



CHINA AND FOREST TRADE IN THE ASIA-PACIFIC REGION:

IMPLICATIONS FOR FORESTS AND LIVELIHOODS

中国与亚太地区国家林产品贸易研究

CHINA SOFTWOOD-LOG COMMODITY CHAIN AND LIVELIHOOD ANALYSIS:

FROM THE RUSSIAN FAR EAST TO CHINA

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Anatoly V. Lebedev,
Natalia Ye Antonova



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ACRONYMS

BAM – Baikal-Amur Main Railway Line

BROC – Bureau for Regional Outreach Campaigns

CIFOR – Center for International Forestry Research

DFID – Department for International Development (United Kingdom)

ERI – Economic Research Institute

RFE – Russian Far East

TOR – Term of References

VAT – Value-Added Tax

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INTRODUCTION

China has rapidly become one of the world's largest importers of wood. The volumes of logs, sawn wood, wood panels, and pulp and paper products shipped to China by producer countries in Southeast Asia, the Russian Far East (RFE), Siberia and other regions have grown especially sharply since China implemented a partial ban on logging in 1998. China's growing demand for wood products is driving deforestation and illegal logging throughout East Asia and the world. It is also influencing the livelihoods of forest-dependent people in these regions.

Forest Trends and the Center for International Forestry Research (CIFOR), with support from the United Kingdom's Department for International Development (DFID), are implementing a collaborative project entitled "Transforming China's Impacts on Forests in the East Asian Region: Strategic Market Intelligence for Sustainable Forests and Livelihoods". The overall goal of this project is to advance the transformation of China's growing demand into markets that improve livelihoods and enhance forest conservation in the East Asian Region.

From the middle of 2003 to the middle of 2004, three reports were prepared as a part of Phase One to cover the Russian part of the project:

- "Overall Structure of Forest Industry in the Russian Far East" by Alexander S. Sheingauz, Economic Research Institute (ERI), Khabarovsk;
- "Siberian and RFE Timber Market for China: Criminal and Official Technologies, Players and Trends" by Anatoliy V. Lebedev, Bureau for Regional Outreach Campaigns (BROC), Vladivostok;
- "Status and Trends in Forest Products Exports from the Russian Far East and Eastern Siberia to China" by Alexey S. Lankin, Pacific Geographic Institute, Vladivostok.

This working paper presents a subsequent study that outlines the Russian part of the timber market structure and its impacts on people's livelihoods in the RFE. As such, this report builds on the aforementioned reports, which focus on regional trade. This work includes two main components:

- (1) Identification and clarification of main Russia Far East-based commodity chains in the Russia-China softwood log trade, including both legal and illegal flows as well as an analysis of the most prevalent chains that represent the largest volume of wood exported to China.
- (2) Research and analysis of market structure and livelihood impacts of each link in these chains. Identification of leverage points in the chains and related policy opportunities.

Unfortunately, there is a tremendous lack of reliable market information and also no vision and strategy for harnessing these market forces for conservation and livelihood goals. Furthermore, although some experts believe that the Russian economy has gradually become more transparent and more legal, illegality remains extremely high. The very respected economist Professor Alexander Livshits, the former Economic Adviser and Finance Minister under Yeltsin, states that the portion of "grey" salary in the Russian economy accounted for 47 percent of the total in 2001 and 45 percent in 2003 (Livshits 2004). Thus, the official data of the Russian State Statistics Committee can be used as a basis for research, but it does not convey the full economic picture. Therefore, the authors have interviewed experts engaged both in differ-

ent branches of the RFE forest sector itself and in other related branches. To elicit frank answers, interviewees were made anonymous.

The study of the legal part of the forest sector focuses on Khabarovskiy Krai, which composes half of the RFE forest sector. For the study, ERI's authors used mostly official statistical data. However, as indicated, official statistical data are not very reliable, especially in the areas of production cost, labor payment, profits, and other financial indices that are linked with tax payment (discussed below). In such cases, the authors were forced to use both their own and other experts' estimates and check the facts indirectly. The interviewed experts included respected managers and scientists of both Khabarovskiy and Primorskiy Krai. Both legal but also illegal logging of both Krai were discussed.

The study of the illegal part, by BROK's author, concentrates on Primorskiy Krai, which has the highest criminality in the RFE forest sector and the tightest links with China's market. Central, forest-rich municipalities of Primorskiy Krai were selected as model areas to study the livelihood-based commodity chain in the illegal timber business, since illegal practices were born here around 10 to 15 years ago and have now reached an almost perfect organizational model. These forest areas contain a certain volume of commercial hardwood and softwood, which is now in high demand on the Chinese consumer market. The harvest of valuable species is highly restricted and sometimes banned, so that the high demand consumes any available timber and leads to illegal logging.

Unsurprisingly, ERI's and BROK's studies appeared to cross some limits and discussing legal and illegal activity in the interviews caused significant tension. Both studies are combined in this report and form the basis for some RFE-wide estimations in the concluding chapter.

The paper seeks to generate a good overall picture of the Russian portion of the commodity chain that supplies China's timber market with RFE softwood logs. The main purpose was not to provide a high-level of fine local detail. Quantitative estimates may be rough and "back-of-the-envelope" calculations and qualitative descriptions are very important due to the aforementioned problem with official statistics.

This working paper is devoted to softwood logs; however, it is usually impossible to separate softwood and hardwood operations. Thus, they were separated only where this was possible. This does not affect the final, overall picture. Where distinction was possible, it was done by differentiation of areas. In Primorskiy Krai and the southern part of Khabarovskiy Krai, where hardwood species grow, hardwoods are the main target of illegal cutting. In the other parts of the RFE, the main target of illegal operations is softwood species. The allure of illegality associated with hardwood is higher than that associated with softwood because the price of hardwood is 1.5 times or more than that of softwood. Hardwood yields more income, thereby better covering the risks. The concept study of Emily Harwell and Chris Barr (2004) was taken as a model for this paper's approach.

This working paper is written by Prof. Dr. Alexander S. Sheingauz, ERI, Khabarovsk (the analysis of the RFE overall and of Khabarovskiy Krai and integration of all of the paper's parts), Dr. Natalia Ye Antonova, ERI, Khabarovsk (the analysis of Khabarovskiy Krai), and Mr. Anatoliy V. Lebedev, BROK, Vladivostok (the analysis of Primorskiy Krai).

FOREST SECTOR TRENDS¹

The Russian economic upturn that began after the ruble devaluation in 1998 continues. It enables the Russian people to formulate mid-term social-economic targets. The target of doubling the Russian GNP by 2010, announced by President Putin in his message to Parliament in 2004, is considered as the basis of the goal to enhance the national livelihood. In Khabarovskiy Krai, the strategy to reach this goal was officially formulated as “to create opportunities for each person to be able to work to earn means for a well-deserved life” (Ishaev 2004).

An economic outline of the RFE forest sector was provided in the aforementioned reports of the first phase of the overall project. This chapter outlines some aspects of the state of the forest sector from the point of view of people’s livelihoods and local economic development.

Economic growth is reflected mostly in export-oriented industries, of which the RFE forest sector is one. The importance of the forest sector varies across different RFE provinces. It plays a significant economic role in the southern provinces (Table 1) where it constitutes a noticeable source of the population’s well-being. Moreover, its importance as a source of well-being in the southern provinces is growing, because the region’s forest sector is most concentrated in these provinces (Figure 1).

Table 1: Economic Significance of the RFE Forest Sector, 2001

Province	GRP*, mln US\$	Forest Sector Share (%)		Provincial Portion of Regional Forest Sector Output (%)
		of GRP*	of Industrial Output	
Sakha Republic (Yakutiya)	3430.0	0.4	0.8	5.2
Primorskiy Krai	2529.9	2.3	8.4	22.5
Khabarovskiy Krai	2809.9	4.9	11.1	53.7
Amurskaya Oblast	1331.7	1.6	10.8	8.2
Kamchatskaya Oblast & Koryakskiy Auton. Okrug	787.7	0.3	0.6	0.9
Magadanskaya Oblast	534.9	0.1	0.2	0.3
Sakhalinskaya Oblast	1651.6	1.2	2.9	7.8
Yevreiskaya Auton. Oblast	164.1	2.4	15.5	1.5
Chukotskiy Auton. Okrug	266.7	-	-	-
RFE Total	13506.4	2.1	5.3	100

Source: Author's calculations based on data in *Regions of Russia* (2003).

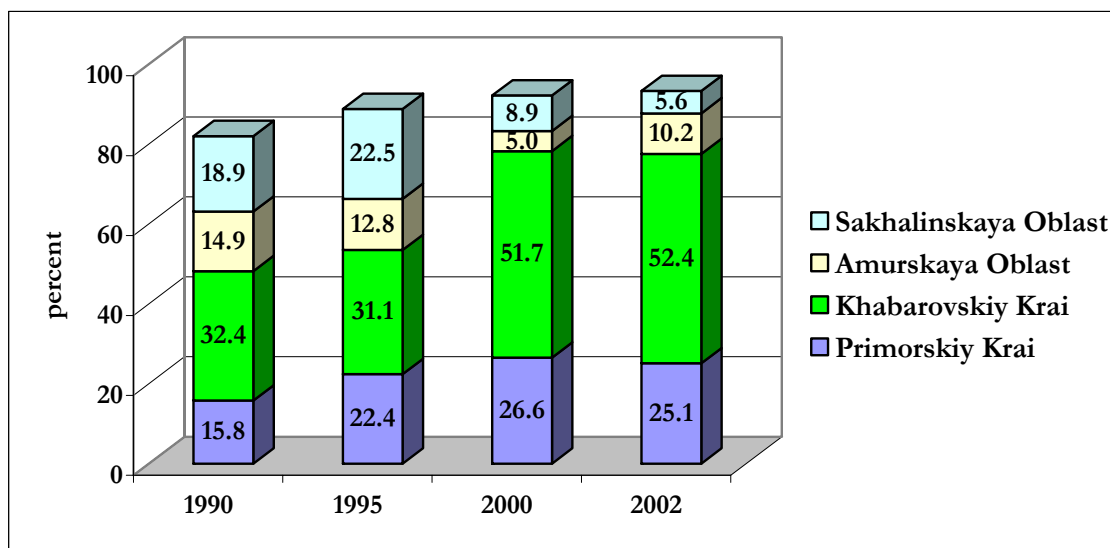
* GRP indicates Gross Regional Product, the “GNP” of a region or area of a country.

¹ This section is compiled with the use of L. Arzhaeva (2004), D. Davydov (2004), Industry (2003), Labor (2002), L. Panchenko (2004), *Regions of Russia* (2003), V. Shikhalev (2004a, 2004b), and A. Sidorenko (2004).

As can be seen in Table 1 and Figure 1, the forest sector of Khabarovskiy Krai accounts for more than half of the total capacity of the RFE forest industry. Its output in 2004 ranks third among the Russian logging provinces. Primorskiy Krai ranks 13th. In 2004, these provinces produce 8.0 and 2.8 percent, respectively of all Russian industrial round wood.

In 2002, the total product value of Khabarovskiy Krai's forest sector was US\$271.6 million (Table 2) and US\$319.1 million in 2003, an increase of 18.0 percent.² For the same years, investment in fixed assets in the sector was US\$47.7 and US\$55.7 million, respectively.

Figure 1: Share of Four Southern Provinces in RFE Forest Sector Output



Source: Author's calculations using ERI Database (2004).

Table 2 contains data from state statistics. According to official data of the Forest Industry Ministry of Khabarovskiy Krai, the profitability of the Krai's forest sector was higher than indicated in Table 2. The Ministry reported 32.8 percent for 2002 and 24.5 percent for 2003.

The significance of the forest sector in Khabarovskiy Krai's economy in 2003 can be described by its shares in the following categories:

- Industrial output – 11.4 percent;
- Investments – 17.9 percent;
- Personnel – 16.1 percent, or 20,000 people;
- Tax collection – 8.6 percent;
- Export value – 22.4 percent.

The forest sector's shares in investments, personnel and export value are significant, but the shares in output and tax collection are relatively weak because effectiveness of timber use remains very low. In

² US dollars are used as monetary units in this paper. Re-calculation of Russian rubles into US dollars is based on an average annual exchange rate.

short, the mode of timber use does not provide enough added value. Only 14.5 percent of industrial timber was processed in 2003 in comparison with an average 37 percent for Russia overall.

