invested companies, companies funded by Hong Kong, Macao and Taiwan investors and other enterprises rose from 22.6 percent in 1998 to 26.6 percent in 1999 and further to 27 percent in 2000. Now there is a dramatically increase in the private economy in forestry sector and private enterprise play a more and more important role in all the forestry industry.

2-2-4 Tertiary industry has grown slowly with declining shares.

In 2004, output value of the tertiary industry in the forestry sector amounted to RMB 44.36 billion Yuan, an increase of 32.48 percent over 2003. Its share in the total output value of the forestry sector fell from 3.7 percent in 2000 to 6.44 percent in 2004.



〈Fig.2〉 Output value of the total forestry industry (1998-2004). Source: *State Forestry Administration (SFA)*.

Fig.2. shows that there is an impressive promotion in total output value in 2004. Reasons behind this can be explained firstly- the six key forestry programs have already been launched by the government, the investment to forestry increases every year; secondly- with the six key program going on, different local areas adjust the structure of forestry and make the economical forest or bamboo enter the output time; thirdly- fast-grow and raw-material forest developed quickly, for meeting the demand of pulp and wood manufactory market, price of the product are upgraded.

2-3 Current status of Chinese timber market

2-3-1 Timber supply capacity

From 1949 to 1998, China's wood production, including the portion covered by SFA statistics and the portion not covered, was basically on the rise. Statistics from the SFA show that wood production in the period amounted to 2,161.58 million cubic meters, with annual production at an average of 44.11 million cubic meters. The portion of wood production covered by SFA statistics is mainly composed of commodity timber which constitutes effective supply in the market (note: effective supply means the quantity of products supplied and accepted by the market, as distinguished from production), while the portion excluded in SFA statistics mainly refers to the timber consumed by farmers themselves and small quantities of small-sized timber. For this reason, there could be some error if only

SFA statistics are used in market analysis. China's future capacity for timber supply depends not only on its forest resources but also on its choice of forest policy, national economic development and environmental protection strategy. From the perspective of forest policy and environmental protection, the ten major shelter forest projects launched in the 1970s, especially the natural forest protection program launched in 1998, have a direct impact on effective timber supply. From the perspective of national economic development, enhanced national economic strength has created favorable conditions for intensive development of man-made forests, leading to higher effective timber supply.

2-3-2 Timber demand

China's current per capita timber consumption is 0.12 cubic meters. However, per capita consumption rises with economic and social development. An increase of 0.1 cubic meter of per capita timber consumption will raise the total demand by 130 million cubic meters. China's effective demand for timber by 2010 is projected to be 320 million cubic meters, exceeding supply by 70 million cubic meters. An analysis of this forecast by the Delphi method, based on the current status of forest resources and other objective conditions, also shows that timber supply will fall short of demand by 70 million cubic meters by 2010. Judging by the imports of the 1990s, timber of large diameter and valuable species will account

for about 10 to 30 percent of the short supply. Therefore, given the significant demand for timber of large diameter and valuable species, it is necessary to develop fast growing, high yield forests and also import certain quantities in the future.

2-3-3 Regional distribution of the timber market

Statistics from the SFA show the proportion of effective timber supply from different forest zones in different periods during 1949 to 1997. Effective timber supply from state-owned forest zones in the Northeast and Inner Mongolia dropped from 77.11 percent in the recovery period (1949 - 1952) to 32.28 percent, down by 44.83 percentage points. On the other hand, effective timber supply from other forest zones grew significantly. Effective timber supply from collective forest farms and forest deficient areas in south China and state-owned forest zones in southwest China, rose by 18.87, 10.65 and 12.37 percentage points respectively. There was no major increase in supply from state-owned forest zones in northwest China. Despite the substantial drop, the effective timber supply from the Northeast state-owned forest zones still accounts for one third of the national effective supply. With implementation of the natural forest protection program, effective timber supply from state-owned forest zones in the Northeast, Inner Mongolia, southwest and northwest will fall significantly. For example, timber production continued to fall from 67.67 million cubic meters in 1995 to

67.10 million cubic meters in 1996, 63.95 million cubic meters in 1997, 59.66 million cubic meters in 1998 and finally to 53.27 million cubic meters in 1999. Effective timber supply from collective forest farms and forest-deficient areas in south China is likely to rise.

