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Abstract

The study provides a forest products market outlook for China and the Former Soviet Union. Since forest resources in the Northeast region of the country are rapidly being depleted, China will most likely face a timber supply shortage in the near future. Lower supply coupled with higher substitution by non-wood resources indicate lower wood products demand. Two critical factors that will determine the level of forest products imports will be the success of policies to attract joint venture investment schemes and the allocation of foreign exchange to purchase wood products from market-based economies. The former Soviet Union possesses substantial amounts of softwood forest resources. However, the lack of capital investments during the current political restructuring has left the forest sector with a limited and deteriorating capital stock. Unless adequate amounts of capital investments take place, timber harvesting and processing capacity will constrain log flows. A renewed domestic demand for forest products may place significant pressures in the western region of the Former Soviet Union.

Introduction

The present analysis draws upon recent studies of the forest sectors of China and the Former Soviet Union to assess implications of the transition occurring in these two markets on the global forest sector. Work in progress on China’s forest sector examines the supply of timber and the demand for these resources by wood processing industries and other sectors in China. The author produces a supply outlook for the Northeast region of China where timber harvests have traditional met the majority of its consumption needs. The work also examines China’s substitution policy and provides an outlook for China’s forest sector in the global economy.
In the second part the study summarizes recent work on the former Soviet Union (Perez-Garcia and Backman 1995). The section focuses primarily on the condition and availability of capital and its impact on the growth of the forest sector.

From these two analyses, the study provides an outlook for two very large forest products markets. The Chinese markets consumes an estimated 300 million cubic meters of wood annually. The former Soviet market possesses over half of the global softwood forest resources. Other studies have shown that uncertainty in global outlooks depend on the behavior of these two markets, particularly for the countries in the Pacific Rim region (Perez-Garcia 1993).

HISTORICAL TRANSFORMATION OF CHINA'S FOREST SECTOR

The push to increase industrial output was a major influence on the development of China's forest sector. An analysis of the economic plans of the central government reveals the goal of industrial development plans (Yu and Perez-Garcia 1994). The forest sector was a source of raw material for industrial sector growth without adequate means to sustain the timber resources. Since China's forest resources faced high timber demands and negligible investments in timber management were undertaken historically, its resource base is currently inadequate to meet projected timber demands.

Table 1 summarizes the impacts centralized planning had on the forest resource base. Eight major planning periods are identified in the table. The National Recovery Period (1949-1952) demonstrated a high growth in timber consumption. Timber consumption grew by 40 percent annually during the three year period. To meet this growth in timber demand, greater areas of forests were harvested which reduced the national timber inventory. Investments in the industrial sector was six times greater than investments for the forest sector during this period.

During the First Five-Year Plan, 1953 to 1957, the Chinese Ministry of Forestry had to meet two demands: supply the timber needs for industrial development and formulate a comprehensive forest policy for forest management. Timber consumption during the First Five-Year Plan continued to increase, growing an additional 60 percent during the plan period. The plan also initiate a forest policy of reforestation programs, mostly geared towards protective use on collective farms rather than productive use to meet state industrial production plans.

The Second Five-Year plan, 1958-1962, is referred to as the Great Leap Forward. It led to the growth of backyard industries which greatly expanded timber consumption. Official statistics did not fully capture the result of an expanding timber demand. At the
same time, industrial investments were given higher priority, increasing by 55 percent during the plan period. The forest sector also received investments, but primarily for the processing sector. From 60 to 80 percent of the available forest sector funds were directed towards industrial sector improvements including harvesting and timber processing.