As a result, 1 cubic meter in Khabarovskiy Krai in 2003 generated an output of US\$46.5, less than in Primorskiy Krai (US\$64.7), Komi Republic (a European Province of Russia, US\$92.4), and the Russian average (US\$92.1). The high-value output of these other territories is due mostly to a higher degree of wood processing.

In comparison with lumber and other processed wood products, production and export of logs is not as profitable, but it demands much less effort than wood processing. This situation results in a strong emphasis on log exports over processed wood exports, a tendency which is aggravated by the huge capacity of the Chinese log market.

Table 2: Economic Indices of the Forest Sector of the Southern RFE Provinces

Index	Khabarovskiy Krai				Primorskiy Krai	Amurskaya Oblast	Sakhalinskaya Oblast
	1990	1995	2000	2002	2001	2001	2002
Forest sector output value (US\$ millions)	1.3	211.9	170.4	271.6	123.1	52.9	26.9
share of total industrial output, %	13.3	10.4	8.0	11.1	8.0	10.8	2.7
Output value of:							
Logging (US\$ millions)	0.7	123.8	154.7	249.1	...	...	...
wood processing, (US\$ millions)	0.4	71.1	15.1	22.2	...	...	...
pulp and paper manufacturing (US\$ millions)	0.2	17.0	0.6	0.3	...	...	...
Structure of forest sector output (%):							
Logging	54.0	58.4	90.8	91.7	...	...	...
wood processing	31.0	33.6	8.9	8.2	...	...	...
pulp and paper manufacturing	14.9	8.0	0.4	0.1	...	...	...
Profitability of forest sector (%)	...	...	13.2	12.3	8.8	...	-1.7
Forest sector personnel (1000 indiv.)	41.9	31.2	24.7	26.6	15.4	4.7	3.4
Specific output (US\$ thousands per capita)	0.03	6.8	6.9	10.2	8.0	11.3	7.9

Sources: Industry of Amurskaya Oblast (2004); Industry of Khabarovskiy Krai (2003); Industry of Primorskiy Krai (2002); Industry of Sakhalinskaya Oblast (2003), and authors' calculations.

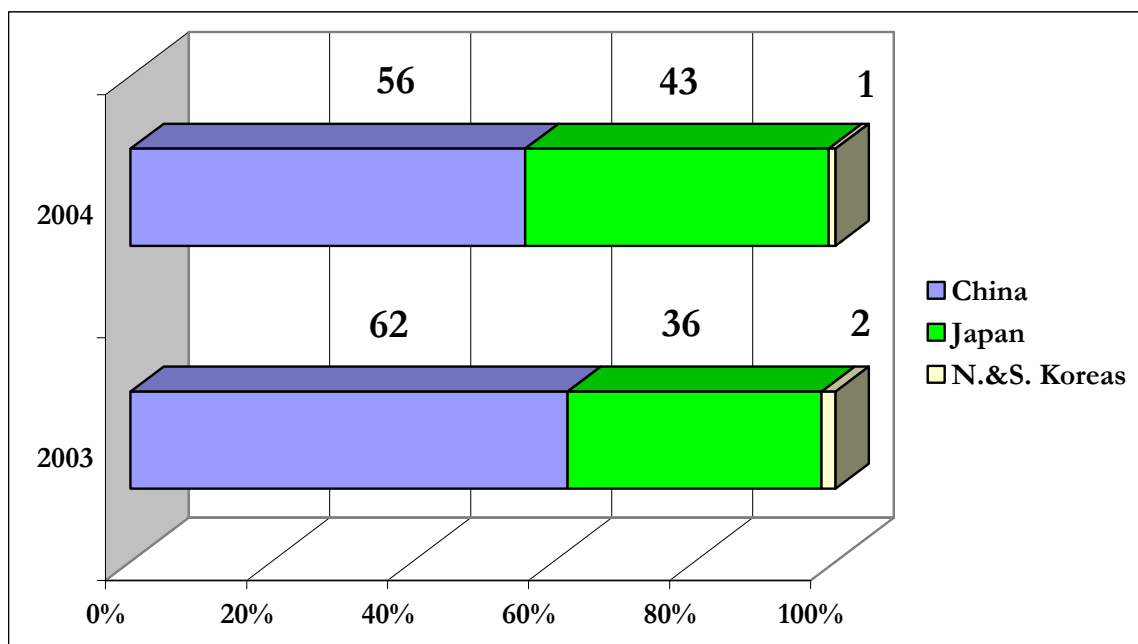
One more factor influences the domestic timber market. In the case of exports, the state returns the VAT to the seller, while in the case of domestic deliveries, sellers do not receive the returned VAT. Thus the profitability of domestic trade is lower than that of international trade.

In addition to the structural demands of foreign markets, the factors mentioned above result in a very poor use of growing wood stocks. According to officials' estimations, 2.0–2.5 million cubic meters of cut wood in the RFE remain unused at the cutting sites. In reality, as we indicated in our Phase One reports, this volume is up to 3.0–3.5 million cubic meters. Moreover, low processing efficiencies in the RFE result in only 30–35 percent of harvested timber entering processing facilities being used in final products.

Economic growth, especially the expansion of building and road construction, has increased timber demand in the RFE's domestic market. Today that market is estimated at about US\$50 million annually. However, it pales in comparison with the volume of timber exports. On top of that, higher export profitability gives rise to a supply deficit in the RFE's own interior forest market, which comprises about one third of RFE demand and is covered by products from other regions, mostly Siberia. An additional reason for the deficit is the low quality and narrow range of local timber goods.

Exports in 2004 are marked by growth of Japanese timber market demand, after some years of stagnation, and an increase in the Japanese share of total RFE timber exports (Figure 2).³

Figure 2: RFE Timber Export Structure by Country

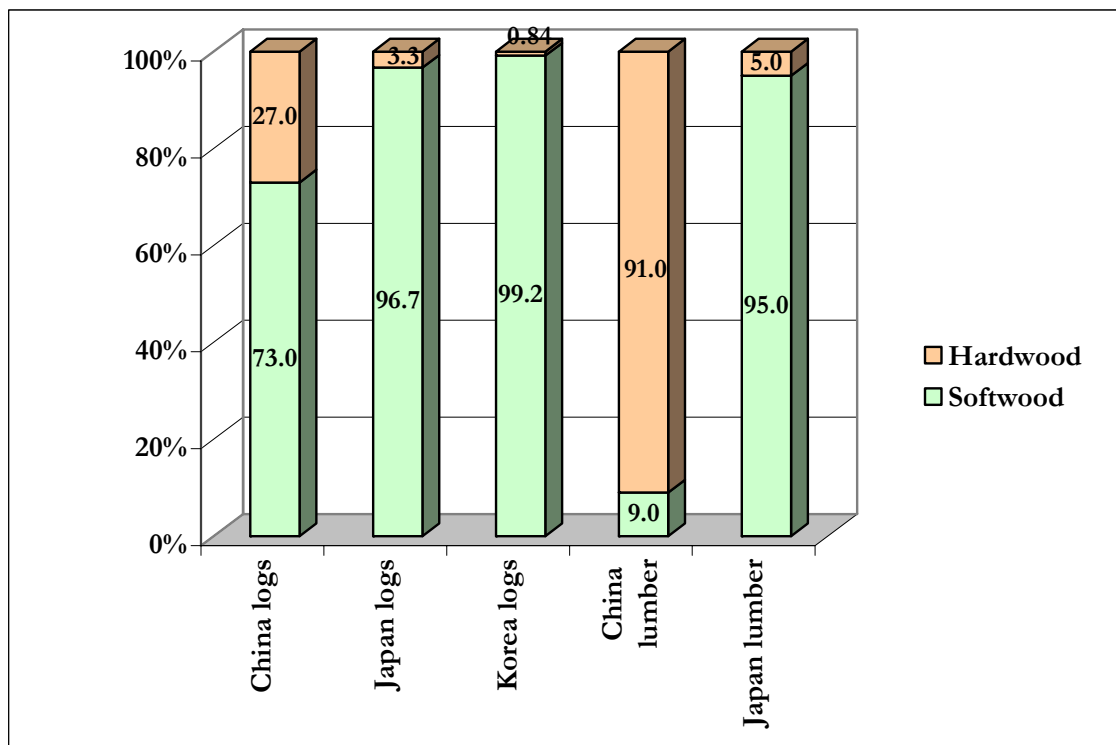


Source: Forest Industry Ministry of Khabarovskiy Krai (2004).

RFE exports to Japan and both Koreas consist almost completely of softwood timber. The export of RFE round wood to China includes about one third hardwood logs; and only one tenth of the export of sawn wood to China is softwood lumber (Figure 3).

³ Full-year exports for 2004 are estimates extrapolated from data for the first 10 months of that year.

Figure 3: RFE Export Structure by Tree Species, 2003



Source: Forest Industry Ministry of Khabarovskiy Krai (2004).

The share of hardwood in the legally harvested volume in the RFE is small – about 3 percent, i.e. 250,000 cubic meters. Interim cuttings yield an additional hardwood portion that is about 300,000 cubic meters. As Figure 3 illustrates, almost all of the hardwood volume goes to China; and hardwood accounts for about 10 percent of all forest product income from exports to China.

Other trends of Khabarovskiy Krai's forest sector are determined by the current forest policy of the Krai Government. The policy is focused on providing incentives for and even enforcements of an increase in wood processing.

The special law “On the Introduction of Coefficients to Minimal Rates of Stumpage Fees” (2003) was adopted by the Khabarovskiy Krai's Legislative Duma in July 2003. According to the law, all forest users whose share of processed timber in their total output is less than 30 percent must pay increased stumpage fees. Increasing coefficients, or multipliers, are applied in conformity with processing degree and tree species. In the case of zero processing, for example, coefficient magnitudes are up to 6.0 for regular tree species and 60.0 for cedar and linden. That is, if the user is not processing timber, the base stumpage fee will be multiplied by as much as 6.0 times for regular species and as much as 60.0 times for cedar and linden.

The Krai Government is now very active in negotiations for the establishment of new wood processing units, including projects such as pulp and paperboard and chemical-thermo-mechanical pulp plants.

TIMBER FLOWS

Commodity chains both influence and are influenced by their environment. On the one hand, overall timber flows are formed by the aggregation of various commodity chains, so that these overall flows reflect the specifics of the chains. On the other hand, each chain is influenced by external conditions (especially transport routes and border gateways) and reflects these.

Flows of timber for domestic consumption are much dispersed and relatively short. Only some of the largest RFE cities, with populations of at least 100,000, have significant domestic timber markets, which are supplied by neighboring districts.

Alexey Lankin's report contains data on gateway distribution of RFE timber flows. Findings, based on this report and other updated information, are listed below.

Exports of Khabarovskiy Krai's timber were distributed to the following gateways and destinations in 2003:

- Sea ports of Khabarovskiy Krai: mostly to Japan, partly to Southern China and the Republic of Korea – 43.0 percent;
- Railway station Grodekovo: linked with China's Suifenhe – 37.0 percent;
- Seaports of Primorskiy Krai: mostly to Japan, partly to Southern China and the Republic of Korea – 11.0 percent;
- By Amur River upstream: to China – 7.0 percent;
- By Amur River downstream (river/sea ships): to China and Japan – 2.0 percent.

Thus, 80 percent of timber volume goes through seaports located within Khabarovskiy Krai's territory and via Grodekovo railway station (Table 3). Information about the distribution of timber export from Primorskiy Krai by gateway was not collected for this study. However, many of the proportions are indicated in Table 3 with some clarifications given below.

The dominant portion of exports from Khabarovskiy Krai to China moves through Primorskiy Krai, especially Grodekovo station. The main part of exports to Japan and the Republic of Korea moves through Vanino seaport (in Khabarovskiy Krai). The Grodekovo station and Vanino Port are the two main gateways for Khabarovsk timber exports.

