ETLA ELINKEINOELÄMÄN TUTKIMUSLAITOS
THE RESEARCH INSTITUTE OF THE FINNISH ECONOMY Sarja B 195 Series

Grigory Dudarev
Sergey Boltramovich
Dmitry Efremov

FROM RUSSIAN FORESTS TO WORLD MARKETS

A Competitive Analysis of the Northwest Russian Forest Cluster

ETLA, The Research Institute of the Finnish Economy

Publisher: Taloustieto Oy

Helsinki 2002

Cover: Mainos MayDay, Vantaa 2002

ISBN 951-628-379-9
ISSN 0356-7443

Printed in: Yliopistopaino, Helsinki 2002

DUDAREV, Grigory – **BOLTRAMOVICH**, Sergey – **EFREMOV**, Dmitry, **FROM RUSSIAN FORESTS TO WORLD MARKETS**. Helsinki: ETLA, Elinkeinoelämän Tutkimuslaitos, The Research Institute of the Finnish Economy, 2002, 154 p. (B, ISSN 0356-7443; No. 195). ISBN 951-628-379-9.

ABSTRACT: This study examines the Northwest Russian forest industry, traditionally the region's most important industry, its competitiveness and future prospects. The transition to the market economy and privatization have left their mark on the industry. Demand and markets have changed, requiring new strategies, operation models and industrial policy. The book analyzes competitiveness employing the so-called cluster analysis approach. The competitiveness of the Northwest Russian forest industry is currently based on production factors, whose conditions have, however, deteriorated during the reform process. Machinery and equipment are outdated, productivity is low and production consists mainly of products with low value added. In principle, the Northwest Russian forest cluster has all the necessary elements that, if developed and improved, could make the cluster competitive. Such developments and improvements require substantial investments and cooperation amongst companies. The book also introduces the most important forest industry companies of Northwest Russia. For many companies export revenues are the main source of income. Investments in production and infrastructure are needed to keep exports at their present level and to increase them. Foreign investors can play a very important role in the development of the Northwest Russian forest industry, if the risks associated with, and barriers to, investment are reduced.

KEY WORDS: Northwest Russia, forest industry, industrial clusters, competitive advantage, economic development, industrial policy

DUDAREV, Grigory – **BOLTRAMOVICH**, Sergey – **EFREMOV**, Dmitry, **VENÄJÄN METSISTÄ MAAILMAN MARKKINOILLE**. Helsinki: ETLA, Elinkeinoelämän Tutkimuslaitos, The Research Institute of the Finnish Economy, 2002, 154 s. (B, ISSN 0356-7443; No. 195). ISBN 951-628-379-9.

TIIVISTELMÄ: Tutkimus käsittelee Luoteis-Venäjälle perinteisesti tärkeää metsäteollisuutta, sen kilpailukykyä ja tulevaisuudennäkymiä. Venäjän siirtyminen markkinatalouteen ja yksityistäminen ovat jättäneet jälkensä metsäteollisuuteen. Kysyntä ja markkinat ovat muuttuneet; nyt tarvitaan uusia strategioita, toimintamalleja ja elinkeinopolitiikkaa. Tutkimuksessa analysoidaan kilpailukykyä ns. klusterianalyysin avulla. Tällä hetkellä kilpailukyky perustuu tuotannontekijöihin, joiden tila on uudistusten myötä kuitenkin heikentynyt. Koneet ja laitteet ovat vanhentuneita, tuottavuus alhainen ja tuotanto keskittyy jalostamattomiin tuotteisiin. Periaatteessa Luoteis-Venäjän metsäklusterilla on kaikki peruselementit, joita kehittämällä siitä voisi tulla kilpailukykyinen. Uudistuminen vaatii mittavia investointeja ja yhteistyötä yritysten kesken. Tutkimuksessa esitellään Luoteis-Venäjän tärkeimmät metsäteollisuusyritykset. Monille yrityksille vienti on pääasiallinen tulonlähde. Myös sen pitäminen nykyisellä tasolla ja kasvattaminen edellyttävät investointeja tuotantoon ja infrastruktuuriin. Ulkomaisten investoijien merkitys metsäteollisuuden uudistamisessa voi olla suuri, jos investoinnin esteitä ja riskejä saadaan pienennettyä.

ASIASANAT: Luoteis-Venäjä, metsäteollisuus, teolliset klusterit, kilpailuetu, taloudellinen kasvu, elinkeinopolitiikka

Preface

Finland has for centuries lived on forests and wood processing. We call our forests green gold and renew them continuously. For this reason, it is easy for us to see what a huge potential our neighboring country Russia has in its forests, which are the largest unexploited forest resources in the world. Forests can bring continuous wealth to Russia unlike its exhaustible natural resources, and the wealth can be evenly distributed throughout the country.

This book studies forestry and the forest industry in Northwest Russia. The forest industry has long traditions in the region. In the 18th and 19th centuries, it was the leading industry in Northwest Russia. Wood products were sent to Europe via the Archangel and later the St. Petersburg seaports. Production volumes continued to grow during the Soviet period due to state investments, although the country's competitiveness deteriorated on the world market. Today, exports consist of products with low value added and they are based mainly on raw materials, transportation, energy and cheap labor.

The Russian forest industry will face a period of widespread development. Increasing international competitiveness requires investments in production technology, improvements to quality, and a shift towards higher value-added production. Productivity levels must also be raised to offset rising production costs. Investments have to be made despite the crying need for funds.

Northwest Russia is the region best suited for the first development wave of Russia's forest industry. It has the country's best infrastructure, industrial traditions, export market expertise, an abundant labor force and ample opportunities for vocational training. And, above all, Northwest Russia is in close proximity to European markets and Russia's largest population centers.

The Finnish forest industry operates internationally. Our companies have cautiously started to invest in Russia, too. The risks associated with making big investments are still too high, however. Investment will nevertheless increase, especially if investment barriers are reduced as our Russian researchers suggest in this book.

Helsinki, November 2002

Pentti Vartia

Author's Preface

Authors of the present study are among the first that started to elaborate the necessary analytical base and material for understanding of the complex issues such as regional and industrial development in the period of transition. This Study is part of a larger project entitled "Analysis of the competitiveness of Northwest Russia," the goal of which is to assess the growth potential of the Northwest of the Russian Federation in the conditions of transition to the open market. The project implies the analysis of the five industries most important to the economy of this region: forest, energy, metallurgy and metalworking, ICT and food. The research was carried out by a consortium of participants, including: *The Center for Strategic Research* (www.csr.ru), a leading Russian think tank that prepared a current action plan and strategy for the Russian Government; *ETLA* (www.etla.fi) - the Research Institute for the Finnish Economy, a leading Finnish economic research institute; and *Solid Invest* (www.solidinvest.com), a St. Petersburg research-based consulting company. We are happy to express our appreciation of valuable help, understanding and support provided by these organizations in our research. The authors are grateful also for financial support from the Finnish Forest Industries Federation and the leading forest cluster companies: UPM-Kymmene, Stora Enso, Metsä-Botnia, Andrizt, Metso Paper, and Timberjack that made it possible to analyze matters with significant depth and penetration.

