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63

THE FOREST SECTOR IN THE RUSSIAN FAR EAST: STATUS AND NEAR-TERM DEVELOPMENT

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July 1997

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PREFACE

The forests of the former Soviet Union have attracted significant attention in recent years as the Russian Federation has sought to move from a tightly-controlled, planned economy to a more open, responsive, market-based system. Given the very huge forests of Russia, and particularly those of Siberia and the Far East regions, the potential impacts of reform are of immediate consequence for domestic economic development as well as for Russia's external relationships with the rest of the world. Nowhere is this potential of greater interest than in the timber economy of the Pacific Rim.

The Center for International Trade in Forest Products (CINTRAFOR) at the University of Washington has included the analysis of the Russian forest sector as a major component of Country-Market research since mid-1988. Several prior studies examined the status of the forestry sector of the former Soviet Union, the nature and extent of the Russian forest resource base, and the broad near-term outlook for the forest sector under political and economic reforms.[1] Political and economic reforms have further separated the linkages of Russia's forestry sector between European or western Russia and the vastness of Siberia and the Russian Far East. While European Russia has relatively well developed and accessible forests, Eastern Russia is confronted with remoteness, inaccessible forests and harsh environmental conditions which have resulted in a relatively undeveloped forest sector predominantly oriented to timber harvesting and shipment of raw primary products (mainly conifer lumber). The huge distances to European Russian markets, combined with greatly increased rail rates and the loss of assured State purchases, have necessitated that East Siberia and the Far East look to international markets. Further, the restructuring of the economy towards market-based performance has caused a serious decline in production since 1991, as inability to cover operating costs and lack of competitiveness has resulted in reduced harvests.[2]

A significant portion of Eastern Russia's participation in Pacific Rim forestry markets originates with the coastal regions of the Far East territory. The proximity to coastal ports, access to rail transport, and more moderate climate along the Pacific coastal ranges and the southern boarder with China makes the RFE of direct interest to major consumer nations of the North Pacific Rim as a future supplier. Other producer countries, including the USA and Canada, are also actively engaged with the RFE through joint ventures as well as being active competitors in other regional markets led by Japan. CINTRAFOR has undertaken more intensive analysis of the RFE with the goal of better understanding the present situation and assessing primary determinants for the likely near-term performance of the forestry sector. This analysis was first presented by Ekaterina A. Gataulina as a professional research paper.[3] This working paper presents an edited version of that analysis.

The authors are indebted to colleagues in the Russian Far East for providing information related to the post-reform developments within the forestry sector. In particular, the authors would like to acknowledge two significant works that became available as this present work was nearing completion. Work by Alexander S. Sheingauz and colleagues at the Economic Research Institute, Far East Branch, Russian Academy of Sciences added greatly to our

[1] "Soviet Forests at the Crossroads: Emerging Trends at a Time of Economic and Political Reform," Charles Backman and Thomas Waggener, CINTRAFOR Working Paper 28 (1990); "Soviet Timber Resources and Utilization: An Interpretation of the 1988 National Inventory," Charles A. Backman and Thomas R. Wagganer, CINTRAFOR Working Paper 35 (1991); "The Russian Forestry Sector Outlook and Export Potential for Unprocessed Logs and Primary Forest Products Through 2000," Charles A. Backman and Thomas R. Waggener, CINTRAFOR Working Paper 46 (1994); and "Outlook for Russian Forest Product Trade with the People's Republic of China," Thomas Waggener, Charles Backman and Ekaterina Gataulina, CINTRAFOR Working Paper 58, 1996.

[2] "Forestry in Transition: Outlook for Production and Trade in Eastern Russia to 2000," Charles A. Backman and Thomas R. Waggener, CINTRAFOR Working Paper 62, May 1997.

[3] Ekaterina Gataulina, "Analysis of Forest Industrial Complex of the Russian Far East in Post-Reform Russia 1990-1996 and Near-Term Outlook for its Development," unpublished Master of Science Research Paper, College of Forest Resources, University of Washington, Dec. 1996.

understanding and is gratefully acknowledged.[4] The analysis of environmental-forestry issues prepared by the Friends of the Earth-Japan also provided timely information regarding these important issues confronting forestry reform in the Far East.[5] Further, the earlier work of Ken Stanick on the Russian Far East was of importance to the current work.[6] Important information which is otherwise largely inaccessible in English to readers outside of Russia is paraphrased with acknowledgment in this current work. Possible errors in the correct interpretation or use of this information rests with the present authors.

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July 15, 1997

[4] Sheingauz, Alexander S., Vladimir P. Karakin and Vladimir A. Tyukalov, "Forest Sector of the Russian Far East: A Status Report," Economic Research Institute, Far Eastern Division, Russian Academy of Sciences, Khabarovsk, for USAID-sponsored Russian Far East Sustainable Natural Resource Management Project, USAID EPT/RFE, 1996.

[5] Newell, Josh and Emma Wilson, "The Russian Far East: Forests, Biodiversity Hotspots, and Industrial Developments," Friends of the Earth-Japan, Tokyo 1996.

[6] Ken Stanick, "Russia Far East Forestry Study," International Trade Centre, Vancouver, BC, Sept. 1994.

EXECUTIVE SUMMARY

? Following implementation of Russian Federation political and economic reforms, the RFE and its forests became a focal point of international attention. The Forest Industry Complex (FIC) can be considered as one of the most interesting sectors of the region due to its importance for business, international trader, tourism and the environment.

? This study reviews the current state of the FIC in the RFE region, recent trends of development, and the outlook for the near future.

ECONOMIC DEVELOPMENT IN THE RUSSIAN FAR EAST

? The RFE is located in Northeast Asia in close proximity to the major wood-deficit countries of the Pacific Rim (Japan, South Korea and China). With the availability of marine transportation, conditions are potentially favorable for greatly expanded RFE timber production and international timber trade, primarily with the Pacific Rim. However, remoteness and poor infrastructure continue to impede the development of markets and trade with the western part of Russia, the former republics of the USSR and Western Europe.

? A monsoon climate exists in the southern RFE, with a Siberian, or Continental, climate in the interior. Almost 75% of the RFE is permafrost, which results in a very low rate of growth on most RFE forests and to the slow recovery of disturbed areas.

? Four main vegetation zones are defined in the RFE (the first two zones have no commercial value for the FIC):

Arctic tundra grows as a thin belt in the far northern regions of Yakutia and Chukotka.

Tundra grows further south, forming a thin belt in Yakutia, covering most of Chukotka and northern Kamchatka, portions of Magadanskaya Oblast and northern Khabarovskiy Kray.

Taiga, the largest mass of boreal forest, forms the third zone that is the heart of the RFE. Further south, this forest gradually becomes more complex, although tundra can still be found along the mountain ranges. The forests of this zone provide a main base for the FIC.

Korean-pine-broad-leaved forests grow below the taiga zone in Primorskiy Kray and southern Khabarovskiy Kray. The conifer broad-leaved forests in these regions are called Ussuri taiga. This forest supports the majority of the RFE's endangered species. Ussuri taiga also is a productive source of timber.

? The RFE is a group of nine territories (sub-regions), which have equal political stature under the jurisdiction of Russia (except for the Republic of Yakutia, which has greater autonomy).

? The RFE, with an average population of 1.25 inhabitants per km^2, is one of the world's least populated areas. Population within the RFE is also unevenly distributed among its territories. The most populated areas are Primorskiy Kray, Sakhalinskaya Oblast and other southern sub-regions which enjoy a more favorable climate. The least populated sub-regions are those of the northern portions of the RFE region and the interior sub-region of Yakutia.

? The RFE has long been a labor-deficit region, where about 10% of total demand for labor is usually unmet. The government of the Russian Federation has stopped subsidies to the RFE regional population, and population has begun to decline with the most substantial drop in the Northern sub-regions of the RFE.

? Non-ferrous metals, marine resources, and timber are the major components of the economy of the RFE region. Although the RFE is rich in natural resources, it is also considered to be one of the least -developed regions in Russia.

? Previously, the RFE enjoyed cheaper (subsidized) transportation for the extracted natural resources that were in demand within the highly populated Western regions of Russia that provided the primary processing industries. National policies were to transport the natural resources rather than to construct processing capacities within the undeveloped areas. The RFE was, in turn, supplied with food products and most consumer goods from the other parts of Russia.

? Industrial production is concentrated in the south of the RFE, which is relatively diversified and self-sufficient. The northern areas have only isolated pockets of industrial (mining) activity with large areas of undeveloped tundra and taiga

? Following the collapse of the USSR, the economy of the RFE has become more oriented towards international markets, especially the Pacific Rim countries which account for almost 90% of RFE exports. The RFE supplies primarily extracted raw materials.

? Industries in the RFE are seeking to develop the capacity to process raw materials internally. Until value-added industries develop, the region will continue to focus on the short-term gains of exporting unprocessed materials.

THE FOREST INDUSTRY COMPLEX OF THE RFE

? Two of the major determinants affecting the FIC are the status of the forest resources of the RFE, and the level of forest management and related land use and environmental issues.

? The **Forest Fund** included about 498 million ha in 1993, or about 80% of the total land area of the RFE. The Forest Fund includes both forest lands and non-forest lands. **Forest land** is land within the Forest Fund on which it is technically possible to grow tree species, which has been set aside for that purpose, and which constitutes the main basis for activities of the FIC. Forest lands total about 351 million ha, comprising about 70.5% (1993) of the total Forest Fund of the RFE.

? **Forest Lands** within the Forest Fund can be either **Forested** or **Non-forested** depending upon the present status of the vegetative cover. **Forested lands** within the Forest Fund totaled almost 274 million ha in 1993, comprising about 44% of the total land area in the RFE, 54.9% of the total Forest Fund and almost 80% of the Forest Lands. The **Non-Forested** component of forest lands are technically allocated for growing tree species, but are not presently occupied by sufficient forest cover. These lands include both plantations and non-regenerated forest lands and constitute the potential basis for further expansion of the forested land category.

? **Non-Forest Lands** within the Forest Fund are just over 147 million ha in the RFE (1993). These lands are mainly swamps and mountain deserts, with little potential for conversion to forested lands or for future logging.

? Forests in Russia are classified by three categories of protection.

Group I are strictly protected forests (13.2% of Forest Fund). All forms of legally protected areas are allocated to this group. Commercial logging is forbidden in this category of forests, although sanitary felling may be permitted.

Group II includes forests in areas with a high density of population, a developed transport network, and both protective and limited-use functions (1 % of the Forest Fund). Principal cutting (commercial harvests) should be carried out in a way to preserve the nature-conservancy functions of these forests.

Group III forests (85.8% of Forest Fund) are forests allocated primarily for commercial exploitation. They are specified by legislation as developed and to-be-developed forests. The forest resource base which is potentially available for logging and for support of the FIC is mainly the group III forests.

? About 61% of forested lands in the RFE are located in the Northern sub-regions of the RFE (Yakutia, Chukotka, Magadan) with a harsh climate. Permafrost, which underlies about three-quarters of the forests, cold weather

and low precipitation limit tree growth and regeneration. These forest areas are also of low productivity and have low stocking densities, which inhibit the development of the FIC in this part of the RFE.

? Almost all forests in the RFE (except Yakutia) are mountain forests. This factor increases costs of logging and in many cases makes forests economically inaccessible.

? Forests of the RFE are primarily conifer (71.9%) with larch dominating (60.9% of all forests). The share of conifer forested area increases from the south to the north. The most valuable forests for the timber industry complex are the mixed conifer-deciduous forests in the south of the RFE. Korean pine, oak, ash and birch are the primary components of this mixed forest.

? Almost half of all the forest inventory in the RFE is mature or over-mature and is considered available for principal felling. The distribution of these age classes is almost evenly distributed across the RFE. This age structure determines the value of the annual allowable cut (AAC).

? Under existing levels of technology and infrastructure the utilization of AAC is very low (14%). Southern sub-regions of the RFE have the highest percent of utilization of AAC, although it is at present much less than under socialist conditions. Forests in Sakhalin are all developed and this sub-region has the highest percent of utilization of AAC at 41 % (1994).

? Forest management systems (especially forest protection) suffer the lack of funding and a distorted monitoring system. Only 28% of total required area was actually reforested in 1994. Only 7.7% of the area which needed to be planted for plantations was actually planted.

CURRENT STATUS OF THE INDUSTRIES OF THE FIC AND FUTURE DEVELOPMENT

? The FIC includes forestry, the logging industry, wood-processing, pulp and paper, microbiology, hydrolysis, and furniture sub-sectors, all based on the forest resources of the RFE. The logging, wood-processing and pulp and paper industries make the greatest contribution to the industrial production of the FIC in the RFE. The logging industry is the most developed and the timber economy is mainly oriented to extraction of raw materials.

? The role of the FIC in the economy of the region was more significant before the introduction of reforms. The traditional planned supply and demand systems collapsed after the reforms, while individual timber enterprises have become more independent.. The declines in production have continued due to constantly changing regulatory structure, lack of capital, and political and economic chaos.

? The reduction in lumber manufacturing has been dramatic. In 1994 lumber manufacturing volumes fell to only 54.5% of the 1950 level. It is essentially now more profitable for most logging enterprises to export unprocessed logs than to sell them to domestic sawmills. There has also been a striking drop in the production levels of pulp, paper and paperboard for the year 1994. Paper production has almost stopped.

? Productivity of the industries in the RFE is only 31.3% of the productivity of the Russian FIC as a whole. Among the main reasons of the worsening situation in FIC are: 1) completion of industrial development of the most accessible forests and uneconomic conditions for undeveloped forests under existing levels of technology and infrastructure; 2) frequent reorganizations in forest management and wood production; 3) rapid increase of all production costs (especially for transportation and energy) due to market adjustments and inflation, which has caused a decrease in competitiveness of regional forest products; 4) sharp decline of demand for wood products in the RFE; 5) loss of western Russian markets for wood products due to the sharp increase of railroad tariffs; 6) shrinking positions in international markets due to chaotic export policy regulations and low quality of wood products which did not meet international requirement; 7) sharp decline in regeneration of forest resources; and 8) increase of ecological, environmental and sustainable management restrictions.

? A main reason for the crisis in the FIC has been the rapid depreciation of main production assets. Modernization in a forest industry has not been a sector-wide process. Rather, upgrading facilities has been carried out on a limited, enterprise basis and has largely depended upon funding by foreign capital investments.

? The geographical location of the enterprises (especially the distance from ports) has begun to play a large role under the new economic conditions. Enterprises of the FIC located in the lower reaches of the Amur River and enterprises near railroads and ports have concentrated on roundwood production for exports which have become more profitable than domestic processing. Enterprises which are farther away from railroads and which use long road hauling or river routes have encountered difficult economic conditions.

? Labor productivity remains at a low level. In 1994 it was 360 m^3 per worker (roundwood equivalent), or about 1/2 to 1/3 of the level in competitor countries. Reductions of industrial harvest and low salaries also caused a reduction in employment in the industries of the FIC.

TRANSPORTATION INFRASTRUCTURE AFFECTING THE FIC

? RFE transportation systems were developed to connect the western territories of Russia and the resource-rich areas of Central Siberia with the Pacific Rim countries. Transportation systems running from north-to-south were neglected. All different modes of transportation (sea, river, truck and rail) are utilized to transport timber to the consumers. International export is conducted mainly via sea routes.

? New ports have emerged in the last five years, and major ports including Vanino and Sovgavan' have been expanded. The road system is poorly developed and is concentrated in the southern part of the RFE region. Future construction will be required for the FIC to secure shorter routes to the RFE seaports and to access presently inaccessible forest resources.

? Main freight transport routes for transporting timber include:

1. Trans-Siberian Railroad to the southern ports of Primorskiy Kray (*Nakhodka, Vostochniy, Poset, Zarubino, Bol'shoy Kamen', Slavyanka)* and all ground transfers via China and Korea borders;

2. Baikal-Amur Mainline (BAM) to the ports of Vanino and Sovetskaya Gavan';

3. Lower part of Amur River with its terminals;

4. Areas around the seaports and terminals of Primorskiy and Khabarovskiy Kray (*Svetlaya, Plastun, Preobrazhenie, Ol'ga, Amgu, Rudnaya Pristan', De-Kastri, Mis Lazarev)*, Tiksi in Yakutia, Ust'-Kamchatsk in Kamchatka and terminals of Sakhalin;

5. Domestic, locally-constrained freight transport routes of Yakutia, Kamchatka, Magadan and Sakhalin.

? The Trans-Siberian freight route accounted for the majority of timber transportation in the RFE (30.9%). The Baikal-Amur route was second in significance (26.7%) of all domestic closed freight routes and played a large role for producers of Northern territories and Sakhalin. About 8.3% was shipped via the lower part of the Amur River.

INTERNATIONAL AND DOMESTIC TRADE IMPACTS ON FOREST PRODUCTS DEVELOPMENT IN THE RFE

? In the mid-1980s about 15-20% of wood products produced in the RFE were exported to other regions within the former USSR; 25% were exported to international markets (with Japan and China as major customers); and the balance was consumed within the RFE. Since 1994, shipments to the other regions of the former USSR have almost ceased. In 1995 approximately 50% of production was exported to international markets while 50% was consumed in the RFE region.

? Major wood products exports originating in the RFE are from Khabarovskiy Kray, Primorskiy Kray and Sakhalinskaya Oblast. The Khabarovskiy Kray and Primorskiy Kray sub-regions will continue to be major industrial roundwood exporters in the RFE region. Northern sub-regions exports of wood product are negligible.

? Exports of lumber were 110 thousand m^3 in 1995. Primorskiy Kray is the leader in lumber export, accounting for 66.3% of the total lumber export of the RFE, and will likely remain as the single chip exporter (30 thousand tons in 1995) in the near term.

? The number of Russian timber exporters has increased since the cancellation of export timber licensing permits. This has resulted in price decreases for Russian timber on the international market. Large intermediary firms and associations have tried to unite small exporters in order to maintain the previously prevailing price levels. About 20% of timber is exported directly by independent exporters, mainly exports of logs by truck and railroad to China.

? Chaotic timber export regulations and violations of contract terms undermine the trust of foreign partners and the position of Russian timber in major Pacific Rim markets. The main obstacle in receiving a satisfactory (profitable) price for exports is the perceived lower quality of delivered wood products.

? Hard currency regulations announced on July 4, 1994, and a broad range of exchange rates were introduced in order to help Russia's national producers. However, this negatively affected the profitability of export trade in wood products and even caused bankruptcies of some FIC enterprises of the RFE region by reducing the net prices when converted to ruble accounts.

? Joint ventures (JVs) or those domestic enterprises with access to foreign capital have played a significant role in restructuring the FIC. Usually they have provided the necessary investments to support logging or other forest industry sub-sectors where they are involved.

? On September 1, 1995 108 JVs were registered in the RFE, related to timber industry. Almost 67% of JVs specialize in logging and production of industrial roundwood for export. The most prominent contributions to international trade were made by JVs of Primorskiy Kray, Khabarovskiy Kray and Sakhalinskaya Oblast sub-regions

? The economic efficiency of most JVs has declined over time. Economic instability in the region and frequent changes in investment legislation have had a negative impact on foreign investment decisions linked to further development of the FIC of the RFE.

? The Japanese market has always been the major foreign market for RFE wood products. Roundwood totally dominates the RFE export structure to Japan. Lumber and chips have recently comprised only about 13.7% of the total by volume. Export of plywood and pulp and paper products was negligible.

? Lumber exports from Russia have increased, due in part to Russian efforts to improve the overall export structure to increase the share of value-added. Russia has sought to insure this by including special terms related to value-added products in the new compensation agreement with Japan.

IMPLICATIONS AND NEAR-TERM PROSPECTS FOR THE FIC

? The significance of international trade with countries of the Pacific Rim and China has increased in the period since reforms were implemented, while the domestic trade within the Russian Federation and former USSR republics have lost position.

? For the future development of FIC of the RFE region it will be necessary to restore a balance with both domestic and international markets. The domestic market consumed about 20 million m^3 of wood products (in roundwood equivalent) from the RFE in the years of maximum production (1980's), while approximately 10 million m^3 were

exported. Logs dominated in the previous RFE export structure, while domestic markets consumed many kinds of different processed forest products.

? Major determinants of the near-term outlook for the FIC of the Far East region can be grouped into three broad categories:

I. National and regional macro-economic factors;

II. Factors related to land base, forest resources and environment;

III. Factors related to forest industrial production and markets.

? Group I (macro-economic) factors are largely outside the direct control of the FIC. However, these factors form the economic environment framework and determine the major policies for industrial development under continuing reforms. This group of factors include the major decisions made at the national and regional levels which will shape economic development of the region: transportation infrastructure, tax policy, and foreign investments.

? Group II (status of land base and forest resources of the region) factors are presently more stable than either Group I or Group III factors. Neither the land base, nor the accessibility of forest resources has changed in significant ways over the last three forest inventory periods. However, conditions for the economic utilization of the resources as well as introduction of sustainable forest management and environmental regulations will be critical to the future. This group of factors includes overall land use, classification of forest resources for non-timber and protective uses, conditions of forest resources and the economic accessibility, forest management (including reforestation), forest-linked environmental policies and requirements.

? Group III (forest industrial production and markets) factors largely depend upon achieving a stable economic and political environment (Group I) as well as upon the longer term status and allocation of the forest resources (Group II). This Group includes the following major determinants: international markets and trade, domestic markets and intra-Russia trade, new trade and forest policy and business regulations, technology, and transportation costs.

? The Group II factors form the primary basis for the near-term development of the FIC in the RFE. Land use and the resource base have been the most stable influences over recent years, although the economic parameters shaping feasibility of access and use have changed dramatically. These factors will continue to play a moderate role for the future development and restructuring of the FIC of the region in the near-term.

? Environmental values associated with the forests of the RFE are forecast to grow, perhaps significantly, in importance in the future. Where land use changes are involved, allocating lands to non-timber purposes will reduce the commercial forest land base (Group III forests) available for logging and support of the FIC. However, in the near-term these factors appear to be less significant. The forest resource base of the Southern sub-regions will largely remain accessible and economically attractive for logging companies. This part of the RFE can be expected to provide the base for the near-term future development of the regional FIC.

? Group III factors (industrial production and markets) have been changed dramatically during the period of economic and political reforms. International trade and transportation costs have become the major determinants of the development of the FIC of the RFE. The importance of access to new production techniques and modern technology has increased greatly, though progress has been seriously impeded greatly by the severe shortage of operating and investment funds. In the near-term, future production of roundwood for export will likely remain as the major trend in the development of the FIC in the RFE.

? It is possible that the economic level and composition of the RFE forest industrial complex may be below the prior socialist levels given the need to rationalize resource use and respond to the actual real costs of production. Exposure to the international markets may prove to be a significant advantage if comparative advantage can be established for more processed materials in lieu of growing exports of unprocessed logs. The

loss of traditional domestic markets will place a stress on the FIC to adapt to changing domestic demands and the disadvantages of great distance from those markets.

? It will be necessary for the FIC in the Russian Far East to work out the elements of a strategic plan for the near term development of the entire region which is supportive of the unique conditions of this important sector. The integration of all the key determinants (factors) affecting the FIC into such a strategy will be critical. Timber resources alone will not be sufficient to assure an internationally-competitive forest industry capable of fully contributing to the recovery of the Russian Far East.

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INTRODUCTION

The Russian Far East (RFE) is known to be one of the few remaining global forestry frontiers. This region is still relatively unknown, but this situation is changing rapidly. After the beginning of Russian economic and political reforms, the RFE and its resources (including forests) rapidly drew the attention of the international community. Policy concerns have centered on the RFE as a source of timber supply versus the environmental values of its wildlands. The Forest Industrial Complex (FIC)[7] of the RFE can be considered as one of the most significant due to its collective importance for local businessmen, international traders, tourists and environmentalists. The FIC is one of the key determinants of the development of the economy of the region. Understanding the current state of the forestry sector and current trends and the near-term outlook for further development will aid decisions about possible future investments and the potential supply of timber and other forest products from this region, as well as decisions about environmental issues and protection of the unique areas for non-timber production purposes. Changes are taking place so rapidly in this part of Russia that long-term forecasts are rather uncertain.

The purpose of this analysis is to provide a better understanding of the current state of the FIC in the Far East region and to identify trends and factors shaping its development in the near-term. The main feature is the recognition that further development of the FIC will be impacted by the cumulative effect of several major determinants working together: the economic situation in the post-reform RFE, forest resources of the RFE (land base), level of forest management, current state of industries included in the FIC, international and domestic trade in forest products, transportation infrastructure, and environmental issues. All of these determinants will be reflected in the evolution of future forest policy and regulations. This paper first summarizes the situation for each of these factors as of the mid-1990's in order to reveal the present starting point for further development of the FIC. The last chapter presents a summary of the likely impacts which will determine the direction of the development of the FIC in the near term.

SOURCES OF INFORMATION

This study is primarily based on the numerous research studies which have already been done in Siberian Russia and in the RFE on various aspects of forests, forestry and international trade in forest products. The many sources utilized are cited in the Bibliography. This work draws upon the following important works in particular:

1. Friends of the Earth-Japan's Hotspot Project[8] --the most complete current work about RFE areas most critically in need of protection;
2. Recent work by Dr. Sheingauz et al.[9] -- one of the most comprehensive studies of the FIC in the Far East region;
3. Forestry Study prepared by K. Stanick[10] for the International Trade Center in Vancouver, BC, 1994;
4. Forest Policy Review of the World Bank, focused on promoting sustainable forest sector development during a transition period;
5. Prior studies conducted by CINTRAFOR and IIASA on the Russian forestry sector in transition.

Information for this analysis also came from various statistical sources and materials published in journals and newspapers (inventory data, Goskomstat annual fact-books, statistical sources of the Federal Forest Service of Russia and unpublished Rosexportles statistics). The *Russian Far East Update*, a monthly business journal on economic activity in the RFE, provided valuable current information on the situation in the Far East region. Texts of official legislation documents, regulations and programs such as Principles of the Forestry Legislation of the Russian Federation were also utilized as reference materials for this analysis.

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[7] The "Forest Industry Complex" is the aggregation of industries that utilize the forest land base and resources of the region for the production and processing of timber.

[8] Newell, J. and E. Wilson, (1996) *The Russian Far East.* Friends of the Earth-Japan.

[9] Sheingauz, A., Karakin, V., Tyukalov, V. (1996) *Lesnoy Kompleks Rossiiskogo Dal'nego Vostoka: Situacionnii analiz*.

[10] Stanick, K. (1994) *Russia Far East: Forestry Study*. Vancouver BC. International Trade Center.

THE RUSSIAN FAR EAST: GEOGRAPHICAL AND ECONOMIC OVERVIEW

GEOGRAPHICAL LOCATION, CLIMATE, ECOLOGY [11]

The RFE includes 6,215,900 km^2 within Northeast Asia. It accounts for 36.4% of Russian total land area, with a population of 7.788 million persons (5.2% of Russian total).[12] The RFE borders China on the south (the length of the border is 1342 miles) and North Korea to the southeast. Japan is less than 30 miles from Sakhalin Island and 122 miles from Primorskiy Kray. Several kilometers of the Bering Strait divides Chukotka in the far northeast from Alaska. Moscow is 5,620 miles and seven time zones away from Vladivostok, the largest city on the Sea of Japan (see Map 1).

The RFE borders Krasnoyarskiy Kray, Irkutsk Oblast and Chita Oblast, on the west, which form part of the East Siberian region of Russia (see Map 2). This closeness to the wood-short countries of the Pacific Rim and availability of marine transportation are favorable conditions for timber trade, while remoteness and poor infrastructure impede the development of trade with the western part of Russia, former republics of the USSR and Europe.

Mountainous landscape is a dominant characteristic of the region. Irregular climate zones are formed by plateaus and mountains range from 1000 to 2000 meters high. Plains cover approximately one-forth of the territory. The plains located along the Amur River and its major tributaries, the Zeya, Bureya and Ussuri rivers, are most productive agricultural areas of the RFE, attractive for people to settle. The other largest rivers of the RFE are the Lena, Viluy, Indigirka and Aldan, which play important roles as transportation routes, though navigation is limited to months of the year when waters are ice-free (see Map 3). The rivers are also a source of electric power for the region. Major hydro power plants are located on the Zeya, Kolyma and Viluy Rivers and in Southern Primorskiy Kray. The Sea of Okhotsk extends along the eastern part of the RFE and is considered one of the richest fisheries in the world. Thus, one of the main natural resource specialization's of the region is fishing.

The climate of the RFE determines to a great extent the type of forests and the rates of growth as well as conditions for logging and transportation. Natural zones of the RFE range from the cold Arctic tundra in the north (Yakutia) to subtropical forests (Amur and Ussuri River basins) in the south. The north-south gradation is strongly affected by mountainous regions where there is a succession of vegetation. Soils are distributed more by elevation than by latitude.[13] The Sea of Okhotsk and the Sea of Japan with warm currents are responsible for a monsoon climate in the southern RFE, western Kamchatka and eastern Magadan. This type of climate is characterized by rainy summer and autumn; cold and dry winter (because of the cold mass of air coming from Siberia at this time of the year), and a long wet spring. A continental climate dominates in the interior Magadanskaya Oblast, western Amurskaya Oblast and all of Yakutia. Winter there is severe and long, but with little snow. Summer is short but often hot. The mountains along the Pacific coastline prevent the warmer maritime climate from spreading further inland. Almost three-fourths of the RFE is permafrost, or permanently frozen ground. Only the coast along the Sea of Japan, lowlands near Ussuri and lower Amur rivers are not occupied by permafrost. This harsh condition leads to a slow rate of growth throughout most of the RFE territory and to a very slow recovery of disturbed areas.

Four main vegetation belts are defined in the RFE:

1. **Arctic tundra** (treeless, polar deserts with patches of moss, lichens and various grasses) extends as a narrow belt along the Arctic coast in the far northern regions of Yakutia and Chukotka.

2. Tundra extends further south, covering most of Chukotka and northern Kamchatka, portions of Magadanskaya Oblast, northern Khabarovskiy Kray and forming a narrow band in Yakutia. Harsh climate extremes in the

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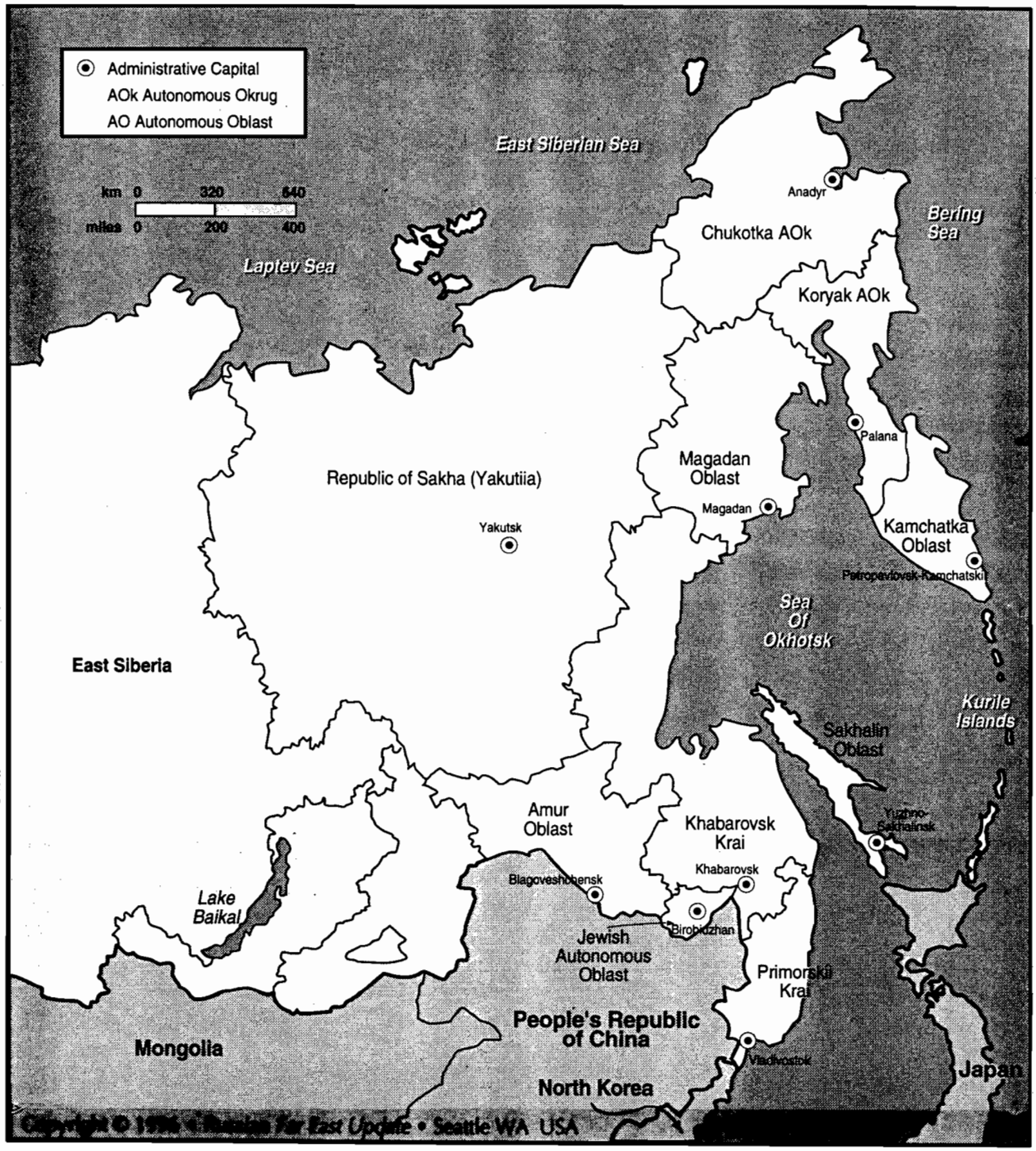
[11] Newell, J. and E. Wilson, (1996) *The Russian Far East.* Friends of the Earth-Japan, p. 5-6. *Pocket Handbook of the Russian Far East: A Reference Guide*. (May 1994) Seattle, WA: Russian Far East Update, pp. 3-4.