<table>
<thead>
<tr>
<th>Economic Plan</th>
<th>Timber Consumption</th>
<th>Industrial Investment</th>
<th>Forest Sector Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Economic Recovery</td>
<td>117% growth in consumption</td>
<td>59% growth in investments</td>
<td>11% growth in investments</td>
</tr>
<tr>
<td>First Five-Year Plan</td>
<td>59% growth in consumption</td>
<td>18% growth in investments</td>
<td>1% growth in investments</td>
</tr>
<tr>
<td>Second Five-Year Plan</td>
<td>A large, unknown positive growth in consumption</td>
<td>55% growth in investments</td>
<td>10% growth in investments</td>
</tr>
<tr>
<td>Three Year Adjustment Period</td>
<td>A large, unknown positive growth in consumption</td>
<td>55% growth in investments</td>
<td>18% growth in investments</td>
</tr>
<tr>
<td>Three Year Adjustment Period, the Cultural Revolution and the Fourth Five Year Plan</td>
<td>Some unknown growth in timber consumption</td>
<td>Some unknown industrial investment level</td>
<td>Forest liquidation due to land clearing and Cultural Revolution</td>
</tr>
<tr>
<td>Fifth Five-Year Plan</td>
<td>20% increase in timber consumption</td>
<td>A readjustment in industrial investment planning</td>
<td>Timber supply constraints</td>
</tr>
<tr>
<td>Sixth Five-Year Plan</td>
<td>42% increase in timber consumption</td>
<td>Y$360 Million investment in industry</td>
<td>Wood imports take place</td>
</tr>
<tr>
<td>Seventh Five-Year Plan</td>
<td>20% increase in timber consumption</td>
<td>Unknown investments in industry</td>
<td>Substitution policy promoted</td>
</tr>
</tbody>
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Table 1. Summary of economic plan impacts on timber consumption, industrial investments and the forest sector (Source: Yu and Perez-Garcia 1994).

Following the Great Leap Forward, the Three-Year Readjustment Period, 1963-1965, focused on adjustments to curtail an ensuing economic recession. Under the plan, state-owned forest industries developed rapidly and investments were made in reforestation. The
plan never abandoned its industrial development pattern during the period however.

The beginning of the Third Five-Year Plan also marked the beginning of the Cultural Revolution and was followed by the Fourth Five-Year Plan (1966-1976). The principle factor affecting the forest sector during this period was the failure of the agriculture sector during the Great Leap Forward. Because of low agricultural output, the adjustment period, the cultural revolution and ensuing Fourth Five-Year Plan emphasized agricultural investments. The call for land reclamation during this period led to forest area clearing and conversion to agricultural uses.

The Fifth Five-Year Plan (1976-1980) was an ambitious plan to recover what was lost during the cultural revolution and too-rapid expansion of the Great Leap Forward. The result was almost similar: too rapid growth for the existing infrastructure. The rapid growth further reduced the timber inventory in the Northeast Region of the country. In the Heilongjiang region, reserves fell 42 percent from 2.5 billion cubic meters in the mid 70’s to 1.4 billion cubic meters by 1980.

It was during the Sixth Five-Year Plan that China began to open its doors to the outside world. Economic development furthered increased the demand for all forest products. Timber consumption increased from an annual average of 51 million cubic meters to 55 million cubic meters according to official statistics. Estimates of total timber consumption, including fuelwood, reached nearly 300 million cubic meters annually during the period (NFPA 1986). In 1981 wood imports to China began as the government realized that timber demand was growing faster than supply. Import levels grew from 2 million cubic meters in 1981 to nearly 10 million cubic meters in 1985. In 1981, the government also put the Southern Forest Production Base project into effect.

Several changes in the Seventh Five-Year Plan took place that changed previous industrial-planned growth. The Chinese government switched priority from large investments in heavy industry to a mixture of producing consumer goods and investments favoring light industry and agriculture. Timber consumption however continued to increase from an annual average of 56 million cubic meters during the Sixth Five-Year Plan to 65 million cubic meters according to official statistics. The consumption levels greatly surpassed the official planning target of 50 million cubic meters. It was during this period that China strongly promoted its substitution policy.

TIMBER SUPPLY OUTLOOK

China is divided in three major regions: the Northeast, Southeast and Central regions. The Northeast has been the production base for forest products historically. More recently,
Figure 1. China's inventory distribution. (source MOF 1986).

Figure 2. Development of the softwood resource in the northeast region of China by age class distribution.
the Southeast region has gained prominence and will become the new production base according to Chinese economic planning.

