



Title	Timber Resources of the Am ur Region and tha Problem of their Effective Utilization
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Citation	Eurasian Journal of Forest Research, 10(1), 121-124
Issue Date	2007-03
Doc URL	<a href="http://hdl.handle.net/2115/24494">http://hdl.handle.net/2115/24494</a>
Type	bulletin (article)
File Information	10(1)_P121-124.pdf



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## Timber Resources of the Amur Region and the Problem of their Effective Utilization

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### Abstract

This study deals with the present state of the Amur Region's timber resources. The process by which we have reached the limit of these resources has been mostly structural in nature. A lack of modern technologies and a production base for value-added timber processing has determined the basic disposition of the timber industry of the region. Measures should be taken to change the forestry system, to better preserve and reproduce these resources.

*Key words:* Timber resources, Logging, Waste of timber, Timber Export, Amur, Russia

### Introduction

Ninety-four percent of arable land in Russia is covered by vegetation, of which 70.0% is forested and 45.0% is other wooded land, which makes it the fifth largest forested area in the world. According to government surveys of the Amur Region, the total forest area is 31.7 million hectares – 17.0% of the total forest area of the Far East. The Ministry of Natural Resources of the Russian Federation controls 30.5 million hectares or 96.9%. Another 3.1% belongs to agricultural enterprises, and 0.6% is in national parks. Government forest reserves still forested are 22.5 million hectares. Government controlled or managed forests in the Amur Region account for 62.9% of the total forest resources in Russia (adding forests belonging to other proprietors it increases to 64.0%) making the Amur Region the most heavily forested area of the country.

In this study, we describe the current status of forest resources in Amur Region and effort towards rehabilitation and restoration after harvesting there.

### Resources status

The total volume of timber resources of the Amur Region is 1.9 million m<sup>3</sup> and 30.0% is actually usable. The total includes a productive timber reserve of 788 million m<sup>3</sup> of which 695 million m<sup>3</sup> are coniferous species. There are 21.8 hectares of forest per capita and 1.9 thousand m<sup>3</sup> of timber. With a total annual cutting of 2.0 million m<sup>3</sup>, an average increase of 28.9 million m<sup>3</sup> per year. These figures indicate that timber resources in the Amur Region are not unlimited, but production has been increasing annually. Conventionally speaking this is true, but a more detailed analysis shows that the process of reaching the limit of such resources is structural in nature.

Firstly, timber resources are unequally distributed. The main logging areas are in the northern area of the Amur Region, but timber resources in this area are being exhausted and logging enterprises must move into less accessible and more undeveloped areas. As

logging shifts to the north and north-east, farther from developed areas with roads, production costs increase.

Secondly, there is a problem in the structure of timber resources. The volume of the most valuable industrial tree species, such as spruce, larch and pine, are being reduced absolutely and relatively. This change in species composition occurs when a specific species, for example conifers, are harvested within a given period of time and the number of soft timber species, due to their faster growth rates, increase. The factors influencing the reduction of the most valuable tree species are: natural causes, human activity and economic forces. Natural forest destruction is characterized by weather (floods, droughts), fire (10.0% are started by lightning), forest diseases, pest damage, etc.

Human activity is a second factor and the most important one is fire; people cause 90.0% of forest fires. The number of forest fires increased 1.7 times, and the area burned in the Amur Region increased by 3.4 times compared to 2005 (Table 1). Of the forest fires recorded in a state forest reserve in 2005 in the Amur Region, 75.0% of them were caused by human activity. Timber losses were estimated to be 10.1 million rubles (9.4 million rubles in 2004), and expenditures for fire fighting were 47.6 million rubles (31.1 million rubles in 2004).