Table 3: Export of Timber Products Produced in Khabarovskiy Krai by RFE Custom Offices, 2003 (Percentage)

Custom office	Country-Importer			Total
	Japan	China	N. & S. Korea	
<i>Khabarovskiy Krai</i>				
Vanino	65.6	15.4	94.3	41.4
Khabarovsk	-	0.1	-	0.1
<i>Subtotal</i>	<i>6.6</i>	<i>15.5</i>	<i>94.3</i>	<i>41.5</i>
<i>Primorskiy Krai</i>				
Grodekovo	-	82.5	-	44.2
Vladivostok	11.2	1.3	2.6	5.1
Nakhodka	12.2	-	1.7	4.7
Khasan	10.7	0.6	1.4	4.4
Ussyriysk	-	0.1	-	0.1
<i>Subtotal</i>	<i>34.1</i>	<i>84.5</i>	<i>5.7</i>	<i>58.4</i>
Others (Sakhalin)	0.3	-	-	0.1
Total	100	100	100	100

Note: The table contains central offices that supervise several border custom points.

Source: Forest Industry Ministry of Khabarovskiy Krai (2004).

The main timber flow from Khabarovskiy Krai to China is carried on the railroads (Figure 4). Table 4 shows that originating shipments are very dispersed and encompass 47 stations. The top 3 stations are located on the Baikal-Amur main line (BAM); and their loads together amount to 28.2 percent of total railroad flows. The next two stations (4 and 5) belong to the Trans-Siberian Railroad, but the remaining stations 11 are also on the BAM.

Figure 4: Softwood Moves along Trans-Siberian Railroad near Khabarovsk Station, October 2004



Source: Natalia Antonova (2004).

Table 4: Timber Flows via Railroad in Khabarovskiy Krai, 2003 (Percentage)

Originating Office	Terminal Office				Total
	Grodekovo	Vanino	Bol'shoi Kamen'	Other 10 stations	
Gorin	6.8	1.4	0.3	1.7	10.2
Vysokogornaya	0.2	9.4	-	0.02	9.6
Postyshevo	6.0	0.8	0.5	1.1	8.4
Khabarovsk-2	6.4	-	-	0.1	6.5
Khor	6.5	-	-	0.1	6.5
Dzemgi	2.4	1.4	0.3	0.2	4.2
Khurmuli	2.6	0.3	0.2	0.5	3.7
Suluk	1.3	0.2	0.3	0.9	3.4
Evoron	1.9	0.7	0.3	-	2.8
Kenay	0.4	2.0	0.0	0.4	2.8
Bolen	1.4	0.7	0.6	0.1	2.7
Other 36 stations	22.9	12.2	1.0	2.8	39.1
Total	58.7	29.1	3.4	7.9	100.0

Source: Khabarovskiy Krai Government (2004).

The terminal stations for Khabarovskiy Krai exports are more concentrated. Three stations account for 91.2 percent of railroad timber flow and more than half of the railway timber flow passes through the main gateway to China – Grodekovo station. A part of timber that goes through other stations adjacent to sea ports is also directed to China. In fact, it is possible to state that at least two thirds of the timber that flows along the railroads from Khabarovskiy Krai goes to China.

The same railroad gateways to China are used by exporters of Primorskiy Krai, Amurskaya and Yevreyskaya Autonomous Oblasts, and Sakha Republic (Yakutiya).

Railway timber traffic encounters some problems. One of them is a lack of railway cars, a longstanding problem which surprisingly has not been solved. Another specific problem is the insufficient carrying capacity of Grodekovo station. While the link to China's Suifenhe station was reconstructed and developed to a very large degree in recent years, the capacity of Grodekovo was not developed adequately. It is being anticipated that within the next few years, an increase of more profitable oil and metal export traffic will force out timber traffic from Grodekovo, so that the latter will shift to another border railroad passage, for example the nearest idle passage, Kraskino (Kamyshovaya) – Hunchun, or to seaports.

The Amur River traffic is also directed mostly to China, including the entire upstream traffic. This upstream traffic even includes exotic passages that begin in the seaports of Lazarev, De-Kastri, and Siziman (all in Khabarovskiy Krai) and move to the Amur River, partly with ships of the type “Sea-River” and partly with reloading onto river barges in the Nikolaevsk-na-Amure river port located at the Amur River mouth (Figure 5). The river's downstream traffic is directed to both China and Japan.

Figure 5: Softwood on a Barge for China Export in the Khabarovsk River Port, July 2004



Source: Natalia Antonova (2004).

In 2003, shipments to China via the Amur River were 351,100 cubic meters upstream and 597,800 cubic meters downstream. For 2004, the expected volume is 267,000 and 770,000 cubic meters, respectively. One of the main Chinese timber river ports is Fuyuan, about 60 kilometers upstream of Khabarovsk City.

The river timber traffic faces the problem of a lack of river-sea ships (ships designed for both river and ocean travel). One of the reasons for this is the more profitable freight rates for shipping from the seaports of Primorskiy Krai. To solve the problem, big companies try to get long-term contracts for ships. For example, the companies *Dallesprom* and *Smena-Trading* each have had 4 ships of the Amur-River Ship Company on a long-term contract. In this way, the logging companies can be assured that they will have access to the ships on an on-going basis and the shipping companies can be certain that their ships will be continuously busy or that idle days will be paid for by the logging companies.

Timber exported from Primorskiy Krai by sea leaves the country through about 20 different ports. In 2003, 87 percent of Primorskiy's sea exports moved through the top five ports: Nakhodka (54 percent), Vostochniy (14 percent), Vladivostok (10 percent), Plastun (5 percent), and Bol'shoy Kamen' (4 percent).

Exporters of Amurskaya and Yevreyskaya Autonomous Oblasts use Amur River transportation widely, while Sakhalinskaya and Kamchatskaya Oblasts can export timber only through seaports.

Exporters of Khabarovskiy, Primorskiy Krai, Amurskaya and Yevreyskaya Autonomous Oblasts move timber across the border with timber trucks, especially during winter when ice roads across the Amur River are opened (Figure 6).

Figure 6: Winter Timber Transportation by Trucks, Lazo Raion, Khabarovskiy Krai, 2001



Source: Lazo Raion – 60th Anniversary (2001).

COMMODITY CHAINS

Before the end of the planned economy era (mid-1980s), all of the main logging firms (*lespromkhozhes*) that were state enterprises had similar commodity chains. Felling was fulfilled by crews that consisted of 5 to 7 people equipped with 1 skidder and 2 to 3 power-saws. In the case of very steep mountain slopes, there was 1 bulldozer for 1 or 2 crews. Each crew delivered harvested trunks by a skidder to (within 100 to 300 meters of) a forest depot (in Russian called an “upper yard”). Tree crowns could be removed either directly at logging sites or in forest depots (often with loppers). Tree trunks were then transported on timber trucks from within 100 kilometers of the forest depot to an industrial log depot (in Russian called a “lower yard”). Industrial log depots were located adjacent to either railway stations or river/sea ports. In the industrial log depots, tree trunks were cut into logs which were loaded onto ships or railway cars. All machines operated within a timber commodity chain belonged to the logging enterprise. Enterprises were not responsible for timber after its loading onto ships/cars. Special state bodies provided delivery and trade services to domestic and foreign markets.

Fundamentally, the same commodity chains can be found in the main logging companies which provide 80–85 percent of harvested timber volume. The following changes, however, have occurred:

- About 25–30 percent of felling crews are based not on a skidder but on a harvester and forwarder. Consequently, there is a lower number of crew members and it is more important that trunks are cut into logs directly at the felling site. This has significantly changed timber use and the ecological situation.
- Some logging firms now hire special transport firms to deliver logs from the forest depot to the industrial log depot.
- Cutting trunks into logs has simplified and reduced the price of equipment needed at industrial log depots. When logs are delivered to the customer or the border by trucks, such a depot is no longer necessary.
- Big logging firms are now responsible for delivering timber to the trader or consumer, even abroad, so they are hiring out and even buying ships and railway cars. The use of timber trucks to fulfill transport tasks has become normal.

The commodity chain that provides the largest part of softwood timber from the RFE, including exports to China, is illustrated in Table 5.

Table 5: Type 1 – The Complete Commodity Chain for Big Logging Companies

Phase Number	Phase Description	Executors
1	Field allocation of cutting areas, stumpage fee payment, obtaining of permit documents, preparation of cutting areas: camp establishment, skidder/harvester route clearing etc.	Forest Service officials, logger's representatives, auxiliary crew
2	Felling operations, cutting tree trunks into logs, moving timber to forest depot	Felling crew
3	Cutting tree trunks into logs in the case of removal of trunks from cutting area as a whole, loading on timber trucks	Forest depot crew or felling crew
4	Transportation from forest depot to industrial log depot	Logger's transport division or hired transport firm
5	Log handling, sorting and piling, loading onto vehicles/ships	Industrial log depot crew
6	Transportation to consumer/trader, custom formalities in case of export abroad	Logger's transport division or hired transport firm

The second most important commodity chain according to timber volume encompassed is the chain provided by traders (Table 6). The red line in Table 6 signifies a shift of loggers' responsibilities to traders. The number of loggers involved in such a type of commodity chain can vary within a very wide range. In the case of small loggers, this "Type 2" chain can be modified by elimination of the forest depot and, consequently, exclusion of phase 3.

Table 6: Type 2 – Trader's Commodity Chain

Phases					Executors
1st logging firm		2nd logging firm		...Nth logging firm	
As 1 of Type 1		As 1 of Type 1		As 1 of Type 1	Mid-size and small loggers
As 2 of Type 1		As 2 of Type 1		As 2 of Type 1	Mid-size and small loggers
As 3 of Type 1		As 3 of Type 1		As 3 of Type 1	Mid-size and small loggers
As 4 of Type 1		As 4 of Type 1		As 4 of Type 1	Mid-size and small loggers
Phase 5					Dealers and trader's industrial log depot crew
Log purchase or/and taking of logs on commission, log handling, sorting and piling, loading onto vehicles/ships					
Phase 6					Trader's transport division or hired transport firm
Transportation to consumer/trader, custom formalities in the case of export abroad					

There also exists some modification of the Type 2 chain when timber purchasing takes place not at the industrial log depot but in the cutting area (this is especially typical for Chinese traders). In such a case, the red line of the Type 2 chain shifts to a position between phases 2 and 3, and phase 3 is often eliminated.

In addition, some large loggers have become traders in parallel with their basic activity. They buy or take on commission timber of mid-size and small loggers. In such cases, phases 5 and 6 of the Type 1 chain take on the functions of the same phases of the Type 2 chain.

Phases 4 and 6 of the Type 1 chain have many versions. The biggest logging firms (*Flora* in Khabarovskiy Krai, *Terneyles* in Primorskiy Krai) have their own transport divisions and use hired transport only for the last leg of transport on freight ships or railroad cars. Sometimes, such firms have established a transport subsidiary. For example, *Flora Co.* has established *DV-Express Co.* for timber transportation.

In the last couple of years, big firms have begun to purchase railroad cars and ships. At the end of 2004, the forest firms of Khabarovskiy Krai had 11 of their own timber ships.

Mid-size and small loggers have neither their own transport means nor enough transport capacity. Therefore, they usually hire specialized firms for transport both in phase 4 and especially for phase 6 in the Type 1 chain.

The specific situation with regard to illegal forest activity must be considered separately. Illegal chains are very similar to legal types in terms of technology. Typically, illegal chains are of Type 2, i.e. they are fulfilled via traders. Traders with their industrial log depots have opportune capacity to launder illegal timber. Illegal loggers try to shorten the chain as much as possible because it is very important to them to cut working time and to involve fewer people. They aspire to exclude phase 3. Especially important for them is phase 5, because small industrial log depots are the very places where illegal timber is “laundered” by mixing it with legal product. Undoubtedly, no silvicultural or social regulations are obeyed during illegal logging operations.

ACTORS IN THE CHAINS

GROUP A – LARGE AND MID-SIZE LOGGERS

The main actors of all chains are logging enterprises. In 2004, 90 percent of Khabarovskiy Krai’s harvested timber was produced by 153 enterprises that have long-term (20 years or more) lease agreements; the other 10 percent was produced by about 400 enterprises, mostly of small size (Table 7).

Table 7: Number of Enterprises in Khabarovskiy Krai

Index	1990	1995	2000	2002
Industry enterprise number, total	1813	2199	2337	2158
Forest sector enterprise number, total	484	445	644	644
including: logging	200	168	540	558
wood processing	282	275	98	82
pulp and paper production	2	2	6	4
Share (%)				
Forest sector in total industry	26.7	20.2	27.6	29.8
Logging in the forest sector	41.3	37.8	83.9	86.6
Wood processing in the forest sector	58.3	61.8	15.2	12.7
Pulp and paper in the forest sector	0.4	0.4	0.9	0.6

Source: *Industry of Khabarovskiy Krai (2003)*.