[12] *Rossiiskiy Statisticheskiy Ezhegodnik*, (Moskva, Goskomstat Rossii, 1994), p. 443.

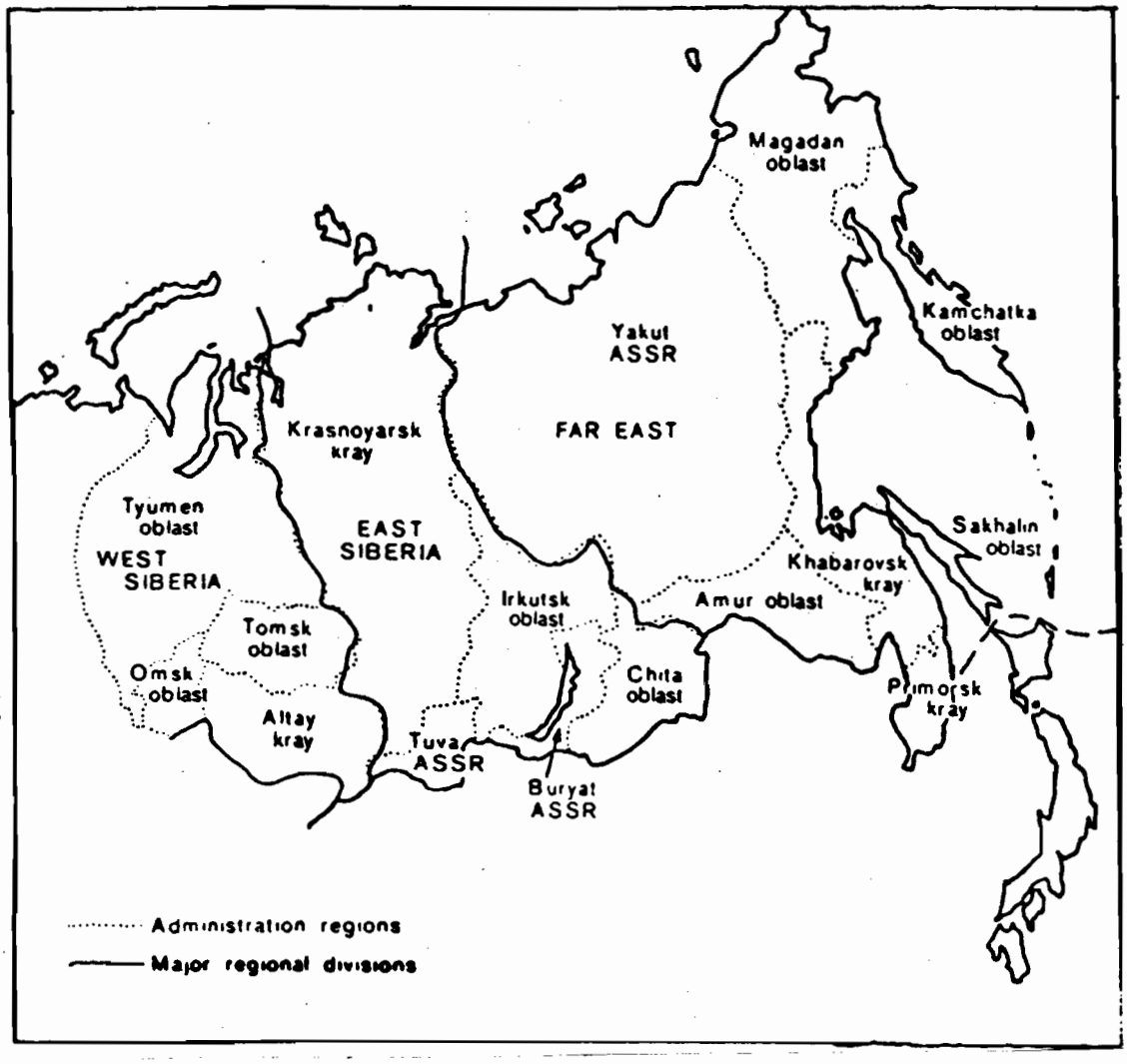
[13] Backman, C. And T. Waggener, (1991) *Interpretation of the 1988 National Inventory*. Working Paper No. 35, CINTRAFOR, University of Washington, p. 5.

Map 1. The Russian Far East: Administrative Regions



Source: *Russian Far East Update. (1996)* special ed. Seattle, WA.

Map 2. Eastern Russia: Siberia and the Far East Economic Regions



Source: The Eastern USSR: Forest resources and forest products exports to Japan, Fenton, R.& Maplesden, F.

winter makes these areas barren and desert-dry. In summer, arctic moss grows all over tundra landscapes, providing food for various wildlife species and herds of domestic reindeer. In the south this zone gradually becomes **forest-tundra**, where creeping forests, dwarf pines and larch emerge. Lonely large trees, mostly larch, which is able to grow on shallow soil, grow along the major rivers. These zones have no commercial value for the FIC, though they play an important role in providing habitat in the fragile ecosystems of this region for snowy owl, Arctic fox, reindeer and many other endangered species. Chukotka is considered to have the highest density population of polar bears in the world. Yakutia is a main nesting site for the remaining Siberian white cranes. Most of the world's population of Ross's gulls nest in the north of the RFE.

3. **Taiga**, a large mass of coniferous forest, covers the central part of the RFE between 70 and 50 degrees latitude. Further south, broadleaf deciduous species gradually become a component of the coniferous stands, although tundra can still be found in the mountains. The north is dominated by larch forests which are able to grow on permafrost. In central and southern regions, with warmer conditions and better soils, spruce, Korean pine, fir and Siberian pine forests begin to appear. The forests of this zone provide a main base for the FIC. Also it is home for hundreds of bird species, brown and black bears, wolves, sables, lynx, elk, and wild boars. Kamchatka Peninsula is estimated to have the world's largest population of brown bears and the world's richest salmon stocks in its rivers and along its shores. Large populations of northern fur seal, Steller's sea lion and sea otter are found along the Sea of Okhotsk and Kamchatka coastlines. The diversity of wildlife also promotes tourism, commercial hunting (especially for brown bears and snow sheep in Kamchatka) and fishing.

4. **Ussuri taiga** (or Korean pine broad-leaved forest) extends along most of Primorskiy Kray and into southern Khabarovskiy Kray. This type of forest, in which evergreen coniferous and deciduous broadleaf trees are widely found, grows below the taiga zone along the Sikhote-Alin' mountain range. Similar conifer/broad-leafed forests grew in the past in China, Japan and on the Korean Peninsula, where they have been largely destroyed. Ussuri taiga supports the majority of the RFE's rare and endangered species, such as the famous Siberian tiger, lynx, goral and many others. Ussuri taiga also is a good source of timber for the FIC as well as a valuable source of medical herbs (eleutherococcus, ginseng, *etc*.).

POLITICAL STRUCTURE AND POPULATION [14]

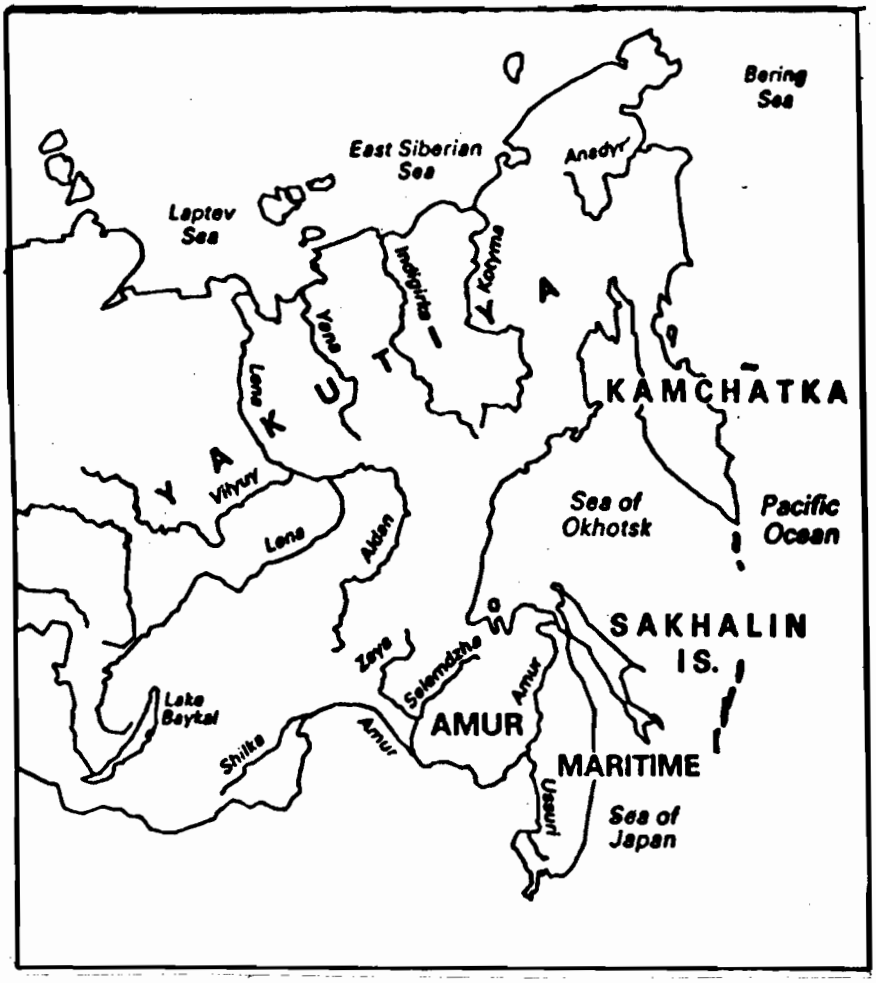
The RFE is an economic grouping of territories which encompasses the easternmost lands of Russia and has no formal political authority. Each territory is governed by a Head of Administration (governor) appointed by the President of the Russian Federation. Each territory is also represented by local duma (parliament).

Nine administrative territories are included in the RFE, all of which have equal political stature under the jurisdiction of Russia (except for the Republic of Yakutia, which has greater autonomy). Administrative sub-regions of the RFE include Yakutia republic, Jewish Autonomous Oblast, Chukotskiy Autonomous okrug, Primorskiy Kray, Khabarovskiy Kray, Amurskaya Oblast, Kamchatskaya Oblast including Koryakskiy Autonomous Okrug, Magadanskaya Oblast and Sakhalinskaya Oblast (see Map 2). Two of these entities, the Jewish Autonomous Oblast and the Chukotskiy Autonomous Okrug, have been considered separate units in recent years. Previously the Jewish Autonomous Oblast was part of Khabarovskiy Kray. In official data sources prior to 1991, Khabarovskiy Kray included data for the Jewish Autonomous Oblast. In a similar way, Chukotskiy Autonomous Okrug previously was part of Magadanskaya Oblast and official sources did not report data separately for Chukotskiy Autonomous Okrug from Magadanskaya Oblast (prior to 1991). The terms, "Kray," "Oblast" and "Republic" refer to territorial regions within Russia, similar to provinces in Canada.[15]

[14] *Pocket Handbook of the Russian Far East: A Reference Guide*. (1994), Seattle, WA: Russian Far East Update, pp. 1-2, 86-89.

[15] Stanick, *op. cit.* , p 1.

Map 3. Major River Systems of the Russian Far East



Source: The Soviet Far East, Rogers Allan (Ed.)

The RFE, with an average population of 1.25 inhabitants per km^2, is considered one of the world's least populated areas per capita. [16] This alone greatly impedes economic development of the region. Population in the RFE is unevenly distributed among its territories as shown in Table 1.

The most populated areas are Primorskiy Kray, Sakhalin Oblast, Jewish Autonomous Oblast, Amurskaya Oblast and Khabarovskiy Kray, *i.e.*, southern areas with the most favorable climate. The most productive forests are also located in these sub-regions.

This makes the southern part of the RFE (also with favorable location close to sea-routes and to countries which consume its raw materials) more attractive for investments. The least populated northern part of the region and Yakutia with its harsh climate provide fewer business opportunities for short-term investments despite of their vast natural resources. However these sub-regions must be considered in terms of forestry potential in the long run.

Most of the population of the RFE is urban (75.7%). The rate of urbanization in this region in 1994 was a little bit higher than the average urbanization rate in Russia (73.1%). In Magadanskaya, Sakhalinskaya, and Kamchatskaya Oblasts and Khabarovskiy Kray, the urbanization rate was 80-85%. On the other hand there are only two cities in the RFE with a population of more than 500,000: Vladivostok (pop. 648,000) and Khabarovsk (pop. 518,000).[17]

The trend in population by sub-region is shown in Table 2 for the period 1970-1994.

Table 1. Distribution of the Population of the RFE by Sub-Region 1994

	Population (000)			Territory		
Sub-region	**Total**	**Urban**	**% of Urban**	**000/km²**	**% of total**	**Population per km²**
Yakutia	1061	692	65.22	3103.2	49.92	0.34
Jewish aut. obl.	218	143	65.60	36.0	0.58	6.06
Chukotskiy aut. obl.	113	80	70.80	737.7	11.87	0.15
Primorskiy Kray	2287	1775	77.61	165.9	2.67	13.79
Khabarovskiy Kray	1608	1296	80.60	788.6	12.69	2.04
Amurskaya obl.	1056	691	65.44	363.7	5.85	2.90
Kamchatskaya obl.	439	359	81.78	472.3	7.60	0.93
Koryakskiy aut. ok.	35	13	37.14	301.5	4.85	0.12
Magadanskaya obl.	307	264	85.99	461.4	7.42	0.67
Sakhalinskaya obl.	699	592	84.69	87.1	1.40	8.03
RFE	7788	5892	75.65	6215.9	100.00	1.25

Source: Computation based on data derived from *Rossiiskiy Statisticheskiy Ezhegodnik*, (1994).

From 1970 to 1989, the population in most sub-regions grew even faster than the overall population of Russia (average population growth rate in Russia for this period was 1.1% while for the RFE it was 1.4%) and faster than any of the other major regions of Russia. This was due to governmental policies encouraging development of the region which also included the re-start of the construction of the Baikal-Amur Mainline (BAM) railroad in 1974. Previously the government compensated for the high costs of living, since much of the RFE territory is unsuitable for agriculture. A substantial share of the necessary products are imported from other regions of Russia. The harsh climate in the northern parts of the RFE require heavy warm clothes as well.

[16] Computation based on data derived from *Rossiiskiy Statisticheskiy Ezhegodnik*, Statistical yearbook. (1994). Moskva: Goskomstat Rossii.

[17] Newell & Wilson, *op. cit.*, p.7.

Table 2. Population in the RFE by Sub-Region 1970-94 (Thousands)

Region	Years									1994/ 1991 (%)
	1970	1976	1979	1988	1989	1991	1992	1993	1994	
Yakutia	664	762	839	1013	1081	1109	1093	1074	1061	95.67
Jewish aut. obl.	172	183	190	205	216	220	221	219	218	99.09
Chukotskiy aut. Obl.	101	124	133	155	157	154	146	124	113	73.38
Primorskiy Kray	1721	1897	1978	2153	2258	2299	2309	2302	2287	99.48
Khabarovskiy Kray	1174	1296	1376	1533	1609	1631	1634	1621	1608	98.59
Amurskaya obl.	793	879	937	1018	1058	1074	1075	1063	1056	98.32
Kamchatskaya obl.	288	353	378	436	466	473	472	456	439	92.81
Magadanskaya obl.	252	314	333	379	386	380	363	327	307	80.79
Sakhalinskaya obl.	615	639	655	689	710	717	719	714	699	97.49
RFE	5780	6447	6819	7581	7941	8057	8032	7900	7788	96.66

Source: Computation based on data derived from *Rossiiskiy Statisticheskiy Ezhegodnik*, (1994).

The RFE has always been one of the most expensive regions of Russia. For example, in 1993 a resident of the RFE spent 35% of the average salary for a standard set of 19 food products, while this figure was 26% for Russia as a whole. Salaries have also averaged higher than in other regions. In 1970 the average monthly salary in Russia was 121 rubles while in the RFE it was 186 rubles (highest among all the regions of Russia). This helped to lure immigrants to the region. Another reason for faster than average population growth was the involuntary migration as prisoners were sent to develop the mining regions in Magadanskaya Oblast and Chukotka.

After the start of the political and economic reforms the State government stopped subsidizing the region and the population began to decline. The most substantial drop of population has been observed in Chukotka (-26.62%). However, according to the Immigration Service, a flow of immigrants from the former republics of the USSR is being seen at the present time in the RFE, slowing the population decline. Immigrants are often trying to escape from areas of ethnic conflict and are also lured by higher standards of living in the Russian Federation. They have primarily settled in Sakhalin and the other southern sub-regions of the RFE. However, they are mostly received by locals as "uninvited guests" who contribute to an increase in the crime rate and compete for jobs with the 13,000 officially registered unemployed of the Sakhalin and Kuril Islands.[18]

According to the Russian Far East Pocket Handbook, the RFE has the lowest share of population of older people (11%) and the highest share of population of working age (61%) among all the regions of Russia. This is because the immigrants who were lured by high salaries are mostly of working age. Many of them consider their residence in the RFE as temporary, or until they can save enough money to return to their permanent residence.

Large real differences in living conditions between the Western regions of Russia and the RFE are yet another reason for people's unwillingness to settle permanently in the RFE. This is especially true for the northern part of the region (Chukotka, Magadan, Yakutia).

The labor force, defined as the number of people willing to work, including unemployed people actively searching for work as well as employed workers, comprised 50.0% of the total population of the RFE in 1993 (50.6% in 1992). This is very similar to Russia's average (50.4% and 50.9% respectively).[19] The share of male and female labor is more equally balanced than in the rest of Russia where female workers dominate. Distribution of the labor force among sub-regions is shown in Table 3.

[18] *Troika Weekly Report*, 15 November 1996.

[19] Computations based on data derived from *Rossiiskiy Statisticheskiy Ezhegodnik*, Statistical yearbook. (1994). Moskva: Goskomstat Rossii, pp. 456, 458.

Table 3. Distribution of Population and Labor Force among Sub-regions of the RFE 1992-1993

Sub-Regions	Population		Labor Force			
	(000) 1992	(000) 1993	(000) 1992	(000) 1993	% 1992	% 1993
Yakutia	1093	1074	594.9	562.0	54.43	52.33
Jewish aut. Obl.	221	219	98.3	96.7	44.48	44.16
Chukotskiy aut. obl.	146	124	97.6	55.3	66.85	44.60
Primorskiy Kray	2309	2302	1139.5	1106.0	49.35	48.05
Khabarovskiy Kray	1634	1621	811.6	814.6	49.67	50.25
Amurskaya obl.	1075	1063	517.8	503.4	48.17	47.36
Kamchatskaya obl.	472	456	233.1	231.5	49.39	50.77
Magadanskaya obl.	363	327	211.1	187.3	58.15	57.28
Sakhalinskaya obl.	719	714	364.8	396.2	50.74	55.49
RFE	8035	7900	4068.7	3953.0	50.64	50.04

Source: Computation based on data derived from *Rossiiskiy Statisticheskiy Ezhegodnik,* (1994).

The labor force declined in a majority of the sub-regions due to the economic hardships of the transitional period, with the largest drop in Chukotka (-22.25%). Temporary residents left this area because salaries were not enough to even compensate for the higher cost of living in this region. In 1993 the population growth rate was also negative in most of the sub-regions (for the RFE it was -1.3 per 1000 persons). This was a smaller decline than Russia's overall average (-5.1) due to the larger share of population of childbearing age.

The RFE has always been a labor-deficit region where 10% of total demand for labor has usually gone unfilled. As a result, the more recent increases of unemployment due to the hardship of the transitional period was not considered a major threat to social stability. In 1993 the total number of unemployed in the RFE was reported to be 2.4 million (6.1% of the labor force). The labor shortage is especially noticeable in the RFE resource-extraction industries (timber, mining). Workers from China, North Korea and Mongolia have been 'imported' to help keep these enterprises running.

RFE is not a "hot spot" of ethnic conflict, which is positive factor for the development of the regional economy. Ethnic Russians comprise 80% of the total population of the RFE, Ukrainians 8%, Yakuts 3.5%, Belorussians 1.5%, and other native people 7%.[20]

NATURAL RESOURCES, INDUSTRIAL DEVELOPMENT, AND BUSINESS OPPORTUNITIES

The RFE is considered to be one of the least economically developed regions in Russia. It produces only 5% of Russia's national product, and depends primarily on energy, minerals and other natural resource extraction.[21] The availability of raw materials determines to a great extent the specialization of the region. Non-ferrous metals, marine biological resources and timber are considered major factors for the economy of the region.

Sakhalin Island and Yakutia have important oil and gas reserves: 308 million tons of high-grade oil and 1.5 trillion m^3 of gas. The continental shelf bordering Khabarovskiy Kray, Magadanskaya Oblast, Sakhalin Island and Kamchatka Peninsula also contains significant off-shore oil and gas reserves. The majority of gold and silver reserves are located in Yakutia, Amur, Magadan, Khabarovsk, and Kamchatka regions. The world's second largest reserve of diamonds is found in Yakutia, providing 100% of Russia's total. Other mineral resources include 4.4 billion tons of iron ore deposits (mostly in southern Yakutia); 18 billion tons of coal (80% in Yakutia); non-ferrous metals including tin, antimony, tungsten, mercury, lead and zinc.

[20] *Ibid*., p. 89.

[21] *Pocket Handbook of the Russian Far East, op. cit*., p. 103.

The RFE also enjoys vast marine resource reserves. Fish stocks are estimated at 29 million tons (85% pollack and sardine). Salmon, crab, shrimp, scallops and sea urchins are other important species valuable for the fishing industry. Marine resources are distributed in the Sea of Okhotsk (46%), in the coastal waters around the northern Kurils (18%), in the Sea of Japan (12%), the Bering Sea (11%) and the eastern shores of Kamchatka (7%).

The Russian Forest Service estimates there are over 21 billion m^3 of timber reserves in the RFE. Over half of these forests are in Yakutia, but the most productive and accessible ones are in the south (Khabarovskiy and Primorskiy Krays, Amurskaya and Sakhalinskaya Oblasts). There are also many important non-timber forest products such as mushrooms, ferns, ginseng and other medicinal plants.[22]

Though the RFE produces just 5% of Russia's total industrial output, in a number of areas its contribution to the national economy is much more significant. The region provides almost 60% of Russia's catch of fish and sea products. Only West Siberia exceeds the RFE in mining (the RFE provides 17% of Russia's national output). Also, the region has a near monopoly in tin, tungsten gold (northern part of the region), diamonds (Yakutia), and antimony.[23] The RFE produced 4.5% of all the electric power in Russia (1993).

Some sectors, however, still need to be developed in contrast to their potential. For example, RFE produces only 1.2% of total Russian steel and 1.9% of metal-cutting equipment.[24] Production of its chemical and textile sectors are well below Russia's national average. Machine building, with a heavy portion formerly in the defense sector, needs investment for restructuring and modernization.[25] The RFE's contribution to Russia's industrial output in 1991 is shown in Table 4.

The industrial structure clearly reflects the RFE dependence on raw materials (see Figure 1). Specialization of the region in the production of seafood and extraction of raw materials but with further processing in other regions of Russia was previously rationalized by the centrally planned allocation of industries and resources. This "theory" stated that the region should become specialized in activities with the least cost of production, taking into consideration the historic mix of economic activity, availability of raw resources and labor force, location of existing enterprises and consumers, level of transportation facilities and the degree of the development of the fuel and energy base.

Historically the RFE with its limited population was a supplier of raw materials to the highly populated European and Ural regions of the former Soviet Union with their more highly qualified workers. Under the planned economy, it was deemed cheaper to transport logs and ore to the major places of final consumption of the products than to build new processing plants and new cities in the frontier areas and then attempt to attract workers to settle there. Another central planning theory stated that the more specialized an enterprise (or region), the more efficiently it works. Karl Marx stressed the assumed benefits of labor specialization at the factory level for increasing labor productivity.

The diversification of the economy was not a primary goal of the socialist government. Whole cities were constructed around the extraction of one or a few resources (Uglegorsk, coal; Neftegorsk, oil). Little money was reinvested to develop processing capabilities.[26] For this reason the economy of the RFE region is highly unstable. The development of the region under socialist conditions (for example, construction of the BAM railroad) was carried out primarily in a manner to get access to the natural resources. The usefulness of the BAM railroad was later argued in Russian papers only after the beginning of the economic reforms. The structure of industrial production by sub-region is presented in Table 5.

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[22] Newell & Wilson, *op. cit.*, p.7.

[23] *Pocket Handbook of the Russian Far East, op. cit.*, p. 103.

[24] Computation based on data derived from *Rossiiskiy Statisticheskiy Ezhegodnik,* Statistical yearbook. (1994). Moskva: Goskomstat Rossii, pp. 622, 624.

[25] *Pocket Handbook of the Russian Far East, op. cit.*, p. 103.

[26] Newell & Wilson, *op. cit.*, p.7.

Table 4. RFE Contribution to Russia's Industrial Output - 1991 (%).

Industry	%
Mining	16.4
Manufacturing	3.7
Nonferrous metals	16.1
Timber	8.0
Fishing	58.0

Source: *Pocket Handbook of the Russian Far East*, (1994).

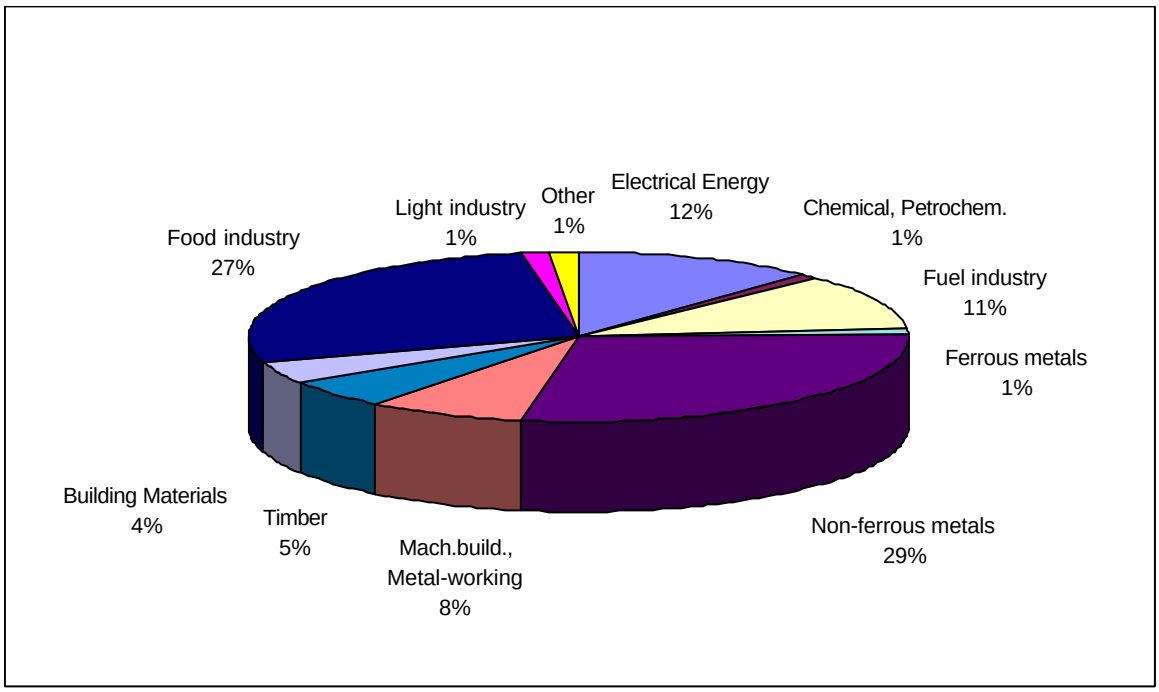

Figure 1. Structure of RFE Industrial Production 1993. Source: Data derived from *Rossiiskiy Statisticheskiy Ezhegodnik*, (1994).

Table 5. Structure of RFE Industrial Production by Sub-region - 1993 (%).[27] Numbered columns represent:

1. Electrical energy
2. Fuel industry
3. Ferrous metals
4. Non-ferrous metals
5. Machine building, metalworking industries
6. Chemical and petrochemical industries
7. Timber, woodworking, pulp and paper
8. Building materials
9. Food, flour milling, ceral and mixed feed industries

Area	1	2	3	4	5	6	7	8	9	10	Other	Total
Yakutia	10.2	12.1	-	66.4	1.1	-	1.2	4.1	4.1	0.3	0.5	100.0
Jewish aut. Obl.	6.3	-	0.4	1.9	25.9	0.1	9.1	17.6	16.1	20.4	2.2	100.0
Chukotskiy aut. Obl.	22.5	2.9	-	70.6	0.2	-	0.2	0.8	2.2	0.1	0.5	100.0
Primorskiy Kray	9.7	1.0	0.1	4.2	12.5	2.5	6.0	5.4	54.3	1.7	2.6	100.0
Khabarovskiy Kray	12.3	26.0	6.3	5.4	14.7	1.8	9.8	4.2	16.1	2.0	1.4	100.0
Amurskaya obl.	19.2	8.0	0.2	23.0	7.8	0.1	8.9	5.3	23.2	1.9	2.4	100.0
Kamchatskaya obl.	13.0	0.1	0.1	0.5	7.6	-	1.8	3.0	73.0	0.6	0.3	100.0
Magadanskaya obl.	14.9	1.4	0.1	65.4	3.7	-	0.6	2.0	10.9	0.4	0.6	100.0
Sakhalinskaya obl.	9.8	19.3	-	0.2	4.0	0.3	12.3	5.4	47.5	0.6	0.6	100.0
RFE	11.9	10.5	1.2	28.4	7.6	0.9	5.3	4.4	27.1	1.3	1.4	100.0

Source: Data derived from *Rossiiskiy Statisticheskiy Ezhegodnik*, (1994).

[27] Non-ferrous metals includes diamonds here.

Industrial production is concentrated in the southern part of the RFE. Khabarovskiy Kray, Primorskiy Kray, Jewish Autonomous Oblast and Amurskaya Oblast are relatively diversified and self-sufficient. The northern areas (Yakutia, Magadan, Chukotka) have only isolated pockets of industrial mining activity among undeveloped tundra and taiga. Sakhalin and Kamchatka are heavily specialized in fishing and fish processing.

Though production of energy (electricity and heat) comprises a substantial part of the industrial structure of the RFE, the region can be considered as energy deficient. Shipments of coal into the southern sub-regions are essential for energy production in the RFE. However, low quality and irregularity of shipments are problems. Reserves of electricity-generating capacities and fuel are estimated as low. The RFE power grid is insufficient and some areas are chronically deficient. This also impedes the rate of industrial and overall economic development of the region. A recent electrical crisis in Primorskiy Kray threatened the work of the enterprises.

Some basic industrial and agricultural products have to be imported from other Russian regions because of the high share of land which is unsuitable for agriculture and the low level of diversification of local industries. After the collapse of the USSR economy and continuing economic crises since 1991, the RFE stopped receiving subsides and investments from Moscow. Assured markets in many cases were lost, mainly due to increased railroad tariffs which made cross-Russia shipment unprofitable. All major sectors of the RFE economy experienced substantial decline.[28]

The economy of the RFE has now become more oriented towards international markets, especially the countries of the Pacific Rim (accounting for almost 90% of RFE exports), supplying them with extracted and largely unprocessed raw materials. RFE international exports are presently growing faster than industrial production. It is reported that 8-9% of total RFE output is now exported. The role of the RFE as a trading intermediary between western and inner Russia and Asian countries is also growing. Only 20% of the exports originate in the Russian Far East, while the rest come from other regions of Russia.[29] Foreign companies are not only prime consumers, but also a vital (and in most cases the only) source of investment capital.

Figure 2 presents the contribution of the sub-regions of the RFE to export trade in 1993. Khabarovskiy and Primorskiy Krays lead in export trade with Sakhalin third. These sub-regions are in the best location geographically for trade and are also the most economically developed within the RFE.

Khabarovskiy Kray has the most diversified export structure, sending abroad timber, fish, fertilizers, military aircraft, vessels, rolled steel, pulp, copper, *etc*.[30] During the first half of 1996, the overall volume of Khabarovskiy Kray foreign trade increased by 2.5% over the first half of the previous year. This included an increase of exports by 9%, and the reduction of imports by 15%. In 1996, a reduction in the export of black and ferrous metals, as well as cellulose and oil products has continued due to the inefficiency and unprofitability of many enterprises. Exports of commercial timber and fish products increased although overall production decreased. In 1995 and 1996, the leading exports were timber (24.9%), services (9.6%), oil products (2.5%), ferrous metals (2.1%) and others.[31]

Fish and fish products comprise almost two thirds of the total export of Primorskiy Kray. Sakhalin exports fish, oil and timber. Other sub-regions' share in the total export structure is increasing. Yakutia and Amurskaya Oblast have begun to play a more significant role in foreign trade. Amurskaya Oblast has become an intermediate partner for traders who buy goods in inner Russia and resell them to China. Yakutia exports are primarily diamonds and coal.[32]

Major foreign trading partners of the RFE in 1992 are shown in Figure 3.

[28] *Pocket Handbook of the Russian Far East, op. cit*., pp. 103-104,108.
[29] *Ibid*., p. 75.
[30] *Ibid*., p. 78.
[31] *Priamursky News*, November 8, 1996.
[32] *Pocket Handbook of the Russian Far East, op. cit*., pp. 77-78.