2-3-4 Price of timber

On the whole, the price of domestic timber has been falling since 1994, despite a slight upturn in 2000. For example, the sales price of timber of state forest farms averaged about RMB 454 Yuan per cubic meter in 1995 and dropped to RMB 345 Yuan in 1997. Despite the slight upturn in the last couple of years, the price was only RMB 359 Yuan per cubic meter in 2000. The situation in supply and demand of timber affects its price. Timber price tends to rise as a result of short supply. But on the other hand, factors such as timber imports and substitution restrict price from rising. An analysis of the statistical data from by the State Statistical Bureau indicates that the price of timber rose slightly in 1999, with a yearly average price index of 102.4 or 2.4 percent higher than in 1998. But price indexes varied significantly throughout the year, with fluctuation in the range of 18 percent, mainly due to factors such as monthly variations in timber imports, transportation volume and market demand.

2-4 China's Imports and exports of forest products

In recent years, imports and exports of forest products have grown rapidly and taken an increasing share in China's total imports and exports. From 1981 to 1992, imports and exports of forest products accounted for only 2.5 percent of China's total imports and exports. By 1999, the share already increased to 4.2 percent with total import and export value at US\$15.23 billion. Exports of forest products in 1999 generated foreign exchange revenues of US\$6.38 billion and accounted for 3.3 percent of China's total exports. Import value of forest products was US\$8.85 billion and accounted for 5.3 percent of China's total imports. Compared with only about US\$1.1 billion in the late 1980s, China's imports of forest products increased seven times to over US\$8 billion by the end of the Ninth Five-Year Plan period, placing forest products among China's current and future leading imports. Of the annual imports of forest products, log imports have been growing especially fast. Import of converted timbers is also growing in response to the needs in the interior decoration market.

China's exports of forest products reached US\$30.398 billion in the Ninth Five-Year Plan period, an increase of 48.3 percent over the Eighth Five-Year Plan period. Its share in the total exports remained stable. Furniture took the lion's share or about 36 percent of exports, followed by wooden

products, paper, converted timber and man-made board. There was little export of logs due to government restriction. The general situation of China's imports and exports of forest product is described below:

2-4-1 Wood products take the largest share in forest product imports and growth of import of wood products is much higher than that of non-wood forest products

In recent years, China's imports of forest products have focused on wood products. Imports of wood products as a share of the total imports of forest products have varied in the range of 79 to 86 percent, while the share of non-wood forest products is only 14 to 21 percent. As a result of the gap between domestic supply and demand and especially impact of the natural forest resources protection programs, imports of wood products rose drastically to a record high of US\$7.83 billion or 88.5 percent of the total imports of forest products. Imports of non-wood forest products were US\$1.02 billion or merely 11.5 percent of the total imports of forest products.

2-4-2 In forest product exports, the share of wood products is increasing while that of non-wood products is declining

Export composition of forest products has undergone gradual adjustments since the 1990s. Exports of wood products has been rising with their share in the total exports