According to the share of forest enterprises in Khabarovskiy Krai's total industrial output, the forest sector is one of the main components of the local economy. In addition, such enterprises are found in most of the Krai's territory because they are operating in almost all forest settlements. Dividing these enterprises into logging and wood processing is not very relevant because many of them have both logging and wood processing capacity. It is also impossible to single out enterprises that deal exclusively with either softwood or hardwood. The operating style of large and mid-size enterprises on the one hand and small enterprises on the other are different. Large and mid-size enterprises follow the law closer, are more transparent and maintain a more consistent reputation.

The top ten softwood exporters of Khabarovskiy Krai in 2003 were (listed in decreasing order): *Flora*, *Rimbunan Hijau DV* (a Malaysian company), *Dal'lesprom*, *Smena-Trading* (only trades, without own logging operations), *Rimbunan Hijau International* (a Malaysian company), *Arkaim* (a joint venture), *Shelekhovskiy KLPKh*, *Suluk*, *Vaninolesexport*, and *Amgun*. Together, these provided 58 percent of the Krai's softwood exports.

Flora, *Rimbunan Hijau DV*, *Rimbunan Hijau International*, *Arkaim*, and *Shelekhovskiy KLPKh* – are all loggers and traders simultaneously. The major company *Flora* has good growth dynamics. During the last couples of years, it has increased its output by US\$1–1.5 million annually. It was established in 1991 as a holding company, along with some former state logging enterprises (*lespromkhozes*) located along the Baikal-Amur railroad to the west of Komsomolsk-na-Amure (*Flora's* residence): *Evoronskiy*, *Gorinskiy*, *Amgun*, *Duki* etc. *Flora* exported 713,000 cubic meters in 2001, 744,000 cubic meters in 2002 and 694,000 cubic meters in 2003. About 70 percent of exported timber is produced by the holding company's enterprises; the rest is commissioned.

Flora exports timber to Japan through the seaports of Nakhodka, Vladivostok, and Bol'shoi Kamen'. All of its exports to China go through Grodekovo station. *Rimbunan Hijau* exports 70 percent of its output to China, all of which passes through Grodekovo. *Shelekhovskiy LPK* ships its timber to China upstream along the Amur River and to Japan downstream along the river. In 2003–2004, the new big exporter and trader *Yumax-DV* appeared on the lower part of the Amur River.

Firms of this group determine a significant part of the Khabarovskiy Krai's forest policy. They work most closely with the Krai's authorities and bear the burden of social support of the Krai's main forest settlements.

The enterprises of this group try to introduce new equipment, understand the necessity of obeying ecological regulations, etc. At the same time, their up-grading has very negative influence on the forests.

GROUP B – SMALL LOGGERS

Khabarovskiy Krai's government takes a very ambiguous stand in the case of small forest businesses. On the one hand, it has special programs to support small business in the Krai. On the other, it proclaims its goal of enlarging logging enterprise to make forestry more transparent, less criminal, and more controlled.

Table 8 demonstrates how these conflicting approaches have produced controversial results. Most of the indices included in Table 8 have increased. Only the share of output value of small forest businesses in the total output value of the forest sector decreased, while the absolute value of small business output has increased.

Table 8: Small Businesses in Khabarovskiy Krai's Forest Sector

Index	1995	2000	2002
Enterprise number	173	458	500
Share of the total forest sector enterprise number (%)	38.9	71.1	77.6
Output value, US\$ millions	16.1	39.8	57.2
Share of output value of forest sector small businesses in:			
Total output value of small industrial businesses	17.6	42.3	49.7
Total output value of the forest sector (%)	7.6	24.2	21.0
Personnel, persons	2477	6605	8010
Share of small business personnel in total forest sector personnel (%)	7.9	26.7	30.1
Average personnel per enterprise	14.3	14.4	16.0

Source: Industry of Khabarovskiy Krai (2003).

It is hard to exert control over the enterprises of this group. Usually they use old technologies which forsake ecology and have obsolete equipment. As a rule, their operations have a very negative impact on forests. These enterprises alone provide the majority of illegal logs.

For example, in Primorskiy Krai, in *Krasnoarmeyskiy Raion* (a district of the Krai), small logging and timber business is based upon privatized old equipment of failed enterprises and some former military self-loading trucks and tractors. Through the mid-1990s, an army of such equipment was distributed more or less equally among privatized logging companies and private owners, where until recently it could be found next to many houses in all the forest towns like *Novopokrovka* (the Raion center), *Roschino*, *Izmailikha*, *Glubinnoye*, and *Limonniki*.

In the case of small enterprises, all the machinery and transport operations for taking timber out of the forest are provided by the loggers themselves. The only exceptions may be seen in the most sophisticated modes of illegal logging, when it is conducted by a member of the official leaser on the leased area or next to it, with the use of the company's logging and loading equipment, but with the goal to privately extract some extra timber to supplement official wages. Such operations may be unofficially adopted by the company, which thus would share a cash profit. Moreover, timber may be transferred to wholesale storage by a truck rented with some friends. The combination of illegal operations has many different models and is usually based on the most trustful relationship between partners, since there is no contract or signatures on the price of timber, its volume, or the size of each share in the consignment. One of the core criteria in this model of collaboration is that at least one player of the group has an official logging permit, which is needed to export logs. Even though its data does not often fit the real condition and volume of timber on the truck, it is much better to have the permit for unfriendly inspectors on the road than to have nothing. In addition, the price paid by the next link of the chain is obviously higher if there is a logging permit.

For example, in the Krasnoarmeyskiy Raion, the illegal logger Gennadiy has a logging crew of 16 people. He also has a shop and bakery (4 staff), one carpenter, a garage (10 staff) and 4 more employees as administrative staff. In addition to 36 permanent employees, he has about 10 to 15 temporary staff. He became an illegal logger when the Raion authority took away his official license and left 18 people unemployed. Now these people are waiting for a governmental decision, being registered as unemployed (and receiving a stipend of about US\$20 a month), and are providing subsistence for their families through illegal logging. Gennadiy also used to keep a bee-garden but when the honey price dropped, he moved to the more profitable timber business. Currently, he has several legal forest leases containing unmarketable timber. Therefore, he is logging illegally in the neighboring areas. The key task for him in this operation is to get timber out of the forest. He already has all the necessary documents for road control. No one will seriously check the origin of his timber.

Small enterprises are the least transparent. They may use simple bookkeeping. They pay most parts of wages without any records and provide many payments in cash without any documentation. Therefore, most of them are not very law-abiding and are linked to criminal activity. Yet at the same time, small enterprises are the main providers of livelihood opportunities in remote depressed settlements.

GROUP C – TRADERS

As mentioned above, many logging firms are engaged in timber trading and even commissioning. However, there are “pure” traders who buy logs from different parties, mostly mid-size and small firms. The top trader in the RFE is *Smena-Trading*, which exported 542,000 cubic meters in 2003, 61 percent of which went to China. The Chinese share of this company's trade decreased to 56 percent in 2004.

However, most traders do not have a large sales volume. According to customs statistics, in Khabarovskiy Krai there are 300 timber exporters whose annual trade volume is under 100 cubic meters; 200 of these sell both softwood and hardwood.

Small traders work only with China (they cannot work with Japan or South Korea, because they cannot load a sea ship with their small timber volume.) Furthermore, some small traders operate openly as Chinese entities. In addition, a large portion of small traders have official Russian status but really operate

with Chinese capital. Small traders buy timber directly in the forest or in the remote small settlements and stations, without any operations such as log piling, sorting, etc. They buy full-car shipments without any log selection.

The enterprises of this group do not have a direct influence on the state of the forest, but the structure of their orders impacts the nature of harvested timber. Their social role has multiple dimensions, one of which is that small traders are “laundering” illegal timber by mixing it with legal products.

GROUP D – TRANSPORT FIRMS

Transport firms are omnipresent because transportation is a main link in timber production and trade. Even such large-scale exporters as *Rimbunan Hijau* and *Arkaim* hire transport firms. As mentioned, *Flora* has established the transport subsidiary *Express-DV*.

At present, timber transport has become a competitive field, especially in vehicle sales and leasing. Not only local but also Moscow firms take part in the competition. One such competitor is the Moscow firm *Transgarant* that provides service to *Arkaim Co.* In parallel, there are many very small firms, sometimes with 1 or 2 timber trucks, which work as freelancers, although they also have customary areas and logger clients.

The enterprises of this group do not have significant impact on either the state of the forest or on the social structure of the surrounding settlements.

GROUP E – EMPLOYEES

Heterogeneity of the group of employees in the sector is the same if not greater than that of previous groups. This group contains managers, clerks and workers. Each subgroup is also diverse. For example workers consist of power-saw operators, operators of harvesters and forwarders, auxiliary workers, tractor drivers, truck drivers etc.

In addition, new diversification has arisen among workers. Local workers used to be masters of the situation, but now face competition from migrants. Local workers live in the place they work for many years, many of them having been born there. They know the local natural environment and are closely connected to community members. However, they represent a not very reliable labor force, partly because of alcoholism and partly because of weak self-discipline.

Migrant workers (a minority of all workers) embody another type of behavior. It is possible to mark out two basic clusters of migrants. The first is Ukrainians from the forested, western mountainous region of the Ukraine (“*gutsuls*”). The second cluster consists of Chinese workers. Both clusters come to earn as much money as possible, and thus work hard without any time limits and rarely a day off. They strongly adhere to prohibition of alcohol, and are a very disciplined and reliable labor force. Ukrainians as a rule work under individual contracts, while Chinese come in cooperative groups with their own chieftains, who hold the contracts for their groups as a whole.

In Amurskaya Oblast and in Verkhnebureinskiy Raion of Khabarovskiy Krai, there are North Koreans workers from groups that had worked under the intergovernmental agreement between the former USSR

and DPRK. They are completely ignorant of Russian laws and rules, as well as interests of the local community. Living in special camps, these Koreans clear out all of the surrounding forests together with illegal Chinese migrants, removing not only timber, but also all of the wildlife, which is the basis of the local communities' livelihoods.

All members of this employee group work directly in forests. However, they are eager to earn as much as possible and to preserve their jobs. They are socially very passive and, aside from top managers, do not directly affect the state of the forest. They do, however, pursue the most profitable operating methods and try to avoid silvicultural-ecological restrictions.

GROUP F – FOREST SERVICE OFFICIALS

Forest Service officials are state employees and have a great degree of independence. Their role in establishing order should be very strong. Commodity chains are initiated when they allocate cutting sites, and must control subsequent phases in the chain, at least up to the industrial log depot. At present, unfortunately, local Forest Service personnel fulfill their responsibilities only to a very small degree, thus creating room for many administrative and even criminal violations. Their share of the local population is not big. For example, the town *Limoniki* has about 250 residents and only 10 of them work in the forest station.

As an example, the forest management in Krasnoarmeyskiy Raion is conducted by *Roschinskiy* and *Izmailikhinskiy leskhoz*es (offices of the state Forest Service), each having several *lesnichestvos* (forest stations). The *leskhoz*es keep all the information, state property rights and documents on their forests and forest leases, and databases and deliver the main logging permits. Having an official monthly salary not exceeding US\$80, a mid-level specialist of the Forest Service has practically unlimited rights within his/her territory to distribute forestlands for logging in favor of some companies or persons that are ready to unofficially share their profits with him/her. Alternatively, he/she can reject appeals for logging outright, forcing applicants into illegal operations.

A forester (the chief of the *lesnichestvo*) may close his/her eyes to any violations, if he/she is paid to do so. Furthermore, there is illegal timber, including banned species, which is sequestered either by Forest Service officials or by the militia (Russian police) and non-government anti-poaching brigades. However, often this timber arrives at the legal industrial log depots and then in China. At these depots, controlled by municipal and regional administrations, all timber arriving without documents is easily legalized. It is either mixed in with a bigger shipment of legal timber or supplied with fake documents prepared either in China or at the local Forest Service. Depot owners make shady payments to officials just to get the timber to their yards, and, if successful, add a share of profit to that payment. The price taken by different inspectors from sequestered timber – when it is sold – is always a matter of negotiation with other shady stakeholders, thus guaranteeing high stability of the whole illegal business. Corruption of Forest Service officials and other people who are designated to guard forests is one of the main underlying causes of the existence of illegal logging.