We would like herewith to express our gratitude to the Steering Group members and other experts that supported and provided valuable inputs to the study: Mr Timo Poranen, President, Mr Claes von Ungern-Sternberg, Director, Mr Pekka Kallio-Mannila, Counsellor, Finnish Forest Industries Federation; Mr Pekka Rahkila, Vice President, Business Development, Andrizt Oy; Mr Timo Piilonen, Vice President, Strategic Investments, Mr Timo Karinen, Vice President, Business Development, Oy Metsä-Botnia Ab; Mr Mikko Siiteri, Senior Vice President, Strategic Development, Mr Auli Huotari, Senior Sales Manager, Russian Trade, Metso Paper; Mr Kimmo Kalela, Senior Executive Vice President, Mr Voitto Pölkki, Senior Vice President, Forest, Mr Kauko Parviainen, Deputy Senior Vice President, Forest Operations, Stora Enso Oyj; Mr Erkki Enkola, Marketing Director, Northwest Russia, Timberjack Oy; Mr Kari Ketola, Director, Mr Erkki Jalkanen, Director, Business Planning, Mr Heikki Pikkarainen, Director, Strategic Development, UPM-Kymmene Group.

The authors wish to acknowledge persons who have contributed the study as experts and active participants to the meetings of the project: Ms Nina Vaskunlahti, Minister and Deputy Head of Mission, Mr Pertti Veijola, Councellor, Economic & Commercial Affairs, Embassy of Finland; Mr Kari Tolvanen, Director, Mr Pekko Kohonen, Training Manager, Sitra - The Finnish National Fund for Research and Development; Mr Harri Ahveninen, Director, Business Development, Mr Lasse Koivunen, Senior Consultant, Jaakko Pöyry Group Oyj; Mr Janne Simelius, Senior Partner, Merasco Capital Oy; Mr Seppo Pulliainen, Senior Operation Manager, Mr Timo Hokkanen, Senior Operations Manager, Technical Assistance Programs, IFC International Finance Corporation, Central and Eastern Europe Department. Authors would especially like to thank Mr Igor Ignatov, General Director of Giprobum, which is the leading R&D institution in the Russian pulp and paper industry. He provided valuable suggestions on portions of the manuscript and made very useful comments.

Our very special thanks also go to Mr Hannu Hernesniemi, Research Director, Etlatieto Oy. This work would have never been possible without his creative, skilful and very active support and advice, we are grateful for his patience and persistence that helped authors to overcome obstacles and difficult periods that came up along the way. The authors would like also to express their acknowledgement to members of our research team, which contributed a lot to this study: Mr Pavel Filippov, Mr Andrey Averin, Mr Dmitry Belov, Ms Veronika Voinovian, Ms Anna Ignatieva, Ms Melina Laakso, Mr Astamur Panov, Ms Mary Catherine Gannon, Mrs Elena Berlinkova.

Helsinki, August 2002

Contents

Figures

Tables

Boxes

Summary

Forest industry has traditionally been an important part of the Northwest Russian economy. In the course of the last decade, the Russian industry underwent drastic changes and transition to the open market and the private ownership. Changes in the domestic demand associated with the reforms, collapse of the demand and then gradual increase, greatly shaped the existing production and corporate structure of forest industry. All this calls for a new understanding of the current situation and development prospects, which is also required to elaborate a competent industrial policy at all levels. The collapse of the Soviet planning system left behind a big industrial policy gap. There is a need for new approaches and strategies based on understanding of the newly emerged realities, assessment of the changes and usage of required theoretical tools.

In the present study the authors have chosen a "diamond" model of the national competitiveness introduced by Harvard professor Michael Porter in his book "The Competitive Advantage of Nations" as a basic approach to the analysis. This model was developed and applied to studies of the regional development issues in later studies that were also taken into consideration in the present study. We also identify and describe the regional agglomerations of the forest cluster in Northwest Russia. This part of the analysis is based on regional economics and new economic geography studies.

The companies of the Northwest Russian forest industries together with their local technology and services suppliers, companies from related and supporting industries, such as transport and logistics, energy, chemicals etc., form a potentially competitive cluster of industrial activities. In the study we review the existing situation, analyze competitiveness of the Northwest Russian forest industry, and identify the key issues affecting the competitiveness in the future.

Competitiveness of the Northwest Russian forest cluster today is mainly determined by production factors. Primarily, these are the substantial but under-utilized forest stock, the infrastructure inherited from the Soviet period, and industrial and human capital. Unfortunately, in the period of reforms the overall state of the production factors has deteriorated. The malfunctioning infrastructure and underdevelopment of the harvesting and processing facilities undermine opportunities arising from raw wood resources and human capital. In general, the cluster is characterized by low productivity and outdated technologies. Hence the companies of the

Northwest Russian forest cluster occupy important positions only in products with low value added. The cost-based competition is the main strategy of the domestic producers. The current factors underlying competitiveness of the cluster do not allow for its sustainable development and growth without substantial efforts and investments. It is essential to increase cooperation between the primary product manufacturers, technology producers, and service providers, as well as related industries.

In the transition from the centralized planning system to the open market, the Russian economy is in now at the stage of integration into the international markets. For the majority of forest industry companies export revenues are the main source of income. This is a factor, which will dramatically influence the development of the forest industries in Russia. Northwest Russian companies are now exposed to competition on the international and domestic markets and follow the trends in the international markets.

After the collapse of the Soviet Union in 1991, domestic demand for forest industry products dropped. The companies shifted their focus to servicing export markets. As a result, since 1992, exports and their share in the total forest cluster production have significantly grown. A statistical analysis of the Russian international trade with the OECD countries (see Chapter 4) has served to identify the key export items: roundwood, pulp and newsprint. As this analysis shows the Russian exports are competitive only in raw wood and basic commodities. There is also a substantial import substitution potential in high value added products groups such as the furniture and paper products. Therefore there are two major parallel ways for the further development of the forest cluster. One is to increase the share of higher value added products aimed at exports. This implies "quantum leap" in improving infrastructure, training, regulations and business climate. Going this way means substantial private investment and commitment on the government side. The other is to target development of domestic manufacturing through import substitution. This approach also requires substantial investments, better infrastructure and skills. It is also less efficient in creating the sustainable competitive advantages due to lesser exposure to global rivalry and presumed government protection of the markets through the tariff policy. As both approaches are not exclusive the mix of both will be present in the near future in Russia.