of forest products rising from 36 percent in 1994 to 56 percent in 1999 and surpassing exports of non-wood forest products. In 1999, exports of wood products continued to grow to US\$3.57 billion, an increase of 18.9 percent over 1998. On the contrary, exports of non-wood forest products fell to US\$2.81 billion, down 1.5 percent as compared with 1998. In addition, China's forestry sector has seen rapid growth of international cooperation. In the Ninth Five-Year Plan period, China borrowed loans and credits of US\$253 million from the World Bank to finance 1.133 million cubic meters of afforestation. Upon completion, the projects were expected to increase forest stock by 150 million cubic meters and fruit production by 2.5 million tonnes. The Forest Resources Development and Protection Project, funded by a World Bank loan of US\$185 million, aimed to complete 877,000 hectares of afforestation. The Forest Development in Poor Areas Project, funded by a World Bank loan of US\$68 million, aimed to complete 257,000 hectares of afforestation. Through the World Bank-financed afforestation projects, RMB 2.77 billion Yuan was invested in developing fast growing, high yield forests for timber supply in the Ninth Five-Year Plan period, an increase of 57.4 percent over the Eighth Five-Year Plan period. There were 745,000 hectares of fast growing, high yield forests planted, an increase of 2.9 percent over the Eighth Five-Year Plan period.

2-5 Trading partners in import and export of wood products

In terms of imports of wood products excluding paper, the five largest trading partners are: Malaysia at 22.9 percent, Indonesia at 18.6 percent, Russia at 9.6 percent, and Germany at 8.7 percent and Gabon at 6.2 percent. In terms of exports of wood products excluding paper, the five largest trading partners are: the United States at 31.1 percent, Japan at 24.7 percent, Hong Kong, China at 17.2 percent, Korea at 4.9 percent, and Taiwan, China at 4.0 percent.

2-6 Import and export of major wood products

2-6-1 Paper

In recent years, China's imports of paper products have been increasing steadily, while exports of paper products are on the decline, with increasing surplus in paper trade. In 1999, imports of paper products amounted to US\$4.89 billion and made up 55.3 percent of the total imports of forest products and 62.5 percent of the imports of wood products. Import value of paper and paper products, excluding non-wood pulp paper and related products, was at US\$3.19 billion; wood pulp at US\$1.4 billion; recycled paper at US\$0.25 billion; and printed matter at US\$0.05 billion. In comparison with 1998, imports of recycled paper increased by 43.2 percent paper and paper products by 10.5 percent and imports of wood pulp increased substantially from

2.18 million ton to 3.08 million, up 41.3 percent. In terms of value, imports of wood pulp mainly came from Canada at 28.4 percent Indonesia at 17.6 percent Russia at 14.9 percent Chile at 14.9 percent the United States at 9.7 percent and Brazil at 5.1 percent. In 1999, China's exports of paper products amounted to US\$480 million, falling by 3.1 percent over 1998, with a deficit of US\$4.41 billion in paper trade.

2-6-2 Log

In recent years, China's imports of logs have been multiplying, while exports are falling. In the Ninth Five-Year Plan period, imports of logs amounted to 32.61 million cubic meters, an increase of 14.48 million cubic meters or 79.9 percent as compared with 18.13 million cubic meters in the Eighth Five-Year Plan period. In 1999, imports of logs made up 15.9 percent of the total imports of wood products and amounted to US\$1.25 billion, an increase of 108.5 percent over 1998. Conversely, log exports in the same period fell by 35.7 percent to only US\$80 million. China imports logs mainly from Russia, Malaysia and African countries. In 1999, log imports from Russia amounted to 4,305 million cubic meters or 42.5 percent of the total volume of log imports and US\$270 million or 21.7 percent of the total value of log imports. In terms of import value, Malaysia comes second with a share at 19.7 percent followed by Gabon at 14.6 percent Germany at 9.0 percent Equatorial Guinea at 5.6 percent Indonesia at 5.6 percent and

Papua New Guinea at 5.1 percent. The sharp increase in log imports is attributable to several factors: 1. Implementation of the natural forest resources protection programs that have led to declining timber production; 2. Zero tariff introduced on January 1, 1999; and 3. Expansion of import channels which allow any enterprise with foreign trade the right to import timber. In addition to substantial increases in log imports, there have also been significant changes in terms of varieties and countries of import. China formerly imported coniferous timber such as American pine, dragon spruce and Chinese hemlock mainly from North America to meet the needs of infrastructure development. With growth of interior decoration, furniture and plywood manufacture, there have been increasing imports of broadleaf timber from the Southeast Asian, African and Oceanic countries. A species grown in Russia, which is similar to Korean pine and deciduous tree grown in the Northeast forest area in terms of timber quality, of wide diameter, high quality and reasonable price, is very popular in the Chinese market.