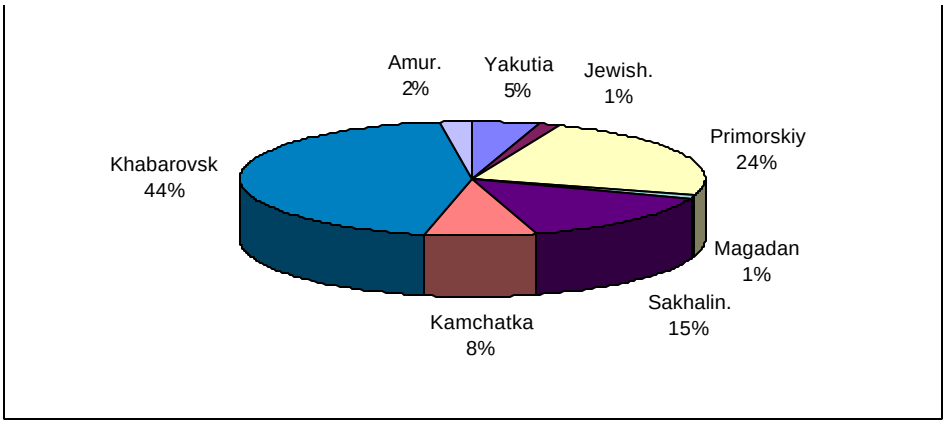

Figure 2. RFE Sub-Region Share of Foreign Trade 1993. Source: Data derived from *Rossiiskiy Statisticheskiy Ezhegodnik*, (1994).

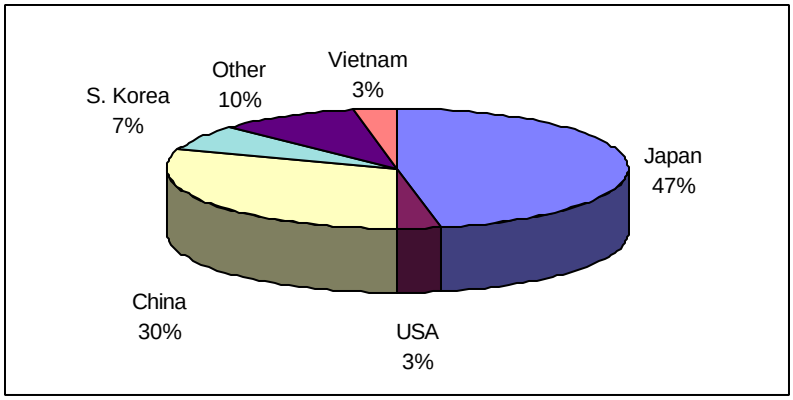

Figure 3. Major Foreign Markets for RFE Exports - 1992. Source: *Pocket Handbook of the Russian Far East*, (1994).

Direct foreign investment in the RFE has been less vigorous than trade. The investment climate is still considered as highly risky, but international investment is growing. Foreign oil and trading companies (including Exxon, Texaco, Royal-Dutch Shell, Marathon Oil, Mitsubishi and Mitsui) plan to invest over US$ 30 billion into four off-shore oil development projects on Sakhalin Island. The Global Forestry Management Group has established the first large US logging ventures in the region. Russia's Ministry of Atomic Energy and RAIES Corporation plan to build seven nuclear plants in the RFE to treat unprocessed logs for insect pests. This will make it possible to export timber to the USA.. Foreign mining companies have been active in establishing joint ventures for mining gold in Kamchatka, Magadanskaya and Amurskaya Oblasts, and coal in Yakutia.[33]

The most favorable areas for the development of a timber industry are the southern sub-regions of the RFE (most productive forests, best developed areas, good location for trade, largest share of population). The following brief summary characterizes the sub-regions of the RFE.[34]

[33] Newell & Wilson, *op. cit*., p. 10.

[34] This section is written based primarily on Newell, J. and Wilson, E. (1996) *The Russian Far East.* Friends of the Earth-Japan.

Primorskiy Kray: largest population with positive migration; most developed food production; machine building (mostly naval vessels and military aircraft); construction materials industry provides for the whole region; coal mining produced 12 million tons in 1993; leading producer of electric energy in the RFE (10.3 billion kilowatt hours in 1993).[35] Over 25% of RFE agricultural output is produced here (leading position for rice, milk and egg production); highly productive timber resources (forests cover 80% of the territory); 2 billion tons of coal resources; nonferrous metals; best climate; important fisheries; diversified wildlife; fairly well-developed infrastructure which includes major year-round ports; second place in the region as an exporter (100% decentralized); proximity to Pacific Rim countries. It is one of the largest and most balanced economies in the RFE. Vladivostok is a major financial center of the RFE. Primorskiy Kray can be considered the most favorable site for short-term and long-term development projects.

Khabarovskiy Kray (including Jewish Autonomous Oblast): second largest population; significant heavy industry (25% of industrial output of the RFE; 100% output of steel production and petroleum refining; almost 45% of machine building production; almost 40% of timber and cellulose; one-fifth of timber exports; majority of logging joint ventures are located here); largest exporter in the RFE with relatively diversified economy; the most promising timber reserves (1.75 billion m^3 of commercial timber); coal, nonferrous metals; oil reserves; significant fisheries. Infrastructure is poor in the northern part of the Kray (few roads and no railway). Good opportunities for investments, especially in the timber industry.

Amurskaya Oblast: provides 8% of RFE's industrial output (gold mining; food processing; power production; coal mining; timber, pulp and paper industries), good timber reserves (2 billion m^3); large gold deposits and other rare metals; coal, iron deposits, hydropower, oil and gas; best sub-region for agriculture (55% of RFE arable land; produces large share of agricultural output of the region); longest border with China (91% of exports to China); well-developed infrastructure; good opportunities for further development.

Sakhalin: largest percent of labor force in total population, though it is mostly transient as in Magadanskaya Oblast, due to economic decline and geographic isolation; important fisheries; important forest resources; gas; major international oil development; gold; coal; heavy private sector emphasis. Fishing and fish-processing is the leading industrial output of Sakhalin. Produced 100% of paper in the RFE; 50% of pulp; most of oil production and over half of natural gas production of the RFE region. Fairly well developed infrastructure (ferry, air flights). Good opportunities for further development.

Kamchatka: sparsely populated with high concentration in Petropavlovsk; major fisheries (including salmon and crab); some forests; gold, silver, other nonferrous metals; coal; oil and gas deposits on the continental shelf; tourist attraction; contributes to agricultural output of the RFE. Fishing industry is major sector for Kamchatka; gold mining, forestry and ship-repair industries are other important sectors. Due to specialization in fishing, Kamchatka is dependent on other regions for all other resources. The fish-processing industry is poorly developed. Unprocessed fish dominate in exports, causing loss of income which might be extracted from value-added processing. Further development of gold deposits in Kamchatka is projected. Fairly good opportunity for investment.

Magadan (including Chukotka): harsh climate; declining transient population; heavy in minerals (gold, other nonferrous metals, coal); fish; reindeer. Magadan economy is based upon the mining industry. The two areas together produced 33% of Russia's gold. This sub-region leads in production of silver, tin, and tungsten, but have a small share in agricultural output. The economy is considered to be the most stagnant and narrow in the RFE. The government hopes to develop new mining sites with the help of foreign investments. Environmental impacts of proposed projects are of concern.

Yakutia: This is a vast sub-region (49% of total land area of the RFE) and is sparsely populated; harsh climate; some unproductive timber reserves; poor, underdeveloped and unbalanced infrastructure. Most transport is seasonal, heavily relies on the Lena river and its tributaries; all roads are unpaved; heavy in minerals (38% of RFE oil

[35] *Rossiiskiy Statisticheskiy Ezhegodnik*, Statistical yearbook. (1994). Moskva: Goskomstat Rossii, p. 624.

reserves, 42% of all RFE coal reserves, 59% of RFE natural gas reserves; diamonds, nonferrous metals; 79% of RFE iron reserves; phosphate deposits, *etc*.); furs (20% of Russia's national output). Plays an important role as a large producer of diamonds (second in the world) and gold (23% of Russia's total). Economy is highly dependent on imported goods (food and consumer goods) and will probably never be economically self-sufficient. Mining has polluted rivers and destroyed fragile ecosystems in Yakutia.

Resource Development: Foreign investment is actively sought given the lack of domestic capital availability. However, such investment may not always be in the best long term interests of the RFE. There is a fear that the RFE is becoming a "natural resource colony" for the Pacific Rim economies. Long a resource colony for European Russia, the RFE could potentially become the same for natural resource processing industries of the USA and Pacific Rim countries unless internationally competitive local value added processing is developed simultaneously with greater resource extraction. The RFE is "a highly truncated regional economy, dependent on external sources of capital, labor and equipment, specializing in the production of a limited number of resources, with economic activity concentrated in urban settlements in the southern part of the region." [36]

Industries in the RFE will need to develop the capacity to process their own raw materials, with a focus on establishing a competitive advantage in export markets so that they can generate fuller benefit from the RFE natural resources. Until value-added industries develop, the region will continue to have an unstable, boom-and-bust economy that focuses on the short-term gains of exporting raw materials.[37]

TRENDS IN THE DEVELOPMENT OF FOREST RESOURCES IN THE RFE

FOREST CLASSIFICATION IN RUSSIAN FEDERATION

In order to comprehend the forest resources of the RFE it is necessary to understand the system of classification of land and forest resources in the Russian Federation. Overall, forest and potential forested lands are included in the Forest Fund. Within this classification, forest lands in Russia are classified by three sub-categories or 'groups' of land protection (or primary use) which are also reflected in the forest inventory.[38]

The forest resources of Russia are included in the overall Forest Fund. This is defined as "an administrative designation for all land which has use for the forest economy or forms part of the mosaic within the land base which contains the majority of the forest resource."[39] The Forest Fund includes both forest lands and non-forest lands such as deserts, roads and clearances, swamps, glaciers, and cultivated land (hayfields, pastures, gardens, vineyards, *etc*.). **Forest land** is a category of land within the Forest Fund which is deemed suitable for growing tree species and which has been set aside for that purpose. Forest land consists of three categories: 1) forested land (which also includes plantations), 2) non-forested land (includes glades, burned and dead stands, cutover land, wastelands and openings) and 3) a category which includes forests which are not yet in such a condition to qualify as forested lands but may be transferred to that group when they become fully stocked. This group includes plantations in which the crowns have yet to close, plantations used for nurseries and other silviculture uses and naturally sparse forests.

Forested land is the same as **stocked forest land**, which is defined as "a category of forest land which supports trees which either have a basal area at least 30% of the "normal" basal area for the type of stand or supports a stand of trees for which the crown closure is at least 30% of normal."[40] So, non-forested land and the third category in this classification are both **non-stocked** forest lands which do not presently meet the minimum criteria established for stocked forest land.

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[36] Newell & Wilson, *op. cit*., p.10.

[37] *Idem*.

[38] The following below part of the section is written based on Backman, C. And T. Waggener, (1991) *Interpretation of the 1988 National Inventory*. Working Paper no. 35, CINTRAFOR, University of Washington, pp. 291-296.

[39] *Ibid*., p. 291.

[40] *Ibid*., p. 295.

For example, **cutover** "refers to forested land which has been harvested but does not yet support another crop of trees."[41] **Glade** "refers to small openings in the forest canopy."[42] **Openings and wastelands** "refer to extended areas of unstocked forest land larger than the category glades."[43]

The forests of Russia are also classified by forest legislation into three groups by protection categories. Definitions of these groups are reproduced below according to the *RF Fundamentals Of Forestry Act*:

> "**Group I** includes **water-conservancy** forests (out-of-bounds forest belts along the banks of rivers, lakes, reservoirs and other bodies of water, and restricted forest belts protecting the spawning grounds of valuable marketable fish); **protective forests** (anti-erosion forests, protective forest belts along federal, republic and regional railroads and motorways, state protective forest belts, coniferous-forest bands, and other forests in desert, semi-desert, steppe, forest-steppe, and forest-scarce mountain areas which are of great importance for environmental protection); **sanitary, hygienic and health-improvement forests** (urban woods, forest-parks, green-zone forests around cities, towns, other populated localities and industrial enterprises, first and second-belt forests in zones of sanitary protection of water-supply sources, and forests of the first, second and third zones of districts of sanitary protection of health resorts); forests of **specially-protected territories** (extra-valuable forest tracts, forests of scientific or historical importance, natural monuments, forests abounding in nuts and fruits, and forests adjacent to tundra); **forests of the nature-conservancy stock** (reserves, reserve forest sectors and national parks). Commercial logging is forbidden in this category of forests." [44]
>
> "In forests of national parks, forests of scientific or historical importance, natural monuments, forest-parks, forests abounding in nuts and fruits, urban woods, forest-park areas of green-zones, first and second-belt forests in zones of sanitary protection of water-supply sources, and forests of the first and second zones in districts of sanitary protection of health resorts, protective forest belts, anti-erosion forests, forests adjacent to tundra, in especially valuable tracts of forest, in restricted forest belts protecting the spawning grounds of valuable marketable fish, cutting and felling must have no other purpose except maintenance, sanitation, reconstruction and other types of cutting (such as building of roads, creation of anti-fire-hazard clearings, laying of pipelines and for other similar purposes). In forest reserves and reserve forest sectors, only other types of cutting (building of roads, creation of anti-fire-hazard clearings, laying of pipelines and for other similar purposes) shall be allowed."[45]

Although legislation protects this category of forests, permission for sanitary fellings creates some ecological problems as timber companies often stretch the meaning of this term and undertake de-facto commercial harvesting. Also clear-cuts of less than 10 ha are allowed with permission of the Federal Forest Service. Group I forests near cities are also often transferred to non-forest lands for building country homes and this has become a really serious problem.[46]

According to the *RF Fundamentals Of Forestry Act*:

> "**Group II** includes forests in areas with a high density of population and a ramified transport network having environment-forming, protective and limited-use functions, and forests in regions with inadequate forest resources, the conservation of whose protective functions requires a restricted regime of forest-stock use."[47]

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[41] *Ibid*., p. 291.
[42] *Ibid*., p. 292.
[43] *Ibid*., p. 293.
[44] Derived from *RF Fundamentals Of Forestry Act* (RF Act #4613-1, RF Supreme Soviet Decree # 4615-1 and Decree # 4616-1, March 06, 1993). RUSSICA Information Inc., article 14.
[45] *Ibid*., article 42.
[46] Newell & Wilson, *op. cit*., p.17.
[47] *RF Fundamentals Of Forestry Act, op. cit*., article 15.

The law states that in

> "Group II forests principal cutting and felling should be carried out in a way to preserve the nature-conservancy functions of these forests, while allowing their continued efficient and rational use."[48]

However, most of these lands have already been heavily logged, are usually near major industrial centers, and need to be restored for environmental or industrial reasons.[49]

Group III forests include

> "prolific forest areas of mainly exploitation importance and intended for the continuous satisfaction of the timber requirements of the national economy, without loss of these forests' ecological functions."[50]

Group III forests are specified by the legislation as presently developed and to-be-developed forests. The latter includes forests not yet involved in exploitation because of their remoteness from transport routes and for other reasons.[51]

ANALYSIS OF FOREST RESOURCES IN THE RFE[52]

RFE is the most forested region among all of the regions of Russia. It has a larger amount of land in the Forest Fund than other regions of Russia and also has the largest absolute area of forested lands (Table 6).

Table 6. Russian Forest Fund Lands and Forested Lands by Economic Region 1988 vs. 94 (000 ha)

	Total lands in Forest Fund		Forested lands		Share of forested lands in Forest Fund, %		% Change in total Forest Fund lands	Change in forested lands.%
Region	1988	1994	1988	1994	1988	1994	1994/1988	1994/1989
Russia	1115821.3	1111790.7	713489.3	709399.2	63.94	63.81	-0.36	-0.57
Baltic	264.8	266.6	220.5	223.8	83.27	83.95	0.68	1.50
Northern	98046.7	98122.3	69205.6	69775.8	70.58	71.11	0.08	0.82
Northwest	8165.8	8323.7	6116.7	6287.6	74.91	75.54	1.93	2.79
Central	14524.8	14178.0	12885.2	12635.8	88.71	89.12	-2.39	-1.94
Volgo-Vyatskiy	11674.2	11677.0	10486.7	10529.3	89.83	90.17	0.02	0.41
Central-Chernozemniy	1347.9	1351.2	1171.0	1185.9	86.88	87.77	0.24	1.27
Povolzhskiy	4737.4	4778.8	3943.8	4006.9	83.25	83.85	0.87	1.60
North Caucasian	3573.5	3525.1	2989.6	2997.5	83.66	85.03	-1.35	0.26
Ural	35515.4	35275.3	29687.1	29751.2	83.59	84.34	-0.68	0.22
Western Siberia	137934.8	138243.2	78818.1	80109.3	57.14	57.95	0.22	1.64
Eastern Siberia	300489.4	296900.6	222977.2	215849.7	74.20	72.70	-1.19	-3.20
RFE	499546.6	498451.3	274987.8	275814.2	55.05	55.33	-0.22	0.30

Source: Computed using data from "Sostoyanie I ispol'zovanie lesov Rossii v 1994 godu (po dannim lesnogo monitoringa)," (1995).

[48] *Ibid*., article 42.

[49] Newell & Wilson, *op. cit*., p.17.

[50] *RF Fundamentals Of Forestry Act, op. cit*., article 16.

[51] *Idem*.

[52] Sheingauz, Karakin & Tyukalov, *op. cit*., pp. 7-13 and Stanick, *op. cit*., pp. 4-5

In 1994 the total forestry fund land area in the RFE was 498.5 million ha or 44.8% of Russia's total.[53] Forested area was reported by the same source as 275.8 million ha or 39.9% of Russia's total. There is always the question of how reliable the reported forestry data are. This concern is usually addressed by comparison of data derived from different sources. If the distortions are not large, one may conclude that data are reasonable and acceptable for purposes of aggregate analysis.

Sheingauz , *et al.,* in their recent work indicated that the total area in the Forest Fund of the RFE is 498.3 million ha,[54] which is relatively close to the data in the annual report of the Federal Forest Service of Russia.[55] Although the RFE has the largest amount of land in the Forest Fund, the percentage of the RFE forested land relative to the Forest Fund lands is the lowest (55%) of the regions of Russia. This is due to a large amount of sparse forest located in the RFE, primarily in Yakutia. There were minor changes in the land base of the RFE from 1988 to 1994. The total amount of land in the Forest Fund was reduced by 0.22%. However, the percentage of forested land within the Forest Fund increased by 0.3%. The detailed structure of the Forest Fund of the RFE by category of land on 1 January 1993 is presented in the Table 7.

Table 7. Structure of the Forest Fund of the RFE by Category of land - 1 January 1993 (000 ha).

	Forest lands					
Sub-Region	Forested lands	Forest plantations with non-closed crowns	Non-forested lands	Total	Non-forest lands	Total
Yakutia	145268	0	45481	190749	66234	256983
Jewish aut. obl.	1553	18	125	1696	531	2227
Chukotskiy aut. obl.	5064	0	4542	9606	17822	27428
Primorskiy Kray	11240	11	303	11554	339	11893
Khabarovskiy Kray	47319	85	10217	57621	16263	73884
Amurskaya obl.	21853	41	3591	25485	5245	30730
Kamchatskaya obl.	19150	34	1581	20765	23178	43943
Magadanskaya obl.	16925	21	10428	27374	16951	44325
Sakhalinskaya obl.	5258	58	784	6200	726	6926
RFE	273730	268	77052	351050	147289	498339

Source: Derived from Sheingauz, A., Karakin, V. & Tyukalov, V. (1996).

Non-forested lands comprise 15.5% of the total land in the RFE, which is relatively high. Non-forest lands also accounted for 29.5% of the total Forest Fund lands.[56] Non-forested lands are those which are allocated for growing tree species, but are not presently regenerated - a situation that can sometimes persist for several dozen years. These areas include cutover lands, burned areas, glades, *etc*. These areas are a potential basis for further increases in the forested land category, and thus the basis for the potential future development of the FIC.

Swamps and mountain deserts comprise a major share of the non-forest category of lands and often become a substantial obstacle for logging. They cannot be feasibly converted to forested lands. Forested lands comprise only 54.9% of the total lands in the Forest Fund and represent the current land base for the FIC. These forested lands are mostly natural forests--plantations comprise only 0.2% of the forested lands (0.7 million ha) and are less than 40 years old. The total area reported for the Forest Fund is, therefore, somewhat misleading when estimating of the true long term potential basis for future growth of the FIC in the RFE.

[53]Derived from "Sostoyanie I ispol'zovanie lesov Rossii v 1994 godu (po dannim lesnogo monitoringa)," ezhegodniii doklad Federal'nay sluzhbi lesnogo hozyaistva Rossii (1995). Moskva.

[54] Sheingauz, Karakin & Tyukalov , *op. cit.* , p. 7.

[55]"Sostoyanie I ispol'zovanie lesov Rossii v 1994 godu (po dannim lesnogo monitoringa)," *op. cit.*, p. 23.

[56] Sheingauz, Karakin & Tyukalov , *op. cit.*, p. 7.

The share of Forest Fund lands for each sub-region of the RFE by main categories of lands is presented in Table 8.

Table 8. Share of RFE Forest Fund by Sub-region and Main Category of Lands (%)

Areas	Forested lands	Non-forested lands	Forest lands total	Total in the Forest Fund
Yakutia	53.07	59.03	54.34	51.57
Jewish aut. obl.	0.57	0.16	0.48	0.45
Chukotskiy aut. obl.	1.85	5.89	2.74	5.50
Primorskiy Kray	4.11	0.39	3.29	2.39
Khabarovskiy Kray	17.29	13.26	16.41	14.83
Amurskaya obl.	7.98	4.66	7.26	6.17
Kamchatskaya obl.	7.00	2.05	5.92	8.82
Magadanskaya obl.	6.18	13.53	7.80	8.89
Sakhalinskaya obl.	1.92	1.02	1.77	1.39

Source: Computed using data derived from Sheingauz, A., Karakin, V. & Tyukalov, V. (1996).

Approximately 66% of lands in the Forest Fund (and 61% of forested lands in the RFE) are located in the Northern part of the RFE (Yakutia, Chukotka, Magadan) with its harsh climate. Arctic regions of the RFE are virtually treeless due to the extreme cold. Permafrost underlies about three-quarters of the forests, and in combination with low precipitation and cold weather limits tree growth and regeneration.

The lowest annual tree growth rate is found in Magadan Oblast, followed by Yakutia (Table 9). These areas are of low productivity and have low stocking densities. This poor forest growth inhibits the development of the FIC in this part of the RFE. In fact, some forestry reports even exclude Yakutia with its mainly dwarf forests from the analysis of forest potential because the data from this republic seriously distorts the overall picture for the rest of the RFE.

Forested lands of the Southern territories (Khabarovskiy Kray, Primorskiy Kray, Amurskaya Oblast, Sakhalinskaya Oblast, Jewish Autonomous Oblast) comprise 31.9% of the RFE territory. These sub-regions are the most productive forests. Among these four sub-regions, Primorskiy Kray leads in terms of total timber volume per hectare, with Sakhalin second, Khabarovskiy Kray (with Jewish Autonomous Oblast) third, and Amurskaya Oblast fourth. These sub-regions also have the fastest tree growth rates. They are the most promising for the further development of the FIC. According to the Russian classification system, forest cover (ratio of total forested lands to the whole territory of the region) is the main criterion for determining if the region is richly forested.[57] Data on forest cover by sub-regions and productivity (annual growth) of forests are presented in Table 9.

Primorskiy Kray has the largest percent of forest cover. Primorskiy Kray, Sakhalinskaya Oblast and Khabarovskiy Kray are the most richly forested as shown in Table 9. Almost all forests in the RFE (except Yakutia) are mountain forests. This means that the forests grow within the mountain regions where relative elevation differences are greater than 100 meters or an average slope surface from lowlands

to the mountain top or to the tree line is greater than 5 degrees.[58] This mountainous terrain increases the costs of production of logging enterprises and in some cases makes forests economically inaccessible.

Forested lands of the RFE are mostly conifer species (71.9%) with larch areas dominating (60.9% of all forests). The larch share increases from the South to the North. Birch forests are in the second leading species occupying 7.6% of total forested lands. Areas of fir-spruce forests (5.5%) are in third. The share of fir-spruce increases from North to

[57] *Ibid*., p. 7.

[58] Backman, Waggener, *op. cit*., p. 293.

West and from South to the East (Table 10). The most valuable forests are compound conifer-deciduous forests in the South of the RFE. They are a mixture of Korean pine (dominant) with 10-20 other species which grow only in the South. These forests are the most developed and also the most threatened. Oak (1.1% of total forests),

Table 9. Forest Cover and Productivity of Forests in the RFE - 1 January 1993

Sub-Region	% Forest Cover	Timber Volume, m^3/ha		Annual tree growth, m^3/ha	Percentage of Mountain Forests
		Total Forests	Mature and Overmature		
Yakutia	47.10	64	84	0.6	34
Jewish aut. obl.	44.60	112	142	1.4	100
Chukotskiy aut. obl.	7.00	17	25	n/a	100
Primorskiy Kray	74.80	157	178	1.5	100
Khabarovskiy Kray	61.40	106	140	1.3	98
Amurskaya obl.	62.00	89	130	1.4	100
Kamchatskaya obl.	42.90	62	76	0.8	98
Magadanskaya obl.	38.30	25	39	0.4	100
Sakhalinskaya obl.	64.70	116	170	1.4	100
RFE	45.00	75	98	0.9	63

Source: Derived from Sheingauz, A., Karakin, V. & Tyukalov, V. (1996).

lime (0.3%) and ash (0.1%) forests also grow in the South. Creeping forests (11.8%) grow on the high elevations and in the North.[59]

Larch is the dominant species in Yakutia (79.2% of all forested lands in this sub-region), Khabarovskiy Kray (53.3%), and Amurskaya Oblast (60.4%). It is the second leading species in Sakhalin (30%) and Magadan (44.8%). Creeping forests and shrub dominate in Chukotka (62.7%), Kamchatka (51.9%) and Magadanskaya Oblast (54%). This type of forest has no commercial value. Fir and spruce dominate in Sakhalin (39.2%) and is the second leading species in Primorskiy Kray (27.2%).

Deciduous species dominate in the Jewish Autonomous Oblast (64.1%), and Primorskiy Kray (42.1%), and are the second species group in Kamchatka (42.1%; most is birch). Primorskiy Kray is the most diversified in respect to species distribution. Yakutia accounts for the majority of the total conifer area in the RFE (63.9%) and holds the leading position in areas of pine and Korean pine (68.3%) and larch (69%) within the region.

Khabarovskiy Kray accounts for the majority of spruce and fir areas in the region (56.8%), is second with respect to conifer areas (18%), larch (15.1%), deciduous forests (21.6%), and is third for pine and Korean pine (10.9%). Primorskiy Kray holds second place for areas of spruce and fir forests (20.3%) and pine and Korean pine forests (14.4%). Amurskaya Oblast is the third leading sub-region for the area of conifer (7.3%) and larch forests (7.9%) and deciduous forests (18.4%).

When Yakutia is excluded from the analysis, the leading position of Southern sub-regions (especially Khabarovskiy and Primorskiy Krays) in distribution of forested lands, is evident. Although the distribution of forested land and the distribution of timber reserve volume is not the same between individual sub-regions, the leading position of the Southern sub-regions (excluding Yakutia) and especially Khabarovskiy Kray are evident in Table 11.

Yakutia obviously accounts for the majority of the conifer inventory volume in the RFE (52.3%) and also for the majority of larch (61.6%) and pine and Korean pine (58.3%) volumes. Khabarovskiy Kray is second in total timber inventory volume and is first in terms of fir and spruce volumes in the region (56.1%), second in total conifer volume

[59] Sheingauz, Karakin & Tyukalov , *op. cit.*, p 7.

(25% of the total in the RFE) and second in larch volume (20.6%). Khabarovskiy Kray's timber volumes are more than double the volumes in each of the rest of the sub-regions.

Larch dominates the total volume of coniferous species in Amurskaya and Magadanskaya Oblasts. In Amurskaya Oblast larch accounts for 91% of the total coniferous volume, while Magadanskaya's coniferous growing stock is made up exclusively of larch. Larch is most limited in Primorskiy Kray, where it only makes up 16.7% of the total conifer growing stock.

Table 10. Structure of RFE Forested Land by Sub-region and Species - 1 January 1993 (000 ha)

	Conifer				Deciduous			Creeping forests; bushes	Total forested lands
					Including				
Sub-Region	Pine, Korean pine	Spruce, fir	Larch	Total	Oak, ash	Birch	Total		
Yakutia	10,377	393	115,023	125,793	0	1,856	2,018	17,457	145,268
Jewish aut. obl.	174	235	149	558	340	434	995	0	1,553
Chukotskiy aut. obl.	0	0	1,777	1,777	0	1	111	3,176	5,064
Primorskiy Kray	2,192	3,060	1,206	6,458	2,248	1,670	4,737	45	11,240
Khabarovskiy Kray	1,663	8,550	25,227	35,440	419	4,431	6,268	5,611	47,319
Amurskaya obl.	702	498	13,199	14,399	431	4,672	5,334	2,120	21,853
Kamchatskaya obl.	13	210	927	1,150	0	6,552	8,063	9,937	19,150
Magadanskaya obl.	0	0	7,579	7,579	0	11	204	9,142	16,925
Sakhalinskaya obl.	70	2,102	1,609	3,781	24	1,081	1,269	308	5,358
RFE	15,190	15,048	166,696	196,935	3,461	20,708	28,999	47,796	273,730

Source: Derived from Sheingauz, A., Karakin, V., Tyukalov, V. (1996).

Table 11. Distribution of RFE Timber Inventory Volume by Sub-region and Species - 1 January 1993 (Million m^3)

	Conifer				Deciduous			Creeping forests; bushes	Total forested lands
					Including				
Sub-Region	Pine, Korean pine	Spruce, fir	Larch	Total	Oak, ash	Birch	Total		
Yakutia	1,113	51	7,788	8,952	0	66	84	193	9,229
Jewish aut. obl.	32	35	16	83	27	35	90	0	173
Chukotskiy aut. Obl.	0	0	50	50	0	*	9	29	88
Primorskiy Kray	465	551	204	1,220	239	194	547	3	1,770
Khabarovskiy Kray	239	1,430	2,603	4,272	44	295	490	231	4,993
Amurskaya obl.	59	82	1,434	1,575	16	287	327	51	1,953
Kamchatskaya obl.	*	38	94	132	0	550	623	440	1,995
Magadanskaya obl.	0	0	288	288	0	*	24	111	423
Sakhalinskaya obl.	1	363	169	533	2	61	73	18	624
RFE	1,910	2,550	12,646	17,106	328	1,488	2,268	1,076	20,450

Source: Derived from Sheingauz, A., Karakin, V. & Tyukalov, V. (1996).

Spruce and fir are mostly found in the Southern territories of Primorskiy, Khabarovskiy Krays and Sakhalin, as these three regions comprise 91.9% of the total RFE spruce and fir volumes. The spruce and fir volumes are primarily

spruce, as fir only accounts for 1.7% of the RFE coniferous volumes[60] and thus has little significance for the development of the FIC.

Of all the regions, Primorskiy has the highest proportion of spruce and fir, 45.2% of the total coniferous volume. Valuable Korean pine grows primarily in the southern regions of Primorskiy and Khabarovskiy Krays. Legislation presently restricts the harvesting of Korean pine due to the disastrous effects harvesting has had on the endangered Siberian tiger habitat. These restrictions are expected to continue, which will limit the commercial importance of Korean pine for the FIC in the future. Other pine forests grow almost entirely in the harsh northern region (Yakutia) and have little current or near-term value for timber industry. Table 12 presents average timber volume per hectare.

It is evident from Table 12 that low stocking volume per area is one of the main constraints for large increases in the development of the RFE forest industry complex. Stocking volume per area is especially low in the north. Average timber volume per ha increases from Northwest to Southeast, achieving a maximum of 157 m^3/ha in Primorskiy

Table 12. RFE - Average Timber Volume by Sub-Region and Species - 1 January 1993 (m^3/ha)

	Conifer				Deciduous			Creeping forests;	Total forested
					Including				
Sub-Region	Pine, Korean pine	Spruce, fir	Larch	Total	Oak, ash	Birch	Total	bushes	lands
Yakutia	107	129	68	71	-	36	42	11	64
Jewish aut. obl.	187	149	107	150	81	80	90	-	112
Chukotskiy aut. obl.	-	-	28	28	-	60	84	9	17
Primorskiy Kray	212	180	169	189	106	116	115	67	157
Khabarovskiy Kray	144	167	103	121	105	67	78	41	106
Amurskaya obl.	84	165	109	109	37	61	61	24	89
Kamchatskaya obl.	11	182	101	115	-	84	77	44	62
Magadanskaya obl.	-	-	38	38	-	34	118	12	25
Sakhalinskaya obl.	21	173	105	141	83	56	57	58	116
RFE	126	169	76	87	95	72	78	23	75

Source: Derived from Sheingauz, A., Karakin, V. & Tyukalov, V. (1996).

Kray. The opposite extreme is seen in Chukotka, which averages only 17 m^3/ha, followed by Magadan (25 m^3/ha). The best stocked areas of Korean pine are in Primorskiy and Khabarovskiy Kray (including Jewish Autonomous Oblast), which have stocking densities reaching 212 m^3/ha. Overall, spruce and fir stands in the RFE average 169 m^3/ha, which is well above the other coniferous species density. In the forest inventory source reports, pine and Korean pine are combined into one category which obscures the picture as other pines are mostly found in Yakutia and are characterized by low stocking density while Korean pine has the highest stocking density within the RFE region. For this reason the overall average for the combined pines appears to be less than for spruce and fir. However, if a comparison is made only between Korean pine and spruce, Korean pine stocking density well exceeds that of spruce and fir.[61]

The average timber volume per area depends on the forest age structure and is approximately 33% less than average timber volume per ha in mature forests at the age of principal felling. Age structure of the forests is approximately as follows (by area): juvenile 17.7%; middle-aged 27.4%; approaching maturity 9.0%; mature and over-mature 45.9%.[62] Definition of these age classes is presented below.

[60]Stanick, *op. cit*., p. 5.
[61] *Ibid*., p. 6.
[62] Sheingauz, Karakin & Tyukalov, *op. cit*., p. 12.