In Chapter 5 we analyze forest industries, services and available technologies in the region, as well as related industries. The analysis shows that the industrial facilities inherited from the Soviet period are characterized by low efficiency, outdated and polluting technologies and processes. Upgrading these facilities is an enormous task for the future. It is highly unlikely that many existing companies will remain as such. Waves

of mergers and acquisitions, bankruptcies and restructuring will be overseen in the near future. In many cases "greenfield" investments are a reasonable solution and the number of this kind of investments will increase. Foreign strategic investors could play a key role in renewing the Northwest Russian forest industry, if only investment barriers and risks could be reduced.

Chapter 6, the key section of the report, contains a competitive analysis, with competitiveness factors grouped to conform to the "diamond" model developed by M. Porter. The study reveals that the forest cluster of the Northwest Russia is virtually lacking any obvious competitive advantages to be developed without major investments. The most problematic bottlenecks are the domestic market capacity, which remains small and inadequate to achieve economies of scale for many products. Development of exports is prevented by the underdeveloped infrastructure and bureaucracy, as well as the weak networks and almost non-existing cooperation between the companies.

An important development constraint is the inconsistent and unstable industrial policy, which lacks the focus and commitment needed to provide a ground for higher value added activities. At the same time, the extensive forest resources of the Northwest Russia, which are the closest forest reserves to the European markets, and substantial inherited assets, skills and infrastructure form a unique basis for building competitive advantages for the firms in this region. The continuously growing demand for forest products and favorable future prospects could motivate the local companies to regain market power. Advances in the industrial policy, increasing interest in the forest industries and improving infrastructure are promising signs of a better future.

In the export markets there is room for Russian forest products. One of the possible alternatives is that Russia will follow a typical development pattern of the follower, i.e. invests in technologies that have already been developed and manufactures well-known products with established global market positions. Taking into account the existing cost competitiveness, such a strategy could lead to good results. Foreign direct investments could play a crucial role in this as a facilitator.

The project team believes that in the medium term the competitiveness of the forest cluster improves, although one should not expect a "big leap". In spite of the increased production efficiency, the general lag behind the developed economies will persist a long time. The scale of investment and effort needed to improve the functioning of the Northwest Russian forest cluster leaves no doubt that this will be a long and painful process.

The study demonstrates that the forest cluster companies of today fall into two broad and rather different categories. The first and by far the largest category is formed by companies that inherited their assets from the Soviet period. These companies have, on average, a lower productivity and they are gradually deteriorating as compared with the other small but growing category, which is formed by new companies, created through green and brown field investments. Companies in the second category are more efficient, enjoy higher productivity and are much less polluting. This is the group that will identify the future of the forest cluster in Northwest Russia in the longer term. The government should concentrate its efforts on facilitating the networks and connections between the user and the producer in the forest cluster. Infrastructure has to be improved as well. In order to develop the forest cluster, the available scarce resources have to be directed efficiently to the most developable regions.

In the conclusions we describe regional agglomerations, which are North-Ladoga, Karelia, Archangel, Kotlas and Syktyvkar. We believe that in the regions where the forest industries are less developed but have a good resource base, focused efforts of the regional governments would lead to creation of new concentrations of the industrial activity. Some new agglomerations could even shape relatively fast, for example Vologda-Cherepovets. In order to sustain their positions, regions with developed forest industries have to concentrate their efforts on improvement of the business environment and operating conditions as well as development of infrastructure and education.

Long-expected improvements related to the forest use are essential for the future development of forest industry. Introduction of extra long leases (more than 49 years) and private ownership could substantially alter the corporate map and foster the development of the forest cluster.

Efforts by the regional and federal governments to develop infrastructure and improve education and training for the forest cluster will certainly bear fruit and ease concentration of the forest cluster in the areas where access to qualified labor force and efficient infrastructure is ensured. This, associated with the concentration of the activities in larger corporations, appearance of the competitive niche producers and evaporation of the less efficient players, would increase the vitality of forest industry centers and bring sustainable wealth.

Developing the Northwest Russian forest cluster is a difficult and challenging task. Nevertheless, there are tools that could ease positive developments. We believe that the study will provide good ideas for decision-makers of different levels and responsibilities to foster growth in the Northwest Russian forest industry.

Yhteenveto

Metsäteollisuus on perinteisesti tärkeä osa Luoteis-Venäjän taloutta. Viimeisten kymmenen vuoden aikana Venäjän teollisuus on läpikäynyt suuria muutoksia ja siirtynyt avoimeen markkinatalouteen ja yksityisomistajuuteen. Uudistusten seurauksena muuttunut kotimainen kysyntä, sen romahdus ja sitten vähittäinen kasvu, on suuresti muovannut myös metsäteollisuuden tuotantoa ja yritysrakennetta. Tämä kaikki vaatii uuden tilanteen ja kehitysnäkymien ymmärtämistä, mitä tarvitaan myös toimivan elinkeinopolitiikan luomiseen kaikilla tasoilla. Neuvostoaikaisen suunnitelmatalouden romahdettua päätöksentekoon ja elinkeinopolitiikkaan on jäänyt suuri aukko. Tarvitaan uusia lähestymistapoja ja strategioita, jotka perustuvat uusien realiteettien ymmärtämiseen ja muutosten arvioimiseen sekä tarvittaviin teoreettisiin välineisiin.

Tässä tutkimuksessa analyysin perustaksi on valittu kansallisen kilpailukyvyn ”timanttimalli”, jonka Harvardin professori Michael Porter esitteli kirjassaan “The Competitive Advantage of Nations”. Tätä mallia on myöhemmin sovellettu laajemmin myös alueelliseen kehitykseen liittyvissä kysymyksissä, mikä on huomioitu tässäkin tutkimuksessa. Tutkimuksessa määritellään ja kuvataan myös alueelliset metsäteollisuuden agglomeraatiot Luoteis-Venäjällä. Tämä osa analyysia perustuu aluetaloustieteeseen ja uusiin talousmaantiedon tutkimuksiin.

Luoteis-Venäjän metsäteollisuusyritykset ja niiden paikalliset teknologian- ja palveluntarjoajat sekä metsäteollisuuden tukielinkeinojen ja muiden läheisten teollisuudenhaarojen yritykset, kuten kuljetus-, logistiikka-, energia- ja kemian teollisuuden yritykset, muodostavat potentiaalisesti kilpailukykyisen teollisuusklusterin. Kirjassa tarkastellaan klusterin nykytilannetta ja analysoidaan Luoteis-Venäjän metsäteollisuuden kilpailukykyä ja määritellään tärkeimmät kilpailukykyyn tulevaisuudessa vaikuttavat tekijät.