2-6-3 Converted timber

China has seen rapid growth of the imports of converted timber in the last few years, with great variety and high added value. In 1999, imports of converted timber, excluding special shaped board, made up 8.4 percent of the total imports of wood products and were valued at US\$660 million, an increase of 90.1 percent over

1998. Its import volume was 2.76 million cubic meters, an increase of 63.1 percent over 1998. Meanwhile, exports of converted timber have been on the rise. In 1999, export value of converted timber was US\$140 million, up 21.2 percent over 1998; and its export volume was 350,000 cubic meters, up 37.4 percent over 1998. China imports converted timber mainly from Indonesia and Malaysia, which supply 41.9 percent of China's total imports of converted timber, followed by the United States at 12.2 percent, Germany at 11.8 percent and New Zealand at 4.8 percent.

2-6-4 Man-made board and veneer

On the whole, imports and exports of man-made board as a share of total volume of timber trade have remained relatively stable. Thanks to increased domestic production capacities, varieties and the quality of man-made board in the last few years, man-made board produced in China has gained competitiveness in the international market. However, in comparison with the developed countries, a gap still remains in terms of equipment and technology, product mix and variety and quality of building material and products. Imports of some man-made boards are still necessary to supplement domestic supplies. Import value of plywood board, shaven board, fiberboard and veneer board was US\$420 million, US\$50.65 million, US\$210 million and US\$200 million respectively, and their import volume was 1.04 million, 250,000, 790,000 and 640,000 cubic meters

respectively. With the exception of plywood board, imports of other boards have somewhat increased over the previous years. Export value of plywood board, shaven board, fiberboard and veneer board was US\$120 million, US\$6.85 million, US\$53.39 million and US\$46.43 million respectively, and their export volume was 420,000, 17,000, 18,000 and 48,000 cubic meters respectively. With the exception of fiberboard, exports of other boards have increased significantly over the previous years.

2-6-5 Furniture

With development of the furniture industry and considerable increase in furniture production and quality in the last few years, China's furniture exports have grown rapidly. Exports of furniture as a share of the total export value of wood products have been on the rise, increasing from 23.6 percent in 1993 to 36.7 percent in 1999. Furniture exports in 1999 increased by 20.7 percent over 1998 numbers to reach US\$1.31 billion, and 39 percent of the increase in wood product exports was attributable to an increase in furniture exports. Major importers of Chinese furniture are the United States at 48.9 percent, Hong Kong, China at 22.1 percent and Japan 10.8 percent of China's furniture exports. In 1999, China's imports of furniture, valued at US\$30 million, fell by 21.2 percent compared with 1998. Its share in the total import value of wood products was less than one percent, with trade surplus at US\$1.28 billion.

2-6-6 Wooden products

China's exports of wooden products have been on the rise in the last few years. In 1999, exports of wooden products reached US\$1.21 billion and made up 34 percent of the total export value of wood products. Major importers of Chinese wooden products are Japan at 29.3 percent, the United States at 25.4 percent, Hong Kong, China at 13.1 percent, United Kingdom at 4.0 percent and Korea at 3.3 percent. China does not import a lot of wooden products. Imports of wooden products in 1999 were only US\$70,000, decreasing by 18 percent compared with 1998. Although there is a big gap compared with developed countries in forestry development, and exists many problems such as: 1. A small contribution in GDP, the secondary and tertiary industries account for a small share of entire forest industries' production value. 2. The secondary industry is small-scaled, less technical and with lower value products. 3. Short of science and technology, slow technology transfer to production. 4. Raw material resource is scarce. But some bright points also come up: 1. Developing very fast, very promising. 2. New industries emerge rapidly and become the highlight of forestry sector. 3. Private economy has become the major developing force. 4. Its products become more and more competitive, and take more and more market share in the world trade.