GROUP G – CUSTOM OFFICIALS

Custom officials are also state employees but are only involved at the end of exporters' chains. Their responsibility is the prosecution of any forest violations that can be identified through customs control. However, this charge is currently not strictly implemented.

GROUP H – ECOLOGICAL AND OTHER NGOS

Neither government nor businesses and investors pay enough attention to taiga resources, adding illegal nuance to all current logging activity, because of bad forest management and the marketing of these resources. Some NGOs try to resist such behavior.

Primorskiy Krai's Administration even initiated the creation of the *Association of Timber Producers and Exporters of Primoriye* (Primorskiy Krai) – *PALEX* – with one of the main goals being to exclude illegal operations from the Krai's forest sector. This association and other NGOs have either established or continue to maintain different groups/brigades aimed at hunting down illegal loggers and sequestering their timber. The brigades are both voluntary (especially those including students and other young people) and professional, including “*Cedar*” and “*Tiger*”.

ECONOMIC IMPACTS OF FOREST SECTOR ACTIVITY

While we have attempted to separate our analyses of economic and social impacts, they are deeply intertwined which forces us to describe them together.

Economic impacts of forest sector activity on local population are:

- Wages;
- Various taxes; and
- So-called “social support”.

The objective of this chapter is, to the degree possible, a comprehensive estimate and analysis of these impacts. The term “comprehensive” here means that we analyzed not only official but also non-official data. It is no big secret that in modern-day Russia, most firms implement double book-keeping to avoid control and taxation. As such, timber sales (especially abroad) are accomplished by officially registered contracts with understated prices and additional secret contracts (signed or unsigned) with real prices. A minor portion of wages is paid according to official documents, while the majority is paid by so-called “envelopes”. There are hardly any firms that does not make wide use of such double book-keeping.

Table 9 shows the official dynamics of monthly wages in the forest sector of four southern provinces of the RFE. According to this data, the average annual increase in wages after the ruble's devaluation in 1998 was good, even in US\$. In rubles, it was also higher than the inflation rate and fluctuations of timber price. At the same time, wage increases have coincided with “grey” wages being brought into daylight.

The question arose: How much was a real increase in wages as opposed to a transformation of “grey” wages into official wages? None of the interviewed experts could provide an answer to this question.

Table 9: Official Monthly Wages in the Forest Sector of the Southern RFE Provinces

Province	1999	2000	2001	2002	2003	Average Annual Increase (%)
<i>In Rubles</i>						
Khabarovskiy Krai	2167	2947	4147	5009	6948	33.8
Primorskiy Krai	2049	2356	2936	...	...	19.7
Amurskaya Oblast	1145	1934	3388	3984	4578	41.4
Sakhalinskaya Oblast*	1705	2065	2649	3773	...	30.3
<i>In US\$</i>						
Khabarovskiy Krai	90	104	142	160	228	26.3
Primorskiy Krai	85	83	101	...	...	9.0
Amurskaya Oblast	47	68	116	127	150	33.5
Sakhalinskaya Oblast*	70,5	72,7	90,7	120,2	...	19.5

* *only logging* - Sources: *Arzhaeva (2004)*; *Industry of Amurskaya Oblast (2004)*; *Industry of Khabarovskiy Krai (2003)*; *Industry of Primorskiy Krai (2002)*; *Industry of Sakhalinskaya Oblast (2003)*.

Timber prices during the same period decreased at an average annual rate of 3.0 percent. Naturally, with such a decrease, timber sales could not provide for the aforementioned fast wage increases. From 2003 to 2004, the prices of timber sold increased by 9 percent but production costs increased by 20 percent. The cost increase was based mostly not on the wage growth but on the growth of fuel, energy, and transport costs, each of which has a similar share in production costs – 20 to 22 percent.

According to experts' estimations, real monthly wages in logging average about US\$780 (excluding middle and top managers' salaries, which are higher) and vary across a very wide range (Table 10). The highest wage noted is in *Arkaïm* (Khabarovskiy Krai). It amounts to an average of US\$1,100. The lowest wage is in *Terneyles* (Primorskiy Krai) – it is about US\$350, but is expected to increase in the near future.

The basic salary of Forest Service employees is lower, about US\$100. However, people who occupy the lowest 2 to 3 levels of the Forest Service hierarchy actually take part in such additional work as interim cutting, forest planting, cutting site allocation, etc. This work officially increases their wages by up to US\$150. In commercially developed *leskbozes*, the real monthly wages of these people are about US\$200–250.

Table 10: Experts' Estimations of Real Monthly Wages in the Forest Industry of Khabarovskiy and Primorskiy Krai, 2004 (US\$)

Occupation	Limits of Average Range		Highest limit	Average for further calculations
	Lower	Upper		
Harvester operator	1,030	1,370	2,400	1,300
Forwarder and skidder operators	510	850	-	680
Bulldozer operator	510	680	-	600
Worker in felling operations (incl. power sawing)	340	1,030	-	685
Timber truck driver	680	750	2,000	750
Foreman	...	...	1,000	1,000
Weighted average	-	-	-	780

Source: Experts' estimations (2004).

The wage data outlined above can and will be used for livelihood estimation, but a more straightforward method is to develop an analysis of the cost structure of 1 cubic meter of production, as follows. The payment level for felling operations, in the case of traditional technology (felling crew with power-chains and skidder), comes to US\$3.5–5.0 per cubic meter. Such a payment level is used especially for settlement of accounts with hired freelance crews. Still, this does not cover the full labor price included in the timber price. In order to take into account wages of other employees, it is better to use more generalized figures. For example, costs of timber handling in forest depots amount to up to US\$5 to 6 per cubic meter. Transportation from the forest depot to the industrial log depot is worth about US\$0.1 per cubic meter for a distance of 1 kilometer. Total production costs from cutting area to industrial log depot (phases 1 to 4 in chain types 1 and 2) are US\$48 per 1 cubic meter. As mentioned above, labor's share in those costs is 20 percent. Thus, this amount (timber cost before loading onto freight vehicles) includes US\$9 to 10 of labor costs. The full price (production costs plus profit of the enterprise) is US\$58 per cubic meter. Thus, the profit of enterprises up to the end of stage 4 is US\$10 per cubic meter.

Some large firms (e.g. *Flora*) have their own dead-end railway siding. In such cases, the cost of car loading is US\$3 per cubic meter, including US\$1.25 as loaders' wages. If a firm does not own dead-end siding, costs of car loading double, whereas substitution of cars by bays (i.e. platform cars, or flatcars) triples costs. The cost of timber when loaded onto railway car/bay (i.e. production cost or expenses up until the point of loading) varies between US\$50 and 60 per cubic meter, i.e. handling and loading in industrial log depots adds US\$10 to 20 in cost per cubic meter, US\$2 to 5 of which is labor cost.

Official railroad tariffs vary widely and, for exported timber, are higher than common tariffs. For example, the tariffs from Gorin station (center of *Flora's* area on the BAM in Khabarovskiy Krai) in US\$ per cubic meter are:

- To Vanino seaport (Khabarovskiy Krai) – US\$5;
- To Bol'shoi Kamen' seaport (Primorskiy Krai) – US\$8;
- To Grodekovo station (Primorskiy Krai, China border) – US\$18.

The cost of truck transportation is comparable to that of the railroad and varies between US\$10 to 12 per cubic meter. Motor transportation, however, cannot compete cost-wise with railroad and ships if the distance is long.

In the case of sea transportation, reloading in ports costs US\$7 to 8 per cubic meter. Average shipping rates (sea freight) are (per cubic meter):

- From Vanino to western Japanese ports – US\$22–25;
- From Vanino to Republic of Korea – US\$27;
- From Vanino to southern Chinese ports – US\$33;
- From Nikolaevsk-na-Amure to Japanese and Southern Korean ports – US\$26.

Thus, transport costs reach 30 and sometimes even 50 percent of F.O.B. price.

Along with the production costs outlined above, all phases of the commodity chain entail tax payments and/or payments to the government. In phase 1 of the chain, these are stumpage and leasing fees. In 2004, stumpage and leasing fees combined were, on average, US\$1.4 per cubic meter in Khabarovskiy Krai, US\$0.4 of which went to the Krai and the rest to the federal government. In addition, legal logging includes the following main taxes:

- Income tax;
- Value added tax (VAT);
- Tax on funds;
- Land tax;
- Social charge of labor costs;
- Pollution tax;
- Other mostly local taxes.

According to information from the Krai's Ministry of Forest Industry, in 2003, tax payments of the Khabarovskiy Krai's forest sector into the Krai's consolidated budget (i.e. the sum of the Krai's own budget and the budgets of its municipalities) were US\$3.8 per cubic meter of commercially harvested timber. Information about payments of Khabarovskiy Krai's forest sector to the federal government has not been published. On the basis of the known ratio between federal and Krai payments, federal tax payments are estimated at about US\$6.5 per cubic meter.

In addition to business expenses and wages, the territory's forest industry also obtains some degree of profit. **Table 2** shows 12.3 percent as the official profitability of the Khabarovskiy Krai's forest sector. As stated above, the Krai's Ministry of Forest Industry has determined this proportion to be 24.5 percent. Experts estimate the profitability of the sector to be 30 percent.

Table 11 attempts to represent the data given above in a spreadsheet delineating phases of the timber commodity chain. Only wages could be determined with some degree of certainty. Other payments could be determined for some phases only under certain conditions. For example, income and social taxes on wages are paid each time a wage is paid to employees by official means. VAT is paid on each documented and registered act of selling/buying. Other common taxes are paid usually once per year, quarter etc. Custom fees are 6.5 percent of price and are paid at the moment of border crossing (*Lesnaya Gazeta* 2004).

Obviously, taxes are paid only from the officially declared income. In addition, no individual company calculates its profit and expenses by phase, as depicted below.

Table 11: Estimation of Forest Sector Contribution to Livelihood in Khabarovskiy Krai (US\$/m³)

Phase Number	Phase Description	Cumulative Price	Wages	Taxes	Company Profit	Other Payments
1	Field allocation of cutting areas, obtaining permit document, preparation of cutting areas: camp establishment, skidder/harvester route clearing etc.	...	0.2	0.1	...	...
	Stumpage fee payment	...	-	1.4	...	...
2	Felling operations, cutting tree trunks into logs, removing timber to forest depot	...	4.2	1.4	...	...
3	Cutting tree trunks into logs in case of removal of trunks from cutting area as a whole, loading on timber lorries	...	5.5	1.8	...	...
4	Transportation from forest depot to industrial log depot, 75 km	...	7.5	2.5	...	...
5	Log handling, sorting and piling in the industrial log depot	48	1.0	0.3	...	...
	Loading onto vehicles	60	3.5	1.2	...	...
6	Transportation to consumer/trader	83.5	3.7	1.2	...	...
	Subtotal	...	25.6	9.8		
	Custom formalities in case of export abroad	-	-	5.9	-	-
	Other taxes	-	-	0.5	-	-
	Total : US\$	90	25.6	16.2	27.0	21.2
	Percent	100	28.4	18.0	30.0	23.6

Source: Authors' compilation (2004).

It has been mentioned that, besides obligatory fees, all logging firms both corporate and individual have the additional burden of covering local social needs. There is no assemblage of data about such social assistance, so it is impossible to compile a complete list of the forest firms' social expenses. According to experts' estimates, average additional social expenses of the logging firms amount to up to 5 percent of loggers' production costs, i.e. about US\$12 million per year in the Krai or annually US\$40 per capita of forest settlement residents.

Logging firms also provide funds to support silvicultural activities of the Forest Service, for the purchase of equipment (fire-engines, computers and so on), gasoline etc. for *leskbozhes*, and for silvicultural work. In theory, the Forest Service must pay off these purchases and work at its own expense, but it has no funds

and in practice does not repay its debts to loggers. There are no accurate figures for funds that are spent for Forest Service support. Experts estimate the support to be about 5 percent of loggers' production costs, i.e. about US\$10 to 12 million annually.

The above information and calculations address the legal forest industry. Similar estimates for illegal logging are much less valid; in addition, the authors can rely only on anonymous information for these estimates. Nevertheless, an analysis of the economic livelihood impacts of illegal logging follows.

Before entering phase 1 of the commodity chain, illegal loggers end up having to pay top forest officials of the provincial administration personally US\$2 to 4 per cubic meter of hardwood and US\$1 to 2 for softwood to get a forest lease. In case of full illegality (no permit at all), approximately the same "price" is paid to the same people, but in a more complicated fashion to keep the business safe.