"There are six age classes of forested land. **Mature and over-mature** are two of them. **Maturity** is reached when coniferous or hardwood deciduous species attain an age between 80 and 140. Softwood deciduous species reach maturity at age 40 to 70. The onset of **over-maturity** is generally considered to occur in conifers when age is between 100 and 140. In softwood deciduous species the onset of over-maturity takes place between 50 and 70. The onset of over-maturity in hardwood deciduous species seems to occur much later."[63]

"**Approaching maturity** is the forth youngest age class, which occurs at an age between 80 and 100 years for conifers and hardwood deciduous species and between 50 and 60 for softwood deciduous species. **Middle aged** occurs between age 40 and 60 for conifers and hardwood deciduous species and between 20 and 30 for softwood deciduous species. The **Juvenile** age class unites two sub-classes: **Young class I** is the youngest one which extends from 10 to 25 depending on the species. **Young class II** extends from 25 to 40 years depending on the species."[64]

Almost half of all the forests in the RFE are mature and over-mature and so could be subject to principal felling. The mature and over-mature age class within the total forest inventory distribution is approximately uniform in the RFE ranging from 33.5% in Amurskaya Oblast to 57.7% in Kamchatka.[65] It is this age structure and the volume of mature and overmature timber that determines the volume of the annual allowable cut (AAC) as summarized in Tables 13 and 14.

The AAC is calculated by central official departments of forestry in agreement with the Ministry of Environment and Protection of Natural Resources of the Russian Federation (RF). It takes into account the physical and biological condition of forest resources, social and economic constraints for commercial felling, and economic feasibility of the development of the resources.

Under existing levels of technology and infrastructure the utilization of AAC is very low. Large areas are still inaccessible to logging due to the mountainous landscape and the lack of infrastructure. However, many accessible areas, particularly around railroads and near population centers have been heavily over-logged.[66] Mainly the coniferous forests are developed and accessible in all sub-regions of the RFE. Primorskiy, Khabarovskiy Krays, Amurskaya and Sakhalinskaya Oblasts are the sub-regions with the most developed forest industry. They also have the highest percent of utilization of AAC, although it is presently at levels much less than under former socialist conditions. In the 1980's the utilization of AAC was 50-60% in these sub-regions. Now, due to the economic realities of the transition period, the volume of harvesting has fallen sharply. Forests in Sakhalin are essentially all developed and this sub-region has the highest percent of utilization of AAC. Sheingauz *, et al.,* report that the AAC was reduced by 15% over the period 1965-1995. This was due to the reduction of mature forests because of the access and prior harvests and to the increase of non-timber use of forests. It is hard to determine logging volumes by species due to the Russian system of timber accounting. Survey methods or a method of expert estimation is required in this case. [67]

Table 13. Annual Allowable Cut (AAC) in the RFE and Utilization by Sub-region - 1993 (Million m^3)

	Annual Allowable Cut (AAC)			Utilization of AAC
Sub-Region	**Total**	**In conifer forests**	**Actual cut**	**%**
Yakutia	33.0	32.5	3.0	9.1
Jewish aut. obl.	1.6	0.5	0.1	6.4
Primorskiy Kray	10.7	6.7	3.4	31.8

[63] Backman & Waggener, *op. cit*., p. 293

[64] *Ibid*., pp. 290, 293, 296.

[65] Sheingauz, Karakin & Tyukalov, *op. cit.*, p 12.

[66] Newell & Wilson, *op. cit*., p.15.

[67] Sheingauz, Karakin & Tyukalov, *op. cit*., pp. 12- 13.

Khabarovskiy Kray	33.3	25.9	7.1	21.3
Amurskaya obl.	15.8	11.6	3.1	19.6
Kamchatskaya obl.	1.9	0.7	0.4	21.1
Magadanskaya obl.	0.4	0.4	0.1	12.5
Sakhalinskaya obl.	4.4	4.1	2.2	50.0
RFE	101.1	82.4	19.3	19.6

Source: Derived from Sheingauz, A., Karakin, V. & Tyukalov, V. (1996).

The AAC for 1994 was calculated at a level a little lower than for 1993 (-4.65%). It was slightly reduced in all sub-regions except for Yakutia where it was left at the previous level. The rate of utilization of the reduced AAC was also lower in 1994. The average regional change in the rate of utilization of the AAC was -5.6%. The largest declines were in Khabarovskiy Kray (-11.7%), Sakhalinskaya(-9%) and Amurskaya Oblasts (-8.6%). The cutting volumes also continue to decline. Harvest in the Southern areas is expected to decline even further because accessible timber stocks are being depleted over time and a fairly large amount of capital will be required to develop access to the remaining inaccessible stocks. In Northern areas the amount of investment required is even higher. The

Table 14. Annual Allowable Cut (AAC) in the RFE and Utilization by Sub-region - 1994 (Million m^3) [68]

	Annual Allowable Cut (AAC)		Actual cut		Utilization of AAC, %	
Sub-Region	**Total**	**Conifer**	**Total**	**Conifer**	**Total**	**Conifer**
Yakutia	33.0	32.5	2.3	2.3	7	7
Primorskiy Kray	10.0	6.1	2.6	2.1	26	34
Khabarovskiy Kray	32.3	25.9	5.0	4.7	16	18
Amurskaya obl.	15.8	11.6	1.8	1.7	11	15
Kamchatskaya obl.	1.4	0.7	0.2	0.2	14	35
Sakhalinskaya obl.	3.9	3.6	1.6	1.6	41	44
RFE	96.4	80.4	13.5	12.6	14	16

Source: Derived from "Spravka o rabote lesopromishlennogo kompleksa Dal'nevostochnogo regiona" (1995).

main trend in the last 20 years has been to develop timber areas in the isolated northern districts of the southern sub-regions versus developing the northern sub-regions. [69]

PROTECTION AND REGENERATION OF FOREST RESOURCES: FORESTRY AND FOREST MANAGEMENT IN THE RFE [70]

Forest management, protection and regeneration of forests are implemented by the Federal Forest Service of Russia which is mainly funded from the federal budget. In the RFE it is represented by territorial forestry departments and forestry enterprises which are subordinate to them, and by research institutes located in the RFE. The forestry departments implement the majority of forest management work or control those which are implemented by forest

Table 15. Number of Forestry Enterprises and Operating Expenditures for Forest Management in the RFE -by Sub-region - 1993-94

		Operating expenditures on forestry (Million rubles)		$/ ha on Forest Land		$/ha expenditures
Sub-regions	**No. Of Enterprises**	**1993**	**1994**	**1993**	**1994**	**1994 / 1993**
Yakutia	28	2804	9356	0.01	0.02	200.00

[68] Data for Jewish Autonomous republic is included in Khabarovskiy Kray.

[69] Stanick, op. cit., p 12.

[70] This part of the section is written based on Sheingauz, Karakin & Tyukalov , op. cit., pp. 27-32.

Jewish aut. obl.	6	633	2454	0.36	0.58	161.11
Primorskiy Kray	30	2807	15459	0.24	0.54	225.00
Khabarovskiy Kray	48	6381	19864	0.11	0.14	127.27
Amurskaya obl.	23	2416	10266	0.09	0.16	177.78
Kamchatskaya obl.	12	1670	5539	0.08	0.11	137.50
Magadanskaya obl.	10	1086	3603	0.04	0.05	125.00
Sakhalinskaya obl.	22	3422	12797	0.54	0.83	153.70
RFE	179	21219	79338	0.06	0.09	150.00

Source: Computed using data derived from Sheingauz, A., Karakin, V. & Tyukalov, V. (1996).

enterprises or other forest users. The recent number of forestry enterprises and total level of expenditures for forest management is shown in Table 15.

Though operating expenditures for forestry increased in 1994 in comparison with 1993 they are not sufficient for implementation of sustainable forestry. The lowest operating expenditures are in Yakutia and Magadanskaya Oblast.

The Russian system of forest management is based on the above grouping of forests into three Groups by varying levels of protection. Many of the forests of the RFE have important environmental values. These forests are classed as Group I forests, and provide habitat for fish and wildlife and play an important role in water and soil protection. Group I forests of the Far East comprised 65.6 million ha in 1994 (8.5% of the total Russian forest area in Group I or 1.1% of lands in the Forest Fund) and increased by 14,600 ha since 1993. Group I forests in the RFE comprised 13.2% of the total area in the Forest Fund. The total area of especially protected territories within Group I comprised 5,580,100 ha in 1994, an increase of 22,200 ha over 1993.[71] Group II forests are those forest lands receiving intermediate protection. One percent (5.2 million ha.) of the RFE Forest Fund lands are classified as Group II forests. The largest share of forests in the RFE (427.5 million ha. and 85.8%) are classified as Group III, which are mainly forests which are allocated for commercial exploitation.[72] The detailed distribution of forests by Group (level of protection) by sub-region of the RFE is presented in Table 16.

Table16. Distribution of RFE Forest Fund Lands by Group and Sub-Region - 1 January 1993[73]

	Group I		Group II		Group III		Total
Sub-region	**(000 ha)**	**%**	**(000 ha)**	**%**	**(000 ha)**	**%**	**(000 ha)**
Yakutia	33271	12.95	0	0.00	223712	87.05	256983
Jewish aut. Obl.	380	17.06	381	17.11	1466	65.83	2227
Chukotskiy aut. obl.	1108	4.04	0	0.00	26320	95.96	27428
Primorskiy Kray	3121	26.24	988	8.31	7785	65.46	11893
Khabarovskiy Kray	9035	12.23	173	0.23	64676	87.54	73884
Amurskaya obl.	2429	7.90	1334	4.34	26967	87.75	30730
Kamchatskaya obl.	12716	28.94	1414	3.22	29813	67.84	43943
Magadanskaya obl.	2273	5.13	0	0.00	42052	94.87	44325
Sakhalinskaya obl.	1287	18.58	935	13.50	4705	67.93	6926
RFE	65620	13.17	5225	1.05	427495	85.78	498339

Source: Computed using data derived from Sheingauz, A., Karakin, V. & Tyukalov, V. (1996).

Forest management in the RFE is governed by "Regulations for principal fellings in the forests of the RFE" and by local forest management laws. In their work Sheingauz *, et al.,* emphasized that industrial harvesting is prohibited only in the especially protected zones within Group I, not over all Group I forests.[74] Especially protected territories in the RFE (according to Sheingauz *, et al.,*) include:

[71] Derived from "Sostoyanie I ispol'zovanie lesov Rossii v 1994 godu (po dannim lesnogo monitoringa)", op. cit. , p 23.

[72] Sheingauz, Karakin & Tyukalov , op. cit. , p 13.

[73] This source reports slightly different area values than "Sostoyanie I ispol'zovanie lesov Rossii v 1994 godu (po dannim lesnogo monitoringa)," (1995).

[74] Ibid., p. 28.

borders of the forest with width 100 meters; forest belts along the banks of rivers, lakes, reservoirs and other bodies of water with width 100-300 meters, forests belts around sources of rivers with width 100-300 meters; forests of 1 kilometer range near mineral springs, districts of sanitary protection of health resorts; forests with endemic and relict species; forest belts adjacent to tundra with width 3-5 km; forests on slopes steeper than 30 degrees.

All of the above-mentioned categories (except the last two) are of negligible size accounting for less than 1% of the lands in the Forest Fund, and do not significantly affect the amount of forest available for potential industrial harvest. Forests adjacent to tundra are located in Yakutia, Magadan and Kamchatka, sub-regions where there is no substantial forest industry. The last category (greater than 30 degree slopes) has begun to be more relevant to industrial harvesting due to changes in technology permitting environmentally sound access to these forests. However, this does not yet affect much of the land base for the development of the FIC.

Ten species are prohibited for cutting in the RFE. Five more species are included on this list in Sakhalin and one in Magadan, but they are all endemic or relict species so the volume of industrial harvest has not been substantially affected. More significant is the prohibition on harvesting of Korean pine and lime. However, there are some exceptions in the regulations which allow harvest of several thousand m^3 of these species. Harvesting of lime is prohibited only in the regions with developed apiculture.

In the last few years, large areas of forests have been allocated to traditional use by native people. Fellings in these areas are restricted and should be approved by local communities. All such restrictions are taken into consideration in calculation of AAC. Besides those official documents which regulate fellings, there are additional forest regulations for hunting, fishing and rules for collecting non-timber products.[75]

The scope of forest management includes not only the allocation of forest plots for harvesting and the administrative control over forestry operations (including reforestation), but also the protection of forests from fires and pests. Forest fires, pests and diseases, industrial pollution, natural disturbance (storms, *etc*.) and damage caused by wild animals all negatively affect the level of timber resources in the RFE.

Forest fires are the main cause of forest destruction not only in the RFE, but in Russia as a whole. In 1994, 225,334 ha of forest was killed by fire, or about 83% of all forests that died that year in Russia. Pests are the second main cause of forest death. Nine percent of all forests which died in Russia in 1994 were killed by this cause. In the RFE, stands of Jeddo spruce (*Picea jezoensis*) are especially vulnerable to pests and diseases. Up to 12 million ha of forests suffered from large-scale withering in 1994.[76]

The ability to implement forest fire control has been affected by the general downturn in the economy. Fires have become a much greater threat to the RFE forest resources. Consistent with the other industries in the RFE, fire fighting has traditionally suffered from the lack of labor resources. This, coupled with poorly developed transportation infrastructure in the timber areas, makes it extremely difficult for the RFE regions to control the loss of timber reserves due to forest fires. Recently, officials in many of the RFE sub-regions have claimed that it is now very difficult to obtain any funding for protection against forest fires from the federal government. Also, rising fuel costs have made helicopters so prohibitively expensive that the forest service can no longer afford to use them for full-time fire duty. This will make forest fires even more of a threat to the resource base.[77] Table 17 presents data on areas of forest fires in the RFE over the period 1970-1992.

Table 17. Area of Forest Fires (000 ha)

Sub-region	1975	1980	1985	1990	1991	1992
Yakutia	9.4	45.2	278.7	605.5	n/a	n/a

[75] Ibid., p. 29.

[76] Derived from "Sostoyanie I ispol'zovanie lesov Rossii v 1994 godu (po dannim lesnogo monitoringa)," op. cit., p. 9.

[77] Stanick, op. cit., p. 6.

Primorskiy Kray	1.9	2.1	2.7	1.3	4.0	7.0
Khabarovskiy Kray	106.9	69.7	23.5	192.6	15.2	17.0
Amurskaya obl.	5.3	28.8	25.5	42.3	11.1	215.3
Kamchatskaya obl.	0.2	0.6	10.2	2.7	n/a	n/a
Magadanskaya obl.	1.9	0.5	0.1	1.7	300.0	46.5
Sakhalinskaya obl.	14.2	4.7	2.7	1.0	0.2	0.2

Source: Stanick, K. (1994).

Reforestation is a positive factor affecting the future level of timber reserves in the RFE and has always been an important component of forest management. In all territories of the RFE, natural regeneration is the main technique for reforestation. Many Russian forest ecologists prefer natural regeneration methods, as it is widely acknowledged that many forest plantations are simply tree-farms and artificial planting does not reconstruct a complex, dynamic forest. Forests with dominant conifer species in the Southern part of Yakutia, Primorskiy and Khabarovskiy Krays, Jewish Autonomous Oblasts, Amurskaya and Sakhalinskaya Oblasts are naturally regenerated on 75-85% of the area.

After logging, almost all natural conifer forest areas are regenerated by conifers. An important factor in successful reforestation is preserving sufficient young growth for seed production in logging areas. However, if felled areas are burned, conifer sites are frequently occupied subsequently by birch and aspen and only after extensive periods does the conifer forest become reestablished. This process can take 40-50 years. If areas were burned two or more times, the conifer regeneration process can be delayed by 100-200 years. In Northern regions natural regeneration is difficult due to the harsh environment and permafrost conditions. Only 45-60% of the areas were regenerated after logging.[78]

Artificial reforestation is divided into two major activities: creation of plantations and assistance in natural regeneration. The mortality rate of plants in the plantations is very high due to the lack of labor force and low salaries, such that required work is often not implemented or carried out completely. Assistance in natural regeneration is mainly scarification of the soil for better germination of the seedlings.[79] Table 18 presents the area of reforestation required under the two silvicultural methods and the areas of reforestation actually implemented in selected years.

Table 18. Area of Reforestation Required and Achieved in the RFE 1988, 1993 & 1994 (000 ha)

	Required					Actual				
		Assisted Natural Regeneration					Assisted Natural Regeneration			
Years	Total	Planting Planned		By Preserving Young Growth	Natural Regener-ation	Total	Planting Planned		By Preserving Young Growth	Natural Regener-ation
1988	1163.4	397.2	168.4	613.3	123.8	138.1	32.4	99.9	44.3	16.8
1993	1154.8	387.9	240.4	580.8	146.7	265.8	28.9	233.6	162.2	5.9
1994	1138.2	388.6	235.1	566.1	134.7	319.2	29.8	289.2	160.4	25

Source: Computed using data from Derived from "Sostoyanie I ispol'zovanie lesov Rossii v 1994 godu (po dannim lesnogo monitoringa)," (1995).

The percentage of actual implementation of reforestation by area required by silvicultural standards is rather low. Only 28% of total required areas were actually reforested in 1994. Only 7.7% of plantation area required to be planted was actually planted. Only 18.6% of areas subject to natural regeneration were actually regenerated. This is a strong indication of insufficient efforts in implementing sustainable forestry in the RFE region.

[78] Sheingauz, Karakin & Tyukalov, op. cit., p. 31.

[79] Idem.

Sheingauz, *et al.,* reported similar data for artificial reforestation in the RFE as shown in Table 19. [80]

Areas of artificial reforestation increased in almost all sub-regions of the RFE. However, areas of plantations decreased. The most developed territories of the RFE (Khabarovskiy Kray, Primorskiy Kray, Amurskaya Oblast and Sakhalin) accomplished better reforestation. Favorable climate conditions and successful reforestation in the most intensively used part of the region created the necessary conditions for the introduction of sustainable forestry. Only this can provide a good base for the steady development of the FIC.

However, overall forest management systems (especially forest protection) have also suffered from the general lack of funding and a distorted system of monitoring. This has caused serious damage to the present and future development of the FIC.

Table 19. Area of Artificial Reforestation in the RFE by Sub-region 1985 & 1994 (000 ha)

	Artificial reforestation, total		Including plantations	
Sub-region	**1985**	**1994**	**1985**	**1994**
Yakutia	32.8	45.0	0.2	-
Jewish aut. Obl.	6.0	7.1	4.0	1.0
Primorskiy Kray	29.2	67.9	13.5	7.6
Khabarovskiy Kray	37.7	115.9	16.4	11.0
Amurskaya obl.	14.9	65.4	6.4	4.5
Kamchatskaya obl.	5.7	5.1	3.7	1.3
Magadanskaya obl.	7.0	4.4	2.0	0.0
Sakhalinskaya obl.	13.9	22.0	9.7	5.1
RFE	147.2	332.8	55.9	30.5

Source: Derived from Sheingauz, A., Karakin, V. & Tyukalov, V. (1996).

ANALYSIS OF THE FOREST INDUSTRIAL COMPLEX IN THE RFE AND THE NEAR-TERM OUTLOOK FOR DEVELOPMENT.

STAGE OF DEVELOPMENT AND MANAGEMENT OF THE FOREST INDUSTRIAL COMPLEX (FIC) IN THE TRANSITIONAL PERIOD[81]

The concept of Forest Industrial Complex was established by the state. It was an attempt to reorganize the forest industry into territorial regions, having one umbrella organization to regulate all forestry sectors within each region.[82] FIC is important for the RFE as it comprised 5.3% of its industrial output in 1993 (10-15% in previous years).[83] In some territories of the RFE, industries of the FIC are the basis for entire cities and are responsible for community stability. The development of FIC impacts the development of the whole region, especially in the Northern sub-regions. The development of the transport and construction industries is also largely based on the FIC. It also accounts for a significant share of regional exports.

The Forest Industry Complex in the Russian Far East includes seven sub-sectors:

1. **Forestry**: Its functions include management and distribution of forest resources on behalf of the state, protection of forests, reforestation, intermediate felling, principal felling (usually small-scale) and industrial utilization of timber from the fellings. Main enterprises are forestry enterprises (leshozy).

[80] Idem.

[81] This section is primarily based on Sheingauz, Karakin & Tyukalov, op. cit., pp. 7-13 and Stanick, op. cit., pp. 20-21.

[82] Stanick, op. cit., p 8.

[83] *Pocket Handbook of the Russian Far East,* op. cit., p. 115.

2. **Logging industry**: It carries out principal felling (in mature and over-mature forests) and mechanical processing of a portion of felled timber. Its main enterprises are logging enterprises (lespromhozi) within allocated forests where they operate.

3. **Wood-processing industry**: It produces lumber, boards, plywood, processes chips, *etc*. Main enterprises are wood-processing combines and wood-processing plants.

4. **Pulp and paper industry**: It produces pulp, paper and paper-board. Main enterprises are pulp-and-paper-board and pulp and paper combines and plants.

5. **Microbiology industry**: It produces products of micro-biological timber processing (food yeast, *etc*.) Main enterprises are biochemical plants. This industry is mainly presented in the RFE by Lesazavodskiy (Primorskiy Kray) and Horskiy (Khabarovskiy Kray) biochemical plants.

6. **Hydrolysis industry**: It produces alcohol and other products. In the RFE this industry is presented only by one enterprise, Horskiy hydrolysis plant (Khabarovskiy Kray).

7. **Furniture industry**: It produces furniture and other consumer products made of wood. All industries are based on forest resources of the RFE. [84]

The main industries, which make the greatest contribution to the total industrial production, of the FIC in the RFE (besides forestry, which was discussed in the previous section) are logging, wood-processing and pulp and paper industries (in descending order of importance). The logging industry is the most developed which is typical for an economy oriented mainly to extraction of raw materials. The microbiology, hydrolysis and furniture industries still require future development and are now of little significance for the economy of the region. Usually they are not included in the analysis of the forestry sector.

The role of the FIC in the economy of the RFE region was more significant before the implementation of political and economic reforms. However, traditional supply and demand systems collapsed after the reforms, while individual timber enterprises have become more independent. This speeded up initial declines since enterprises lost assured markets and were held responsible for their operating costs and had to absorb any losses. This greater independence followed the cancellation of all state capital funding in 1988. With a constantly changing regulatory structure, a serious lack of operating and investment capital, and general political and economic chaos, the declines in production within the FIC have continued until today.[85] The share of FIC industries in the industrial production of the RFE region declined from 10% in the 1980's to 4.6% in 1994.[86] In 1994 harvest volume was approximately 29.4% of the 1988 volume; production of lumber only 16.4%; pulp 7.7%; paper 5.3%; fiberboard 25%; and particleboard 25.6%. In 1994 enterprises of FIC in the RFE produced 832.9 billion rubles of marketable products, 64.9% (without inflation) of the 1993 level. The production efficiency (productivity) of the forest industries in the RFE is only 31.3% of the production efficiency of the Russian FIC as a whole. Profits which have remained at the enterprise level are not enough to even maintain production capacities and public services (such as daycare) on a sufficient level.[87] According to Sheingauz *, et al.*, among the main reasons for the worsening situation in the FIC are:

1. completion of industrial development of the most accessible forests and undesirable transformation of forest resources in the developed forests, which caused reduction in potential commercial harvest volumes under the existing level of technology and infrastructure;

2. frequent reorganizations both in the field of forest management and wood production;

3. contradiction between state ownership of forest resource base and private production;

[84] Sheingauz, Karakin & Tyukalov, op. cit., p.5

[85] Stanick, op. cit., p. 8.

[86] Sheingauz, Karakin & Tyukalov, op. cit., p. 19.

[87] "Spravka o rabote lesopromishlennogo kompleksa Dal'nevostochnogo regiona" (1995), unpublished materials of Rosexportles joint stock company.

4. rapid increase of all production expenditures (especially for transportation and energy) due to the high inflation, which caused decrease in competitiveness of regional forest products;
5. sharp decline of demand for wood products in the RFE;
6. loss of Russian market for wood products due to the sharp increase of railroad tariffs;
7. shrinking positions in international markets due to chaotic export policy regulations and low quality of wood products which did not meet international requirements; price decrease in Japanese markets;
8. sharp decline in reproduction of forest resources; and
9. increase of ecological restrictions which reduce land base for logging.[88]

According to the same source, in 1989-1992 there was a strong tendency towards decentralization in all industries of the FIC. It was relatively easy to register a private enterprise or cooperative and get access to forest resources which were being allocated by regional authorities. Large investments were not necessary at the first stages of reform. These enterprises also frequently found ways to export the timber production and primary products. Almost every plant or forest enterprise tried to be an independent producer and supplier of commodities on the international market without engaging the services of trade intermediaries. It was widely believed that this could make enterprises more profitable.

Many joint-stock companies related to forestry or forest industries appeared in almost all sub-regions of the RFE. Almost all forest industry enterprises were converted into joint-stock ventures. The largest are Dal'exportles, which incorporates timber suppliers from Siberia and the RFE; Dal'lesprom, logging and wood-processing; and Dal'drev and Dal'les which were created in order to coordinate export price policy. As a result, enterprises of the FIC became a mixture of different types of ownership, including joint-stock ventures, small enterprises, industrial cooperatives and limited liability companies. Approximately 90% of industrial production is now produced by enterprises with mixed or private types of ownership. However, it has become very difficult to effectively coordinate and regulate the FIC with such a large number of independent small enterprises.

By 1993 local administrations began to establish financial-industrial groups (FIG) using controlling blocks of shares in forest industrial enterprises which were transferred to them by the state. Also forest export policy was restricted and independent logging enterprises encountered marketing and supply difficulties. In the RFE it was easier to establish FIG's on the basis of large joint-stock ventures like Dal'lesprom and Primorsklesprom. A tendency towards centralization and resurrection of monopoly structures in the FIC became evident. Large joint-stock ventures, stock share holdings, and FIG's became the basis of a new structure for the FIC. Former logging enterprises became part of FIG's and produced 75-80% of all regional timber harvest.

In 1995 a new stage of development of the FIC began. All former state enterprises of the forest sector are required to transfer more than 51% of shares for selling in stock markets. This means that controlling blocks of shares in forest industrial enterprises of the RFE may transfer from the local leaders of the forest sector to the representatives of Moscow and foreign business circles. This is a beginning of a new redistribution of industrial structures and forest resources ownership and control within the RFE region. However, local administrative authorities are expected to try to preserve the controlling blocks of shares for local FIG's and stock holdings.

The process of establishing new enterprises in the FIC continued during 1994-1995. For example, in 1990 there were 160 wood enterprises in the RFE. In 1994 there were some 316 wood enterprises in just the Khabarovskiy Kray, Primorskiy Kray and Sakhalin sub-regions. This caused keen competition for prospective timber harvesting areas. Distribution of forest resources is essentially carried out by confidential closed negotiations between local administrations and potential forest users, in contradiction of the "Fundamentals of Forest Legislation" which requires distribution of forest resources on the basis of open auctions. As of 1995 no auctions had taken place in the RFE. The administrations preferred to allocate forest resources to the members of local FIG's and holdings and to

[88] Sheingauz, Karakin & Tyukalov, op. cit., p. 20

foreign investors. The new forestry code which is now under discussion may substantially restrict the rights of local administrations. This could potentially contribute to a future rapid process of reallocation of new forest tracts.

Payment for the use of forest resources in the RFE is established by local legislators and administrations at a very low level in order to help economically-struggling logging enterprises to survive during the difficult transition period. Local government budgets therefore capture a very small portion of the forest resource value or "rents". The main part of the resource value is transferred to the logging enterprises.

Management of the FIC in Khabarovskiy and Primorskiy Krays is carried out by specialized departments within the local administrations. In other sub-regions FIC management is a function of local industry departments. These administrative structures cannot directly interfere in the operational activities of firms and enterprises.

The forestry component of the FIC is managed by forestry departments subordinate to the Federal Forest Service of Russia. They coordinate decisions (including allocation of forest tracts) with committees or departments responsible for the utilization of natural resources which are incorporated into the structure of sub-regional administrations. It is also necessary to formally coordinate main forestry allocation decisions with sub-regional committees of the Ministry of Nature which has controlling regulatory functions.

One of the main tasks of the local administrations is to attract investments in support of the FIC of the region. This is not a simple task because the investment climate has been generally interpreted as highly risky due to disorganization of the economy, mutual non-payment of debts and obligations, high political risk, insufficient provision of juridical norms, absence of mortgage legislation, absence of benefits for foreign investments, a complicated taxation system with a high level of taxes, lack of control over international trade and weak currency controls, obsolete book-keeping and accounting standards, poor infrastructure, instability in the banking system, chaos in supply systems, chaos in transportation services, frequent changes of tariffs, poor living conditions, and the limited and poor information systems for economic and production and market data.

All these factors taken together create a serious obstacle for foreign investment and have greatly impeded the development of FIC in the RFE.[89]

ANALYSIS OF PRODUCTION DATA FOR THE FIC IN THE RFE [90]

The contribution of each sub-region in the total production of the FIC in the RFE (in terms of percent by value) is summarized in Table 20 for 1990 and 1994.

Table 20. Distribution of Forest Industrial Production by Sub-region of the RFE 1990 and 1994 (percent by value)

Sub-region	1990	1994	Change
Yakutia	9.0	8.8	-0.2
Jewish aut. Obl.	-	1.7	1.7
Primorskiy Kray	15.8	22.2	6.4
Khabarovskiy Kray	32.4	30.2	-1.1
Amurskaya obl.	14.9	11.0	-3.9
Kamchatskaya obl.	9.0	3.3	-5.7
Magadanskaya obl.	-	1.1	1.1
Sakhalinskaya obl.	18.9	21.7	2.8
RFE	100.0	100.0	100.0

Source: Computed using data derived from Sheingauz, A., Karakin, V. & Tyukalov, V. (1996).

[89] Ibid., pp. 21-24.

[90] This part of the section is written based on Sheingauz, Karakin & Tyukalov, op. cit., pp. 32-41.

Four sub-regions located in the South of the RFE, Khabarovskiy Kray, Primorskiy Kray, Sakhalinskaya Oblast and Amurskaya Oblast, hold the leading position in the production of forest products. They accounted for 82% of the total wood production in 1990 and 85.1% in 1994. The share of Northern sub-regions is rather small and continues to decline. In the period 1990-1994 the role of Primorskiy Kray and Sakhalin increased further while the share of Khabarovskiy Kray declined slightly.

Production data for industrial harvesting and lumber production is plotted in Figures 4 and 5, showing the great decline in these sectors of the FIC since the beginning of economic changes begun in the late 1980's. Logging production has spiraled downward since peaking in 1986 with total harvest of 36.7 million m^3 to only 13.5 million m^3 in 1994 (-63.2%). In 1994 the volume for timber harvest was even below that of 1950, when the forest industry of the RFE was still in its early primary stage of development.

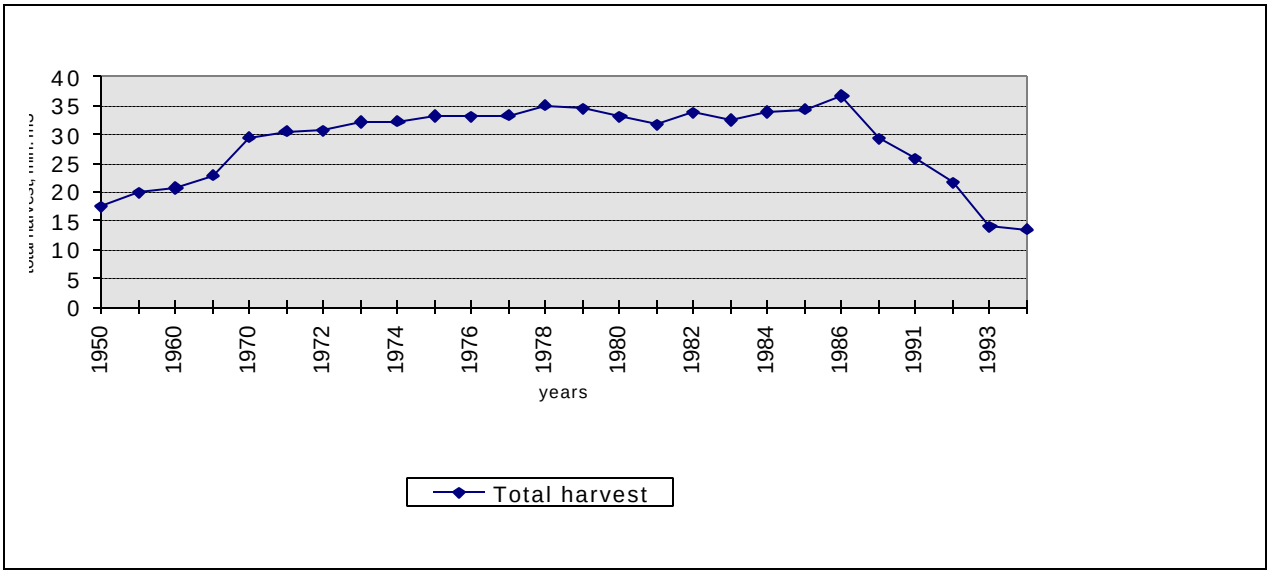

Figure 4. Total harvest in the RFE (000,000 m^3). Source: Zausaev, V., unpublished materials; Stanick, K. (1994); Rosexportles joint stock company, unpublished materials.

The reasons for consistent annual declines in production levels since 1986 have been discussed in the previous subsection. However, Sheingauz , *et al.*, assumed that the official statistical data reported lower levels of industrial harvest than actual volumes for the following reasons:

1. considerable share of black market economy in this sector of the FIC;
2. harvest volumes are deliberately under-reported by logging enterprises in order to reduce taxes;
3. statistical organs do not count enterprises with fewer than 50 employees, *i.e.*, all small and medium businesses.

According to the same source, the actual harvest may be almost twice as much as the officially reported data. This was confirmed by surveys conducted in Primorskiy Kray and by reports of forestry enterprises for timber removals. The reported data for timber harvest since 1993 can be considered as the volumes reported by FIG which is cautiously judged to be approximately 60% of actual total harvest in the region.

The reduction in lumber manufacturing has been even more dramatic than the reduction in timber harvest. The reported official data is estimated to be closer to the actual production volumes. In 1994 lumber manufacturing volumes fell well below the 1950 level, to only 54.5% of the level of 1950 and only 17.9% of the 1978 production volume, which was a peak year for FIC industries in the RFE. (Figure 5).

Lumber production volume by sub-region is summarized in Table 21 for the period 1975-94.