3. The Future Trend of China's Forestry

3-1 The goal of forestry

Construction of developed industry infrastructure, overall upgrade of forest industry structure, income improvement of forest employees and peasants, policies renewal and technology improvement, acceleration of forest processing with high-tech.

3-2 The changing trends

During the process of developing, forest industry will have four major changing trends: 1. Economy structure will transform from resource-based to technology-dominated. 2. Resource allocation will change from government-dominated to market-dominated. 3. The economy growth will change from extensive to intensive. 4. The developing models will transform from single government-owned model to multiple mixed economy model.

To meet market needs for timber, China will have the following options:

1. Actively taking measures to save and substitute wood with other materials.
2. Increasing timber imports.
3. In the medium and long term, given the constraints of international timber supply, price and balance of payment, China needs to take the following measures to address the supply-demand problem.
4. China should fundamentally accelerate development in forest resources and increase effective

supply of timber by expanding the scale of fast growing, high yield woods nationwide, strengthening development of fast growing woods on collective forest farms in south China where water and climate conditions are more favorable, enlarging areas of fast growing woods and intensifying tendering of existing young and middle forests. 5. Enhancing utilization rates of forest resources and comprehensive utilization of timber.6. Vigorously developing forest industries that use man-made forests and remnants of forests as raw material. 7. Actively seeking access to international forest resources, timber and other forest product markets.

4. Future trend of China's forestry policies

4-1 Policy recommendations in the future

4-1-1 Timber trade and development strategy

As the world's second largest importer of logs, China depends heavily on the international market. China is also a country with great potential for forest development. For this reason, the choice of timber trade and development strategy will have a major impact on the sustainable development of the country's forestry sector and wood-related trade activities. Prior to or even beyond 2010, China will continue to import wood and related products. This strategy will help China reduce the consumption of

its own forest resources, gain breathing space for the forest sector, accumulate a resource base for sustainable forestry development, place social benefits before economic benefits, and maintain a balance between the ecosystem and economic growth. However, China cannot forever depend on imports of wood and wood products to meet its total domestic demand, which would put China in an extremely passive position in terms of sources of imports, foreign exchange disbursements, inspection and quarantine and employment in the forest sector. Since the forestry sector depends on forest resources, development is equally or even more important than trade policy and measures. Given the growing shortage of forest resources and intensifying competition worldwide, over-dependence on the international market will not be a wise policy. Acceleration of the development of the domestic forestry sector and continued increases in domestic supply capacities should be a key policy option.

4-1-2 Adopting a flexible trade strategy

For many years, China followed a one-sided export-oriented import and export strategy for wood and related products. In developing a trade development strategy for wood products, consideration should be given to domestic factors such as the availability of domestic resources and processing capacities, trade systems and structure, supply and demand, and international factors such as the pattern of international trade in wood, business cycle,

price, exchange rate, trade barriers and movements of multinational corporations and economic integration organizations. In general, it will not be advisable to choose one strategy, as all strategies have certain advantages and disadvantages. There should be different focuses in different periods of time in light of the changing domestic situation and developments in international trade, to make them compliment and facilitate each other. At present, China's forestry sector is characteristic of processing imported resources. Consequently, China should adopt an open export strategy by importing a lot of wood resources through multiple channels and exporting a lot of its special forest products such as rosin, tong oil, tea and bamboo products. When the economy is good, China should follow a strategy of importing resources and exporting products through the international market. When the economy is in recession, China should continue to import resources from abroad but sell its products mainly in the domestic market. This strategy will help China make full use of its existing production capacities. An industrial system dependent on imported resources is subject to the international business cycle and fluctuation with risks. However, with China's reserve resources and the vast world market for wood products, we should be able to check the negative effects so long as we size up the situation correctly, take a flexible open trade strategy, overcome the temporary shortage of forest resources, and promote the long-term sustainable growth of

the forest industry with the help of imports and exports while meeting domestic needs.