An examination of China's latest inventory reveals that the Northeast region contains the vast majority of the timber inventory. It has 41 percent of the country's softwood resources and 61 percent of the hardwood resources (Figure 1). However, the Southeast region is growing in importance. It's warmer climate and vast area allows forest management practices to reduce the time of harvests from 80 to 30 years according to forest plans for the region. Nevertheless the Southern Production Base is still far from replacing the Northeast as the major producer, and is not likely to become so until well into the next century.

Recent projections for the development of the timber resources in the Northeast indicate that there are likely to be shortages in raw materials prior to the coming on line of the Southern Production Base. Figure 2 illustrates the development of the softwood resources for the Northeast region for a fifty year horizon. The figure illustrates that as forest resources are removed to meet industry demand, inventory of merchantable age classes will become scarce. Even with adequate investments in forest management, it is likely that a timber shortage from the region will occur within the next two decades.

CHINA'S FOREST SECTOR OUTLOOK

The outlook for the forest sector in China is difficult to predict. Several factors will influence the outlook. Among these are centralized plans to substitute wood products with non-wood materials. Projections for substitution under a government initiated policy indicate a shrinking demand for traditional solid wood products. A second factor is the success of the Southern Production Base. Reforestation plans in the past have been disappointing. Some estimates indicate that only a small percentage, as low as 11 percent, of reforestation efforts have been successful (MOF 1986). The Southern Production Base will be an important source of timber for domestic use, but its major contribution will not begin until well into the next century. At the macro economic level, the extent to which China's economy is able to raise foreign currency will also impact its ability to meet domestic forest products demand with foreign imports, particularly from market-based economies. The recent rise in international log prices has reduced China's ability to compete for log purchases from market-based economies except for the lowest log grades. Since wood products do not earn foreign exchange, rather they utilize it, timber and forest products purchases from market economies will take lower priority. Raw materials and other products that would support industries which will earn foreign exchange are more likely to receive incentives to allow imports.

As a result of the above factors, the outlook for China's forest sector is one of short-supply. Recent estimates by Guo et al. (1994) indicate that even when substitution effects are
considered, there will be a shortfall of over 30 million cubic meters early into the next century (Table 2). It is not clear how this supply will be met. Two factors to consider are: processing capacity in the Northeast will most likely decline due to low investment priority and dwindling resource base; the comparative advantage that China possesses is in its labor force. As a result, one would expect to see China develop plans to attract joint ventures from overseas to replace aging processing capacity in the Northeast. It is likely that this processing capacity will be promoted in the southeast to meet domestic demand and a limited export market to capture foreign exchange.

<table>
<thead>
<tr>
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<th>2000</th>
<th>2010</th>
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<tbody>
<tr>
<td>Domestic Supply</td>
<td>241.4</td>
<td>247.7</td>
</tr>
<tr>
<td>Imports</td>
<td>30.7</td>
<td>42.3</td>
</tr>
<tr>
<td>Total Supply</td>
<td>272.2</td>
<td>290.0</td>
</tr>
<tr>
<td>Demand</td>
<td>307.0</td>
<td>323.0</td>
</tr>
<tr>
<td>Gap</td>
<td>34.8</td>
<td>33</td>
</tr>
</tbody>
</table>

Table 2. Outlook for China's supply and demand of wood products in roundwood equivalents (million cubic meters; Source Guo et al., 1994)

THE FORMER SOVIET UNION'S TRANSITION TO A MARKET ECONOMY

In contrast to China, the Former Soviet Union is faced with a different set of policy development questions. In some respects there are similarities between the two nations: the question of capital investment and how to meet domestic demands. However, the principal task confronting the republics of the Former Soviet Union is how to restore its rapidly deteriorating harvesting and processing capacity. This is particularly true for the western region of Russia, the former European and Asian Republics. A recent analysis of the capital stock in Former Soviet Union illustrates the need to provide incentives to attract capital investments to service both the domestic and international markets.
A recent study on the effect of a declining capital stock on the outlook for the former Soviet Union's forest sector illustrates the importance of developing policies to attract adequate investments in the sector. The study produced results that suggest substantial declines in log flows in the former Soviet Union forest sector will occur if current neglect of the productive capacity of the forest sector is overlooked.