Luoteis-Venäjän metsäteollisuuden kilpailukyky perustuu tätä nykyä tuotannontekijöihin. Näitä ovat ensisijaisesti suuret mutta alihyödynnetyt metsävarannot, neuvostoajoilta peritty infrastruktuuri sekä teollinen ja henkinen pääoma. Valitettavasti uudistusten aikana tuotannontekijöiden tila on heikentynyt. Infrastruktuurin toimimattomuus ja metsäkoneiden ja tuotantolaitosten jälkeenjääneisyys heikentävät raakapuun ja henkisen pääoman käytön mahdollisuuksia. Ylipäänsä klusterille on nyt tyypillistä alhainen tuottavuus ja vanhanaikainen teknologia. Siksi Luoteis-Venäjän

metsäyhtiöillä on merkittäviä asemia enimmäkseen vain niukasti jalostetuissa tuotteissa. Kustannuksiin perustuva kilpailu on kotimaisten tuottajien keskeinen strategia. Nykyiset klusterin kilpailukyvyn perustana olevat tekijät eivät mahdollista kestävää kehitystä ja kasvua ilman huomattavia ponnistuksia ja investointeja. On ensiarvoisen tärkeää lisätä merkittävästi metsäteollisuuden yritysten, teknologiavalmistajien ja palvelun tarjoajien sekä läheisten teollisuudenhaarojen yhteistyötä.

Siirtymisessä keskitetystä suunnitelmataloudesta avoimeen markkinatalouteen Venäjän talous on nyt siinä vaiheessa, että se integroituu kansainvälisille markkinoille. Suurimmalle osalle metsäteollisuusyrityksistä vientitulot ovat tärkein tulonlähde. Tämä on tekijä, joka vaikuttaa dramaattisesti metsäteollisuuden kehitykseen Venäjällä. Luoteis-Venäjän yritykset ovat nyt alttiita kansainvälisten ja kotimaan markkinoiden kilpailulle ja seuraavat kansainvälisten markkinoiden suuntauksia.

Neuvostoliiton romahdettua vuonna 1991 metsäklusterin tuotteiden kotimainen kysyntä laski oleellisesti. Yritykset keskittyivät vientimarkkinoihin. Tämän johdosta vienti ja sen osuus metsäklusterin tuotannosta on vuodesta 1992 lähtien kasvanut merkittävästi. Tilastollinen analyysi Venäjän kauppavaihdosta OECD-maiden kanssa (ks. 4. luku) osoittaa tärkeimmät vientituotteet, jotka ovat tukkipuu, sellu ja sanomalehtipaperi. Analyysin mukaan Venäjän vienti on kilpailukykyistä vain raakapuun osalta ja perushyödykkeissä. Pitkälle jalostetuissa tuotteissa, kuten huonekaluissa ja paperituotteissa, on suuri potentiaali korvata tuontia. Tämän vuoksi metsäteollisuutta voidaan kehittää edelleen kahdella samansuuntaisella tavalla. Toinen on vientiin suunnattujen pitkälle jalostettujen tuotteiden osuuden kasvattaminen. Tämä edellyttää suuria harppauksia infrastruktuurin, koulutuksen, säädöksien ja liiketoimintailmapiirin parantamisessa. Tämä tapa merkitsisi huomattavia yksityisiä investointeja ja valtion sitoutuneisuutta asiaan. Toinen tapa on kotimaisen valmistuksen kehittäminen korvaamaan tuontia. Myös tämä vaatii huomattavia investointeja, parempaa infrastruktuuria ja osaamista. Se ei myöskään ole yhtä tehokas kestävien kilpailuetujen luomisessa, koska silloin valtio suojelisi markkinoita tullipolitiikan avulla eivätkä ne olisi yhtä alttiita globaalille kilpailulle. Koska nämä tavat eivät ole toisiaan poissulkevia, vaikuttaa niistä kumpikin Venäjällä lähitulevaisuudessa.

Luvussa 5 on analysoitu metsäteollisuutta, palveluita, alueella käytössä olevaa teknologiaa ja läheisiä teollisuudenaloja. Analyysi osoittaa, että neuvostoajalta perityille teollisuuslaitoksille on tunnusomaista alhainen tuottavuus, vanhentuneet ja paljon saastuttavat laitteet ja valmistustavat. Näiden tuotantolaitosten uudistaminen on valtava tehtävä tulevaisuudessa. On erittäin epätodennäköistä, että kovinkaan moni nykyisistä yrityksistä säilyy entisellään. Fuusioiden ja yritysostojen aalto, konkurssit ja

rakennemuutokset ovat väistämättömiä lähitulevaisuudessa. Monissa tapauksissa investointi uuteen tuotantolaitokseen on järkevä vaihtoehto ja tällaisten investointien määrä kasvaa. Ulkomaisten strategisten investoijien rooli Luoteis-Venäjän metsäteollisuuden uudistamisessa olisi todella tärkeä, jos investoinnin esteitä ja riskejä voitaisiin pienentää.

Tutkimuksen pääosiossa, 6. luvussa, on kilpailukykyanalyysi, jossa kilpailutekijät on ryhmitelty Porterin ”timanttimallin” mukaisesti. Tutkimuksesta käy ilmi, että Luoteis-Venäjän metsäklusterilla ei ole kovin paljon sellaisia kilpailuetuja, joita voisi kehittää ilman mittavia investointeja. Yksi pahimmista pullonkauloista on riittämätön kotimaan markkinakapasiteetti, joka on monilla tuotteilla liian pieni suurtuotannon etujen saavuttamiseksi. Viennin kehitystä taas vaikeuttavat kehittymätön infrastruktuuri ja byrokratia sekä yritysten heikko verkottuminen ja lähes olematon yhteistyö toistensa kanssa.

Tärkeä este kehitykselle on epäjohdonmukainen ja epävakaa elinkeinopolitiikka, josta puuttuu jalostustoiminnan kehittämiseen tarvittava sitoutuminen ja keskittyminen olennaisiin asioihin. Samalla Luoteis-Venäjän laajat metsät, joka on Euroopan markkinoita lähinnä oleva puuvaranto, sekä huomattavat perityt edut, taidot ja infrastruktuuri muodostavat ainutlaatuisen perustan alueen yritysten kilpailukyvyn rakentamiselle. Metsätuotteiden jatkuvasti kasvava kysyntä ja suotuisat tulevaisuuden näkymät kansainvälisillä markkinoilla voisivat motivoida paikallisia yrityksiä hankkimaan markkinavoimansa takaisin. Elinkeinopolitiikan edistyminen, kasvava kiinnostus metsäteollisuuteen ja infrastruktuurin kehittäminen ovat lupaavia merkkejä paremmasta tulevaisuudesta.