Forest management effects the utilization of timber resources by reducing the volume of logging, which affects the amount lumber delivered to consumers. We should mention the fact that the region's development follows the timber industry. Logging leads to roads, the building of industrial enterprises, oil and gas pipeline construction, farming, and mining. There is even the creation of state forest reserves as well. Actually, state forest preserves are the main conservation areas in the Amur Region. The condition of forested lands that have been returned from temporary use by industry is extremely unsatisfactory.

Effectiveness of financial innovatory methods in the field of forest protection is extremely low, that's why

forest restoration expenditures do not exceed 0.12-0.30% of the country's gross domestic product (GDP). The result of this style of management is rapid degradation of forest resources with no more than 50-60% of forests destroyed during industrial logging being restored.

Table 1. Forest fires in Amur Region.

	Years					
	2000	2001	2002	2003	2004	2005
Number of forest fires	597	438	766	744	192	332
Forest areas subjected to fires, thousand hectares	192.8	53	153	192.8	9.5	31.9
Burnt and damaged timber (thousand m <sup>3</sup> )	1285	670.5	1171	1087	88.8	226.3

### Effort for rehabilitation and restoration

To preserve forests in the Amur Region rehabilitation and restoration work is being done under a new law passed in 2005. This law replaced a program that ran from 2002-2005. According calculations done by this program forest restoration was to have been done on an area of 30.0 thousand hectares, which included sowing and planting on 3.0 thousand hectares, plus assisting natural restoration on 27.0 thousand hectares. Forest restoration work was done on 33.3 thousand hectares, 2.5 thousand hectares and 30.8 thousand hectares in Amur Region, respectively (Table 2).

Forest restoration relies mainly on natural regeneration (92.0%). There are several reasons negatively affecting forest restoration in the Amur Region. The total area of forest destroyed in 2005 was 8.7 thousand hectares of which fire consumed 7.3 thousand hectares (3.4% increase). Of the total area of forest destroyed 5.8 thousand hectares was coniferous forests (4.5% increase). Rational use of timber resources is in most cases determined by the harvesting method selected, which is influenced by technological standards, local conditions and available equipment.

### Harvesting

In the Amur Region up to the 1980s they did clear felling, and with this harvesting method the most valuable tree species were cut and low grade, rotten, broad-leaved timber remained in the logging area. Under these conditions from 45.0 to 92.0 m<sup>3</sup> of timber

Table 2. Forest restoration work in the Amur Region.

Years	Forest restored thousand hectares	Expense breakdown	
		Sowing and planting	Assisting natural regeneration of forests
2000	37.0	3.5	33.5
2001	33.8	3.5	30.3
2002	30.7	3.5	27.2
2003	30.9	2.9	28.0
2004	29.6	3.0	26.6
2005	33.3	2.5	30.8

per hectare was wasted. The majority of the timber (40.0 m<sup>3</sup>·ha<sup>-1</sup>) was left as stumps or trunk fragments, and another 30.0 m<sup>3</sup>·ha<sup>-1</sup> was uprooted trees. A high level of slash left in the logged areas makes it difficult to replant and raises fire danger. The use of multi-purpose machines such as the LP-49 feller-skidder not only causes terrible damage to the environment, but they are also responsible for great losses of timber. In separate logging areas where the LP-49 were used, up to 20.0% of trunks were destroyed by the feller-skidder. Less than 25.0% of saplings were preserved in these areas and as much as 92.0% of the area was destroyed during logging and transportation of the timber. Annual felling areas equal 80 thousand hectares, but forest rehabilitation work is carried out on only a third of it. Now we need new saving nature machines for logging.

The Tyinda district in the Amur Region (according to the Far Eastern Scientific Expedition organized by the USSR's state forest committee in August, September, 1989) is an example of horrific timber harvesting practices. Logging was done by a North Korean labor force that broke laws and ignored ecological requirements in taking the most valuable timber from hundreds of hectares of productive forests. In their wake they left vast areas treeless. At the same time hundreds of thousands m<sup>3</sup> of timber, mainly coniferous, was abandoned along the roads.