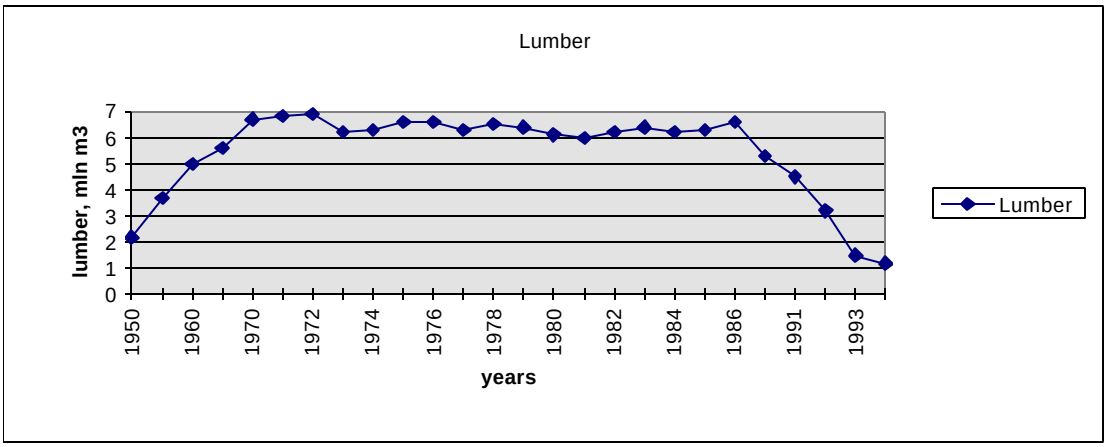

Figure 3. Lumber production volumes (000,000 m^3). Source: Zausaev, V., unpublished materials; Stanick, K. (1994); Sheingauz, A., Karakin, V. & Tyukalov, V. (1996).

Table 21. Volume of RFE Lumber Production by Sub-region 1975-1994 (000 m^3).[91]

Areas	1975	1980	1985	1990	1991	1992	1993	1994	1975/1994
Yakutia	582	730	810	809	612	477	258	226	2.58
Primorskiy Kray	1703	1608	1495	993	842	577	270	168	10.14
Khabarovskiy Kray	1383	2120	2075	1897	1683	1100	491	386	6.17
Amurskaya obl.	807	777	756	812	727	618	248	206	3.92
Kamchatskaya obl.	212	253	270	209	169	110	39	37	5.73
Magadanskaya obl.	227	218	188	119	102	61	14	12	18.92
Sakhalinskaya obl.	660	548	585	447	410	268	202	136	4.85
RFE	6574	6254	6179	5295	4545	3211	1522	1171	5.61

Source: Stanick, K. (1994); Sheingauz, A., Karakin, V. & Tyukalov, V. (1996).

Khabarovskiy Kray and Primorskiy Kray were the leading lumber producers in the RFE, accounting for 62.2% of total lumber production in 1975 and 52.2% in 1992. Amurskaya Oblast, Yakutia and Sakhalin provided most of the balance of lumber volume, together accounting for 31.2% in 1975 and 28.9 in 1992. The Jewish Autonomous Oblast accounted for 19-20% of the lumber production reported for Khabarovskiy Kray in 1985 and 1990. In 1994 its share dropped to 12.3% in total lumber production of Khabarovskiy Kray. Chukotka provided 9.2% of the total lumber production of Magadanskaya Oblast in 1990. In 1994 lumber was reportedly not produced in Chukotka.

All sub-regions showed a sharp drop in lumber production volume, especially Magadanskaya Oblast. In 1994 lumber production in Primorskiy Kray and Khabarovskiy Kray (main lumber producers of the RFE) was 9.9% and 16.2%, respectively, of the 1975 production volume.

It is currently more profitable for logging enterprises to export unprocessed logs rather than to sell them to the domestic sawmills. The high prices for raw materials (including logs) have caused shut-down of many wood-

[91]Data for Jewish Autonomous Oblast is included in Khabarovskiy Kray. Data for Chukotskaya Oblast is reported in Magadanskaya Oblast.

Table 22. Volume of Main Wood Products Output in the RFE, 1950-1994.

Products	Units	1950	1955	1960	1965	1970	1975	1978	1980	1985	1986	1990	1991	1992	1993	1994	1995
Total harvest	000 000 m^3	17.4	19.8	20.6	22.9	29.5	33.2	35.0	33.0	34.4	36.7	29.2	25.7	21.6	13.9	13.5	n/a
Lumber	000 000 m^3	2.2	3.7	5.0	5.6	6.7	6.6	6.5	6.1	6.3	6.6	5.3	4.5	3.2	1.5	1.2	n/a
Plywood	000 m^3	19.6	25.3	31.0	36.5	50.7	45.7	43.9	36.0	35.9	39.8	25.3	15.1	11.4	7.2	1.7	n/a
Chip board	000 m^3	-	-	1.0	1.5	33.7	59.3	102.0	99.8	112.4	118.5	139.8	186.8	125.7	102.5	48.0	n/a
Fiber board	000 000 m^2	-	-	5.5	5.3	6.5	15.6	18.4	18.9	23.0	25.8	23.8	20.1	19.9	11.0	5.5	4.0
Commercial pulp	000 tons	n/a	n/a	30.0	38.0	110.0	192.1	163.5	147.0	176.0	185.0	168.5	160.0	141.6	64.9	38.0	n/a
Cardboard	000 tons	12.0	29.5	107.0	107.0	121.1	133.7	185.0	169.7	192.0	234.7	240.6	220.5	152.0	51.8	8.0	n/a
Paper	000 tons	66.3	137.4	167.1	167.1	195.3	220.0	244.1	231.6	228.3	226.7	215.5	207.7	148.7	62.6	11.0	n/a

Source: Stanick, K. (1994); Sheingauz, A., Karakin, V. & Tyukalov, V. (1996).

processing plants and sawmill divisions. In addition, many ship-repair and ship-building enterprises have sawmill and furniture divisions in addition to their main industrial activities and have also been impacted.

The volume of main wood products output for the RFE for the period 1950-1994 is given in Table 22. As noted, all sectors of the FIC of the RFE have shown a significant drop in production. The worst situation is for the plywood sector where production volume in 1994 equaled only 8.7% of the level of 1950 (see Table 22). Plywood production has practically stopped in the RFE.

Of the wood-based panel products reported in Table 23, the chip board sector has adjusted best to the economic changes. Volume produced in 1994 exceeded the production level for 1970 and equaled 80.9% of the production level of 1975. The rate of decline is the smallest in the forest products sector. Fiberboard production in 1994 was equal to the production volume in 1960, when this industry was first established. However, in 1995 production volume dropped even further to 4 million m^3. Chip and fiberboard industries were first established in the 1960s, after which the production volumes quickly increased. The peak chip board production was in 1991, from which it dropped significantly in 1994 (-74.3%). The rate of decline in these two products was smaller than that for the other forest products that are presented in Table 22.

Table 23. Volume of RFE Panel and Board Production by Sub-region 1975-1994[92]

	Years							
Subregion	**1975**	**1980**	**1985**	**1990**	**1991**	**1992**	**1993**	**1994**
				Plywood, 000 m^3				
Primorskiy Kray	30.2	20.0	23.5	17.2	6.9	5.4	4.1	1.1
Khabarovskiy Kray	15.5	16.0	11.2	6.9	7.5	5.4	3.1	0.6
Amurskaya obl.	-	-	1.2	1.2	0.7	0.6	-	-
RFE	45.7	36.0	35.9	25.3	15.1	11.4	7.2	1.7
				Chip Board, 000 m^3				
Primorskiy Kray	59.3	70.3	69.8	87.0	94.2	50.4	50.0	28.0
Khabarovskiy Kray	-	29.5	40.5	52.2	92.0	75.1	52.2	20.0
Kamchatskaya obl.	-	-	1.1	0.6	0.6	0.2	-	-
Sakhalinskaya obl.	-	-	1.0	-	-	-	-	-
RFE	59.3	99.8	112.4	139.8	186.8	125.7	102.2	48.0
				Fiber Board, 000 000 m^3				
Primorskiy Kray	4.7	3.1	1.7	1.6	1.1	1.2	0.6	0.3
Khabarovskiy Kray	10.9	15.8	21.3	22.2	19.0	18.7	10.4	5.2
RFE	15.6	18.9	23.0	23.8	20.1	19.9	11.0	5.5

Source: Stanick, K. (1994); Sheingauz, A., Karakin, V. & Tyukalov, V. (1996).

Table 24 shows the striking decline in the production levels of pulp, cardboard and paper in 1994. Paper production almost ceased (it was 1/6 of the production volume achieved in 1950). Cardboard production was 66.7% of the level of 1950 and pulp volume was equal to the volume produced in 1965. The drop in production in 1994 from 1993 was the most significant for pulp (-41.4%), cardboard (-84.6%), and paper (-17.6%). The reason for this sharp decline was the virtual elimination of all capital investment for the pulp and paper sector which caused the shut-down of many facilities.

The paper industry has traditionally been centered in Sakhalinskaya Oblast. The paper industry in this sub-region has seen such a substantial drop largely because of the complete deterioration of the Japanese equipment which was

[92] Data for Jewish Autonomous Oblast is included in Khabarovskiy Kray.

originally installed when the mills were first established in 1907.[93] Production volume by each sub-region of the RFE is presented in Table 24 for the period 1975-1994.

Different sources reported similar production data except for chip board. Sheingauz *, et al.*, reported a higher volume of chip board production for 1990 (189,000 m^3) and 1985 (117,000 m^3). Primorskiy and Khabarovskiy Krays account for 94-100% of total regional production of plywood, chip board and fiber board. The Jewish Autonomous Oblast produced approximately 12% of the reported Khabarovsk plywood output in 1985 and 11.2% in 1990.

Paper production is centered in Sakhalin (94-97%). Pulp and cardboard production is located in Sakhalin and Khabarovskiy Kray. Sakhalin accounted for 37-34% of cardboard production in 1985-1991 and 37.5% in 1994. Sakhalin's share in pulp production for the RFE region was 42-46% in 1985-1991 and was 47% in 1994. Pulp and paper production has been almost suspended as has been plywood production.

Table 24. Volume of RFE Pulp and Paper Production by Sub-region 1975-94[94]

	Year							
Sub-region	**1975**	**1980**	**1985**	**1990**	**1991**	**1992**	**1993**	**1994**
				Cardboard, 000 tons				
Khabarovskiy Kray	42.9	84.4	120.3	155.7	143.2	99.2	38.2	5.0
Sakhalinskaya obl.	90.8	85.3	71.7	84.9	77.3	52.8	13.6	3.0
RFE	133.7	169.7	192.0	240.6	220.5	152.0	51.8	8.0
				Paper, 000 tons				
Khabarovskiy Kray	9.0	8.6	9.2	8.5	4.9	1.9	1.4	0.3
Amurskaya obl.	4.3	3.4	3.5	3.1	2.9	-	-	-
Sakhalinskaya obl.	215.7	219.6	215.6	203.9	199.9	146.8	61.2	11.0
RFE	229.0	231.6	228.3	215.5	207.7	148.7	62.6	11.3
				Commercial Pulp, 000 tons				
Khabarovskiy Kray	105.7	88.6	95.1	96.9	92.3	89.9	50.0	20.0
Sakhalinskaya obl.	86.4	58.4	80.9	71.6	67.7	51.7	14.9	18.0
RFE	192.1	147.0	176.0	168.5	160.0	141.6	64.9	38.0

Source: Stanick, K. (1994); Sheingauz, A., Karakin, V. & Tyukalov, V. (1996).

Table 25 provides the distribution of production by volume in each of the sub-regions as a percent share of the total RFE volume. This table shows that Khabarovskiy Kray has the most diversified wood product structure, including production volumes in all eight product classes. Primorskiy Kray and Sakhalin also produce a relatively wide range of wood products. It is evident that Southern sub-regions dominate wood production in the RFE region due to the richer resources, better climate conditions and more developed infrastructure. Northern sub-regions are plagued with underdeveloped infrastructure, severe working environment, lack of labor and low quality of resources which hamper any large scale forest industry development.[95]

Furniture production is difficult to document since the primary statistical sources count furniture in value terms due to a great diversity of items produced by this sector. Inflation and changes in the price structure made it impossible to draw reliable estimates from this data. However, the furniture industry is also in crisis, almost up to the point of a complete shut-down of most furniture enterprises.

[93] Stanick, op. cit., p. 9.

[94] Data for Jewish Autonomous Oblast is included in Khabarovskiy Kray.

[95] Ibid., p. 9.

Biochemical plants which process chips and slash wastes had been launched shortly before the beginning of the political and economic reforms. In 1990 such enterprises produced 70,000 tons of yeast in combination with pulp and paper enterprises. After the reforms the demand for yeast has dropped due to the inability of customers to pay. During 1994-1995 these plants did not work most of the time. As a whole, the decline in production for the FIC industries of the RFE was more severe than for other industries of the region.

Table 25. Distribution of Forest Products Production by Sub-region, 1994 (Percent by Volume)

Areas	Total harvest	Lumber	Plywood	Chip Board	Fiber Board	Commer-cial Pulp	Card-board	Paper
Yakutia	17.04	19.30	-	-	-	-	-	-
Primorskiy Kray	19.26	14.35	64.71	58.33	5.45	-	-	-
Khabarovskiy Kray	37.04	32.96	35.29	41.67	94.55	52.63	62.50	2.65
Amurskaya obl.	13.33	17.59	-	-	-	-	-	-
Kamchatskaya obl.	1.48	3.16	-	-	-	-	-	-
Magadanskaya obl.	0.00	1.02	-	-	-	-	-	-
Sakhalinskaya obl.	11.85	11.61	-	-	-	47.37	37.50	97.35
RFE	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Computed using data derived from Sheingauz, A., Karakin, V. & Tyukalov, V. (1996) and "Spravka o rabote lesopromishlennogo kompleksa Dal'nevostochnogo regiona" (1995).

The continuing decline in output of the FIC industries affects almost all other value-added sectors and has caused fundamental structural changes within the FIC. Before 1992, roundwood production comprised 40.3% of output, primary wood-processing production (sawmilling, production of chips, *etc*.) 41.3%, pulp and paper production 16.0%, and microbiology and hydrolysis production 2.4%. In 1994-1995 production of the logging industry comprised 75-85% of output in spite of the significantly lower harvest due to the collapse of other sectors of the FIC.

One of the most significant reasons for the crisis in the FIC has been a rapid depreciation of the main production capacity. In the last few years, investments for modernization of equipment and technology, reconstruction and development of production facilities almost ceased. The federal budget financed only the most significant projects. For example, in Khabarovskiy Kray the level of capital investment for the FIC declined by 87.5% in 1994 in comparison with 1991. The FIC share in total regional investment declined from 29% to only 9%.

Capital investment has been used mainly for maintenance of the existing facilities and for housing construction. According to the government policy, the share of investments into industry from the federal budget must not exceed 20%. Enterprises of the FIC should generate the remaining 80% themselves from their profits. However, this is insufficient, even for maintaining stable work and minimal development of production capacity. Enterprises of the FIC cannot finance technical modernization, or research and scientific development within the industry. This greatly impedes restructuring and development in all industries of the FIC.

In 1995 the number of machines used within the FIC (such as skidders, log trucks, timber fork loaders and bulldozers) had been reduced by about 25-40% in comparison with the beginning of the 1990s. In 1995 the total annual purchase of new logging equipment was only 14-20% of the level of 1990. This slowdown in equipment replacement effectively increased the percent of depreciation of the older equipment kept in active use. In 1994 depreciation was 41% in Yakutia, 55% in Jewish Autonomous Oblast and 43% in Amurskaya Oblast.

Rapidly increasing prices and inflation have also constantly reduced the profitability of wood products enterprises. Industries of the FIC depend more than most other industries on transportation of the bulky and heavy products over long distances, and on imported energy resources which are necessary for the production process. Frequent price increases for these two primary inputs have negatively impacted the economic feasibility of much of the FIC of the Far Eastern region.

The geographical location of FIC enterprises (especially the distance from ports) has began to play a much larger role under the new economic conditions. Enterprises of the FIC can be divided into two groups. The first group is located near transport routes with short distances to the ports or borders. The second group are those enterprises

which are much further away from railroads and which under previous conditions used long automobile roads or river routes for primary transportation of timber and production outputs.

The first group includes almost all enterprises in the lower reaches of the Amur river and all enterprises near the Trans-Siberian and the BAM railroads and those adjacent to the primary ports. These enterprises presently concentrate on roundwood production for export and are profitable. The second group includes the majority of the enterprises of the FIC in the RFE. They try to find individual means of economic survival and some have succeeded. For example, the stock-venture Sakhalinlesprom, which lost its domestic market, subsequently improved the quality of its pulp output and in 1994 began to sell into China, India and Indonesia. The Tungusskaya Furniture Plant began to make furniture on special order.

However, the number of such examples of successful enterprises among the second group of enterprises is not large. In 1994 the share of unprofitable enterprises in the RFE was estimated at 25% of the total. For example, in 1994 profitability of enterprises of the FIC in Primorskiy Kray was reduced by 71.4% in comparison with 1993. This tendency is similar for each sub-region. In 1995 roundwood and lumber production in Yakutia were unprofitable as products could only be sold below the cost of production. Only furniture production was profitable in this sub-region.

Unprofitable enterprises in the FIC in Sakhalin (for 11 months of 1995) comprised 82% of the total, which was substantially higher than the share of unprofitable enterprises for industry in Sakhalin as a whole (51.7%). Holdings of inventory has increased in almost all FIC enterprises within the RFE. The share of commodities actually delivered to customers for which the sellers cannot obtain payment has also increased. Because of this, a large number of enterprises cannot even pay their employees on time. Salaries are being delayed for 3-4 months.

Labor productivity remains at a low level. On average, in 1980 one employee in the FIC produced 680 m^3 annually (in roundwood equivalent). In 1994 output productivity was 360 m^3, 1/2 to 1/3 the level in the forestry sector of major timber competitor countries. Reduction of industrial harvest and low salaries contribute to a reduction in employment in the industries of the FIC. By 1994 the number of employees in the industries of the FIC in the RFE had declined by 20.6% compared to 1990. Reduced funding of related social services (kindergartens, schools, clubs, hospitals located in the settlements) and for housing maintenance and construction also contributed to worker migration. This population decline caused a deterioration of many settlements and the shut-down of existing enterprises.

In order for the industries of the FIC to overcome these existing difficulties, it will be necessary to attract new investment capital, and to deal with the higher transportation tariffs and energy costs. This can only be done through stabilization of the whole regional economy and the financial system, a task well beyond the capacity of the FIC itself.[96]

THE FIC OF KHABAROVSKIY KRAY

Khabarovskiy Kray is the leader among the sub-regions of the RFE in the production of wood products. It is helpful to understand the current situation of this sub-region more thoroughly. Khabarovskiy Kray has the most diversified structure within the FIC and is considered to be the most developed sub-region. As previously noted, it has substantial timber reserves for development of the FIC. It also has the most developed infrastructure. The Trans-Siberian and the BAM Railroads cross Khabarovskiy Kray. Major international ports include Vanino and Sovetskaya Gavan'. Vanino is the terminus of the BAM and the ferry from Sakhalin originates there. The Amur Steamship Company handles 20% of Russia's trade with Japan. Khabarovskiy's international airport is the largest in the RFE. However, the northern part of the Kray has no railway and very few roads.[97]

Timber is very important for the economy of the Kray. Khabarovskiy Kray is a center of the RFE's forest industry and produced 7.026 million m^3 of timber in 1993 (almost 40% of the total cut in the RFE). Six million m^3 of the total 7

[96] Sheingauz, Karakin & Tyukalov, op. cit., pp. 36, 38,40.

[97] Newell, Wilson, op. cit., p. 71.

million m^3 were harvested by clearcutting.[98] Three million m^3 were exported. Timber accounts for 45% of exports, with 85% of this trade imported by Japan.

Logging is concentrated in two areas. One harvest area is in the western part of the sub-region, centered around the towns of Chegdomyn and Tyrma and the BAM railroad. The other concentration is in the mixed forests between the Amur-Amgun' river basin and the coast, along the Sikhote-Alin' mountain range. The two most heavily logged enterprises in 1993 (Urgal'skiy and Tyrminsky) are in the western area, where 57% of the timber cut that year was larch. The logging enterprises of the Sikhote-Alin' and the coastal region harvest a number of different species, including spruce, larch, beech, willow and oak. Logging is expected to increase in coming years - assuming greater economic stability - because of the greater market value of the species growing there.[99]

The FIC of Khabarovskiy Kray includes 371 enterprises involved in logging, pulp and paper, and wood-processing industries.[100] All enterprises are privatized and united into two forest industry companies employing a total of 26,100 persons.[101] Production capacities of the FIC of the Kray in 1995 are summarized in Table 26. The percent of utilization of existing production capacities is rather low. In 1994, the production capacity for timber removal was utilized at only 33.6%. Lumber production capacity utilization was 25%; pulp 8.5%; cardboard 20%; fiber board 25% and chip board 30%. As previously noted, a large decline in all sectors of the FIC in Khabarovskiy Kray was observed in 1994 in comparison with 1988 (pre-reform). Timber removal in 1994 was down to just 27% of the 1988 level; lumber production to 13.7%; plywood to 5%; boards to 29.4%; pulp to 10%; cardboard to 28.6%. Declining production continued in 1995 as well.[102]

Table 26. Production capacities of the FIC in Khabarovskiy Kray on 1 January 1995.

Product	Units of measurement	Production capacities
timber removal	million m^3	9.9
lumber	million m^3	1.2
pulp	thousand tons	342.4
cardboard	thousand tons	217.6
fiber board	million m^2	21.0
chip board	million m^3	80.0
plywood	thousand m^3	18.0

Source: "Spravka o rabote lesopromishlennogo kompleksa Dal'nevostochnogo regiona" (1995).

According to "Rosexportles," in 1995 the logging industry of Khabarovskiy Kray performed at relatively the same level as in 1994. Timber removal for 8 months of 1995 was 2.49 million m^3. For the same period of 1994 harvest was 2.56 million m^3. Production of industrial roundwood was 1.9 million m^3 for 8 months of 1995, or about 2% lower than for the same period of 1994.

According to the same source, the state subsidy received in 1995 allowed the enterprises to reduce direct costs for producing one ruble of marketable output to 89.5 kopecks during the first six months of 1995. In 1994 the same index was 120.2 kopecks. In 7 months of 1995, 21 enterprises of the FIC (36.8% of the total) had total losses of 56.6 billion rubles. Creditor indebtedness from January to July of 1995 increased from 264.2 billion rubles to 416.8 billion rubles. Profits were 11.9 billion rubles for the same period of 1995. For the same period, the number of employees in industries of the FIC decreased by 2.6% to 26,100 compared to the same period of 1994. Enterprises of the FIC

[98] Ibid., p. 72.

[99] Ibid., p. 76.

[100] Analysis here does not include furniture, hydrolysis and microbiology industries.

[101] "Spravka o rabote lesopromishlennogo kompleksa Dal'nevostochnogo regiona," op. cit., p. 5.

[102] Idem.

worked intermittently with frequent temporary shut-downs due to the lack of operating funds and insufficient timber inventory necessary for continuous production.

Enterprises did not develop adequate pricing policies in response to evolving market conditions and have frequently sold products at a lower price than other enterprises in other sub-regions of the RFE. For example, enterprises of Khabarovskiy Kray sold conifer sawlogs at 131,800 rubles per m^3, while enterprises of Primorskiy Kray sold essentially the same products at 427,400 rubles per m^3. This caused a loss of profitability for many enterprises of Khabarovskiy Kray. The enterprises of Dal'lesprom were more successful.[103] This holding company remained the largest timber producer in the Kray, cutting 50% of the total timber. On credit from the Moscow International Bank, it has been able to purchase 150 new timber loaders and about 200 tractors.[104] On short-term credit from Japanese firms, it obtained fuel and machine oil.[105] Its volume of timber removal for 8 months of 1995 and production of roundwood and industrial wood exceeded that for the same period of 1994 by 4-5%. Dal'lesprom plans to broaden its logging activities in the near future.[106]

The economic and financial situation in industries of the FIC also worsened due to a decline in viable export possibilities. In 1991 enterprises of Khabarovskiy Kray exported wood products to a wide range of countries and to the republics of the former Soviet Union. Now, exports of wood products are mostly limited to Japan and other countries of South-Eastern Asia.

There are four prominent logging joint ventures operating in the Kray: MAK Starma Holding, whose foreign partner is the Pioneer Group (US), operates in three locations with a potential harvest of 1.2 million m^3 per year; MAK Interprom, which is linked with a French firm and which operates in at least four areas; and AO Forest Vanino, which operates in a partnership with the Forest Finans holding company (Norway). This joint venture is logging in the Tumnin River basin with logs shipped for export from Vanino; MAK Eksprales, which has a new joint venture agreement with Global Forestry Management Group (US; 50% of authorized capital). It is expected that a total of 1 million m^3 will be logged from joint venture enterprises over the next three years. In 1995, harvest is estimated at 150,000 m^3; in 1996, 350,000 m^3; and by 1997, 500,000 m^3.

A feasibility study is being carried out to explore a new lease agreement which would allow the joint ventures to cut 2 million m^3 of timber after 1997. An American partner provides logging equipment and the means of transportation and conducts export operations. Russian partners provide fuel and parts associated with repairs of Russian equipment. Also they are responsible for juridical support of the joint venture. The enterprise experienced difficulties due to the customers' failure to pay for the purchases.

There are also a number of Russian-Japanese joint ventures (the largest are Somon, Lidoga and Vanino-Tairiku). Japanese firms mainly purchase unprocessed logs for export through Russian firms and then process them in their own domestic facilities. Therefore, Japanese investment in joint ventures has been limited considering the extent of the timber trade between the two countries. However, if Russia is successful in stabilizing the situation politically and economically, Japanese investment in the RFE timber industry may increase rapidly.

Also in the Kray, Russian-North Korean Logging operates a joint venture which has a troubled history including alleged human rights violations and poaching. The Russian and North Korean governments signed an agreement in May 1995 to extend the contract to at least 1997. North Korean laborers log the forests around the town of Chegdomyn. In 1994 production of timber there was 240,000 m^3 but without recorded profits due to the increase in railroad tariffs and the depletion of accessible forests.[107]

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[103] Ibid., p.6.

[104] Idem.

[105] Newell & Wilson, op. cit., p. 76.

[106] "Spravka o rabote lesopromishlennogo kompleksa Dal'nevostochnogo regiona," op. cit., p.8.

[107] Newell & Wilson, op. cit., pp. 76, 78-80.

The pulp and paper industry of Khabarovskiy Kray is represented only by Amurskbumprom, a stock venture which specializes in production of viscose pulp and cardboard. In 1994 this enterprise had 342,400 tons of production capacity for pulping and 217,600 tons of cardboard production. Utilization of capacity was 8.9 percent and 2.4% respectively. In 1994 pulp production decreased by 90.4% in comparison with 1988. Cardboard production declined by 97.1% during this period.

Amursbumprom was profitable until 1992 and largely satisfied the national demand for viscose pulp for the production of fabrics and the demand for container board. A sharp increase in prices for energy, transportation and raw materials reduced competitiveness of Amurskbumprom products in the markets of the European part of the former USSR and resulted in a complete loss of these markets and the sharp drop in output.

Production of container board almost ceased in 1993. The enterprise began to produce bleached sulfate pulp in small volumes as a substitute for the traditional specialization on the production of viscose pulps. However, in July 1995 international demand for viscose pulp increased and resulted in a revival of production in Amurskbumprom.[108]

According to J. Newell and E. Wilson, Khabarovskiy Kray timber enterprises will, in the near-term, continue to export raw logs in order to capture short-term profits. Japan will remain the major importer of unprocessed logs for the foreseeable future. An increase in the volume of unprocessed log exports is predicted in the near term as logging recovers some economic strength. Value-added wood processing will likely remain negligible, which will put greater pressure on accessible forests for exports. This could lead to a greater concentration center for logging operations in the coastal regions of the Kray as it is much easier (and less costly) to transport logs to the adjacent ports.

Proposed plans for a large-scale expansion of the Vanino and Sovetskaya Gavan' ports may speed up log exports significantly. If new joint ventures such as Global Forestry Management Group, Strama Forest and others prove financially successful, other larger timber multi-nationals will likely enter the RFE export market. This possibility has raised the concerns for protecting the remaining old-growth forests in the southern part of the Kray. These forests are deemed environmentally crucial, as these forests support the highest biodiversity of the RFE and are also the most productive for timber growth in the region.[109]

TRANSPORTATION INFRASTRUCTURE OF THE RFE AND ITS IMPORTANCE FOR THE DEVELOPMENT OF THE FIC

GENERAL STATUS AND PERFORMANCE OF TRANSPORTATION IN THE RFE 1990-1994.

The future development of infrastructure will be very important for further development of the FIC in the RFE. Infrastructure for transportation determines the rate of utilization of forest resources as roads are needed to access timber stands for harvesting and transport of timber to the enterprises, ports, or consumers. Existing infrastructure and the related level of tariffs dictate the pattern of distribution for timber harvested in the RFE and the decisions regarding what products will be produced and where facilities may be located. Major trends of the development of the whole transportation system throughout the RFE region will affect the FIC. The status of the transport system and developments over the past few years and the implications for timber producers are important factors in assessing the near term outlook for further development of the FIC.

Historically, commercial expansion and military purposes were the main reasons for developing the RFE transportation systems. Linking western (European) Russia with the resource-rich areas of Central Siberia and with the Pacific Rim countries has been the main goal. Little attention was placed on developing the transportation systems running north-to-south, while east-to-west connections and transportation developments formed along the southern borders of Siberia. Connections with the RFE have been a main priority.

[108] "Spravka o rabote lesopromishlennogo kompleksa Dal'nevostochnogo regiona," op. cit., p.8.

[109] Newell & Wilson, op. cit., p. 81.

This policy created a powerful trading link between the eastern and western areas of the country. Waterways and road transportation also played a part in the historic development of the transportation systems in the RFE, though the construction of a powerful railway system was the top priority in transportation development.[110] Table 27 illustrates the utilization of the different modes of transportation for freight turnover within the RFE.

Table 27. Freight Transportation in the RFE - 1990-94

	1990		1992		1994	
Year	**million tons**	**%**	**million tons**	**%**	**million tons**	**%**
Total, including	323.90	100.00	215.10	100.00	102.60	100.00
Rail	113.50	35.04	78.50	36.49	40.20	39.18
Truck	127.40	39.33	81.20	37.75	27.00	26.32
River	39.00	12.04	20.50	9.53	6.70	6.53
Sea	43.40	13.40	34.70	16.13	28.70	27.97

Source: *Russian Far East Update*, (June 1995). Figures do not add since total also includes air freight.

Freight turnover declined in 1994 in comparison with 1990 for all transportation modes, reflecting the steady decline in industrial output as a whole. In 1994 the overall amount of cargo turnover was only 31.7% of the 1990 level. Volumes shipped by rail transportation comprised only 35.4% of the 1990 volume; truck transportation, 21.2%; river transportation, 17.2%; and sea transportation, 66.1%. River and truck transportation sectors suffered the most while sea transportation was affected the least due to the developing international trade.

Trends in the utilization patterns also changed in 1994 in comparison with 1990. Sea transportation began to play larger role than before, comprising almost 28% of the overall cargo turnover in 1994, while in 1990 it comprised only 13.4% of the total. Truck and especially river transportation sectors lost position and comprised 26.3% and 6.5% in total freight structure, respectively, in 1994. Their shares in the total structure in 1990 were 39.3% and 12.0%, respectively.

According to the *Russian Far East Update*, sharp increases in rail and cargo tariffs in 1993 and 1994 seriously affected the flow of imports and exports via RFE ports. Shippers of raw materials and fuel designated either for export or for shipment to the RFE Northern sub-regions are finding it increasingly uneconomical to ship goods to the RFE ports using railroads.[111]

The second major cause of the decline freight turnover was a sharp reduction in domestic coastal trade turnover (which is the transfer of domestic Russian products via vessels to the RFE Northern sub-regions). In the 1980s coastal trade comprised approximately 70% of the total cargo turnover for the RFE ports. Most RFE ports were used exclusively for domestic coastal trade with the exception of Vostochniy and Nakhodka, which conducted international shipments as well. In 1993, coastal trade comprised only 42% of the total cargo turnover for all the RFE ports. One important reason for the decline is that the suppliers of raw materials (including timber) are demanding pre-payment from the Far North sub-regions or simply not shipping because of high rail tariffs.

However, export/import cargo has increased. These changes are reflected in cargo turnover figures for Vanino for 1993 as compared to 1992. Total cargo turnover and coastal trade dropped by 11% and 31%, respectively, while export/import cargo turnover increased by 48%.[112] This allowed the Vostochniy trade port to make a net profit of 35 billion rubles (US $7 million) in 1995 compared to a profit of 27 billion rubles in 1994. The port processed 8.3 million

[110]Stanick, op. cit., p 26.

[111] *Russian Far East Update*, September 1994, p.7.

[112] Idem.

metric tons of cargo in 1995. Most of the profits were to be reinvested for port development and construction of a new dock.[113] Table 28 represents cargo turnover at major Primorskiy Kray ports.

There was no corresponding major reduction in volumes shipped from major ports of Primorskiy Kray in 1994 as compared with 1993. Vladivostok even increased its shipments. However, delays in processing cargo continue to cause problems for carriers and shippers' agents. All of the ports in the RFE are in serious need of investment for expansion and reconstruction which will facilitate the speed of processing cargos.[114]

Table 28. Cargo Turnover at Major Primorskiy Kray Trade Ports - 1993-94 (000 000 tons).