Vientimarkkinoilla on tilaa venäläisille metsätuotteille. Yksi mahdollisista vaihtoehdoista on, että Venäjä seuraa tyypillistä perässätulijan kehityskulkua, ts. investoi jo kehitettyyn teknologiaan ja tuottaa entuudestaan tunnettuja tuotteita, jotka ovat vakiinnuttaneet asemansa kansainvälisillä markkinoilla. Ottaen huomioon vallitsevan kustannuskilpailukyvyn tällainen strategia mahdollistaisi hyvät tulokset. Tässä ulkomaisilla suorilla sijoituksilla voisi olla merkittävä rooli.

Projektin tutkijat uskovat, että keskipitkällä ajalla metsäklusterin kilpailukyky parantuu, mutta mitään suuria hyppäyksiä ei ole odotettavissa. Huolimatta tuotantotehokkuuden paranemisesta ero kehittyneisiin talouksiin säilyy vielä pitkään. Luoteis-Venäjän metsäklusterin kehittämiseen tarvittavien investointien määrä ei jätä sijaa epäilyksille, etteikö prosessista tule pitkä ja kivulias.

Tutkimus osoittaa, kuinka nykyiset metsäklusteriyritykset voidaan karkeasti jakaa kahteen varsin erilaiseen tyyppiin. Ensimmäiseen ja ylivoimaisesti

suurempaan ryhmään kuuluvat yritykset, jotka ovat perineet omaisuutensa neuvostoajalta. Näillä yrityksillä on keskimäärin alhaisempi tuottavuus ja ne heikentyvät vähitellen verrattuna toiseen pieneen mutta kasvavaan ryhmään, joka on perustanut kokonaan uusia tuotantolaitoksia tai uudistanut olemassa olevia perusteellisesti. Tämän toisen ryhmän yritykset ovat tehokkaampia, tuottavampia ja huomattavasti vähemmän saastuttavia. Tästä ryhmästä riippuu Luoteis-Venäjän metsäklusterin tulevaisuus pitkällä tähtäimellä. Valtion täytyy edistää metsäklusterin toimijoiden verkottumista. Myös infrastruktuuria täytyy parantaa. Jotta metsäklusteri kehittyisi, käytettävissä olevat niukat varat täytyy keskittää tehokkaasti Luoteis-Venäjän kehityskelpoisimmille seuduille.

Yhteenvedossa on kuvailtu vahvoja alueellisia agglomeraatioita joita ovat Pohjois-Laatokka, Karjala, Arkangel, Kotlas ja Syktyvkar. Projektin tutkijoiden mukaan myös niillä alueilla, joilla metsäteollisuus on heikommin kehittynyt mutta joilla on hyvät metsävarat ja infrastruktuuri, aluehallinnon keskitetyt toimenpiteet johtaisivat uusien teollisen toiminnan keskittymien syntymiseen. Osa uusista agglomeraatioista voisi muotoutua suhteellisen nopeastikin, esimerkiksi Vologda-Tsherepovets. Asemansa säilyttääkseen kehittyneen metsäteollisuuden alueiden on keskitettävä voimansa liiketoimintaympäristön ja toimintaolosuhteiden parantamiseen sekä infrastruktuurin kehittämiseen ja koulutukseen.

Metsänkäyttöön liittyvät, kauan odotetut parannukset ovat välttämättömiä metsäteollisuuden kehitykselle. Hyvin pitkien vuokra-aikojen (yli 49 vuotta) käyttöönotto ja yksityisomistus voisivat muuttaa yrityskenttää huomattavasti ja nopeuttaa metsäklusterin kehitystä. Pitkät vuokra-ajat edistäisivät metsänhoitoa ja mahdollistaisivat uusien sellu- ja paperitehtaiden perustamisen, kun raaka-aineen jatkuva saanti olisi turvattu.

Alue- ja liittovaltion hallinnon ponnistelut infrastruktuurin kehittämiseksi ja metsäalan koulutuksen parantamiseksi tuottavat varmasti tulosta ja helpottavat metsäklusterin keskittymistä sinne, missä on ammattitaitoista työvoimaa ja tehokas infrastruktuuri. Tämä sekä liiketoiminnan keskittyminen suuriin yhtiöihin, kilpailukykyisten niche-tuottajien ilmaantuminen ja tehottomampien tuottajien häipyminen parantaisivat metsäteollisuuskeskusten elinvoimaa ja toisivat kestävää vaurautta.

Luoteis-Venäjän metsäteollisuuden kehittäminen on vaikea ja haastava tehtävä. On kuitenkin keinoja, jotka voivat helpottaa myönteistä kehitystä. Tekijät uskovat tämän tutkimuksen tarjoavan eri tasojen ja vastuualueiden päättäjille käyttökelpoisia ajatuksia Luoteis-Venäjän metsäteollisuuden kasvun nopeuttamisesta.

1 Introduction

This document is a Report containing the outcomes of the study analyzing the forest cluster of Northwest Russia. The forest cluster is the industrial foundation of Northwest Russia, along with metallurgy, machine-building, and the fuel and energy complex. During the Soviet period, government industrial policy emphasized the development of large-scale mechanical wood processing and pulp-and-paper manufacture, which was aimed to supply domestic market of the Soviet Union with its products. Each manufacturing facility was assigned its production targets and competition was avoided by the state planning as the manufacturing of excess goods that could compete on the market was not possible. There were also no price incentives for competition owing to the state planning authority (Gosplan) that introduced uniform prices and standards for products. On the other hand all the production costs were distorted as well, i.e. the costs of raw materials, labor, energy and transportation never matched their true value and lead to excesses, over-investment and wasteful production.

In the 1990s, the forest industries of Northwest Russia, as well as Russian industry as a whole, underwent fundamental changes. The domestic market was opened for the competition and contracted sharply, many ties with consumers and suppliers were disrupted, and as a result, many companies (those who were able) increased their exports. The Russian producers quickly have found out that on the international markets, only raw materials and products with low added value were viable. Nobody waited the Russian producers with the open hands – market shares are a hard earned piece of cake. Thus, the structure of domestic manufacture changed radically along the change in demand in favor of less finished goods and raw materials. Added to this was the fact that fundamental structural changes were taking place in the corporate sector: rapid privatization and property realignments, which continue in the industry to this day. Understanding the effects of listed above changes and determinants that could lead to competitiveness of the higher value added products addressed in the present study should be of very much interest to decision makers of all levels.

After the initial euphoria and high expectations generated by democratic reform, rapid privatization and transition to a market economy the hard reality has hit the Russian society. Many forest companies ceased or decreased scale of operation. Sometimes the whole cities and settlements dependent on their activities found themselves without employers or

with substantially reduced employment and low pay as the forest industries were a backbone of the regional prosperity and development in majority of the Northwest Russian regions for centuries. Thus there is a call for addressing the issues related to ensuring development and growth, increasing employment in the forest industries.