Formally, illegal commodity chains are the same as legal ones, although there is a tendency in the illegal case to strive for simplification and even exclusion of some phases. Naturally, the price of illegal logs is lower than that of legal ones. In the case of illegal operations, loggers do not pay any taxes or fees. They use stolen motor fuel and fully worn and torn equipment without the need to pay depreciation charges, etc.⁴ On the other hand, they have to pay a significant amount of bribes from the beginning to the end of the commodity chain.

Militia officers, traffic inspectors, environmental groups and other control brigades usually levy 500 to 1,000 rubles (US\$17 to 34) on each truck of timber to let it pass. Those that work in the same area and use the same road during a comparatively long period of time may negotiate a 50 percent discount. A forest inspector receives US\$100 for every 3 timber trucks he lets pass by the road, but, in this case, there is a more complicated scheme.

For example, a forester may allot a 10-hectare area where trees are to be felled (*'lesoseka'*) according to the permission granted in one felling card (*'lesorubochniy bilet'* – annual permission for harvesting). However, both the logger and the forester would like to get more timber with that same felling card to gain some shady income. They make a non-documented agreement to increase the real size of the plot up to 30 hectares and the logger will give US\$10 to the forester per each 1 cubic meter of timber logged on those extra 20 hectares. This is a standard price for such kind of "service". Remarkably, no logger can lie to the involved forester and get more, so the system is very "honest" and stable as compared to officially legalized logging volumes and legal obligations.

Almost all exporters reduce the real quality and quantity of consignment at the customs checking yard. This situation has been revealed, for example, in *Dalnerechensk* town (a *raion's* (district's) center in Primorskiy Krai). From this evasion of payments to the State budget, customs officers always get some cash payment for their pocket, reportedly also around several dollars per cubic meter. For 49 years, in Amurskaya Oblast, the Forest Service used to arrange leases of forest plots preferably to people from the Caucasus and China, for a bribe of 140 rubles (US\$5) per cubic meter. Currently, bribes are much higher and are said to go straight to Moscow.

⁴ Logging firms are required to accumulate "depreciation charges" in special accounts and spend these on equipment repair and purchase. Illegal loggers, however, can avoid this requirement.

A significant share of illegal timber is harvested by small “flying” crews that work mostly at night and are so called because they emerge for a short period of time in different places and then vanish. Getting 10 cubic meters in one night, as is usual, may bring 1800 rubles (US\$62) to one participant, if a felling crew does not meet unpredicted checking on the road and if an inspecting member of another corrupted chain does not sequester all the timber, ignorant of the bribes already paid or promised to others. Therefore, even when proper bribes are distributed, this business remains very risky, not for being a crime, but because of the large amount of players awaiting easy profit from the stolen timber. People from different regions, even illegal loggers, must constantly be prepared for unpredicted checking by the seriously corrupted system and may give up their timber in almost 50 percent of the cases to another player, who either has more authority, or is ruder and better armed. Given the situation, real income may be reduced to an average of about 1000 rubles (US\$34) per participant per night.

One of the main targets of illegal logging are valuable, banned species, which are both hardwood like lime (linden) or Manchurian nut and softwood like Korean pine. There is a particular way by which the species may appear in an official logging permit. If there are less than 10 to 20 percent of those species in the leased plot, the Forest Service officials may include them on the felling card and it becomes legal to cut some of them. A forester has various ways to promote this as a loophole, if he is paid for it.

According to BROC’s estimates, if there is 1 cubic meter of hardwood logged by a Russian illegal logger and sold for US\$140 in Chinas Suifenhe, the shares of this sale are as follows:

- US\$70 goes to Chinese wholesaler (middleman);
- US\$4 – to regional administration officials;
- US\$5 – to municipal administration officials to get to “appropriate” depot;
- US\$5 – to environmental inspector to get out of forest without sequestration;
- US\$3 – to Forest Service officials so as not to be sequestered;
- US\$5 – to militia so as not to be sequestered;
- US\$5 – to customs officer;
- US\$10 – to timber depot for documents;
- US\$5 – to forest leaser to keep right to enter again next time;
- US\$5 – to local criminal fund to be safe;
- US\$5 – for gasoline;
- US\$18 – shared between logger, security, and truck driver; thus US\$6 each.

The experts recognize that the profitability (ratio of profit to production costs) of illegal logging can reach up to 100 percent. They also estimate that over the last two years the real volume of illegal logging in Khabarovskiy Krai amounted to 10 to 15 percent of the legal harvest, i.e. 0.8–1.2 million cubic meters. Taking into account interim cuttings, the total questionable harvest reaches a maximum of 1.5 million cubic meters. On average, it is 1.2 million cubic meters, 200,000 to 250,000 cubic meters of which is hardwood and the rest softwood.

Regarding the legal sector, income of the Khabarovskiy Krai’s forest sector increased by 27 percent in 2004 because of a 25 percent rise in market prices. However, only 1/3 of this growth accrued to the forest sector, while the rest was absorbed by freight costs, railway tariffs, fuel and energy costs, etc. On the whole, the forest sector consumes or retains only 47 percent of its revenues. The other 53 percent goes to other industries, including transport, construction, machine repairing etc.

SOCIAL IMPACTS OF FOREST SECTOR ACTIVITY

The forest sector provides jobs for the populations of many forest settlements. Skillful workers who live in depressed settlements with depleted forest tracts (especially in the southern part of Khabarovskiy Krai and Amurskaya Oblast, and in the western and southern part of Primorskiy Krai) become employed by logging firms in other parts of their provinces. In Khabarovskiy Krai, the forest sector is pivotal for no less than 100 settlements with a total of more than 300,000 people (20 percent of the krai's population).

Along with its direct activity, the forest sector bears a big burden to provide social benefits to small settlements. For example, until 2002, each lease agreement in Khabarovskiy Krai included specific articles of social assistance. Now, each lease agreement stipulates an additional contract with the *raion's* municipal authority for providing social assistance to local communities. Such "social assistance" has different components: employment of local people, supplying the local population with firewood at low prices, and supplying firewood free of charge to pensioners and disabled people. Forest firms also repair or cover repair costs for local schools and hospitals, roads and bridges. They buy computers for schools and musical instruments for local orphanages, support summer children's camps, etc. However, along with their important positive social role, logging companies' activities also result in many negative consequences.

The relations between different local social groups form a very complicated net. The more thorough one attempts to analyze this net, the less clear the social features of the commodity chain become. Real models of relationships and flows of timber revenues are always more complex than any scheme. Many social groups and agencies are involved in the commodity chains. Forest management and administrative staff often play the key role in the trade. Logging groups determine behavior and involvement of certain management agencies and individuals. Traders dictate the model and real prices of each kind of service, including management, transport, inspection, legalization etc.

Chinese entrepreneurs play a very special role in the RFE timber commodity chain, working and living in the area on an on-going basis and known by simple Russian names. This front guard of the RFE's new forest economy was met with public rejection and outrage during the last 10 years, but was patient enough to keep constructing the huge system of a new, low-level timber business, finally replacing Japanese dominance in the Asian market and the former Soviet domestic wood-processing industry. There are several hundred Chinese citizens working on an on-going basis in almost every forest *raion* of the southern RFE in many timber companies (some thousands in total), creating livelihoods for hundreds of thousands of their compatriots back home through the depletion of Russian forests. Their number is constantly increasing, and their influence penetrates all municipal institutions, including the administration and the militia. They always have cash and always work hard to their advantage and thus gain growing respect among the most active part of local communities and businesses. Sooner or later, they buy houses or apartments through new Russian friends and aim to become regular Russian citizens. To obtain a passport and thus full citizenship is not easy, but it is easier with bribes.

Small, local illegal logging groups usually do not organize operations more than twice a week, since loggers need first to search for appropriate trees, log them and then plan to remove them while there are appropriate people on duty in the inspecting groups. Therefore, the profit for a man working as an illegal logger is less than the income of his wife if she is trading Chinese consumer goods on the local public market. And usually one male in the family who deals with illegal timber also has to partially support his or his wife's retired parent with a pension of about 1000 rubles a month each (US\$34), one child, and

some other relatives with low incomes. This typical situation explains the formation of local “criminal groups” seeking subsistence and livelihood through illegal logging. Given the limited frequency of and low income from logging operations, most of these local people working with illegal logging groups also keep vegetable and fruit gardens, grow chicken and pigs, have cows, harvest cedar nuts, ferns, berries and mushrooms, and often sell these to supplement family income.

For example, in Krasnoarmeyskiy Raion, with a population of about 23,000, including roughly 400 of the most active Chinese, there are about 30 illegal crews averaging 5 people each, openly working and feeding all the administrative and inspection systems. The inspector position seems much more attractive than that of loggers and timber market operators. Essentially, any official somehow concerned with forestry and the timber business may go to the logging site, road or log depot at any time and get any amount of money in the form of fee, penalty, bribe or sequestered timber which he may re-sell immediately without moving even one log. This situation creates a fundamental difference between routine illegal loggers or traders and all kinds of municipal and state managers, because the latter exploit others’ hard work and enrich themselves by it. Assuming an average family of 3 people, a regular logger, as described above, may bring home an average income of US\$50/month/person; a hard working illegal logger gains more – up to US\$100 per family member. At the same time, a municipal administrator may provide subsistence to his relatives at the level of US\$300–500 per person per month. Non-timber forest product (NTFP) harvesting and vegetable gardening, which involve all social groups, yield on average an additional US\$50 a month, which is essential only for the group of lowest income. Thus, corrupt foresters and administrators in forest towns are easily recognized by their new cottages, usually similar to those of the timber barons/traders. This rich upper layer of communities is not large.

Trustful relationships among family and friends play a core role in the distribution of timber business benefits. They may break any ideal commodity chain in any particular town, creating unique chains which eventually may be replicated somewhere.

In interviews in Lazo Raion of Khabarovskiy Krai, 82 percent of respondents evaluated the impacts of illegal logging negatively (Developing a Forest Conservation Strategy 2004). Nevertheless, although an entire community might generally criticize illegal logging and request that it be substituted with real jobs, on an individual basis, most people, including children and retired elders, used to be proud if they shared even some benefits from the illegal timber business of their family’s head. If they are members of a militia officer’s or a forest ranger’s family, they can always “honestly” accuse the government for the unreasonably low basic salary, which challenges officials of all the state agencies to look for their own outside subsistence. They believe they have the right to use the natural resources of their territory, since people in cities have a range of other jobs from which they can choose.

This system is totally geared towards the Chinese market and is stable when:

- 1) The market is growing constantly and needed volume of commercially marketable timber is available through the illegal channels existing at present;
- 2) Common people are not law-abiding.

Illegal operations are only possible with the existing infrastructure for transport or with serious destruction of protective water zones because timber is being transported on small rivers and creeks. This is frequently criticized by many community members, uncorrupted inspectors and administrative staff. Since destruction of creeks is being reduced by public and legal enforcement in the more developed areas, the

market is obviously pushing bigger companies to move to the intact roadless and protected areas. This seems to be even more dangerous to the forest environment in the long run. On the other hand, the more sophisticated China's demand for particular timber species becomes, the more rare endemic timber species are endangered, many of which are located in local RFE forests.

This working paper does not explore the ecological damage of timber harvesting. However, it must be stressed that ecological damage engenders social tension. The differentiated rich forest ecosystems of the RFE provide many tangible and intangible services, such as clean water in rivers and creeks, high biodiversity, unique habitat for tigers and aborigines, recreation and the chance to experience spiritual energy. The culture of local forest communities is based upon non-timber forest product collection, hunting, and fishing and these activities still have good market prospects in China and Japan. All of these are worth much more to local communities than the cottages or jeeps accruing, through the current structure of logging activities, to individual community members, although these can also be a part of the picture if there is appropriate governance and management.

The most significant social conflicts associated with the timber industry occur on territories that have some special protected status, are reserved in some form for future protection, or are already being used for non-timber forest products. For example, the planned national park "Udege Legend" in Krasnoarmeyskiy Raion was designated by the regional law in 1991 and had to be excluded from any logging operations. However, since officials were unable to complete national park designation on the federal level, they consider that area not to be a reserve and keep leasing it for harvesting. This disputed area provides a big honey yield to the large local community of bee-keepers. Now both legal and illegal loggers cut restricted linden trees to meet China's high demand for linden timber and destroy the environment for bee-keeping. Another affected group in this territory is the indigenous hunters community which is involved in the harvesting (both legal and illegal) of many non-timber forest products.