	Vladivostok			Nakhodka			Vostochnyi			Poset		
	1993	**1994**	**%**	**1993**	**1994**	**%**	**1993**	**1994**	**%**	**1993**	**1994**	**%**
Total	3.7	4.2	113.51	5.9	5.7	96.61	7.8	7.5	96.15	0.9	0.4	44.44
Exports	1.6	2.7	168.75	5.3	5.3	100.00	6.4	6.3	98.44	0.6	0.3	50.00
Imports	1.1	0.7	63.64	0.5	0.3	60.00	0.5	0.4	80.00	0.1	0.1	50.00
Domestic	1.0	0.8	80.00	0.1	0.1	100.00	0.9	0.8	88.89	0.2	0.1	25.00

Source: Computed using data derived from *Russian Far East Update*, (June 1995).

UTILIZATION OF TRANSPORTATION SYSTEMS FOR TIMBER PRODUCTS [115]

Timber Distribution in the RFE

Timber produced in the RFE is distributed to users according to the following three-stage scheme: delivery stage, removal stage and transportation stage.

1. Delivery includes hauling via temporary forest trails of whole trees with uncut branches, stems and logs from the felling area to the upper landing (distance is usually 0.5-1.2 km). At the upper landing the trees are delimbed (if necessary) and loaded on the trucks or on the flatcars if narrow-gauge railroads are available in the area.

2. The removal stage involves timber transported by surface roads or by narrow-gauge railroads, usually over distances of 100 km or even more. The timber is delivered to the logging terminal which is located near a larger transport artery. If the sawmill is located near the felling area, then removal is the final stage of the transportation process.

3. At the third stage of the transportation process timber is sorted and processed into a marketable state at the logging terminal. Then it is loaded on railroad wagons or on log vessels and transported to the purchaser/consumer via main transport lines at almost any economic distance.

Climate conditions vary widely throughout the RFE and some large areas are physically accessible only during the winter months. Often timber enterprises will store the transported timber during the winter at an upper landing until late spring or summer when the haul to the mill will be completed. In some cases, the upper landing areas are accessible only four to five months during the year, in the winter when it is possible to use frozen rivers as transportation highways.[116]

1. The main transport routes for timber in the RFE includes the Trans-Siberian Railroad, Baikal-Amur Mainline, Amur river with its main tributary the Ussuri, and several automobile roads of national significance (the most prominent are Khabarovsk-Vladivostok and the partially constructed Chita-Khabarovsk-Nakhodka).

[113] *Russian Far East Update*, July 1996, p.2.
[114] *Russian Far East Update*, September 1994, p.8
[115] Sheingauz, Karakin & Tyukalov, op. cit., p.42.
[116] Stanick, op. cit., p. 35.

International export is conducted mainly via sea routes. The relatively small number of main routes determines the volume of commercial timber transported. The several main freight transport routes include:

1. Trans-Siberian Railroad with southern ports of Primorskiy Kray (Nakhodka, Vostochniy, Poset, Zarubino, Bol'shoy Kamen', Slavyanka) and with all ground transfers via China and Korea borders;
2. Baikal-Amur Mainline (BAM) with ports Vanino and Sovetskaya Gavan';
3. Lower part of Amur river with its terminals;
4. Areas around each of the following sea-ports and terminals: Svetlaya, Plastun, Preobrazhenie, Ol'ga, Amgu, Rudnaya Pristan', De-Kastri, Mis Lazarev, Tiksi, Ust'-Kamchatsk and terminals of Sakhalin;
5. Domestic closed freight transport routes of Yakutia, Kamchatka, Magadan and Sakhalin.[117]

Table 29 illustrates the distribution of commercial timber via five main freight transport routes (defined above) in 1994. The Trans-Siberian freight route accounted for the majority of timber transport in the RFE (30.9%). Producers in Primorskiy Kray shipped 72.9% of its commercial timber via the Trans-Siberian railway. Producers in Amurskaya Oblast shipped 49.2%; producers of Khabarovskiy Kray 22.7%; and producers of Jewish Autonomous Oblast 100% using this route. The Baikal-Amur Mainline (BAM) route was the second in significance (26.7% of all commercial timber was transported via this transport route). This route was utilized primarily by producers of Khabarovskiy Kray and Amurskaya Oblast, which shipped 43.5% and 50.6% of their commercial timber volume, respectively, via the BAM. Sea ports accounted for 18.3% of the total shipped timber volume and was mainly utilized by Sakhalin producers (100% of its shipped volume), Primorskiy and Khabarovskiy Krays producers (27.1% and 12.4% respectively) and Kamchatka producers (27.8%). Domestic closed freight routes played a large role in Yakutia (100%), Sakhalin (47.9%), Kamchatka (72.2%) and Magadan (100%). Though volumes of shipped timber in Kamchatka and Magadan are negligible in comparison with volumes shipped by other sub-regions, 15.9% of all shipped commercial timber of the RFE was transported using domestic transport routes. The remaining 8.3% were shipped via the lower part of the Amur river. Only producers of Khabarovskiy Kray utilized this route.

Table 29. Distribution of Commercial Timber Produced in the RFE via Main Freight Transport Routes, 1994 (000 m^3)*

	Main Freight Transport Route					
Area	**Trans-Siberian**	**Baikal-Amur**	**Low Amur**	**Sea ports**	**Domestic**	**Total**
Yakutia	-	-	-	-	464	464
Jewish aut. obl.	21	-	-	-	-	21
Primorskiy Kray	827	-	-	308	-	1135
Khabarovskiy Kray	595	1139	560	325	-	2619
Amurskaya obl.	650	670	-	-	-	1320
Kamchatskaya obl.	-	-	-	20	52	72
Magadanskaya obl.	-	-	-	-	14	14
Sakhalinskaya obl.	-	-	-	586	538	1124
RFE	2093	1809	560	1239	1068	6769

Source: Sheingauz, A., Karakin, V. & Tyukalov, V. (1996). *This table shows the distribution channels for timber in the first stage of the distribution process.

[117] Sheingauz, Karakin & Tyukalov, op. cit., p.44.

Transport by Forest and Public Roads

The road system in the RFE is very poorly developed and is mostly concentrated in the southern sub-regions within the territories of Primorskiy Kray, Khabarovskiy Kray and Amurskaya Oblast. It is the least developed transport sub-system in comparison with railroads and water transportation. This situation has caused significant difficulties for the FIC. The first problem associated with truck transportation is the limited road network throughout the RFE. For example, there is no surface road route from the city of Komsomolsk-na-Amur to the seaport of Vanino. This port is accessible only by railroad. Many semi-developed areas, such as the ports of Mago and Nikolaevsk are also isolated from all southern areas in regard to surface road transportation.[118]

Forest roads which are of particular importance for the development of the FIC are also in poor condition. The construction of such roads should precede the logging operations. However, all enterprises now finance road construction from the funds obtained from the operations. Road-construction teams have been liquidated in most of the logging enterprises due to the lack of funds. Logging enterprises construct roads only to remove timber during the current year.

Forest harvest areas and mature stands located near previously constructed roads are mostly depleted. Until 1990 logging enterprises in the RFE constructed up to 1,000 km of automobile gravel roads annually. Now only 20-25% of this amount is being constructed. The necessity of developing the road network for the FIC is made more critical by this depletion of the developed forest resources and by the search for new routes leading more directly to the RFE seaports. New timber ports are being developed on the shore of the Sea of Japan in Primorskiy Kray. The process of redirecting timber freight routes towards these new facilities is ongoing. This has the potential for greatly reducing the transportation expenditures in the total timber cost structure. [119]

Because of the lack of railway or river transport systems in the areas surrounding seaports like De-Kastry, Svetlaya, Plastun and Olga, mills have relied exclusively on road transportation for hauling timber products. This has resulted in better development of roads as compared with inland areas.[120]

There are several projects of new road construction (forest and public) in the RFE. Among them are a projected road from Khabarovsk to Sovetskaya Gavan'; a Lidoga-Vanino road (170 km) which connects the Severniy Lespromkhoz plot with Vanino and transects Priamur'e and Sikhote-Alin' uncut forests; a Skupay-Nel'ma road which would open up million of hectares of roadless wilderness; Siziman to Vysokogorniy (140 km) which connects both Strama's Siziman operation and the Tumninskiy plot with the railroad line at Vysokogorniy.[121] When completed, these improvements will certainly help to develop the FIC in these areas. However, progress is slow due to limited capital investments. If the present situation with road construction continues, then the FIC would expect to continue to encounter major difficulties in the near term.

Water Transport [122]

There are two significant reasons for the utilization of water transportation in the RFE. One is the trade with the countries of the Pacific Rim, which potentially will consume larger volumes of Russian timber exported from the RFE. The second is connection of isolated northern sub-regions with the more southern sub-regions.

For example, Magadanskaya Oblast and Kamchatskaya Oblast depend on sea transportation for receiving and exporting cargo, because they are not otherwise accessible by railroad or road. In addition to this lack of land transportation to and from northern sub-regions, some ports are navigable for only about five months of the year because of ice.

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[118] Stanick, op. cit., pp. 34-35.
[119] Sheingauz, Karakin & Tyukalov, op. cit., p.44.
[120] Stanick, op. cit., p. 35.
[121] Sheingauz, Karakin & Tyukalov, op. cit., pp. 44,46-47.
[122] Stanick, op. cit., p.32.

Winter ice closes all rivers in the RFE region and also affects utilization of the Amur River throughout Amurskaya Oblast and Khabarovskiy Kray in the southern RFE. The river is navigable for approximately six months, from May to October. Shallowness and drought also constrains the utilization of the rivers in Yakutia and in the Northeast.[123] As for the sea, Vanino maintains the status as the most northern year-round ice-free port in the RFE, although the port needs to use ice breakers about two months in winter to clear routes. Other main ports which are negatively affected by ice include De-Kastry, which is accessible for only 6.5 months per year, Mis Lazarev, accessible for 6 months, Mago, accessible for only 5 months, and Nikolaevsk-na-Amure, accessible for 5 months.

Sea and river ports have of necessity become more important for timber transportation in the RFE, especially for timber export. New ports have emerged in the last five years and are now developing rapidly. Their importance is changing relative to each other as reflected in Table 30.[124]

Table 30. Volume and Share of Timber Shipments in the RFE by Port (including international and domestic shipments)**

Ports	Volumes shipped, 000 m^3	Share in the total regional shipment, %	
	1994	1990	1994
Vanino	1298	30.4	21.9
Nakhodka	1200	29.7	20.3
Vostochniy	880	7.3	14.9
Ports of Sakhalin	459	*	7.7
Ports of Amur	350	5.2	5.9
Svetlaya	320	0.7	5.4
Plastun	285	6.4	4.8
De-Kastri	241	10.1	4.1
Vladivostok	219	*	3.7
Ol'ga	140	1.1	2.4
Mis Lazarev	94	1.1	1.6
Sovetskaya Gavan'	87	*	1.5
Mago	82	3.9	1.4
Bol'shoi Kamen'	55	*	0.9
Rudnaya Pristan'	48	*	0.8
Tiksi	48	3	0.8
Ust'-Kamchatsk	22	*	0.4
Amgu	22	1	0.4
Pod'yapol'skogo	21	0	0.3
Poset	20	*	0.3
Zarubino	15	*	0.2
Slavyanka	10	*	0.2
Preobrazhenie	7	*	0.1
RFE	5923	100	100

* less than 0.1%.
** Includes timber harvested in both the RFE and other regions of Russia
Source: Sheingauz, A., Karakin, V. & Tyukalov, V. (1996).

However, Vanino and Nakhodka still lead in the total shipment of timber from the RFE, accounting for 42.2% of the total volume shipped. However their share has been reduced by 17.9% compared with 1990, as other ports began to account for a larger share of shipments. Following the two major ports, the secondary ports and a number of small loading terminals are scattered along the coast, specializing almost exclusively in shipping wood products. For

[123] North, R. (1990) "The Far Eastern transport system" in Rodgers, A. (ed.) *The Soviet Far East*, London and New York: Routledge, p. 197.

[124] Table 30 includes sea and river ports (ports of Amur).

example, the De-Kastry operation in Khabarovskiy Kray, has loading facilities to handle the wood products from the local Japanese/Russian joint venture, Samon.

Table 31 shows the effects of the economic crisis which began in 1989 and has contributed to the reduction in shipments of forest products from the four major seaports of the RFE. In the five years from 1989 to 1993, loaded shipments of forest products declined by 33%, from 4.75million tons to 3.19 million tons. Volumes destined for international export decreased by slightly less than 30%.

Table 31. Volumes of Timber Freight Loaded at Major RFE seaports - 1989-1993 (000 tons)[125]

Year	Total	Export	% of Total
1989	4751	4492	94.5
1990	4092	3924	95.9
1991	3128	3031	96.9
1992	2627	2554	97.2
1993	3188	3147	98.7

Source: Stanick, K. (1994).

Port facilities are presently under-utilized. For example, in 1994 total potential capacity of ports in Primorskiy Kray was utilized 44% on average and in such ports as Zarubino and Poset 15% and 7%, respectively.[126]

The share of cargo shipped by river declined sharply from 12.04% in 1990 to 6.53% in 1994 (see Table 27). There has been no increase in the exploitation of this method of transporting timber shipments although it has generally proven to be cheaper than rail for timber products ultimately destined for export to Japan. The main reason for this advantage is due to the historical intensive harvesting of timber growing near the rivers. Now, felling areas are often too far away from the river ports to justify the initial surface transportation required to move timber to the nearest river loading facility. Instead of delivering timber by railroad to a nearby river loading facility in order to transport it further to a seaport, it is now often more efficient and cheaper to transport timber by rail directly to the closest seaport. However, there are a number of small river ports which still exist. These smaller loading ports, along with the main river ports in the cities of Khabarovsk, Komsomolsk-na-Amur, Leninskoe and Blagoveschensk, are the basis of the river transportation infrastructure.

Poor infrastructure is seen as the main obstacle to increased timber exports from the RFE. Several prominent projects for port expansion and reconstruction are now being implemented. Other projects are being seriously discussed. Among them are the expansion of Vanino and Sovetskaya Gavan' ports, which would increase the capacity to export logs from the Russian Far East.

Railways and Transport [127]

Rail transportation in Russia is the main and probably the best-developed mode of transportation infrastructure. It is estimated to be the most advanced relative to western standards due to the historic importance of transport for military planning in the old Soviet system. The extensive rail transport development enabled cargo capacity to satisfy the needs of production during the production peaks in the 1980s. Since then there has been an excess capacity as production has decreased during the 1990s.

Ownership of the Russian railway system has remained under the Russian Federation with little likelihood that there will be any movement towards privatization. The two governing bodies which control the operations of the railways are the Ministry of Transportation and Communication and the Ministry of Railway.

[125] Main seaports include Vanino, Vladivostok, Nakhodka and Vostochny.
[126] Sheingauz, Karakin & Tyukalov, op. cit., p.51.
[127] Stanick, op. cit., p. 28.

Seventy to 95% of the timber volume is now transported by railroad. Therefore, increases in railway tariffs have been one of the main factors affecting the delivered log cost since the early 1990s. Transportation costs for shipments to and from the RFE have increased more than the rate of inflation, due mainly to the repeal of federal subsidies.

The structure for calculating railway tariffs has remained almost the same since 1978 and is based on the class of cargo and profitability of the cargo being shipped. Rates also take into account the expenses incurred while loading, unloading and transporting the cargo and any special privileges for goods such as medical supplies.

The Russian railway system has a fixed tariff scale for all regions of the country. This tariff scale varies according to the product, type of rail car and tonnage. These three factors result in 19 different base rates which are then indexed to a scale by distance and multiplied by an adjustment coefficient based on the current time period which results in the final tariff rate per car. Since 1990, the coefficients have been constantly changed in an effort to keep rail rates current with the rapid rates of inflation. However, there have been very few changes to the distance index and the base rate since 1964.

There were a total of 18 increases of the adjustment coefficient from January 1991 thru July 15 1994. The coefficient value changed from 1.25 to 4922 for an open car with a capacity of 44 metric tons. According to K. Stanick, real railway costs (adjusted for inflation) increased by 4920% over this same period.[128] These increases negatively affected timber flows in the RFE. The shipment of timber to the Western part of Russia and former republics of the USSR has almost ceased.

According to the Business Information Service for the Newly Independent States, the Russian rail ministry further increased freight charges by 2.5% after November 15, 1996. The rise affects all forms of freight and was made in line with government price restrictions imposed on the ministry as a natural monopoly. Loading and other services increased in cost by an additional 2.8%.[129] This increase also negatively affects the development of the FIC in the RFE.

EXPORT TRADE IN TIMBER PRODUCTS AND ITS IMPACT ON THE DEVELOPMENT OF THE FIC IN THE RFE

OVERVIEW [130]

Timber exports have traditionally accounted for 20-25% of the total wood production in the RFE and this percentage is increasing. Most timber is exported in the form of unprocessed logs (roundwood). Timber trade with South Korea is growing; however Japan and China remain as the major importers jointly buying 70% of all timber exports from the RFE. As noted, most timber is exported through a few Far Eastern ports. Chinese imports have traditionally been transported by railroad, although marine shipments are increasing. All Japanese imports are shipped by water.

Before March 1995, it was necessary to get a special exporter's permit from the federal government in order to export timber. In Khabarovskiy Kray, for example, all timber exports were conducted through 13 organizations which had this permission. Together enterprises formed an Association of Exporters, which dealt with an Association of Importers based in the purchasing country. Organizations within this association of exporters "mixed" the timber when it reached the port of destination, so it has been almost impossible to find out which individual enterprise was providing what specific species or grade of wood and to whom it was being sold. Importers simply purchase timber at the loading port. On March 25, 1995, President Yeltsin signed a decree exempting exporters from the obligation of obtaining the exporter's permit .

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[128] Ibid., p. 29.

[129] *Business Information Service for the Newly Independent States (BISNIS)*, (November 1996).

[130] Sheingauz, Karakin & Tyukalov, op. cit., pp. 47-52.

Log "mixing" has also made it more difficult to control illegal trade in protected species. Unofficial reports claim that actual log exports are much higher than the officially reported figures. Timber exporters seek to avoid taxes on timber shipments.[131] Further, enterprises usually try to show lower than actual volumes of timber exports in order to avoid hard currency control and general taxes. This is made possible by the widespread practice of trading only for cash. According to expert opinion, Russian foreign trade statistics include only about 80% of the actual volumes traded. Customs duty statistics are considered the most accurate; however this information is not currently published.

The RFE accounts for about 40% of the total Russian roundwood export volume. Profitability of timber exports (in hard currency) from the RFE has always been higher than from any other region of Russia. However, profitability is now falling because of increasing production expenditures (especially high energy and transportation cost) and keen competition between exporters. As a result Siberian timber, which is produced at enterprises utilizing relatively cheap energy, has become more competitive and is beginning to substitute for RFE timber in the export trade with other Pacific Rim countries. Table 32 summarizes the wood product export volumes for the RFE by sub-region.

Major sub-regions exporting wood products from the RFE are Khabarovskiy Kray, Primorskiy Kray and Sakhalinskaya Oblast. In Khabarovskiy Kray timber export accounts for more than 50% of the total trade by value

Table 32. Major Wood Product Exports from the RFE 1994,1995 & 1996 by Sub-region by volume

Sub-region	1994	1995	1996 (forecast)
	industrial roundwood, 000 m^3		
Jewish aut. obl.	12	5*	6
Primorskiy Kray	660	469	1200
Khabarovskiy Kray	2590	2445	2900
Amurskaya obl.	525	600*	600
Kamchatskaya obl.	20	30*	35
Sakhalinskaya obl.	586	670	600
RFE	4393	4219*	5341
	lumber, 000 m^3		
Primorskiy Kray	70	100*	120
Kamchatskaya obl.	4	5*	8
Magadanskaya obl.	3	3*	3
Sakhalinskaya obl.	33	6	50
RFE	110	114*	181
	chips, 000 tons		
Primorskiy Kray	31	30*	35
Sakhalinskaya obl.	1	-	-
RFE	32	30*	35
	pulp, 000 tons		
Khabarovskiy Kray	6.6	13.1	7
Sakhalinskaya obl.	12.2	23.4	15
RFE	18.8	36.5	22
	paper, 000 tons		
Sakhalinskaya obl.	13.8	13.7	
RFE	13.8	13.7	

* estimation
Source: Derived from Sheingauz, A., Karakin, V. & Tyukalov, V. (1996).

[131] Newell & Wilson, op. cit., p. 20.

(Table 33). However, wood products exports from Primorskiy Kray accounted for only 7% of the total exports from this sub-region in 1994. All sub-regions exhibit a rather narrow structure for wood products exports. Industrial roundwood export dominates in all sub-regions.

Table 33. Export Structure of Khabarovskiy Kray and Sakhalinskaya Oblast 1993-94 by Value

Export, US $ million	Khabarovskiy Kray		Sakhalinskaya Oblast		
	1993	1994	1991	1994	1995
Total	516	403	307	251	499
Forest products	233	218	33	60	81
Share of forest products, %	45.2	54.0	10.8	23.8	16.2

Source: Sheingauz, A., Karakin, V. & Tyukalov, V. (1996).

Sakhalinskaya Oblast has the most diversified wood product export structure, accounting for 100% of paper exports from the RFE region, 15.9% of industrial roundwood exports (1995) and 64.1% of pulp exports. It also contributes to regional lumber export. Pulp is exported from Khabarovskiy Kray as well, but in a very modest quantity (6,600 tons).

Export of industrial roundwood was estimated to increase by 26.6% in 1996 as compared with 1995, primarily due to the increased export volumes from Khabarovskiy Kray (+18.6%) and Primorskiy Kray (+155.9%). These two regions continue to be the major industrial roundwood exporters in the region, accounting for 76.8% of the total.

The share of the total output of FIC in the RFE which is exported varies considerably between the sub-regions and by product (Table 34). Amurskaya Oblast and Sakhalin were expected to export 600,000 m^3 of commercial timber each, together accounting for the remaining 22.5% of total roundwood exports. In contrast, the contribution of Northern sub-regions to RFE wood product export is negligible. Primorskiy Kray will continue to lead in lumber export, accounting for 66.3% of the total lumber export of the region, and will also likely remain the single chip exporter.

Table 34. Share of Total Production Exported by the FIC of the RFE by Sub-region and Product - 1994 (%)[132]

Areas	Industrial roundwood	Lumber	Pulp	Paper
Yakutia	0	0	0	0
Jewish aut. obl.	57	0	-	0
Chukotskiy aut. obl.	0	0	-	-
Primorskiy Kray	58	42	-	-
Khabarovskiy Kray	99	0	32	-
Amurskaya obl.	40	0	-	-
Kamchatskaya obl.	28	11	-	-
Magadanskaya obl.	0	0	0	0
Sakhalinskaya obl.	52	24	83	125
RFE	65	9	57	124

Source: Sheingauz, A., Karakin, V. & Tyukalov, V. (1996).

It is evident that industrial roundwood production in the RFE is primarily for export purposes. The urge for hard currency forces even timber producers in Kamchatka to export timber (Kamchatskaya Oblast has limited amounts of conifer forest and usually imports timber from other sub-regions). An unusually high share of exported industrial roundwood production can be explained by the inclusion of the residues of the previous years' production in the export statistics of the current year. This can also explain how paper export from Sakhalin exceeds 100%.

[132] Export can include products in inventory from the previous year in addition to current production, so the share may exceed 100%.

In the mid 1980s 15-20% of wood products produced in the RFE were exported to other regions of the USSR (Middle Asian republics, Kazakhstan, *etc*.), while 25% were exported to international markets (10-13 countries with Japan and China as major customers).The remaining volume was consumed within the RFE. Since 1994 shipments to the other regions of the former USSR have almost ceased. In 1995 approximately 50% of production was exported to international markets and 50% was consumed within the region. The structure of wood products exports from Primorskiy Kray by importer countries is presented in Table 35.

Table 35. Structure of Wood Product Exports from Primorskiy Kray by Importing Country January-September, 1995 (%)[133]

Importer	Percentage
Unprocessed wood products	
Japan	75.0
Republic of Korea	14.7
China	10.0
USA	0.2
Hong Kong	0.1
Taiwan, Singapore	less than 0.1
Processed wood products	
Japan	79.1
China	9.1
Taiwan	3.8
China	9.1
Taiwan	3.8
Malaysia	2.8
Singapore	2.3
Uzbekistan	2.2
Republic of Korea	0.5
Indonesia	0.2
Plywood	
China	100.0
Pulp	
China	53.4
Republic of Korea	46.6
Newsprint	
Vietnam	100.0

Source: Sheingauz, A., Karakin, V. & Tyukalov, V. (1996).

Table 36 illustrates the increase of the international share in total export of wood products from Khabarovskiy Kray in 1993 as compared with 1992. Especially striking is the increase in lumber exports. Lumber exports to the republics of the former USSR fell from 43.5% in 1992 to just 1.9% in 1993.

The increased number of Russian timber exporters since the cancellation of the requirement for export timber licensing permits has resulted in price decreases for Russian timber on the international market. Large intermediary firms and associations such as Dal'les, Rosexportles, Dal'exportles, and Exportles have tried to unite small exporters and to maintain the prevailing price level. Only 20% of timber is exported directly by independent exporters without

[133] Includes wood products produced in Primorskiy Kray and wood products re-exported from Primorskiy Kray.

engaging the marketing services of the large agencies. To a large extent, the smaller independent exporters engage in the export of unprocessed logs (mostly ash and oak) by trucks and railroads to China.

Table 36. Structure of Wood Products Exports from Khabarovskiy Kray 1992-93 (%)

	Industrial roundwood		Lumber	
	1992	**1993**	**1992**	**1993**
RFE subregions	10.8	12.9	12.0	10.6
Republics of former USSR	4.4	0.6	43.5	1.9
Russia, total	15.9	15.1	13.9	13.7
International	79.7	84.3	42.6	84.8
Total	100.0	100.0	100.0	100.0

Source: Sheingauz, A., Karakin, V. & Tyukalov, V. (1996).

The development of timber exports from the RFE and the recovery of its former position in Pacific Rim markets is of high priority for the enterprises of the FIC in the region. Unfortunately, chaotic timber export regulations and the consistent violations of contract terms (failure to fulfill delivery obligations, dumping prices, quality of deliveries lower than specified in contracts, *etc*.) have undermined the trust of foreign partners and the resulting position of Russian timber in major Pacific Rim markets. A brief analysis of the Japan market, which is the most important for Russian exporters, follows in the next section.

Undoubtedly, RFE timber can occupy a strong and stable position in the Pacific Rim markets. Due to its high density and fineness, which makes Russian Far East conifer timber especially valuable for construction, the resource itself is highly recognized as one of the remaining available global under-utilized sources Only timber from British Columbia and the Northern USA is widely recognized as competitive for construction uses. RFE logging enterprises presently appear to have an advantage over Canadian competitors due to lower internal costs. In the third quarter of 1995 the cost of harvesting of 1 m^3 of timber in Khabarovskiy Kray (main exporter in the RFE) was 120,000-210,000 rubles (US$27-47). At that time the FOB price was on average about 230,000 rubles (US$ 51). Price CIF on the Japanese market for RFE saw logs was US$85-90. Siberian timber (mainly pine) is also competitive with the RFE timber. Export quality Siberian timber had a wholesale price at the location of harvest of US$45 per m^3; its delivery to Vanino costs US$43per m^3.

However, in the second and third quarters of 1995, Japanese customers managed to negotiate a reduction in the price of RFE timber of about US$25-30. As a result, the profitability of exports fell. The profitability of exported conifer pulp wood was almost zero. The main obstacle in getting a profitable price is the quality of the delivered wood products. Japanese quality requirements are rather strict and the price paid is reduced as a result of any mechanical damage, miter cut, bad marketable state of supplied logs, *etc*. All these shortcomings could possibly be avoided without large investments and thus higher competitiveness could be achieved with greater concern for quality of production and proper handling and distribution of products.

On July 4, 1994, a regulation on the range of hard currency exchange rates that would be permitted in Russia was introduced in order to help national domestic producers. However, this negatively affected the profitability of export trade in wood products and even caused bankruptcies within the FIC enterprises of the region. This happened because the exchange rate of the ruble had lagged in comparison with the high inflation rate and the increasing domestic price-cost structure. This was true not only for the RFE but for Russia as a whole. According to Rosexportles, average profitability of timber export operations on May 1995 was +25.5% and on May 1 1996 +10.4%. Export of fiber board and chip board became unprofitable in 1995 and profitability of export of plywood became low.[134]

[134] Rosexportles joint stock company, unpublished materials.

THE ROLE OF JOINT VENTURES (JV) IN THE EXPORT OF WOOD PRODUCTS FROM THE RFE[135]

In 1995 the RFE accounted for 7% of the total joint ventures registered in Russia (compared with +5% in 1989). There were 108 forest products joint ventures registered in the RFE as reported for 1994. This included including 75 specialized in logging and exporting roundwood and 37 specialized in the production and export of lumber and furniture. The distribution of the registered JV's by sub-region is summarized in Table 37. Also shown is the average share of foreign capital by sub-region.

Table 37. Number of Registered Joint Ventures Specialized in Production and Export of Wood Products in the RFE, 1994

Sub-Region	Industrial Roundwood		Sawmilling and Furniture	
	Number	Share of foreign capital in the authorized capital	Number	Share of foreign capital in the authorized capital
Yakutia	8	50	2	35
Jewish aut. obl.	-	-	1	48
Primorskiy Kray	14	49	8	25
Khabarovskiy Kray	14	50	21	50
Amurskaya obl.	3	41	3	41
Kamchatskaya obl.	6	72	-	-
Sakhalinskaya obl.	30	53	2	49
RFE	75	…	37	…

Source: Sheingauz, A., Karakin, V., Tyukalov, V. (1996).

Almost 67% of joint ventures specialize in logging and production of industrial roundwood for export. The most significant contribution to international trade by sub-region was made by JV's of Primorskiy Kray, Khabarovskiy Kray and Sakhalinskaya Oblast. At the end of 1995, only 17 of the 22 JVs registered in the forest sector in Primorskiy Kray were actually operating. Among them were seven with Chinese capital and two with Singapore capital. Finland, the Philippines, Australia, Great Britain, Japan, South Korea, Hong Kong and Liechtenstein were all partners in a single JV operation of the remaining group. However, the Russian-Japanese enterprise produced 98.4% of the total production volume of all registered forestry JVs in this sub-region. A Russian-South Korean JV produced 0.7% of the total production volume, with the remaining enterprises contributing less than 1% of production. Other prominent forestry-based JVs in the RFE are mentioned below.

In 1990 the South Korean firm Hyundai and the Russian firm Primorsklesprom (including its subsidiary enterprise Terneyles, which is now an independent stock-venture) established Svetlaya Logging JV with 50% Russian capita and 50% South Korean capital. This JV had a planned full production volume of 800,000 m^3 annually. The achievement of full production level was planned for 1992. This JV was established at the time when regulations provided significant tax privileges in the first three years of operation of a JV. Equipment of foreign investors was exempt from import duty and taxes. Also, all hard currency revenues remained at the JV. However, due to changes in the regulations regarding foreign investments and local disputes regarding the rights of native people and alleged violations of the terms of the regulations governing forest use (for example, the JV did not cut dead trees in the logged area), the JV has largely been an economic failure. All tax privileges for JV's with foreign capital were canceled and new taxes were levied (value-added tax, increased profit tax, pension fund deductions, social insurance, medical insurance, local taxes).

Also, increased customs duties came into force and the production of the Svetlaya Logging JV was subjected to them. In 1991-1994 the level of the customs duty was increased three times. New methods of payment for utilization of forest resources were introduced. As a result, the Svetlaya Logging JV paid 80-90% of its profits to the local

[135] Sheingauz, Karakin & Tyukalov, op. cit., pp. 52-59.

budget whereas the original terms of the JV was to pay only 10% of total profits as a profit tax, plus an additional 20% of the Korean partner's profits when timber products were actually exported. No other taxes were considered or required at the time the JV was established. The enterprise became unprofitable because it was not possible to implement the planned profit allocation.

The Svetlaya Logging JV has logged approximately 200,000 m^3 per year near Svetlaya (only 25% of the planned volume) and has sold the unprocessed logs primarily to Japan. Sumitomo Corporation (Japan) has been the major importer. In 1995 the volume of export production was just 23,.900 m^3 of conifer saw logs and 700 m^3 of lumber.[136]

Kamchatstar is the largest timber JV in Kamchatka. Forest-Vanino and Sovgavan'les are the most prominent timber JVs in Khabarovskiy Kray. These joint ventures specialize in roundwood production. Vanino-Tairiku, Somon and Lidoga are the largest timber JVs, specializing in lumber production, in Khabarovskiy Kray.

Sovgavan'les is a Russian-American JV which was established in 1994. The enterprise has a forest resource base of 154,000 ha with growing stock of mature and over-mature forests of 8.2 million m^3. Timber lands were leased by the JV for 50 years in a mountainous area. The reported AAC is 150,000 m^3. In 1995 this JV exported 14,500 m^3 of roundwood with a total value US$892,000. In 1996 production was stopped several times due to the lack of revenue caused by the failure of customers' to pay for their purchases in a timely manner.

Somon JV (Russian Far East Forestry Corp., 80%; Nichimen Corp., 20%) is logging timber holdings near the town of De-Kastri. The JV is also milling semi-processed products for export to Japan. Nichimen, Japan's ninth largest trading company, is the main importer in terms of timber volume. Nichimen launched a mill in De-Kastri, and the RFE Forestry Corporation provides roundwood. The mill will mainly process silver fir logs into semi-processed products.

Lidoga JV (Innokent'evskiy Lespromkhoz, 51%; Itochu Corporation (Japan), 49%)[137] was set up in 1989 to produce semi-finished furniture parts, chips for export and hardwood lumber for export. Itochu set up a sawmill and furniture-making equipment in the town of Lidoga. However, the JV has effectively collapsed due to a 90% decrease in Itochu's stake, and an overall lack of finance, raw materials and energy. In 1995 Lidoga produced only 500 m^3 of lumber (20% of the 1994 volume). Itochu was reportedly unsatisfied with the quality of the furniture parts the JV produced.