These issues were brought into general agenda when, after an overall turmoil of the 90-ies, Vladimir Putin replaced Boris Eltsin as a President of the Russian Federation. The new reforms introduced by his team targeted at removing imbalances in economy, ensuring stability and predictability. This helped the economy of the country in its move to the first years of economic growth. One would argue that such growth, of course, has its origin mainly in the favorable world market trends for the Russian energy and other raw materials exports. As we learn from the many decisions and actions by the new team this is well understood and we can say that today there is a situation when the decision-makers and ordinary people in Russia start to turn their heads to the sustainable industrial development away from the macroeconomic issues that were on the top in the preceding period.

It is evident that the process of restructuring of the cluster, and the acceptance of new rules of the game corresponding to the altered economic conditions, will take long. The forest cluster of Northwest Russia undoubtedly has significant potential that can and must be exploited. This study is devoted to the analysis of the viability of the forest industry cluster, and to its prospective development under the new economic conditions.

Development of the forest industries is very important for the overall economic growth in Northwest Russia as we see from the above. There are issues identified that are necessary to understand the current processes and development strategies. This Study is aimed to provide an analytical base and framework for the possible further decision-making in the development of forest industries of Northwest Russia. Therefore the main purposes of the present study were as follows:

- To create an informational and analytical database for defining strategic solutions in the field of investments and business development of forest companies, industrial policy development by the governments and administrative bodies;
- To analyze the current competitiveness of the Northwest Russian forest cluster, and the factors that influence the creation, strengthening and development of competitive advantages
- To assess the potential and the possible directions of the Northwest Russian forest cluster development

In order to study the above issues an extensive analysis of available material and field research was carried out. The study includes the critical analysis of statistical material (FAO[1], OECD-Organization for Economic Cooperation and Development, Goskomstat[2]), data from the industrial associations (The Finnish Forest Industries Federation, The Union of Timber Producers and Exporters of Russia, Association of Furniture and Wood Processing Enterprises of Russia and others), and analytical material received from official and other open sources. Moreover, the research includes analysis in comparison with the "best practice" of West European countries and the results of interviews with the leading forest companies of Northwest Russia.

This study is one of the first attempts in Russia to present accumulated statistical and analytical material applying the modern approaches widely used in many leading countries of the world for assessing economic and industrial development. The main emphasis in the study is the analysis of factors that determine the competitiveness of Northwest Russian forest cluster.

Please note that the project team did not aim to deliver a detailed, comprehensive report containing an elaborate review of the multiple issues related to the forest cluster. The study is meant rather as an attempt to initiate the discussion of the parties involved and to trigger in-depth projects of a wider scale.

1 FAO – UN Food and Agricultural Organization
2 Russian State Committee for Statistics

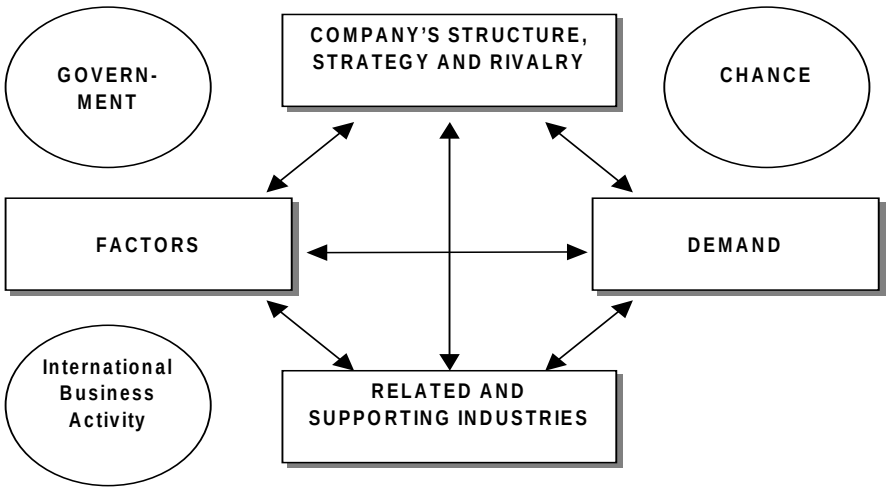
2 Theoretical Framework

2.1 Introduction

The present study is inspired by the influential book *The Competitive Advantage of Nations*, published in 1990 by Michael Porter, a professor of Harvard University, and by later research on matters related to regional development and competitive advantages (see box below). In the approach presented in his book, Michael Porter describes how companies find sources of competitive advantages in the specific combinations of skills and networks created in their industries and around it in specific countries and regions. He also studied the competitiveness of nations and regions in terms of their ability to offer companies an environment that provides unique advantages embedded in the networks and industrial structure of those particular regions. The study was grounded in detailed case studies of regions that are known for their persistent ability to provide the world with companies that are able to outperform others, such as Silicon Valley, Detroit, northwest and central Italy, etc.

As a main tool in the analysis presented in this Study the "Diamond" model of national competitiveness was introduced (presented below in Figure 2.1.). In this study this model is also used, although slightly adjusted (for more information see box below), as a key tool for assessing

Figure 2.1 "Diamond" Model



and analyzing the competitiveness of Northwest Russia. Although, initially, Michael Porter used this model for studying national competitiveness, it was later tested to fit the studies of regions that are positioned within boundaries of certain countries, or even to regions that comprise neighboring areas of different countries.

The "Diamond" model distinguishes four main sources of competitive advantage. These are

- *Factors.* This category includes production factors such as natural resources and geographical location, as well as created factors inherited from preceding stages. The first group can include natural resources, demographic conditions, geographical location, etc. The second group usually includes production facilities, and positions on various markets, infrastructure, human capital and R&D potential.

- *Demand.* The presence of a sufficient demand for the primary goods is the necessary condition of development and a source of competitive advantage. Here it is important that existing demand allows achieving economies of scale in local production. This demand is formed by local and export constituents. The local demand is a necessary starting source for creating competitive advantages for firms that will cluster in the region, thus reinforcing local advantages. Such specific characteristics of domestic demand as high quality and diversification requirements of consumers, or user-producer cooperation and consequent demand for specific solutions and product/service combinations, which for certain reasons were not possible in the other regions, substantially enforce the sustainability of competitive advantages of domestic producers. In certain industries, the strong and rapidly growing export market and demanding foreign customers played an essential role in formation of competitive domestic producers as well. In this case access to the foreign markets played a key role in formation of the competitive advantage.

- *Related and Supporting Industries.* The existence of developed related and supporting industries could be a source of competitive advantage for regional companies due to the possibility of obtaining advantages from the early access to high quality and reliable supplies of essential and unique or rare components and materials, from the cost advantages gained from the competitive local supplies. This also allows for an increase of production efficiency as a result of specialization. An available developed system of subcontractors and suppliers in a given region makes it possible to offer more complex products and after-sale service systems. It creates a unique local system of industrial co-

operation that exceeds and surpasses similar competitors' systems by their possibilities and degree of development.