4-1-3 Intensifying development of fast-growing man-made forests

In the medium and long term, intensifying development of fast-growing man-made forests is a major approach to addressing the issue of protecting forest resources while meeting domestic needs for wood. China should accelerate cultivation of domestic forest resources, speed up development of man-made forests and forest farms for industrial use and improve the quality of forests, with a view to ensuring domestic supplies on a sustainable basis. Development of man-made forests should be guided by market demand and based on consideration of the needs and trade structure for wood.

4-1-4 Using state subsidies to exchange for protection of forest resources

It is a feasible approach to use state subsidies, including subsidies by central and local governments, to exchange for protection of forest resources. Developed countries and some developing countries have adopted similar approaches and achieved good results. China's natural forests protection program is a wise policy option based on the experience from other countries. The Government invests about RMB10 billion Yuan each year in the protection of the forests in the aforementioned areas, which is still insufficient. The case of Guizhou is

somewhat typical and useful for a study of national scope. Given the regional differences across the country and unavailability of detailed data, it is difficult to calculate the figures for the whole country.

4-1-5 Some specific policies

First, transform from timber dominant development to forest land and forest regional resource dominant development, Improve productivity, enlarge the forest production base. Second, transform resource advantages to strengthen economic power; satisfy people's multiple demands with forest's multiple functions. Third, change from using natural forest to using plantation forest, Expanding timber forest base, and increase efficient timber supply, Strengthen technique of "inferior small timber" use, Strengthen plantation of rare and large diameter wood species, Speed up bamboo sector development, Accelerate adjustment of forestry site allocation, stimulate timber processing in south china. Fourth, strengthen technology improvement and invention; improve efficiency of timber usage, Develop timbers' substitution. 5. Make use of domestic and international resources and markets; insist on the opening policy to make full use of the foreign forest resource. Recover the forest reserves of China, participate actively in and cooperative to develop the forest with Korea/Russia/Japan/USA

5. Summary

With the economy reform carried on deeply step by step, forestry industry is playing an important role for the country's economy. How to use the limited resources to make the largest economical benefit is a key point for the industry development. It is exciting that Chinese forest resources is gaining sustainable development gradually. Forestry output value is also increasing every year, and input & export volume is enlarged fast. By the development of forestry industry infrastructure, income improvement of forest employees, polices renewal and technology improvement, acceleration of forest processing with high-tech and by reasonable strategy, a prosperous future of China's forestry can achieved.

6. References

- CFSDC. <http://www.cfsdc.org/>
- Li, Y. "Forestry Development Strategy for the 21st Century". China Forestry Press.
- Liu, Can, etc. 1994. "A Study of the Supply-Demand Model of China's Timber Market". Forestry Economy.
- Li, J. C., F. W. Kong, N. H. He and I. Ross. 1988. Price and policy: the keys to revamping China's forestry resources. In R. Repetto and M. Gillis, eds. Public policies and the misuse of forest resources. United Kingdom, Cambridge University Press.

State Forestry Administration, 2004. China Forestry Development Report". China Forestry Press, 2005. Beijing.

WWF. 2002. Scoping study on the economic, social and environmental impacts outside China of Chinese domestic forest policy reform. Draft Report. Beijing, World Wide Fund for

Nature.

Zhang, Y.Q., G. C. Dai, H. Y. Huang, F. W. Kong, Z. W. Tian, X. Wang, and L. Zhang. 1998. The forest sector in China: towards a market economy. In M. Palo, and J. Uusivaori, eds. World forests, society and environment, Vol. 1.