Vanino-Tairiku JV (AO Severovostok Zoloto, 50%; Tairiku-Boeki, 50%) exported 78% of the production from a mill set up by Tairiku-Boeki. Exports were shipped to Japan while AO Severovostok Zoloto provides the logs for processing.[138]

Enterprises which utilize North Korean labor are the oldest and the largest "joint venture" operations in the RFE timber sector in terms of the number of employees and the volume produced. These operations produced up to 5 million m^3 (maximum) under former socialist conditions.[139] However, volume is reported to have declined to 240,000 m^3 in 1994 within Khabarovskiy Kray.[140] All capital and other means of production (except labor) are Russian, so these enterprises are not registered as a JV; however part of the production goes to North Korea which gives consideration of such enterprises as a special form of JV. The enterprises are located in Khabarovskiy Kray and Amurskaya Oblast. They frequently suffer from disagreements regarding contract terms, local social and cultural conflicts, and a persistent lack of finance.

Economic efficiency of most of the timber JVs in the Far East region has declined over time. The examples of Svetlaya Logging JV and Lidoga JV illustrate this tendency. Economic instability in the region and in Russia generally is the most important factor which has negatively impacted the development of the FIC in the region. Frequent changes in investment legislation also have a negative impact on foreign investment in the FIC of the region. It will be necessary

[136] Newell & Wilson, op. cit., p. 57.

[137] According to Sheingauz et.al, the authorized capital is 90% Russian and 10% Itochu.

[138] Ibid., p. 79.

[139] Sheingauz, Karakin & Tyukalov, op. cit., p. 53.

[140] Newell & Wilson, op. cit., p. 80.

to review and revise (strengthen) investment policy and regulations in order to attract more foreign investment to the forestry sector of the Russian Far East. Greater economic stability for JV enterprises which introduce new technology and/or develop in the depressed areas must be assured and operating regulations and fees/taxes linked to profitable production must be enforced .

Several large projects with foreign capital involvement are now being carried out or planned in the region. Among them is a US$250 million investment project between Roslesprom and the Ex-Im Bank (USA). A memorandum of mutual agreement on supporting projects in the Russian forest industry was signed in 1996. Documentation and implementation instructions based on this memorandum have been finalized. The Ex-Im Bank will provide loan guarantees to Russian timber enterprises for the purpose of purchasing US equipment and services. In return, the enterprises which receive loans must sell timber to western companies acceptable to Ex-Im Bank. The buyers will deposit "sales proceeds" directly into offshore escrow accounts.[141] Reconstruction of the stock-venture (SV) Sakhalinlesprom is expected to be financed through this project. Large shipments of chainsaws and heavy logging equipment will be imported to the region from the USA. However, international environmental organizations are concerned that this support for the forestry sector could actually help Russian enterprises to clear-cut previously inaccessible and environmentally sensitive areas, such as on steep slopes.[142]

The fourth KS Sangyo Forestry Project has been negotiated, but formal approval has stalled because Russian participants demand an increase in the percentage of value-added wood products which they can provide under the agreement. The Russian side also wants more support for improved wood processing, rather than only extractive timber harvesting machinery and related equipment (road building and transportation). The Japanese side strongly prefers credits for equipment to support the continued import of materials, primarily unprocessed logs. There also appears to be a power struggle among Russian interests involved in negotiating this agreement. It remains unclear who will be the major negotiator for the Russian side at the bargaining table. These KS forestry compensation agreements have helped create a RFE logging industry dependent on foreign equipment, but are widely perceived as hindering or discouraging the development of the domestic processing industry. It is critical to the Russian interests that future KS agreements focus on domestic processing of timber and the linked exporting potential for value-added wood products to Japan. This change in focus for the KS agreements and other similar international cooperation agreements for the forestry sector (such as the US Import-Export Bank guarantees) are seen as necessary so that the RFE can make the transition towards a sustainable forest industry.[143]

Large international ecological projects are also being carried out in the RFE. Although they can not be considered as directly related to increasing trade in forest products, these projects do potentially affect timber supply and exports by potentially leading to more sustainable and stable forestry for the commercial forest lands. However, various proposals for greater reserved forests and reducing the forest resource base which will be available for logging can also restrict future supply.

Among the environmentally-oriented projects is the Russian-American project (US$16.7 million) for "Rational Nature Use in the RFE" (EPT/RFE). This project covers Primorskiy Kray and the Southern part of Khabarovskiy Kray. The initial phase of the project is being implemented within 1994-1997.

Another project is the Gassinskoe Canadian Model Forest project (US$3.3 million) which is supported by the Green Plan for International Partnerships Fund, administered by the Canadian Department of Foreign Affairs and International Trade. There is a local concern that the model forest is potentially being used to help Canadian timber companies get a strong foothold in the RFE timber market.[144]

The largest international contribution to the overall economic development of the FIC in the RFE has been made by enterprises with Japanese capital. Due to the large need for imported timber, Japan is leading in the RFE evolution of greater international trade in wood products. Russian-Japanese JVs utilize relatively modern Japan-produced

[141] *Russian Far East Update's mid-month e-mail Advisory, (18 December, 1996).*
[142] Newell & Wilson, op. cit., p. 27.
[143] Ibid., p. 23.
[144] Ibid., p. 79.

equipment. These operations also have the most diversified regional export structure and they are the most stable in comparison with other JVs. South Korean firms compete with both Japanese and Chinese firms, and the South Korean presence in the RFE is forecast to become stronger. American investors also have become active in the region in recent years. This is largely because American companies have, for the first time, recently succeeded in getting insurance from OPIC (US government-backed insurance specializing in insuring private investments abroad). for the political risks associated with timber sector investments in the RFE.

RUSSIAN-JAPANESE TRADE IN WOOD PRODUCTS IN THE RFE

The Asian Pacific region has always been an important market for RFE wood products. Table 38 shows the total amount of forest products exported from the RFE to the Asian Pacific countries in 1954-1995. Japan and other countries are not identified specifically in this aggregated table. However, the Japanese market has always been the largest and the most important export opportunity for the RFE timber industry. This table reflects the overall export structure of the RFE forestry sector to the Asian Pacific region expressed in terms of roundwood equivalent volume.

Table 38. Cumulative Wood Products Exports from the RFE to Asian-Pacific Markets 1954-1995 by Volume

Wood products	Units of measurement	Amount	In roundwood equivalent (000,000 m^3)	Share, %
Round wood	000,000 m^3	223.0	223.0	86.2
Lumber	000,000 m^3	8.9	14.0	5.4
Chips	000,000 m^3	11.5	18.7	7.2
Pulp and paper	000 tons	650.0	2.9	1.1
Plywood	000 m^3	50.0	0.1	0.1
Total			258.7	100.0

Source: Rosexportles (Unpublished Materials)

Roundwood has totally dominated the RFE export structure. Lumber and chips have comprised only 12.6% of the total by volume. Exports of plywood and pulp and paper products have been negligible.

Table 39 presents the total Japanese import of wood products in 1995. The recent Japanese import structure differs significantly from the overall longer term RFE export structure noted above. Imports of roundwood comprised only

Table 39. Total Japanese Import of Wood Products - 1995

Wood products	Units	Volume	Roundwood Equivalent (000,000 $m^{3)}$	Share, %
Round wood	000,000 m^3	21.98	22.00	22.4
Lumber	000,000 m^3	11.72	18.50	18.9
Chips	000,000 m^3	25.00	25.00	25.6
Plywood	000,000 m^3	4.33	10.50	10.7
Pulp	000,000 tons	3.50	15.80	16.1
Paper/paper board	000,000 tons	1.10	4.60	4.7
Chip board	000,000 m^3	0.37	0.70	0.7
Fiber board	000,000 m^3	0.05	0.10	0.1
MDF (medium-density fiber board	000,000 m^3	0.37	0.70	0.7
Isolation boards	000,000 m^3	0.04	0.10	0.1
Total			98.00	100.0

Source: Rosexportles (Unpublished Materials)

22.4% of the total volume, while imported chips represents the largest share (25.6%) of the imported volumes in roundwood equivalents. Lumber, pulp and plywood also represent a considerable share in the import structure. Imports of paper and boards are rather small.

In value terms, total timber imports reached US$17.5 billion. Roundwood and lumber comprised US$9.9 billion or 56.6% of the total.

Table 40 reports the wood product volumes shipped from the RFE to Japan in 1995. Total value of exported wood products exported from the RFE to Japan in 1995 was US$799 million. This accounted for 4.6% of total Japanese imports of wood products in 1995 (total US$17.5 billion).

Table 40. Total RFE Wood Products Exports to Japan by Volume - 1995

Wood products	Units	Volume	Roundwood equivalent (000,000 $m^{3)}$	Share, %	Value, million US$
Round wood	000,000 m^3	5.413	5.413	86.0	680
Lumber	000,000 m^3	0.424	0.670	10.6	112
Chips	000,000 m^3	0.195	0.195	3.1	6
Other	000,000 m^3	-	0.022	0.3	1
Total			6.300	100.0	799

Source: Rosexportles (Unpublished Materials)

The 1995 export structure for wood products from the RFE to Japan is similar to the export structure from the RFE to other Asian Pacific countries. Roundwood exports dominated, and comprised an equal share (86%) in the export structure of wood products from the RFE to both markets. Relatively more lumber was shipped to Japan in 1995 as a share of the total wood exports than was shipped to the Asian Pacific countries in 1954-1995 (see Table 38). In contrast, the share of chips decreased from 7.2% to only 3.1% of the total exports. Exports of other wood products was negligible. Specialization of the RFE region in the export of unprocessed logs has been steady over time.

The role of Russian timber in Japanese total wood product imports in value terms is a modest 6.4% of the total. In terms of equivalent roundwood volume, Russian exports accounted for 4.6% of Japan's total imported volume. However, roundwood imports (unprocessed logs) from the RFE comprise 24.6% of the total Japanese log imports, a significant contribution. The share of lumber and chips was only 3.62% and 0.78%, respectively.

The composition of Japanese imports by country-region for 1994-1995 is presented in Table 41.

Russia considerably increased exports of wood products to Japan in 1995 in comparison with 1994 (wood products exported were produced mostly in the RFE and to a small extent in Siberia, but shipped through the RFE ports) while North American exporters (USA and Canada), the main competitors for Russian industrial roundwood, and exporters from South-East Asia and Oceania experienced reduced exports. Japan reduced its import of Canadian roundwood by 31.3% (although Canadian log exports were small), which helped to strengthen the position of Russian industrial roundwood. However, Canadian exporters managed to increase the export of lumber to the Japanese market by 7.3% due in part to the reduction of housing construction in Canada in 1995 as compared with 1994 (-28.6%).[145]

[145] Rosexportles joint stock company, unpublished materials.

The structure of Japanese wood product imports (roundwood + lumber) by grouping of supplier countries in 1995 (in terms of volume) is presented in Figures 6, 7 and 8.

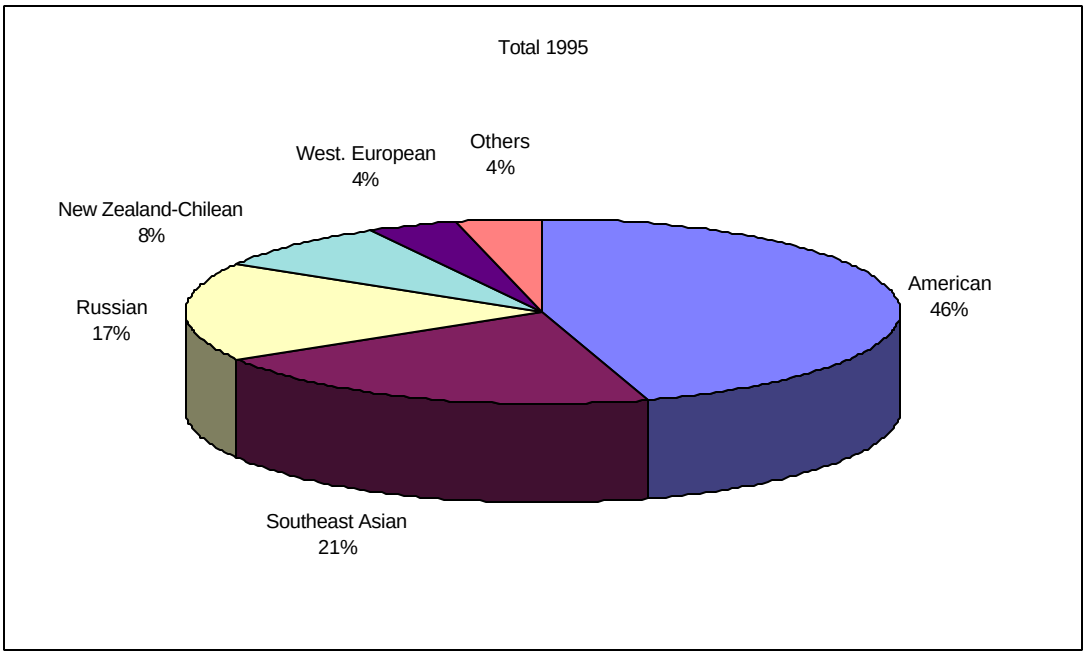

Figure 6. Japanese Wood Product Imports (roundwood + lumber) by Exporting Country Groups - Share by Volume, 1995. Source: Rosexportles (Unpublished Materials)

Table 41. Japanese Imports of Roundwood and Lumber 1994-1995 (000 m^3)

Groups of exporting countries	Total			Roundwood			Lumber		
	1994	1995	Ratio 1995/1994	1994	1995	Ratio 1995/1994	1994	1995	Ratio 1995/1994
North America (USA, Canada)	15289	15241	99.7	7654	7300	95.4	7635	7941	104.0
South-Eastern Asia	7930	7099	89.5	6769	5998	88.6	1161	1101	94.8
Russia	5157	5837	113.2	4806	5413	112.6	351	424	120.8
Oceania (New Zealand, Chile)	2559	2840	111.0	1996	1988	99.6	563	852	151.3
Western European	890	1384	155.5	298	521	174.8	592	863	145.8
Others (Africa, China, *etc*.)	1317	1298	98.6	862	760	88.2	455	538	118.2
Total	33142	33699	101.7	22385	21980	98.2	10757	11719	108.9

Source: Rosexportles (Unpublished Materials)

North American exporters led in Japanese timber markets, although the share decreased by 0.9% as compared with 1994. Japan also imported a considerable share of wood products from Southeastern Asia (21.1%), though this region's share was 2.8% less than in 1994. Russia occupied third place in supplying the Japanese market (17.3%),

increasing its share from 15.6% in 1994. Western European producers increased its share of exports to Japan (+55.5% as compared with 1994) though the total share was only 4.1%.

The total value of Japanese imports of roundwood and lumber in 1994 was US$9.5 billion, of which Russia accounted for US$0.621 billion or 6.5%. In 1995 the total value of Japanese imports of roundwood and lumber was US$9.852 billion (+3.5%), of which Russia accounted for US$0.792 billion (+27.5%), or 8.0% of the total. Russia lost profits because of the lower quality (and thus lower prices) for its roundwood and lumber products, and only a small share of value-added lumber in its export structure.

Russia was the third leading supplier (after North America and Southeast Asia) in exporting roundwood to the Japanese market (by volume). Russia increased its share of roundwood export in 1995 by 3.1% in comparison with 1994. American producers exported less in 1995 (-4.6%) than in 1994 and their market share decreased by 1%. The share of Southeast Asian exporters also decreased by 2.9%. West European exporters increased their exports by 74.8%, but that represented only 2.4% of total Japanese roundwood imports.

The total value of Japanese imports of roundwood in 1994 was US$4.985 billion, of which Russia accounted for US$542 million or 10.9%. In 1995 the total value of Japanese imports of roundwood was US$4.768 billion (-4.4%), of which Russia exported US$680 million (+25.5%) or 14.3% of the total.

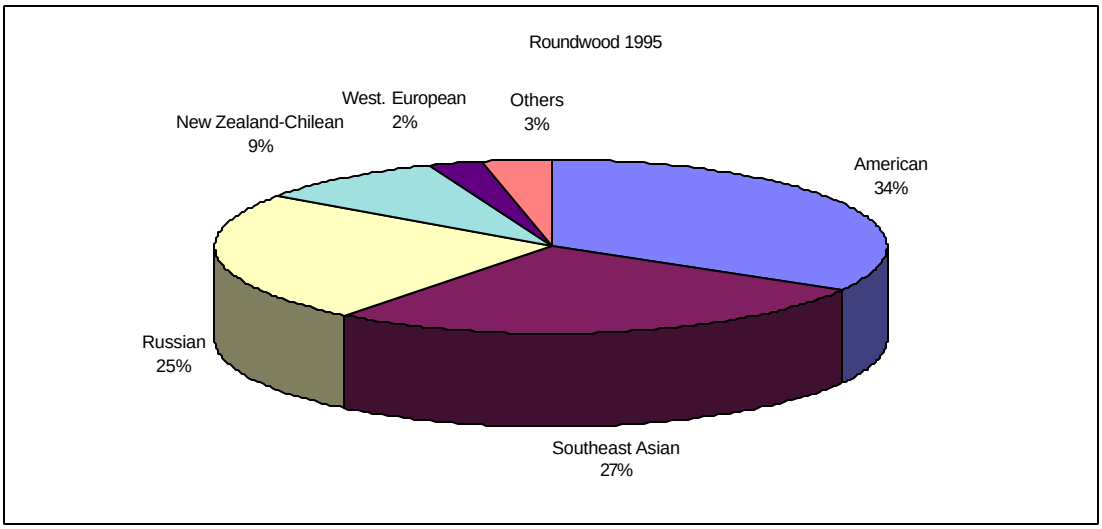

Figure 7. Share of Japanese Roundwood Imports by Exporting Country Group by Volume, 1995. *Source: Rosexportles (Unpublished Materials)*

The Russian share of Japanese lumber imports was rather modest (3.6%). North American exporters provided the majority (68%) of lumber to the Japanese market, although the share decreased as compared with 1994, when it was 71%. Russia increased its share of Japan's lumber imports in 1995 by 0.3% in comparison with 1994 when it was 3.3%. Southeast Asia exporters' share of lumber imports to Japan decreased in 1995 by 1.4%. West European and New Zealand/Chilean exporters increased their shares of Japanese lumber import by 1.9% and 2.1%, respectively.

The total value of Japanese imports of lumber in 1994 was US$4.535 billion of which Russia exported US$79 million or 1.7%. In 1995 the total value of Japanese imports of lumber was US$5.084 billion (+12.1%), of which Russia shipped US$112 million (+41.8%), or 2.2% of the total.

Table 42 shows the relative ranking of countries and groups of countries exporting roundwood and lumber to the Japanese market in 1995 and 1994.

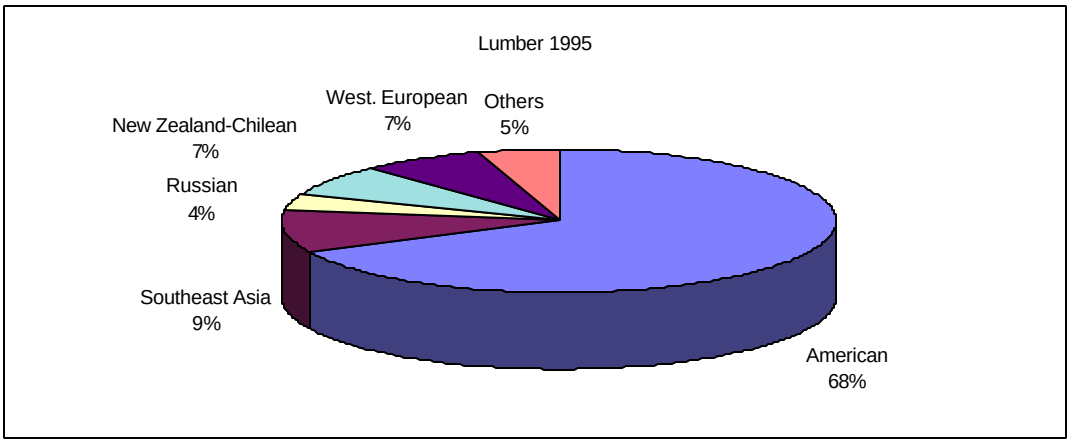

Figure 8. Share of Japanese Lumber Imports by Exporting country Group by Volume, 1995. Source: Rosexportles (Unpublished Materials)

Table 42. Ranking of Countries Exporting to the Japanese Market, 1994 and 1995 (by Volume)

	Total export place		Place in roundwood export		Place in lumber export	
Exporting Country	**1994**	**1995**	**1994**	**1995**	**1994**	**1995**
USA	1	1	1	1	2	2
Canada	2	2	8-9	9	1	1
Russia	3	3	2	2	6	7
Malaysia	4	4	3	3	3	4
New Zealand	5	5	5	4	9	8
Papua New Guinea	6	6	4	5	-	-
West Europe	7	7	8-9	7	4	3
Chili	10	8	10	10	7	5
Africa	8	9	6	6	10	10
Indonesia	9	10	-	-	5	6
China	12	11	11	11	8	9
Solomon Isles	11	12	7	8	-	-

Source: Rosexportles (Unpublished Materials)

Russia occupied third place among other exporters to the Japanese market after the USA and Canada in terms of total roundwood and lumber export volume. Russia occupied second place as a roundwood exporter after the USA. However, Russia ranked only seventh as a lumber exporter. Exported wood products were mainly produced in the RFE and with only small volumes originating in Siberia.

Table 43 presents the trend in the deliveries of Russian timber in Japan for 1985-1995. The market share of Russian timber deliveries to the Japanese market for 1985-1995 is shown in Table 44.

Total Russian export of roundwood and lumber to Japan was a maximum in 1986 (6,582,000 m^3) and then declined to 4,489,000 m^3 in 1992.

Japanese traders in Russian wood expected that the system of exporting roundwood from Russia and the quantity and quality of Russian wood products would improve with the reforms in Russia. However, this expectation has not yet been fully realized. Demand for wood in Japan has increased since 1985, with the recovery of the economy after the second oil shock. Imports have also increased. However, because of the economic and social chaos in Russia,

imports from that country decreased by almost one-third from 1986 to 1992. For example, Japanese trading companies contracted with Exportles to import 6.7 million m^3 in 1988, but Exportles was able to supply only 4.5 million m^3.[146]

Table 43. Trend in Total Russian Timber Export Volume to Japan 1985-1995 (000 m^3)

Years	Conifer saw logs	Conifer pulp wood	Other conifer	Total conifer round-wood	Deciduous	Total round-wood	Total (round-wood, lumber)
1985	4470	529	14	5013	536	5549	5703
1986	5260	470	21	5751	681	6432	6583
1987	5058	465	13	5536	578	6114	6292
1988	4577	394	25	4996	824	5820	6048
1989	3877	516	14	4407	835	5242	5504
1990	3486	517	14	4017	824	4841	5105
1991	3108	449	3	3560	743	4303	4553
1992	3329	321	8	3658	609	4267	4489
1993	4205	310	10	4525	459	4984	5259
1994	4101	381	17	4499	348	4847	5175
1995	4668	365	-	5033	380	5413	5837

Source: Rosexportles (Unpublished Materials)

By 1993 structural changes occurred in the FIC of the RFE. Enterprises began to specialize in the production of roundwood for export as it had become one of the main sources of income. At the same time, local administrations began to establish Financial-Industrial Groups (FIG) on the basis of the large joint-stock ventures. To some extent, this restored a monopoly in the timber trade as the major players in the international timber trade were identified as key participants in the FIG's.[147] This helped to organize production and export trade in wood products. As a result, in 1993 Japan's imports of Russian logs began to increase, reaching5,837,000 m^3 in 1995. However, this level is well below the volumes historically achieved (Japan imported 9.0 million m^3 in 1973).

Conifer species dominate the export structure (Table 44), fluctuating from 82.7% to 93% in 1995. Conifer saw logs comprised 86.8-92.9% of the total export of conifer roundwood, while conifer pulpwood exports comprised 6.9-12.9% of the total conifer export to Japan. Export of roundwood dominated, with 97.7-92.7% of the total volume (roundwood equivalent) of lumber and roundwood exported to Japan. Recent years have shown a modest increase in the volume of lumber exported. This is due in part to the growing recognition within the RFE of the need for a greater role of value-added products in the export structure.

Table 45 shows the composition of trade by timber species for Russian conifer timber exports to Japan, comparing the first quarters of 1995 and 1996.

Spruce and pine saw logs accounted for the majority of the total exported conifer saw logs to the Japanese market. The shares for these two species has alternated one over the other in various years. For example, in the first quarter of 1995 spruce accounted for 39.2% and pine for 36% of conifer saw log deliveries. However, in the first quarter of 1996 pine accounted for the majority of all saw log deliveries (40.2%) with spruce decreasing to 30.7%. The share of larch has also fluctuated from 24% to 28%, depending on Japanese demand. Cedar pine made up the balance of conifer species in saw log export.

Spruce dominated in pulpwood exports, accounting for 59.5%-63.6% of all conifer pulpwood Japanese exports. Larch accounted for 27-30%, while pine and cedar pine made up the balance, accounting for 6-7%

[146]Kakizawa, H. (1994). *Market Potential for Russian Forest Products in Japan.* Working Paper WP-94-94, Austria: IIASA, p.8.
[147]Sheingauz, Karakin & Tyukalov, op. cit., pp. 21-22.

Table 44. Composition of Russian Timber Exports to Japan 1985-1995 (% by Volume).

Years	Conifer saw logs	Conifer pulpwood	Other conifer	Total conifer round-wood	Deciduous	Total round-wood	Lumber	Total (round-wood, lumber)
1985	89.17	10.55	0.28	90.34	9.66	97.30	2.70	100.00
1986	91.46	8.17	0.37	89.41	10.59	97.71	2.29	100.00
1987	91.37	8.40	0.23	90.55	9.45	97.17	2.83	100.00
1988	91.61	7.89	0.50	85.84	14.16	96.23	3.77	100.00
1989	87.97	11.71	0.32	84.07	15.93	95.24	4.76	100.00
1990	86.78	12.87	0.35	82.98	17.02	94.83	5.17	100.00
1991	87.30	12.61	0.08	82.73	17.27	94.51	5.49	100.00
1992	91.01	8.78	0.22	85.73	14.27	95.05	4.95	100.00
1993	92.93	6.85	0.22	90.79	9.21	94.77	5.23	100.00
1994	91.15	8.47	0.38	92.82	7.18	93.66	6.34	100.00
1995	92.75	7.25	-	92.98	7.02	92.74	7.26	100.00

Source: Rosexportles (Unpublished Materials)

Table 45. Species Structure for Russian Conifer Exports to Japan - First Quarter 1994 v. 1995

	Ist Quarter of 1995		Ist Quarter of 1996		1996/1995
Tree Species	000 m^3	% of total	000 m^3	% of total	Ratio, %
		Saw logs			
Spruce	503.1	39.2	380.8	30.7	75.7
Larch	308.1	24.0	350.4	28.2	113.7
Pine	463.2	36.0	499.1	40.2	107.8
*Cedar pine	10.5	0.8	10.5	0.9	100.0
Total	1284.9	100.0	1240.8	100.0	96.6
		Pulpwood			
Spruce	49.0	63.6	66.6	59.5	135.9
Larch	20.8	27.0	33.4	30.0	160.6
Pine	4.7	6.0	7.9	7.0	168.1
Cedar pine	2.6	3.4	3.9	3.5	150.0
Total	77.1	100.0	111.8	100.0	145.0
		Poles and Pilings			
Larch	0.8	100.0	4.7	100.0	587.5
		Total			
Spruce	552.1	40.5	447.4	33.0	81.0
Larch	329.7	24.2	388.5	28.6	117.8
Pine	467.9	34.3	507.0	37.4	108.4
Cedar pine	13.1	1.0	14.4	1.0	109.9
Total	1362.8	100.0	1357.3	100.0	99.6

*Cedar pine (*Pinus sibirica*).

Source: Rosexportles (Unpublished Materials)

and 3.4-3.5%, respectively. Spruce, pine, and to a lesser extent, larch comprised the majority of total Russian timber exports to Japan.

Table 46 identifies the major Russian timber exporting firms engaged in trade with Japan during the period 1995 and January-April, 1996.

Table 46. Major Russian Exporting Firms Engaged in Wood Products Trade with Japan 1995 and January-April 1996 (000 m^3)

Exporting Firm	1995	1996	Ratio 1996/1995, %
		Roundwood	
Major firms			
Dal'les	630	400	63.5
Rosexportles		230	
Eksportles		100	
Subtotal	315	330	104.8
Other firms			
Dal'intorg		20	
Koopvneshtorg		-	
Dal'lesprom		90	
Terneyles		75	
Tindales		86	
Irkutslesprom		130	
Primorsklesprom		94	
Other		691	
Subtotal	990	1186	119.8
Total - roundwood	1935	1916	99
		Lumber	
Total	118	130	110.2
		Chips	
Terneyles		15-20	

Source: Rosexportles (Unpublished Materials)

Dal'les was one of the major exporters of roundwood to the Japanese market (32.6% of the total) in 1995. However, its share comprised only 20.9% of the total in early 1996, due to a sharp reduction of its exports (-36.5%). Other suppliers managed to increase their export quantities, taking advantage of weakened position of Dal'les. Japanese customers were reported to be unsatisfied with the timber quality and constant delays of Dal'les' export deliveries.

The majority of lumber was exported by the "Other" category of exporters. In combination, Dal'les, Exportles and Rosexportles exported approximately one-third of the total. In January-April 1996, chips were exported only by Terneyles.

In the same period, 75,000 m^3 of Russian roundwood were exported to South Korea, a much smaller market than Japan. Dal'les exported 30,000 m^3 of this amount. Primorsklesprom and Sakhalinlesprom were other major contributors. 25,000 m^3 of roundwood were exported to China in the same time period by exporters shown as "Other."

Table 47 presents CIF contract prices for the Japanese timber market. In 1991-1992 prices were set quarterly. However, due to the high inflation and instability it has become standard procedure to determine contract prices every month. Prices fluctuate during the year, depending on many different factors (changes in supply and demand, behavior of competitors, *etc*.). Also seasonal weather affects log production, and partially determines log deliveries and the quantity available for export. In 1960-1980 prices were at a maximum in December-March. However, in 1991-1995 there were no maximum prices in those months.

Table 47. Average Contract Prices for Conifer Saw Log Exports to Japan 1991-1995* ($/CM CIF)

Period of price setting	1991	1992	1993	1994	1995	Average price 1991-95
January			108.40	106.00	132.50	112.35
February	99.45	117.65	110.40	111.20	134.15	113.80
March			133.90	115.80	136.80	118.80
April			144.80	116.70	138.80	117.90
May	99.15	109.10	141.30	116.30	134.60	120.10
June			135.10	116.30	126.40	117.20
July			122.35	116.30	120.50	112.60
August	98.75	105.20	105.50	121.70	118.45	109.90
September			104.90	127.80	105.75	108.35
October			103.70	127.80	105.10	111.00
November	107.70	110.55	103.70	129.60	105.10	111.35
December			104.40	129.60	108.00	112.05
Annual average	101.25	110.60	118.15	119.60	122.20	113.80

* Dal'les; shipped from Vanino; CIF; $/ m^3; short standard; d=22-30 cm; I-II-III sort - 1991-1992; I-II sort - 1993-1995; spruce 55%; larch - 40%; pine - 5%.

Source: Rosexportles (Unpublished Materials)

Average nominal contract prices of conifer wood products imported by Japan from Russia were much lower compared to the prices for similar products imported from Canada and the USA (Table 48).

Table 48. Average Japan CIF Contract Prices for Conifer Wood Products Imported from the USA, Canada and Russia 1994-1995 (US$/$m^3$)

	Round wood			Lumber		
Year	USA	Canada	Russia	USA	Canada	Russia
1994	288.40	288.50	114.10	419.75	373.55	224.50
1995	311.15	303.60	120.35	407.65	378.15	264.15
1995/1994	107.90	105.20	105.50	97.10	101.20	117.70

Source: Rosexportles (Unpublished Materials)

Prices reported by Rosexportles for USA wood products were consistently higher than Russian prices. Russia exporters received only about 9.6% of the USA price for the same kind of roundwood and 53.5-64.8% of the USA price for the same kind of lumber.

Table 49 presents similar patterns for the deciduous timber imported by Japan in 1995.

In 1995 Japan imported 90,000 m^3 of deciduous timber from the USA, 380,000 m^3 from Russia and 70,000 m^3 from China. From data presented in Table 49 it is clear that the rate of price reduction from month to month for Russian deciduous roundwood in some periods (February, July-December) was larger than the rate of price reduction for Chinese and American deciduous roundwood. The average price for Russian deciduous roundwood was only 16.2% of the USA price and 19.4% of the price for Chinese roundwood.

The position of Russian wood products in the Japanese market can only be expected to strengthen when significant improvement in the quality of products supplied is achieved and there is better pricing information available to Russian exporters.

Table 49. Average Japanese Prices for Deciduous Roundwood Imported from the USA, Russia and China - 1995 ($US/CM)

	Average prices for deciduous timber						
	From USA		From Russia		From China		
Month	US$/m^3	%	US$/m^3	%	%	US$/m^3	%
January	749.90	100.00	147.80	100.00	100.00	667.80	100.00
February	869.45	115.90	142.75	96.60	96.60	722.10	108.10
March	630.00	84.00	153.20	103.70	103.70	687.00	102.90
April	978.75	130.50	146.50	99.10	99.10	528.45	79.10
May	692.15	92.20	163.60	110.70	110.70	570.30	85.40
June	798.40	106.50	138.45	93.70	93.70	562.15	84.20
July	836.80	111.60	124.90	84.50	84.50	648.75	97.10
August	603.20	80.40	101.00	68.30	68.30	633.45	94.90
September	850.65	113.40	106.20	71.90	71.90	1229.15	184.10
October	700.75	93.40	100.25	67.80	67.80	475.00	71.10
November	857.35	114.30	103.25	70.00	70.00	643.35	96.30
December	946.00	126.20	117.75	79.70	79.70	584.95	87.60
Annual average	792.80		128.80			662.70	

Source: Rosexportles (Unpublished Materials)

SUMMARY: NEAR-TERM OUTLOOK ON DEVELOPMENT OF THE FOREST INDUSTRY COMPLEX IN THE RUSSIAN FAR EAST.