- *Company's Structure, Strategy and Rivalry.* The industry structure is an important determinant of the possibility to gaining competitive advantage if the industries are competitive and the competition motivates leading companies to invest in the product and market offering, management and marketing as well as process development. In this case the larger markets for essential supplies and components are created, infrastructure could be better targeted to meet specific requirements of the particular industries, the competitive pressures also motivate higher organizational efficiency and training as well as spin-offs.

Porter offers for consideration two additional areas from which companies are able to draw sources of competitive advantage in his model:

- *Chance.* The role of chance or "luck" reflects rapid changes on world financial markets; changes in currency quotations, an unexpected growth in local/international demand and the event of war. All these sudden and unexpected events create situations on the market when unforeseen opportunities are created. In some cases these opportunities could become a source of competitive advantage.
- *Government.* The influence of government, through its current policy (liberal, deterrent, etc.), is only considered as an attribute in analysis. However, this policy determines the performance of all actors in the regional and/or national economy. A rational governmental policy provides for the growth of potential investor confidence and attracts capital, experience and technology to the economy.

As a result of studies of globalization, another potential source of competitive advantage was later added to Porter's "Diamond" model of national competitiveness: this is international business activity.

International business activity became a source of competitive advantage for companies from particular regions as a result of their internationalization, i.e. their ability to locate production facilities in regions that could offer the best advantages for the particular activity, and thus gain from access to several "diamonds" of the national advantage simultaneously.

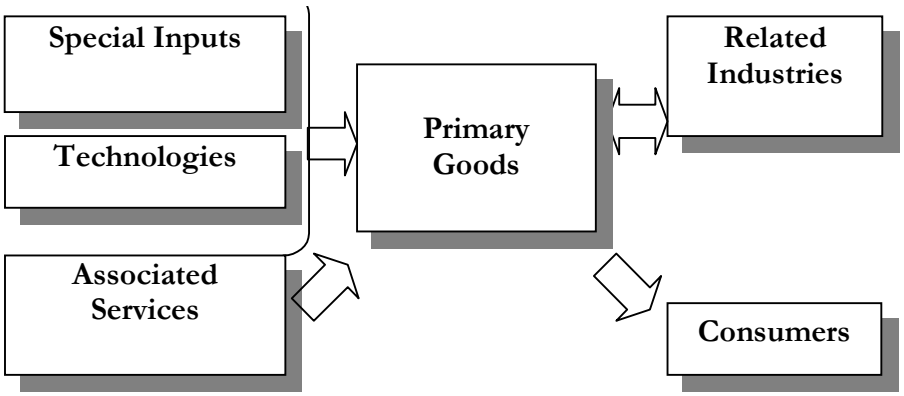
2.2 Concept of the Cluster

As we discussed in earlier in this Chapter the regional competitiveness is based on the ability of the particular location to offer the firms opportunities to gain competitive advantage owing to the specific factor and demand conditions, high demand and quality conscious consumers, and developed

networks of competitive companies in related and supporting industries located in this region.

Cluster analysis presumes that no specific industry can be viewed separately from others, but should be analyzed systematically within a cluster of vertically and horizontally linked sectors. It is obvious that the development of a key industry would give a push to the development of supplying and consuming industries, as well as service segments associated with the cluster.

Figure 2.2 Cluster Structure



A cluster structure can be illustrated as a set of separate, but closely interrelating sectors of the national economy, as well as special inputs inherent for the region. There are the following elements in a cluster:

- *Primary goods* – a list of goods or groups of goods, which are competitive on the world market and companies manufacturing these products form the core of the cluster.
- *Specialty inputs* – the main factors of production inherent for the country (region) and mentioned in the Factor conditions, are the raw materials, transport, infrastructure, labor force, educational system, RD etc.
- *Technologies* –a description of technologies, machines and equipment consumed by the core sector of the cluster and its producers.
- *Related and supporting industries* – the different sectors of the economy and particular companies, whose products are directly or indirectly consumed or may be consumed by the core sector.
- *Consumers* – the main consumers of primary goods manufactured by the companies of the cluster.

An analysis and understanding of the cluster and its structure can help companies to create focused development strategies, and authorities to identify the sources of competitiveness in their particular regions, and to create on the basis of this an efficient and active system of general development, of infrastructure and operational environment improvements, including relevant regulatory acts, actions and decrees of the legislative power.

Although there is an extensive body of theory and research behind the matters presented in this chapter we do not dare to bother readers with further explanations and would like to proceed to the analysis presented in the following text. Those who are interested to learn more we ask to refer to the forthcoming book "Advantage Northwest" by Grigory Dudarev and Hannu Hernesniemi where these issues will be addressed in more detail.

Box 2.1 A Survey of Theoretical Routes

It was long time a widely accepted fact that national and regional location is central to growth, increased welfare and well-being. Already in the end of the 19th century Alfred Marshall introduced "industrial districts", later Joseph Schumpeter - "innovation clusters", Eric Dahmen - "development blocks", François Perroux - "development and growth poles", economic geographers – industrial and "high-technology" agglomerations. These concepts assessed the geographic concentration of economic activities and innovation from different perspectives. Going here deeper into the intellectual history underlying these approaches and the difficulties of making the above concepts analytically operational is beyond the scope of the present review. Nevertheless we will touch upon their implications that were integrated into the approach used in our study. The reason why these concepts were not successful was not because policy makers did not consider them important: the source of growth and the origins of disparities have remained central to the preoccupations of policy makers and analysts. The unresolved issues that underlie the wide use of the "cluster" concept are related to the following questions: Why do activities cluster? Why is clustering important? How can the clustering process be managed? Is that possible? What are the possible tools and factors that could influence clustering in certain regions? Can, and should, one do something about it?

Michael Porter in his book "The Competitive Advantage of Nations" presented some answers and explanations for many of the above questions. He incorporated implicitly many previous developments, mentioned above in the knowledge base (Rouvinen and Ylä-Anttila, 1999).

Although, according to these authors, the framework presented by Porter is rewrap of old ideas, they agree that the "diamond" model is internally consistent and in the line with the mainstream competitiveness literature. The ambiguities surrounding the cluster concept (and other related concepts such as industrial districts), proper definitions, and their relationships to regional economic performance are the subject of extensive literature (Asheim and Isaksen, 1997; Feser, 1998a, 1998b; Harrison, 1992; Heinenreich, 1996; Isaksen, 1997; Jacobs and de Man, 1996; Kaufman et al., 1994; Park and Markusen, 1995; Steiner, 1998).