Figure 3 illustrates the baseline outlook for log production, consumption and trade for the western region of the Former Soviet Union. The figure also illustrates harvesting capacity as a declining function of time. The assumption for capacity development is that this capacity will decline 5 percent annually. Under this scenario, total roundwood production is limited by the available capacity by 2000. Imports of roundwood from the eastern region of the former Soviet Union occur to replaced log flows lost in the western region, but the imports are also impacted by declining capital stocks in eastern Russia. Imports begin to decline after 2003.

Figure 4 illustrates the development of log flows in the eastern region of the Former Soviet Union. Only log exports to international markets are maintained under the scenario of zero investments.

The decline in log flow in the western region reduces coniferous sawnwood production (Figure 5). To meet its domestic demand, more lumber imports from the eastern region occur but level off as processing constraints in the eastern region limit the production capacity prior to the turn of the century (Figure 6).

The results of the above scenario analysis indicate that without investments in maintenance and replacement, the capital stock will become inoperable and obsolete preventing any expansion in harvest flows to occur. The deterioration of the capital stock will reduce log production, first in the western region of the Former Soviet Union, where demand is strongest, followed by a decline in log production in the eastern region. A similar outlook--declining capacity brought about by the passage of time and use--is expected for log processing capacity and other infrastructure used by the forest sector.

The eastern region of the Former Soviet Union acts as a marginal producer to supply the consumption needs of the much larger western domestic market. In addition, the eastern region will respond to international demands, but only to a small extent. Export licenses and inadequate infrastructure will control the amount of export logs--the principal export commodity--to international markets.

Sensitivity analysis on assumptions for domestic demand, transportation costs, trade and investment levels are presented in Table 3. The table indicates that altering the assumptions changes the constraining date in the western region only slightly. Even with an assumption that maintains capital stock at 1992 levels with adequate investments still results
Figure 3. Baseline outlook for log production, consumption and trade for the western region of the Former Soviet Union.

Figure 4. The development of log flows in the eastern region of the Former Soviet Union.
Figure 5. Sawnwood production consumption and trade in the western region of the Former Soviet Union.

Figure 6. Sawnwood production consumption and trade in the eastern region of the Former Soviet Union.
in a shortage of capital by 2008. Eliminating exports from the western region to other European countries, such as the Scandinavians would delay the date capital limits log flows by two years. Higher demand will exacerbate the capital shortage by two years.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Year that capacity constraint is binding</th>
</tr>
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<tbody>
<tr>
<td>High Demand (demand increase 3% annually)</td>
<td>1998</td>
</tr>
<tr>
<td>No exports allowed from either the western or eastern regions</td>
<td>2002</td>
</tr>
<tr>
<td>Investments in harvesting and processing capacity maintain capital stock at 1992 levels</td>
<td>2008</td>
</tr>
</tbody>
</table>

Table 3. Sensitivity analysis for the western region of the Former Soviet Union.

CONCLUSIONS

It is difficult to assess the outlook for two major forest products markets primarily because the supply and demand for forest products are determined by policy more than market factors. Nevertheless, the outlook for both the Chinese and Former Soviet Union forest sectors is pessimistic. A shortage of timber in China, a strong substitution policy and the lack of modern processing capacity will constrain demand growth for wood products in China. The outlook for imports from market economies such as the U.S. will depend on China's ability to raise sufficient foreign exchange and policies developed by trade ministries in China. Given the abundance of its labor resource, and its plans to establish a large production base in the Southeast region, product substitution in China will occur only if it is not able to commit foreign investments in processing capital within China through joint ventures. The relative lack of forest resources in China will also push investments towards wood-savings technologies rather than traditional solid wood processing.

The outlook for the Former Soviet Union is also dependent on policy development, outside investments within the region and political stability. The critical factor in the Former Soviet Union is not the supply of raw materials but the condition and availability of capital to harvest and process timber. Given the disarray of all sectors in the former Soviet economy, it does not seem likely that the forest sector will receive a high enough priority unless it is seen as capable to produce foreign exchange. As such, policies within the country must be
developed that stimulate and attract foreign and domestic investments. The development of such policies is likely to take several years as other issues take on higher priority. Additionally, the exportation of resources from the Russian republic is likely to be regulated by the government given the ability of this activity to secure foreign exchange.

LITERATURE CITED