This mixture of interests and impacts on the same territory has produced a series of appeals to the raion's administration and forest service; and forest leasers have decided to stop logging here and to move operations to other commercially available territory. The administration had developed an initiative to stop the logging of linden trees completely and a more hard-nosed inspection campaign against illegal loggers began. Nevertheless, these did not help to stop logging, but rather resulted in the sequestering of highly demanded timber for sale to China. Another group of people kept stealing the linden and Korean pine timber from this area using existing roads and became the subject of a hard campaign by the forest leaser. This conflict involved thousands of people, but nobody really sought a wise solution, which obviously would have had to entail compromise.

There are an impressive number of other examples across the RFE, in which destruction of the forest environment by logging occurred as a result of existing commodity chains of timber sale and had negative impacts on communities, although they did not result in the complete loss of forest land for communities. Two big logging companies in central Sikhote-Alin are currently operating in leased areas allocated on watersheds that have been used by local indigenous communities of *udege* hunters for centuries and are subject to a set of regulations devoted to their preservation. These companies are *Rimbunan Hijau DV* in the *Sukpai* watershed in Khabarovskiy Krai and *Termeyles* in the *Samarga* watershed in Primorskiy Krai. As a result of their activities, several hundreds of indigenous people in each territory have lost their traditional livelihoods through the destruction of wildlife habitats and the entire forest environment. The same situation recently appeared in both Amurskaya Oblast (the RFE) and Chitinskaya Oblast (Eastern Siberia)

where officials under federal pressure started negotiations on the creation of big logging leases with direct Chinese investment and participation, including Chinese labor.

While there has been a set of acts requiring public participation and involvement in making decisions of such scale for many years, such leases regularly come to the territory “unexpectedly”, without broad public discussions. Neither in *Sukpai* nor in *Samarga* villages was there any appropriate public discussion or impact assessment on the preliminary plans for the projects, but instead forest bidding took place and lease agreements were signed before information was provided to communities.

Anti-poaching task forces have been operating in the RFE for about 10 years. Unfortunately, their activity does not and could not bring essential changes to lifestyles based upon the ignorance of laws in favor of local community subsistence. On the other hand, armed and often steadily paid rangers usually provoke equally negative and reasonable reactions among everyone in the logging community. Since rangers in the final analysis multiply the circles parasitizing on the logging and timber business as consumers of bribes, fees and sequestered timber, their activity seems more destructive now and is not a leverage point from which it would be possible to change the situation to a more constructive one.

In the 1990s, the only reason to keep these task forces, consisting of people who are part of the community and its social and environmental interests alive, was to fight criminal gangs in the forest. However, overt criminal activity seems to have disappeared from most areas, with people either turning to a more official style of work or joining the groups of illegal operators, taking care of the shady timber business in favor of the community. Some of them have moved to the new, remote areas of the RFE. If any criminal activity remains, it takes place in remote areas to which rangers usually do not have access. Even if do have access, they tend to avoid it because of the danger of being met with open violence and because it is not clear if it would be legal to use their own weapons in such a case. This leaves rangers only the possibility to stop people on a road and by a complex task force with Forest Service officials, militiamen, private security of the forest leasers and NGOs. This kind of anti-poaching collaboration is already demonstrating great success and efficiency, mainly because such a model makes bribery impossible or at least doubtful, as individuals involved in the task force would not dare to take bribes in the presence of their group-mates.

To summarize, timber going from the RFE to Chinese, Japan, and Korean markets, harvested with economically and environmentally destructive methods, enriches a long chain of actors who put different amounts of labor into timber production and gain returns that are not proportional to their efforts. A significant part of the income falls to logger-bosses, Chinese merchants and managers and local as well as federal bureaucrats. The smaller part is more or less equally distributed among poor local communities at the expense of devastating their living environment and livelihood sources. While Chinese families who are a regular part of this chain are able to build their own processing factory in China or in the RFE and local bosses construct 2-storied brick cottages and buy new jeeps, small-scale illegal loggers are only able to send their children to school, restore their old wooden houses and buy second-hand jeeps to continue operating in the forest. Local loggers must work hard to maintain their position in the community, compared to Moscow bureaucrats, who consume bribes and payments from the state budget without any worry of the consequences.

Current forest policy has not let any small timber and non-timber forest product business come to the administration’s attention and has thus initiated the vast development of illegal operations, environmental violations and ignorance of community needs. As a result of that ignorance and the generally low level of

incomes in the community, workers in logging operations have no social and life insurance and security, low skills, and thus often risk their health and even lives without any hope of compensation for themselves and their families. In addition, current methods of timber harvesting devastate areas, creating jobs, but destroying lifestyles.

A case study of a Raion's commodity chain is given in Table 12. Although this working paper is devoted to log exports, the table includes a column "Wood Processing" because this part of the small and mid-size timber business in the whole region is growing rapidly; it involves separate groups of the community, including Chinese operators, and is seriously changing the overall picture of the commodity chain.

Table 12: Description of the Timber Commodity Chain in Krasnoarmeyskiy Raion, Primorskiy Krai, 2003

Index	Administration	Logging	Transport	Wood Processing	Brokering / Trading
Production volume*, m ³ /year	800,000	800,000	800,000	50,000	800,000
Export to China*, m ³ /year	240,000	270,000	270,000	30,000	270,000
Groups of people and organizations involved in link	1 raion administration; 14 municipal administrations; 3 leskhozoes; 11 lesnichestvos; 1 militia division; 1 environment inspection group; 1 “Cedar” group; 1 “Tiger” group	32 leasers; 4 state and municipal logging companies; 8 Entrepreneurs; 30 illegal crews; 50 illegal entrepreneurs	32 leasers; 100 private entrepreneurs	25 leasers; 10–15 private entrepreneurs	30 leasers; 80 private entrepreneurs
For each group above, number of persons employed and/or obtaining livelihood from link (including 3 family members per logger and 400 Chinese total in the raion)	150 in raion administration; 200 in municipal administrations; 200 in leskhozoes; 100 in lesnichestvos; 150 in militia division; 5 in environment inspection Group; 15 in “Cedar” group; 15 in “Tiger” group	3,200 associated with leasers; 150 in state and municipal logging companies; 450 in illegal crews; 150 working with illegal entrepreneurs	600 associated with leasers; 300 with private entrepreneurs	250 associated with leasers; 30–45 with private entrepreneurs	300 associated with leasers, 240 with private entrepreneurs

Medium per capita income obtained for each group involved in US\$/month (and including all Chinese and 3 family members per group member and assuming income of US\$50 for each person from private gardens, cattle and harvesting of non-timber forest products.)	Raion administration officials – 400; municipal officials – 300; leskhoz officials – 400; lesnichestvo officials – 300; militiamen – 400; environment inspectors – 300; “Cedar” group members – 300; “Tiger” group members – 300	leasers – 100; state and municipal loggers – 100; illegal crews – 150; illegal entrepreneurs – 150	Leasers – 100; private entrepreneurs – 150	Leasers – 150; private entrepreneurs – 150	Leasers – 200; private entrepreneurs – 250
Negative impacts on livelihoods	Chinese participation in link, high taxes, customs fees and fines for violations, going out of raion, environmental destruction of area by logging, hard economic pressure from state and regional administration	Inappropriate forest management, absence of support to small business by all the state and local authorities, high bribery and corruption	Bad roads and long distances for timber transfer from the site because of destruction of the forest around infrastructure	Replacement of locals by Chinese labor and owners in saw-mills, easy hiding of illegal timber in board shipments	Reduction of official part of contract price to hide a part of income from tax; rare species exporting; easy hiding of illegal timber in big shipments; legalization of illegal timber
Group controlling link and involvement of local people in decision-making	State control by the krai level; public control by hearings, impact assessment, mass media and lawsuits; elected Municipal Council control in decision-making	Forest Service and inspection bodies, “Tiger” & “Cedar” groups, militia, administration, public role in decisions via Municipal Council	Traffic-roads patrol & control groups; “Cedar” and “Tiger” groups; public groups, if any: administration, Municipal Council	Timber industry and administration officials; immigration, tax control; public control via Municipal Council	State export & price control, tax service, militia, administration, customs, prosecutors, Municipal Council

Policy affecting link	Forest Code and legislation, state and regional economic strategy, personal interest of upper level powers, law enforcement and public activities, general public awareness of problems in forest and timber business	Market priorities in species and volume, personal interest of municipal and regional officials, Forest Code and regulations, law enforcement activity	Level and activity of road control and militia, market competition, acting system of timber transfer documents	State and regional tax and customs policy, local regulations, immigration policy	General export tax strategy, customs rules, market priorities in species and volume, political will of all the local and regional powers
Leverage points within link/policy opportunities if any	Public hearings and media campaigning; local initiatives in alternative forest use and recreation; legislation initiatives in Municipal Council and community; promotion and support of deep timber processing, non-timber forest product marketing, and lumber in parallel with reduction in logging	Sustainable dialogue with logging firms and groups, constant public presence in the forest, active marketing of non-timber forest products industry	Constant education of truck drivers with regard to water protection zones and other environmental priorities, development of alternative transport opportunities	Replication of positive experience involving moving low-quality timber into processing, training local community members to work at sawmills, increasing level of timber processing, promotion of lumber industry with reduction of logging volume	Strengthening control of timber depots, export contracts and prices; training of customs officers in recognizing timber species; public monitoring of timber depots; control of timber wholesale market by Municipal Council

**Numbers for these first two indices indicate throughput (volume of lumber) passing through each link in the chain.*

Source: Authors' compilation (2004).

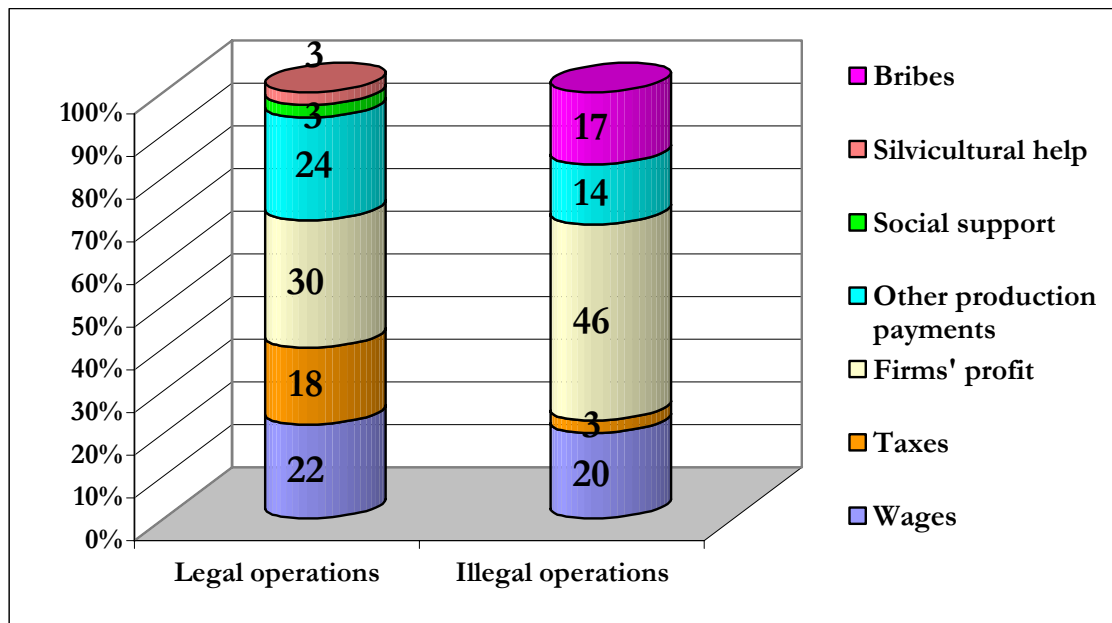
ESTIMATE OF THE RFE FOREST SECTOR'S CONTRIBUTION TO LOCAL LIVELIHOODS

The estimate of the RFE forest sector's contribution to local people's livelihoods is made on the basis of the above data for legal and illegal activity. The insufficient reliability of the data is discussed and demonstrated in previous chapters.