The largest logging enterprises in the Amur Region in 2005, based on overall production were "Tyindales" (36.5%), "Zeyskiy lesoperevalochniy factory" (27.0%) and "Taldanskiy lespromkhoz" (9.9%). The last two enterprises increased their volume of production over 2004 by 2.2% and 5.2%, respectively. "Tyindales" decreased 29.0% which impacted the economy of the Amur Region (Table 3). The cause was many of their leases expired in 2004 making it difficult for them to find a supply of timber.

Table 3. Main types of production "Logging".

	Actual value in 2005	Production index (% change)					
		2000	2001	2002	2003	2004	2005
Logging	-	104.9	116.1	121.5	99.5	95.5	87.4
Timber production	1165.0	-	121.5	121.3	106.6	91.9	98.8
Transportation. (thousand m <sup>3</sup> ).	1066.4	104.8	112.9	121.5	99.5	94.3	87.4
Commercial timber.	923.5	112.0	114.4	119.7	106.0	92.7	96.2

It would seem that as the volume of logging declines the more rationally the timber would be used, but that is not the case. Losses of different kinds are especially high in this industry. Overall 1/3 of timber is lost in natural production because as a rule the bark is lost (10.0% of the tree) boughs (12.0%) stumps (8.0%) (there are more pessimistic estimates). Also as result of clear felling (cutting coniferous species of trees, soft boreal species are destroyed – birch tree, aspen etc.),

and leaving slash makes it difficult for natural regeneration. In addition, there are large and direct timber losses connected with timber processing (shavings, sawdust, etc.).

As the result, we spend more on raw materials per unit in Russia than industrialized countries in the West. It has been estimated that in Russia for every thousand m<sup>3</sup> of transported timber 30.0 tons of paper and cardboard is produced, but in Canada it is 85.0 tons, in the USA -141 tons, and in Finland -201 tons. It is the same in the production of veneer. We produce 6.0 m<sup>3</sup> in Russia, but in Canada it is 10.0 m<sup>3</sup>, in Finland -13.0 m<sup>3</sup>, in the USA -37.0 m<sup>3</sup>. The value added is also a problem. For example, Russia is first in the world in timber resources (half of coniferous species are in the Russian Federation) second in timber production, third in veneer production, fourth in cellulose production, and eighth in paper production.

### Trade

The Amur Region's economic dependence on raw material extraction can be seen in the timber industry, with the dynamic development of logging in recent years, but the stagnation of timber processing. In 1995, logging occupied 57.0% of the timber industry, but in 2005 it had reached 80.0%. This process has been influenced by the development of a commodities market in timber and timber products in the Asia Pacific region. The demand for timber goods grows constantly, and this has led to an increase in timber exports to Japan, the Republic of Korea, and China. In 2005, 1227.1 thousand m<sup>3</sup> of timber was exported, which was 3.7 times more than in 2000, and 24.0% more than 2004. This is partly the result of higher world prices.

Exports of timber and timber products in 2005 increased by 33.8% in comparison to 2004 as the result of increases in world prices. One of the biggest importers of timber is China because they have implemented a domestic forest preservation program. This program prohibits logging near the sources of big rivers and logging in northeast China is limited for 50 years. To stimulate timber imports the Chinese government gave up its monopoly on timber imports and made imported timber and processed timber products duty free items. With China now the largest importer of Russian timber, the structure of the Amur Region's timber exports has changed and destroyed the balance of exports with Japan. The demand for timber products in the Japanese market decreased because the majority our exports are now round timber and the Japanese market needs processed timber and sawn timbers.