The Russian forest sector has faced significant change over the 1990-1996 period due to significant economic and political reforms and the consequent disruption of past forms of operation. The transition from a central, planned economy to a market economy has been very painful for the country as a whole, and equally so for the forest sector. Declines in forest sector performance became evident in 1990, increased after 1991, and have continued largely unabated into early 1996. Disruptions within the forest products sector have affected both industrial production and export trade. In 1994 harvest volumes were approximately 29.4% of the pre-reform 1988 volumes. Production of lumber was 16.4% of the 1988 level; pulp, 7.7%; paper, 5.3%; fiberboard, 25%; and particleboard, 25.6%.[148] The share of the FIC in the total industrial production of the region declined from 10% in the 1980s to only 4.6% in 1994.

Important structural changes have also occurred in the FIC of the region. The FIC has become more specialized in roundwood production for export, since that has become almost the only source of reliable income for the enterprises of the FIC. Production of value-added products, with their higher costs of production, has almost ceased. Prior to 1992, roundwood production accounted for 40.3% of the total FIC wood products production volume. Within the FIC, production of the wood-processing industries accounted for 41.3% of the total, the pulp and paper industry 16%, and wood chemistry 2.4%. In 1994-1995 roundwood production accounted for fully 75-80% of the total FIC production volume.[149]

Rapid increases in transportation costs gave advantage to the enterprises of the FIC which are located near established transportation routes (railroads, ports). They were able to concentrate on roundwood production for export and thereby regained profitability. Enterprises located in remote areas of the RFE are now on the verge of bankruptcy. In 1994 the proportion of unprofitable enterprises in the RFE was estimated as 25%.[150] In 1993 it was estimated that 60% of the logging and wood-processing enterprises in Amurskaya Oblast faced bankruptcy.[151] The

[148] "Spravka o rabote lesopromishlennogo kompleksa Dal'nevostochnogo regiona," op. cit., p. 5.
[149] Sheingauz, Karakin & Tyukalov, op. cit., p. 32.
[150] Ibid., p. 36.
[151] Rakitskiy, O. (1995) "Russia-forestry and wood-processing equipment," market research reports ISA9504, Vladivostok, document from market database, p.3.

situation was even worse in the northern sub-regions where low forest density, harsh climate and poor infrastructure contributed to the difficulties of the transitional period. In Yakutia only furniture production was profitable in 1995.

Major changes have also occurred in the export of wood products from the RFE. In the mid-1980s, 15-20% of wood products produced in the RFE were exported to other regions of the USSR; 25% were exported to international markets and the rest were consumed within the RFE. Since 1994, shipments to other regions of the former USSR have almost ceased. In 1995, approximately 50% of production was exported to international markets and 50% was consumed within the region.[152]

Most timber exports were in the form of unprocessed logs. Japan and China have bought 70% of all timber exports from the RFE, but trade with South Korea is growing.[153] Southern sub-regions have dominated the export trade in wood products. The contribution of northern sub-regions has been negligible. Profitability of exporting timber from the RFE has fallen due to increasing production expenditures, keen competition among major exporters, and tighter regulation of the range for foreign currency exchange rates. Nevertheless, the volumes of wood products exports are expected to increase modestly in the near future as the economy slowly stabilizes and enterprises of the FIC begin to modernize and improve quality at standards more closely tied to international market requirements.[154]

These observable results of the performance of the FIC of the RFE in recent years reflect the status and stability of the overall economic environment prevailing in the post-reform era. The changing dynamics of the FIC have occurred in response to the combined impact of major factors which can be grouped into three broad categories:

I. National and regional macro-economic factors;

II. Factors related to land base, forest resources and environment;

III. Factors related to forest industrial production and markets.

Group I (macro-economic factors) factors are largely outside the direct control of the FIC. However, they largely shape the economic environment for the forest industry in the RFE and determine key policies for industrial development and restructuring under political and economic reforms. This group of factors includes the major determinants of macro-economic development of the RFE region, tax policy, foreign investments, exchange rate, and transportation infrastructure.[155]

Group II (factors dealing with land base and forest resources of the region) remains much more stable than either Group I or Group III at this time. Neither the overall forest land base nor the accessibility of forest resources for industrial operations (Group III forests) has changed significantly since 1989. Economic utilization of the resources, as well as the introduction of sustainable forest management and other land use changes, will potentially become more critical in the future. This group includes the following major factors: land use policy, forest land classification, forest resource inventory and economic accessibility, forest management and productivity, and forest-related environmental regulations.

Group III (factors related to forest industrial production and markets) depends upon a stable economic environment (Group I) and industrial restructuring (including significant capital investment) as well as upon the emerging situation with respect to the forest resources (Group II). The switch to a market economy dictates the need to manage enterprises on the basis of profitability and to adjust to the loss of old assured markets. This group of factors includes the following major determinants: international trade, domestic trade, trade and forest policy regulations, managerial ability, technology, and transportation costs.

These factors are all very important for the future development of FIC of the Far East region. All factors are interrelated with the others within their group as well as factors included in the other groups. The allocation of

[152] Sheingauz, Karakin & Tyukalov, op. cit., p. 42.
[153] Newell & Wilson, op. cit., p. 20.
[154] Backman, C. A. and T.R Waggener, "Forestry in Transition: Outlook for Production and Trade in Eastern Russia to 2000," CINTRAFOR Working Paper 62, May 1997.
[155] The list is not complete. Only the most important determinants are included here, due to the limited scope of the study.

factors to groups simply aids in conceptual understanding of the complexity of factors impacting the forest products sector and the nature of potential effects on development of the FIC in the near term.

For example, the introduction of a new technology (Group III) greatly depends upon investment (Group I). Also, it can often be observed that cumulative sector development is produced by a combination of factors from different groups. Logical and structured consideration of grouped factors and their collective interactions is of concern here, in order to comprehend their relative importance to the near-term development of the FIC.

Overall progress in economic development of the RFE and its sub-regions will largely determine the environment for the performance of the FIC. Under socialist conditions, the economic development of the region played only a moderate and largely indirect role in the development of FIC. If the party and the government considered the development of a particular region or industry to be of high priority (usually because of its greater role in national defense), then that region or industry received greater centrally- allocated capital investment and governmental benefits at the expense of other regions and industries. This support allowed the government to target any chosen sector to be developed at a faster rate. Capital investments were pursued by taking capital away from the profitable enterprises and reallocating it to the priority regions and industries which had been selected to be developed or subsidized. This consistent practice contributed to the lack of incentive for profitable enterprises to work efficiently, which resulted in tremendous structural inefficiency (Table 50) and ultimately the collapse of the centrally planned economy.

Table 50. Average Annual Indices of the Performance of the Russian Economy

	Increment, %		
	1976-1980	**1981-1985**	**1986-1990**
Gross National Product	7	3.7	2.4
National Income	4.3	3.2	1.3
Main production assets	7.4	6.4	4.8
Industrial production	4.4	3.6	2.5
Capital investments	3.7	3.7	6.1

Source: *Narodnoe Khozyastvo SSSR v 1990 godu* (1991).

The RFE was previously considered to be an important provider of raw materials for the western part of Russia. Also the RFE region had a large military significance due to its closeness to China, the Pacific Rim countries and the USA. The development of RFE raw materials extraction industries (including logging) and the defense sectors were therefore considered to be a very high national Russian (USSR) priority. The region received substantial privileges, including budget subsidies and special prices for RFE products. Social infrastructure costs were built into weapons prices. Money was allocated to complete the construction of the Baikal-Amur Mainline railroad and to insure higher salaries for most RFE workers. At the same time, little money was reinvested in processing capabilities, because it was not considered necessary at that time to improve either economic or technological performance and efficiency.

The period from 1981 to 1987 saw the economy of the region increasingly focused on the extraction of raw materials. State concerns regarding the specialized sectors involved in the extraction of raw materials gradually grew as production rates fell even prior to the large scale implementation of political and economic reforms. As production rates decreased, production efficiency fell, and state investments became less profitable, a high rate of regional economic growth based on the extensive development of new natural resources could no longer be supported.

The initial concepts for a shift in the RFE's development strategy appeared during the mid-1980s. The central theme was the formation of an economic complex in the RFE that would depend for its development not only on state investments but on its own internally-generated financial resources as well. The key goals became modernization of the primary sectors of the economy and the creation of new manufacturing enterprises that could effectively supplement the extraction of raw materials. The development of the manufacturing sector with a view toward

increasing the share of value-added products was considered essential. Unfortunately, this program was implemented for only two years, so the strategy resulted in only minor changes in the specialized sectors.[156]

In the transition period (1991-1993) and in the post-reform period when state subsidies to the regional economy ceased, relative economic development of the RFE territories became of greater significance. The more developed southern sub-regions held an advantage over the less developed northern sub-regions and thereby attracted more investment. Also, enterprises located near railroads or in proximity to the sea and river ports became more competitive under the newly emerging policies and economic conditions. Population began to migrate from the depressed areas, and the distortions and unevenness of economic development between the sub-regions of the RFE became even more pronounced.

Under socialist conditions, consideration of national defense and national benefits could result in significant investments in less-developed areas and within selected industries despite improbable economic considerations. However, in the transitional period only immediate returns on investments were considered. Short-term gains soon outweighed any long-term strategic benefits. This reinforced the position of the natural resources extraction sectors of the economy, including logging in the FIC, which became more oriented toward direct export trade. The development of secondary value-added processing industries within the FIC ceased or was severely impeded as processing became less and less profitable.

This situation is unlikely to change in the near-term future, despite a broad understanding of the potential long-term benefits of domestic processing and subsequent exporting of a larger share of value-added products. Presently, the majority of value-added products are of low quality and are largely non-competitive in the international markets which are considered to be the major customers for the RFE forest products.

This factor emphasizes the great role of new technology and new processing techniques under the emerging market economy conditions. “Technology” was included in Group III (factors related to forest industrial production and markets), but it is closely related to the broader economic development status of the RFE region, the political and financial environment, and factors such as international trade policy, foreign investment regulations and risk, environmental requirements, forest resources allocation and the accessibility of forest resources.

Under prior socialist conditions the majority of goods produced by the FIC of the RFE were consumed within the former USSR. Only about 25% were exported.[157] The quality requirements in the domestic market were not as limiting as in the current international markets. Quality standards could be more easily satisfied with the existing level of technology, although the introduction of new methods was encouraged. Logging was conducted in such a manner that there was a large amount of waste (an amount equal to approximately one-half of the volume of harvested timber was left at the cutting site, and scraps from logging and timber processing were almost entirely unused). [158] However, only the availability of accessible, cheap forest resources allowed this practice to continue. Modernization of technology and rationalization of production played only a moderate role in the FIC at that time.

Demand for forestry and wood-processing equipment under socialist conditions was satisfied by domestic machine-building, which was also heavily concentrated and specialized. For this reason, only factories within the former USSR’s integrated technological chain could produce the required types of equipment. After the collapse of the USSR and the socialist bloc, the factories that manufactured wood-cutting equipment were suddenly located outside the borders of the new Russian Federation. The unified industry structurally created under the former USSR was suddenly torn apart.[159] This caused severe difficulties in modernization and the replacement of equipment in the forestry industry, especially under the new market conditions, when most of the cheap and accessible timber resources were already depleted and it became necessary to obtain better equipment to exploit previously

[156]Minakir, P. (1995) “The Russian Far East: From a Colonial to a Borderland Economy” in Kotkin, S., Wolff, D. (eds), *Rediscovering Russia in Asia Siberia and the Russian Far East*, New York, London, England: M.E. Sharpe Inc., Armonk, pp. 173-174.
[157] Sheingauz, Karakin & Tyukalov, op. cit., p. 42.
[158]Barr, B. (1990) “Forest and fishing industries,” in Rodgers, A. (ed.) *The Soviet Far East*, London and New York: Routledge, p. 121.
[159]Rakitskiy, op. cit., p.2.

inaccessible timber stands economically. Also as noted, improvement of the quality of the exported wood products (especially value-added products) to achieve international competitiveness became of vital necessity.

The role of technology has increased under the new, and still evolving, economic conditions. However, industries of FIC are still plagued with a serious lack of available funding for both current operations and for long-term capital investments. Only enterprises with foreign capital can now afford to upgrade their production capacities. Most foreign companies now responding to opportunities in Russia's timber industry are trying to improve the technological efficiency of existing operations by the introduction of western technology and management style. This is oriented towards the use of expensive imported equipment. However, the problems of employee training to use the technology effectively, and even convincing the Russian partners of the usefulness of proposed changes may become the foreign partner's biggest hurdle.[160] Difficulties and delays in obtaining expensive parts necessary to maintain and repair the imported equipment also impede the progress in the introduction of imported equipment in the FIC of the RFE.

Because of the above-described factors, many enterprises of the RFE have very obsolete and ecologically damaging equipment that has not been replaced for many years. Modernization in the forest industry is not a broad process, but rather is being carried out in separate enterprises and funded by foreign capital investments. Technology continues to play only a moderate role in the effort to develop the FIC in the RFE due to the lack of the necessary funding for the introduction of new technology and upgrading the existing equipment. Efforts have generally focused on the improvement of existing facilities and capacity. Comprehensive utilization of delivered wood is difficult for the relatively small and scattered enterprises and waste is high. Vertically integrated and comprehensive utilization of wood and fiber remains an elusive goal under present conditions.

However, there is some noted progress in the sector. Roslesprom has now finalized documentation with the US Export-Import Bank for obtaining sector loan guarantees[161] of $2.5-3 billion to modernize Russian timber yards and mills. In the meantime, Roslesprom is also working to obtain a loan of $500 million, 85% of which is to be spent on the purchase of US equipment. The agreement was to take effect in 1996. The Russian Timber Investment Corporation already has a set of 24 investment programs representing a potential total of $800 million to modernize Russian timber yards and mills. Some of these programs will be carried out in the RFE. For example, Sakhalinlesprom will get a share of the investment to modernize its production capacities. Roslesprom has also signed a memorandum with a consortium of Japanese companies to secure a core agreement to invest $350 million in timber operations in the RFE.[162]

The development of transportation infrastructure has also become one of the major deterrents affecting the FIC in the RFE. This factor, included in Group I (macro-economic factors), is also closely connected to such factors as foreign investment, international trade and broad economic development of the region. Greatly improved transportation infrastructure can be considered an essential part of the latter. However, consideration of transport as a separate factor for forestry operations is justified due of its great importance for the development of FIC of the region.

Proximity to transportation routes has become one of the main factors determining allocation of investments under the new market-based conditions. Enterprises located near roads or ports have became more competitive and have attracted more investment. In large measure, this is the direct result of increased transportation costs which have become one of the major expenditure items.[163] Russian logging enterprises have reduced the amount of road construction due to the lack of funds at their disposal.

Under socialist conditions, RFE railway traffic was heavily subsidized. Railroad tariffs had barely changed since 1967 and special discounts were applicable for moving freight to and from the RFE. Under the new economic conditions this situation has changed rapidly.[164] From January 1991 to July 15, 1994, there were a total of 18 increases in railway

[160] Stanick, op. cit., pp. 41-42.
[161] *Russian Far East Update's mid-month e-mail Advisory, (18 December, 1996).*
[162] Rakitskiy, op. cit., p. 5.
[163] Transportation cost is included in Group III (factors related to forest industrial production and markets)
[164] North, R. (1990) "The Far Eastern transport system" in Rodgers, A. (ed.) *The Soviet Far East,* London and New York: Routledge, p. 193.

tariffs. During the first five months of 1994, tariffs for shipping logs in the RFE by railroad increased on average by 25% per month. Currently the tariffs are expected to change regularly every quarter--if the rate of inflation slows enough to justify changes only four times per year.[165] This creates a situation where many logging enterprises are in control of large timber reserves but with little economic ability to bring either harvested timber or forest products to market.

The current orientation of the FIC of the RFE toward greater export trade with Pacific Rim countries has contributed to the rapid development of port facilities. Logging for export appears to be increasing in the sub-regions along the Pacific coast. The ports of Ol'ga, Plastun, Svetlaya and Amgu have begun to play a greater role in timber exports. It is easier for timber companies to "control" the smaller ports such as Ol'ga or Plastun than the larger ports in Nakhodka and Vladivostok. Also, timber exporters have been working on the conversion of former military ports at Bol'shoy Kamen' and Sovetskaya Gavan' to timber ports.[166]

Faced with a lack of accessible timber, inland logging and trading companies (usually with foreign capital involvement) are increasingly willing to invest in constructing new roads and in expanding port facilities. Also the necessity to find new short routes to sea and river ports (because of the increased railroad tariffs) has contributed to road construction within the region, also funded through the participation of foreign capital. This will eventually help to facilitate the development of previously inaccessible and intact forests at a much faster rate.

Transport infrastructure in the RFE will be developed, perhaps slowly, in the near term, primarily to the extent it can be justified by profits from greater exports of raw materials (including timber). Foreign investors (now the major source of capital investment in the region) are largely willing to invest primarily in raw material extraction industries in order to obtain a greater share of profits by subsequently selling products processed by themselves outside of Russia or from direct sales to third-country markets. Russian enterprises simply do not have funds of their own to develop any long-term infrastructure projects.

The "international trade" factor, which is included in Group III (factors related to forest industrial production and markets) has become of great significance for the development of the FIC of the region. Under new conditions, the most reliable customers who can pay quickly for purchases of timber or wood products are almost exclusively located outside the former Soviet Union, with Japan as a preferred customer. Old assured markets within the former Soviet Union were lost due to increased transportation cost and the crisis of mutual non-payments (when customers can not pay for the purchased goods because they can not get payment for their own production from their customers).

Under former socialist conditions, export quantities were calculated as a residue after the satisfaction of domestic demands (or administratively determined requirements) for timber had been achieved. Now, even the shrinking domestic market demand is not fully satisfied because timber trading companies prefer to sell goods to more reliable foreign partners who can pay in hard currency. According to Oleg Rakitskiy, the deficit of saw timber for domestic consumption is estimated at more than 100 million m^3 annually. This shortage is especially damaging for the construction industry and railroad transportation.[167]

The significance of domestic markets for forest products fell, while export trade has almost recovered to its former historical (pre-reform) levels. The Japan market has always been the most important for the RFE producers (80-85% of timber export from the RFE).[168] Figures 9 and 10 present Russian logs and lumber imported by Japan from 1954 to 1995.

It is clear from Figure 9 that Japan log imports from Russia increased each year from 1991 to 1995 (to 5,413,000 m^3 in 1995). However, this volume is still considerably below the historical levels (maximum of 9,015,000 m^3 in 1973).

[165] Stanick, op. cit., p. 30.
[166] Newell & Wilson, op. cit., p. 57.
[167] Rakitskiy, op. cit., p. 4.
[168] Sheingauz, Karakin & Tyukalov, op. cit., p.42.

Lumber exports from Russia have constantly increased due to the efforts on the Russian side to improve the timber export structure by increasing the share of value-added goods. Russia has tried to insure this by including special terms in compensation treaties with the Japanese. In the near future the export of Russian logs to Japan is forecast to increase again to around 6 million m^3.

The development of the FIC of the RFE is now highly dependent on expanding export trade, primarily for unprocessed logs. However, it may be impossible to develop the FIC of the region based only on international demand. Even in the year of maximum production (1986) the RFE exported only 8.2 million m^3 of roundwood, 0.5 million m^3 of lumber and 0.7 million m^3 of chips. This was approximately

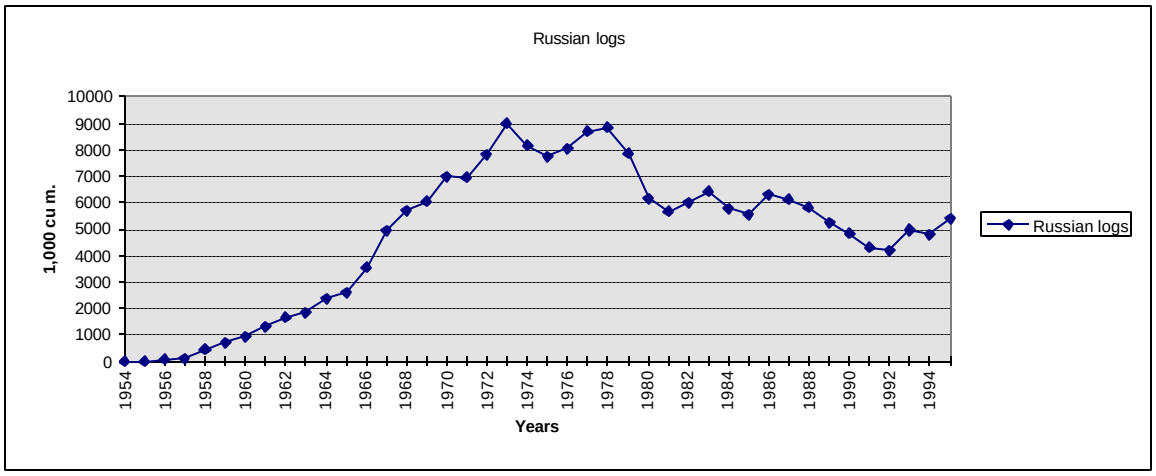

Figure 9. Russian Logs Imported by Japan 1954-1995 Source: Kakizawa, H. (1994).

10 million m^3 in roundwood equivalent. It will take several more years to achieve even this level of export under current and near-term economic conditions. However, such a level of export volume would mean an increase in current production volume of approximately 50%.

International demand for Russian wood products is primarily for unprocessed logs, small amounts of chips and comparatively small volumes of rough-cut lumber. This structure will not likely change significantly in the near future. Japan has resisted Russian proposals to supply more value-added products in exchange for Japanese machinery. This situation almost stalled the fourth KS Sangyo project. Other countries are also primarily interested in obtaining unprocessed materials as well. The domestic Russian timber market (outside the RFE) has been pretty much lost to the RFE timber industry complex.

The volumes of various wood products (in roundwood equivalent) formerly consumed within the RFE (mid-1980s) was approximately 20 million m^3 annually at its maximum. The consumption structure was also more diverse, with a broader mix of wood products consumed.

The recovery of the FIC of the RFE will over time require that the sector be oriented to both international and domestic markets through policies which are closely connected to the stabilizing of the economy of the entire region (and Russia as a whole). [169]

[169] Ibid., p.59.

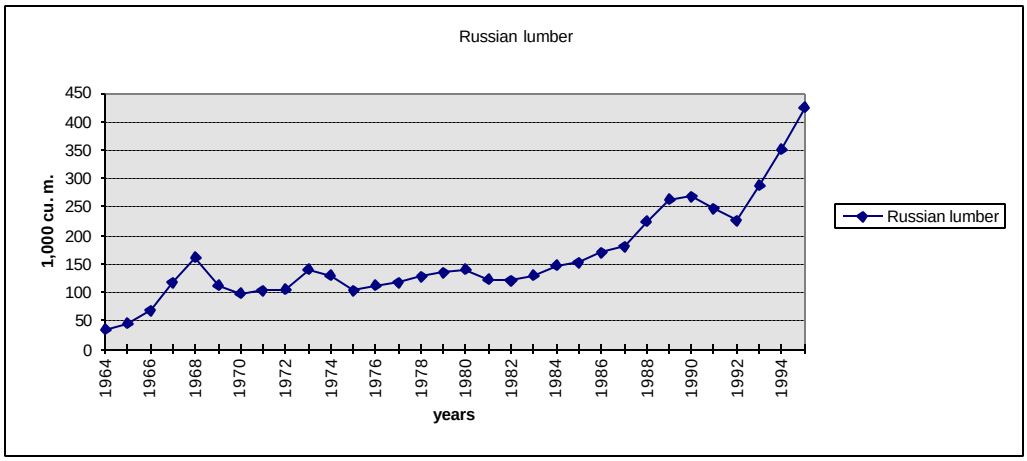

Figure 10. Russian Lumber Imported by Japan 1964-1995 Source: Kakizawa, H. (1994).

Both trade and forest policy regulations play a large role in the development of FIC in the RFE. They are included in Group III (factors related to forest industrial production and markets) and essentially affect all of the other factors.

Frequent changes in basic economic legislation have resulted in a highly unstable investment climate. The example of Hyundai Logging Joint Venture, which ended up paying 90% of profits to the local government in the form of various taxes (instead of the planned 10%) is quite revealing of the difficulties and complexities confronting the FIC. No one knows with any certainty what regulation, tax or fee will come next and how it will effect timber production and trade. Policies and regulations constitute the framework within which all the other factors affecting the development of the FIC in the RFE perform.

The introduction of a controlled hard currency exchange rate as well as cancellation of the tax privileges of joint ventures with foreign capital involvement were imposed in the form of special regulations. These changes have also negatively affected the profitability of timber exports. Numerous taxes also reduce the potential profitability of primary and secondary production as well as exports from the FIC.

The tax burden on Russia's forest industry is considered to be one of the greatest obstacles to restoring production and profitability. Different types of taxes which affect the FIC include federal, territorial, and municipal taxes, as well as miscellaneous taxes and fees such as registration fees, fines and duties, mandatory currency exchanges, and one-time goal-oriented taxes. Tax legislation is presently poorly documented and complex. Follow-up documents with detailed instructions and interpretations of tax legislation are rarely provided to the outlying regions. Variable enforcement of tax regulations also contributes to a high degree of uncertainty.

In early 1994, the four most important of the eighteen effective taxes faced by the FIC were:

1. **Enterprise profit tax**, levied at the beginning of each quarter and based on estimation of gross profits for the coming quarter. Currently, this tax is 13% (federal) plus up to 22% (territorial). In addition profits upon distribution to shareholders or principals are subject to 15% tax.
2. **The value-added tax** (VAT), the major tax at the federal level, is 23% via levies on fuel, spare parts, and equipment.
3. **The timber conservation tax**, was originally set at the territorial level at 7%. In 1991 a federal tax of 20% was substituted. That was lowered to 5% after aggressive lobbying by the timber industry. The tax was revoked in April 1995.
4. **Payroll taxes**, the most common group of payments, also include assessments for social and medical insurance, unemployment and pension reserves and amount to 40% of payroll costs.

Other taxes include:

Territorial taxes include stumpage fees established by species; an additional 23% VAT levied on stumpage; a timber lease fee based on the primary species and the duration of the lease (the average is 40% of the stumpage requested rather than actual harvest on an annual basis); and a land usage tax of 5% of the stumpage requested on an annual basis.

Municipal taxes. Local authorities have the power to assess taxes of up to 3% of an enterprise's gross revenues for such purposes as education, police, housing maintenance, sanitation, business licensing, highways, lottery, computer transfer, transportation, *etc*. According to local managers, the 3% limitation is not always observed.

Miscellaneous taxes. This category of taxes in some cases accounts for a major portion of the total tax liability of enterprises. In many cases it is cheaper for the enterprises to pay the fines for logging and environmental violations rather than investing in compliance measures. In 1993 such fines exceeded total stumpage payments by 1,000% in Khabarovskiy sub-region. Exporters of wood products should register their contracts with the local branch of the Ministry of Foreign Economic Relations and with Roslesprom. A fee of 1.5% is collected on the total sales contract, to support science and research in the industry. In practice, these fees are often higher, and hidden as consulting fees or service charges. Export duties on roundwood shipments and import duties range widely according to the product and the local authorities' inclinations, a situation that makes business difficult.[170]

Interpretations of the tax laws can also differ significantly and much of the law is still incomplete. This creates a climate for inconsistency and even potential bribery. Unfortunately, this situation is unlikely to change in the near future. As before, enterprises of the FIC must try to survive given the changing economic circumstances while facing a great deal of operating uncertainty.

Group II factors, which include such issues as the scope of the forest resources and their accessibility for timber production, potential land use changes, future forest management and productivity as well as changing environmental regulations impacting timber harvests and the AAC, will continue to play a moderate role in the future development of FIC.

The forest land base and classifications did not change much in the RFE over the period of 1988-1994. Changes in total Forest Fund lands in the RFE from 1988 to 1994 were minor as were changes in the share of forested lands by group within the Forest Fund (see Table 6) and the change in total forested lands. The percent utilization of the AAC in the RFE has continued to be rather low (19.6% in 1993 and 14% in 1994). The main constraints in developing new forest plots is not the lack of sufficient Group III forests or timber reserves, but rather the severe lack of operating and investment capital and high transportation costs, which have made it unprofitable to develop forest capacity in remote locations of the RFE with the poor existing infrastructure.

This has lead to continued extensive logging in the coastal areas and areas near rivers and railroads. New imported western logging techniques may allow for environmentally acceptable standards of harvest on previously inaccessible forest areas, such as stands on slopes which are steeper than 30 degrees. This has raised the concern about environmental damage on the part of those who oppose harvesting in ecologically sensitive areas.

The growing recognition of the environmental values of forests will undoubtedly play a much greater role in the strategic development of the FIC of the RFE in the future. Under socialist conditions, environmental values did not receive a high priority. The environmental and resource protection system was primarily implemented through the classification of forests into the three categories of protection (Groups I-III) and by establishing different types of nature reserves (zakazniks, zapovedniks, *etc*.). Today the unique flora and fauna of southern territories and fragile northern ecosystems are attracting worldwide attention. The government has created new types of protected areas such as regional parks and Territories of Traditional Nature Use (TTPs) that are intended to permit the integration of human needs with biodiversity protection.

[170]World Bank. (1996). *Russian Federation Forest Policy Review*, draft, volume II, pp. 72-73.

However, the existing protection systems are also plagued by shortages of funds. The help of other economically-developed industrial countries will be needed for the continuing restructuring of an environmentally sustainable forestry sector, including the forest industrial complex.

The current situation can be summarized in a matrix ranking of the major determinants which appear to impact the future development of FIC in the Russian Far East in the near term. In the above discussion, these major factors influencing the transition of the Russian economy and the development of FIC have been noted. The significance of individual factors has changed over the period 1990-1996. Some factors influencing the forestry sector and the FIC have become more powerful (such as tax policy or transportation cost) while the role of others has not changed significantly (forest accessibility).

A generalized assessment of the determinative factors, ranked from high to low, is presented in Table 51, indicating the likely relative importance of each for the near term development of the FIC in the RFE. The ranking is based on the analysis presented in the previous sections.

The major macro-economic factors (Group I) are of highest priority for the development of the FIC in the RFE in the near future. The overall economic development of the region is a fundamental precursor to long-term stability and development of individual sectors, including the forestry and forest industry sub-sectors. These overall regional conditions create the economic operational environment for the performance of the forest industrial complex. Following the collapse of the old centrally-planned economy and the movement toward a market system since 1989, conditions have changed rapidly and somewhat unpredictably.

Tax policy and exchange rates can be administratively changed by the government authorities in unpredictable ways as has been demonstrated in the past few years. This results in business uncertainty and creates an unfavorable domestic and international investment climate for the region, and day to day operating uncertainty for the forestry sector as well. New comprehensive banking, credit and financial policies are equally important for long-term economic stability. Energy and power policies will influence operating costs in important ways. Communications technology is required for more comprehensive linkages of the sub-regions and commercial centers of the RFE with

Table 51. Factors Influencing the Near-Term Development of the Forest Industry Complex in the Russian Far East

Group / Factors	High	Medium	Low
Group I: Macro-economic factors	*		
Economic development of the region	*		
Tax policy	*		
Foreign investments			
Infrastructure	*		
Group II: Factors related to forest resource base		*	
Land use		*	
Forest resources and their accessibility		*	
Forest management		*	
Environmental requirements		*	
Group III: Factors related to forest industrial production and markets			
Transportation cost	*		
International trade	*		
Domestic trade			*
Technology		*	
Trade and forest policy regulations	*		

the more rural and isolated forest communities. Labor markets, compensation and social policies surrounding a stable workforce, together with education and training, remain as critical requirements for both broad development and as linked to the needs of the changing forest industry complex.

Economic development of the region and transportation infrastructure will require substantial time and significant investment capital in order to create the more favorable and stable conditions for the FIC in the RFE. The wide difference between the more developed southern and northern sub-regions is growing. Uneven development of the areas within the individual sub-regions is also noticeable. The stabilizing of the economy of the region is of high priority for the successful development of all the industries.

Group II development factors are the basis for the development of the FIC itself within the RFE. Perhaps surprisingly, these have been the most stable over time and will continue to important but will play a more moderate role as possible constraints on the development of the FIC of the region in the near term. Environmental values are forecast to grow in importance in the future, potentially reducing the land base available for logging or otherwise constraining operations on Group III industrial forests. However, in the near term this is unlikely to restrict access to adequate forest resources severely. The forest resource base of the southern sub-regions will remain attractive for logging companies and can be a good base for the future development of the regional FIC.

Group III development factors have also been changing dramatically since the beginning of the political and economic reforms throughout the Russian Federation. International trade policies and transportation costs linked to trade opportunities have become major determinants of the development of the FIC of the RFE. In large part, emerging policies have dictated a focus on the export of unprocessed raw materials, including timber, in lieu of supporting greater domestic processing capacity that can become internationally competitive in the face of market-profitability requirements of the market economy. The role of the domestic market, in contrast, has been made less critical by virtue of the loss of markets in European Russia and the other republics of the former Soviet Union due to long distances and greatly increased transportation costs.

The importance of new production techniques and processing technology has also increased, although the technical restructuring progress is presently greatly impeded by a shortage of funds. In the near future the production of roundwood for export will remain as a major trend influencing the development of the FIC in the RFE.

It will be necessary for the forest sector of the RFE to work out a strategic plan for comprehensive development of the FIC based on the identification of realistic economic goals reflecting current and near-term possibilities and realities. This will also require the integration of the key macro-economic factors affecting the regional forest sector but which are beyond the immediate control of the sector itself into a broader regional development planning process and strategy.

Finally, it must be recognized that future economic viability for forest production may well be below historic levels of harvest and production achieved under central planning when economic criteria were less important to planning. Dislocations of harvesting and production can be expected as restructuring decisions impact the location, scale, and greater vertical integration decisions in pursuit of greater efficiencies and competitiveness. Such adjustments will necessarily involve a human dimension as well. Land use decisions, including emerging environmental considerations will assure that the future of the FIC will not remain a business as usual approach—however, the outlines of the restructured sector are only beginning to emerge. International cooperation and assistance can and will shape this future but the results must be firmly rooted in the needs and aspirations of the RFE and its people.

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