The contribution of softwood commodity chains to livelihoods is estimated based on the average structure of returns, as calculated by the above-cited data, which were compared, verified and generalized. One of the most controversial types of data used for the calculation is the real wages portion of production costs. In 2003, real wages officially made up 16 percent of sales (i.e. production cost plus company profit). According to our calculations above (see Table 11), this proportion is 28.4 percent. For the calculations in Table 13, an average proportion of 22 percent is assumed.

Especially uncertain are the costs associated with illegal logging. The estimated cost structure includes wages as 20 percent of sales and the firm's profit as 46 percent of sales. Tax payments of illegal logging are estimated to include only 50 percent of the customs tax (Figure 7).

Figure 7: Structure of Full Costs and Profits of Logging Operations in Khabarovskiy Krai, 2003



Source: Authors' estimates (2004).

Table 13 shows calculations based on the estimated cost and profit structure. It shows that the total amount generated from the various forms of forest sector activity in the territory of Khabarovskiy Krai makes up about US\$700 million.

Table 13: Estimate of Annual Return from Logging Operations in Khabarovskiy Krai, 2003*

Income Item	Legal operations		Illegal operations		Total, mln US\$
	US\$/ m ³	Subtotal, mln US\$	US\$/m ³	Subtotal, mln US\$	
Net wages	20	132.9	18	18.0	150.9
All taxes	16	106.3	3	3.0	109.3
Firms' profits	27	179.4	41	41.0	220.4
Other production payments	21	139.5	13	13.0	152.5
Local social support by logging companies	3	19.9	-	-	19.9
Silvicultural assistance	3	19.9	-	-	19.9
Bribes	-	-	15	15.0	15.0
Total	90	598.0	90	90.0	688.0

* Legal harvest in 2003 was 6.6 million cubic meters and illegal cutting was 1.0 million cubic meters of commercial wood.
Source: Authors' estimates (2004).

However, the territory and its population do not receive the full return of legal logging:

- Migrant workers take with them 80 to 85 percent of their wages when they go back to their homelands. Furthermore, very often they receive their net wages (after expenses for meals and housing) in banks of their native areas. The portion of net wages exported out of the Krai can be estimated as 25 percent of total forest sector net wages.
- 100 percent of the customs taxes and 65 percent of other taxes are transferred to the federal budget. These make up 78 percent of the total amount of tax collected.
- Foreign companies and joint ventures operating in the forest sector repatriate a significant part of their profits. Besides, large Russian companies are taking out loans from foreign banks and are repaying both the principal loan and interest. Together, this repatriation of profits and the loan interest payments sent abroad can be estimated as 15 to 20 percent of total company profits.
- Only about half of other payments (fuel, transportation, repair etc.) remain within the territory.

Khabarovskiy Krai's economy also receives returns from illegal logging, but, as with legal logging, the return does fully remain in the local economy:

- The small taxes that illegal loggers pay to customs go to the federal budget.
- At least half of a firm's profits belong to Chinese entrepreneurs.

At the same time, because of illegal logging, the Krai's economy loses US\$13 million in tax payments. Also, people involved in such activity lose various benefits (pension fund allocations, disability, welfare, etc.).

Based on the considerations given above, the return that remains in Khabarovskiy Krai's territory is calculated in Table 14. The results indicate that Khabarovskiy Krai's economy receives slightly more than two thirds (68.2 percent) of the total returns.

Table 14: Calculation of Annual Return from Logging Operations that Remains in the Territory of Khabarovskiy Krai, 2003

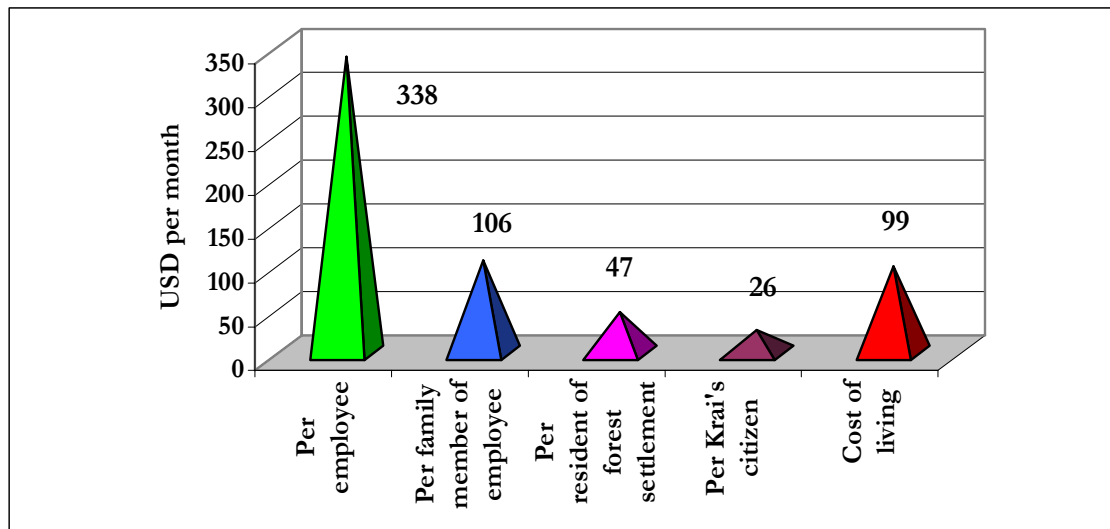
Income Item	Legal operations			Illegal operations			Calculated total amount retained in Krai, mln US\$
	Residual Coefficient	Subtotal, mln US\$	Calculated Krai's share, mln US\$	Residual Coefficient	Subtotal, mln US\$	Calculated Krai's share, mln US\$	
Net wages	0.75	132.9	99.7	1.00	18	18.0	117.7
Taxes of all kinds	0.42	106.3	44.6	0	3	0.0	23.4
Firm profits	0.83	179.4	148.9	0.50	41	20.5	169.4
Other production payments	0.50	139.5	69.8	1.00	13	13.0	82.8
Local social support by logging companies	1.00	19.9	19.9	-	-	0.0	19.9
Silvicultural assistance	1.00	19.9	19.9	-	-	0.0	19.9
Bribes	-	-	-	1.00	15	15.0	15.0
Total	-	598.0	402.8	-	90.0	66.5	469.3

Source: Authors' estimates (2004).

Four levels of per capita assessment of livelihood input are given below:

1. *Per employee*: In 2003, there were 24,000 legal logging employees in Khabarovskiy Krai. Their monthly average income was US\$346 per capita. There were about 5,000 illegal loggers. Their monthly average income was US\$300 per capita. Based on these figures, the weighted wage index was US\$338 (Figure 8). The average monthly wage in Khabarovskiy Krai's industrial sector overall was US\$289 in the same year, i.e. the wages of logging employees were 1.2 times higher than the average.

Figure 8: Estimate of Monthly per Capita Income from Forest Sector in Khabarovskiy Krai, 2003



Source: Authors' estimates (2004).

2. *Per family member of logging employees:* Taking into account the average number of family members (3.2 according to demographic data), the legal forest industry determines the livelihoods of 76,800 people and the illegal forest industry those of 16,000. Together, they make up only 6.4 percent of the Krai's population, but one third of its small settlement population. Each member of the families associated with the legal logging industry has an average monthly monetary income of US\$71 officially and of US\$108 according to our estimate. In the illegal industry, the estimated monthly income was US\$94 per family member. The weighted average index for the legal and illegal sectors combined was US\$106.

In comparison, the official average per capita monetary income per month in Khabarovskiy Krai's was US\$203 in 2003 and the average official cost of living per capita was US\$99 (see Figure 8). The official figures are intentionally understated because they are the basis for calculating state/municipal allowances for people who cannot work. According to research of the Khabarovsk Center of Strategic Developments, the lower per capita monthly income limit of middle class-residents in Khabarovskiy Krai was US\$517 in 2001.⁵ Thus, the average income of one member of a logging employee family was only 1.1 times higher than the cost of living and only 52 percent of the official average income.

3. *Per resident in settlements connected to forest sector activity:* As mentioned, there are 300,000 people in Khabarovskiy Krai living in settlements connected to the forest sector. Their forest sector-derived income contains employee wages and support for social benefits, the latter being equivalent to about 10 percent of firm profits plus about half of the bribes associated with illegal logging (bribed persons are often members of the community). Total average income from forest sector activity amounts to US\$47 per capita monthly.

⁵ Personal correspondence with Dr. Vladimir I. Syrkin, the First Vice Governor and the Chief of the Center.

4. *Per capita for Krai residents overall:* According to the all-Russian census of 2002, 1.44 million people live in the Krai. Taking into account the total calculated return from the industry that is retained in the Krai (US\$469.3 millions), the overall per capita income amounts to an average of US\$27 per each citizen of Khabarovskiy Krai per month.

It is possible to extend Khabarovskiy Krai's data to the RFE overall, because the forest sector of Khabarovskiy Krai makes up one half of the RFE's legal forest sector. Its share in illegal logging can be estimated as one third. Based on these proportions, the RFE's annual return from legal logging operations is US\$806 million, the return from illegal operations US\$200 million, and the total return from logging about 1 billion US dollars.

CONCLUSION

The contribution of the forest sector to the livelihood of local communities is significant and crucial for communities of small forest settlements. However, it is not a great enrichment of livelihood for most employees and their relatives; only a small group of logger-bosses and bureaucrats benefit financially.

Clearly, the dominant timber flows, especially of softwood, are generated by large and mid-size firms that are more or less law-abiding. That does not mean that there is no illegal logging involved, but most of them aspire to keep their operations legal. One of the main tasks now is to make all links of the timber commodity chain fully transparent and fully controlled, including through public hearings, public examination of projects, public availability of information, transparent management, etc.

Overall, the significance of illegal logging for the economy has been overemphasized. Illegal logging has a big impact on hardwood cutting, particularly in the southern part of the RFE. In addition, the social impacts (including both costs and benefits) of illegal logging is very large and extends far beyond the limits of the activity.

As indicated in our working papers for Phase One of the project, illegality is based on the double standards in the economy and other aspects of life in Russia. Such duplicity has been part of the Russian culture over many decades and the situation in the forest sector in general, but especially on community and municipal levels, reflects it as well. While there are official statistics reporting salaries and livelihood levels, there is also a common understanding that all members of the local society have some additional income that they do not report. Thus, the quality of life in territories where people have access to natural resources is higher than officially presented. Inaccuracy can also be found in: official population statistics, which do not include Chinese people; the size and number of forest fires and the harvest of pine nuts, sable furs, logs and fish. At a minimum, each family in a forest settlement derives some of their income in the form of vegetables, fruits, meat and milk from a small piece of private land. Given the pervasive nature of the gray economy in Russia, there is no incentive for law enforcement at any link of the roundwood chain; and, instead, there is ignorance of and a lack of interest in the law.

To fundamentally improve this situation, a strong and stable forest policy will have to be implemented. Two of the most forested provinces of the RFE – Khabarovskiy and Primorskiy Krai – have elaborate

official forest policies. These contain all the main directions to change destructive forest management methods to sustainable ones. However, to meet these guidelines two crucial problems must be solved:

- the need for resolute economic and social reforms and the real transformation of the Russia into a legal society;
- the need for the attraction of investment to develop new production, especially in the technology sector.

The second problem cannot be solved only by the investments of logging firms, because of a lack of capital. Today, a law-abiding firm pays about 65 percent of its net profit in taxes to state and municipal administration. This situation hampers the accumulation of investment funds.

The first problem requires fundamental changes, but it is impossible to make improvements in different sectors of the industry without transforming the overall economic environment. This transformation, however, is taking place gradually and new developments are supporting it. For example, there have been positive trends over the last few years among some members of the illegal logging community. They have achieved a more or less respectable standard of living, have raised their children and would now like to move into fully respectable jobs. This group of illegal loggers is either shifting to the wholesale business of establishing sawmills or food-processing factories with Chinese partners and often become the basis for many important social and environmental initiatives.

In addition, the socially active part of local communities, especially ecological NGOs, strives to develop and implement the universal model of public hearings on forest use projects all over the forest raions in collaboration with the main forest leasers and local authorities. This activity has just started recently, involves people from all links in the chain, and promises to be a successful means for making illegal operations more transparent. It is essential to assess these and other positive developments and to make them a part of the dialogue on the development improved forest policy.

In closing, the authors would like to emphasize once more that it is not possible to deliver an exact description of the situation, but that all available information was obtained and made compatible to come as close to a complete description as possible.

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