In 1995, export deliveries of timber to China were 5.8 thousand m<sup>3</sup>, and 282.2 thousand m<sup>3</sup> to Japan, in 2000 they were 187.0 thousand m<sup>3</sup> and 130.2 thousand m<sup>3</sup>, in 2004 they were 599.5 thousand m<sup>3</sup> and 329.1 thousand m<sup>3</sup>, in 2005 they were 944.0 thousand m<sup>3</sup> and 221.1 thousand m<sup>3</sup>, respectively. In the export of goods structure, timber and timber products made up 33.0% in 2000, 65.0% in 2001, 83.0% in 2002, 80.0% in 2003, 66.0% in 2004, and 58.0% in 2005. As a percentage

of the total volume of timber products processed ones in 2003 were 7.5%, in 2004, 5.1%, and in 2005, 1.6%. In addition, we supplied China with more than 8.6 million m<sup>3</sup> of wood-fibrous slabs (98.0% produced in the Amur Region).

Data provided by the Blagoveshchensk customs office show that Chinese timber buyers in the district centers of the Amur Region, such as Shimanovsk, Svobodny and others, have driven local businessmen away from the timber market, where not only buying but logging are characterized by numerous violations of logging laws. Today the majority of customs violations are connected with the timber trade. Investment in timber resource development is very low and can be explained by the quality of the timber and the dense plots far from communication lines and processing facilities. Taking into account all the facts it is necessary to change the timber export structure and focus on value-added processing in the future.

From an economic point of view, forests are mainly a source of raw materials. In spite of the vast reserves of timber in the Amur Region extensive logging is no longer viable. The only way out to meet the demands of the economy and the forest environmentalist is to transition to resource saving technologies in the forest industrial complex. Measures should be directed at changing the complete system of forest utilization, its preservation and reproduction.

It is necessary to introduce institutional changes in the way the government regulates the forest complex. One body should be created to coordinate the work of the forest industrial complex, but with a sharp division of authority between the Federal and Regional powers. The main point is to create legislative input in the forming of national forest policy: introduction of changes and amendments to laws related to forest taxation and budgets, for the purpose of creating a special fund to finance the forest industrial complex.

### Politics and perspectives

In regard to taxation policy, it is important to return part of the taxes collected from the different branches of the forest industrial complex as subsidies to promote innovation and cost reductions. As for the forest, and pulp and paper industries the main feature will be perfecting the tax structure. There are several steps that need to be taken. For example, tax credits for extra cost reductions, increasing the role of tax on profits, simplification of the taxation system, tax breaks for enterprises doing value-added timber processing. It is necessary to support all branches of forest complex especially working access using different kinds of taxation policies.

In the field of budget-credit policy it is necessary for the different branches of the forest industrial complex to conclude agreements with the government and commercial banks to create a specialized bank to finance the forest complex with control packet shares belonging to the government. It is also necessary to support credit cooperation. At the same time it is also necessary to pay attention to the social sphere and organizations and facilities being supported by the

forest industrial complex and restructure forest enterprises that are in debt.

In the field of customs policy it is necessary base the level of export duties on the amount of value added to processed timber products exported to the other countries and at the same time decreases the duties on imported machines and equipment for the logging, timber-processing, and pulp and paper industries.

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Table 4. Average export prices of non-processed timber (soft timber in logs).

Prices	Years					
	2000	2001	2002	2003	2004	2005
World. in \$ per m <sup>3</sup>	180.8	157.7	145.9	145.6	171.6	-
Russia. \$ per m <sup>3</sup>	43.4	43.9	44.8	48.1	56.0	-
Amur Region. \$ per m <sup>3</sup>	50.0	56.9	53.8	54.3	65.2	72.8

Note: - means no data were available.

Table 5. Amur Region timber product exports.

Index	Years					
	2000	2001	2002	2003	2004	2005
Export of all goods in \$. thousand	55854	65453	70749	76619	103289	157370
Timber and timber products in \$. thousand	18213	42358	58604	60924	67990	90952
Timber and timber products export. in thousand tons	291.2	624.4	917.9	979.9	890.7	1092.4
Unprocessed timber products. (thousand m <sup>3</sup> )	335.7	708.4	1029.5	1085.9	987.7	1227.1