Notwithstanding the fact that this model is obviously a good and comprehensive tool to assess competitiveness and clusters, i.e. represents a certain advance in this area, it has some drawbacks. As Penttinen demonstrated in 1994 they are the following: competitiveness can also be found outside clusters; the diamond model does not properly account for foreign direct investment and multinational enterprise; the model may not be suited to small open economies (as it was suggested by Rouvinen and Ylä-Anttila, 1999 we also used broader cluster definitions); the model may not be applicable to resource-based industries (Rouvinen and Ylä-Anttila, 1999 applied the model to resource-based industries successfully); the role of macroeconomic variables in the Porter's model is unclear; it is unclear whether model is dynamic or static; the studies may not be conducted with sufficient rigour (the loosely defined theory offers possibilities for misuse).

One of the main advantages of the Porter model was that it remarkably departed from traditional analysis and integrated the new, more up-to-date developments in theory such as cluster-based approach. The main differences between traditional and cluster-based approach are that by specifying strict boundaries for industries or sectors (mostly based on statistical data accounting procedures), the traditional sectoral approach fails to take into account the importance of interconnections and knowledge flows within a network of production (Rouvinen and Ylä-Anttila, 1999).

The cluster-based approach also has substantial importance as a tool to study regional development issues. Empirical studies today are far more frequently conducted on the sub-national level (Nelson, 1993, Ohmae, 1995) and often patterned after Porters' model of competitive advantage. There is also a substantial contemporary research in regional development (Russo, Storper and Scott, von Hippel) and sources of competitive advantages (Barney, 1992 a, 1992 b, Asanuma, 1989, Dyer) that complements Porter's model in a major way adding more understanding and insight into the localization of process of the knowledge creation and diffusion, learning, etc.

In conventional macroeconomics the markets are characterized by anonymous relationships between suppliers and users. Anonymity according to Gibbons and Weijers complicates product innovation because

new product development requires effective transfer of specific cost and performance needs knowledge from the potential user to the would-be producer. The challenges of the product innovation process are well captured by Lundvall who stated that reciprocal information flows between producers and users are essential to successful innovation. Rothwell who introduced the notion there are two main interfaces in user-producer interactions extended this view. These are the interface between the supplier and the producer and the producer and the customer. The above arguments stress importance of geographical proximity, personal knowledge and trust in the development of new products through user-producer co-operation.

John Holmes studying the Californian agglomeration went along theoretical lines of transaction cost theory. He rooted flexibility in the division of labour in production and linked that to agglomeration via analysis of the transaction costs associated with the interfirm linkages, i.e. traded exchange. This analysis is parallel to a major trend in business economics, i.e. that of network forms of production. The transaction cost theory is about the allocation through cost-minimization owing to its concentration on the traded input-output relationships. The evolutionary theory and knowledge based view in the strategic management open the way to understanding "untraded" interdependencies, which does not appear in recorded input-output transactions (Storper, 1997, Storper and Salais, 1992).

Another significant challenge and difficulty in the present study was to assess the transition to the market economy and its impact on clusters and competitiveness. In this respect one shall mention the territorial-industrial complexes by Kolosovsky (1969) approach that included creation of both production facilities and a network of specialized higher educational establishments and R&D organisations in the certain region that was a central national and regional industrial policy and planning tool in the Soviet period. Implementation of this approach resulted in the major distortions in the production allocation decisions and, as a result of the on-going changes, the regional industrial landscape is bound to change substantially in Russia. We believe that material presented in our study could shed some light on the processes of re-allocation in the Russian economy. We used also Porter diamond model to assess the regional competitiveness in the Northwest Russia. Brown and Brown (1998) examined empirically the structure-conduct-performance paradigm in Russia and found supporting evidence. Therefore we believe that there is at least some evidence that one of the corner stones of the Porter approach, i.e. industrial organization approach is suitable to assess the period of transition.

3 Identification of the Forest Cluster of Northwest Russia

3.1 Brief History of the Cluster

The Pre-Soviet Period

The forest industry is the oldest industrial sector of Northwest Russia. Timber harvesting for wooden-shipbuilding, construction, heating and other economic needs began here long ago.

The industry developed rapidly in the early 18th century, when Peter the Great founded the largest port and the capital of Russia, St. Petersburg – and the newly created and growing fleet was in need of lumber and other materials. During that time many new sawmills were built in Northwest Russia.

The regional pulp and paper industry also dates back to the early 18th century. In 1716 the Krasnoselskaya paper mill was founded, and two years later the St. Petersburg paper mill was built.

During the 18th and 19th centuries the forest industry remained the leading industry in Northwest Russia.

Table 3.1 Share of the Forest Industry in Industrial Production in Some Regions of Northwest Russia at the Beginning of the 20th Century

Province	Total industrial output, RUR million	Forest industry output, RUR million	Share of the forest industry, %
St. Petersburg	45.4	14.1	31
Novgorod	19.6	6.7	34
Olonetsk*	4.8	3	62
Pskov	4.7	1.3	28

* At present, most of the area of the former Olonetsk province is a part of the Republic of Karelia.

Source: Lavritshev, A. Economic geography of the Soviet Union, Moscow, 1986

The forest industry made up a large share of the industrial production of the Olonetsk province, as well as of the Arkhangelsk and Vologda provinces. The companies of the Vologda province harvested and sawed timber for consumers in St. Petersburg, while the mills of the Ark-

hangelsk province mainly exported their products to Europe. England was the major importer of Northwest Russia wood-based products.

On the whole, the development of the forest industry promoted industrial growth in Northwest Russia. Many large metallurgy and machine-building companies, such as the Izhora plant in St. Petersburg, were established on the sites of the former sawmills.

The Soviet Period

During the Soviet period, many of the still-existing large mills were put into operation, while some of the old ones were expanded and modernized. In the Soviet period harvesting volumes in Northwest Russia grew significantly. The forestry and harvesting were carried out in accordance with the State Development Plans.

Table 3.2 Modernization of the Largest Companies of the Forest Cluster

Manufacturer	Year of Foundation/ Most recent reconstruction
Kotlas PPM	1969 / n.a.
Arkhangelsk PPM	1940 / 1980s
Solombala PPM	1936 / 1960s
Syktyvkar PPM	1969 / n.a.
Segezha PPM	1939 / 1980
Kondopoga PPM	1929 / 1963
Svetogorsk PPM	1887 / 1985
Vyborg PPM	1936 / 1988
Syas PPM	1928 / 1969
Neman PPM	1914/ 1970s

During World War II, Russia conquered the Karelian Isthmus and some other areas of Finland. As a result, Russia obtained several pulp and paper mills (Enso's Svetogorsk PPM, Vyborg PPM), sawmills and hydroelectric power plants that generated power for mills located in that area.

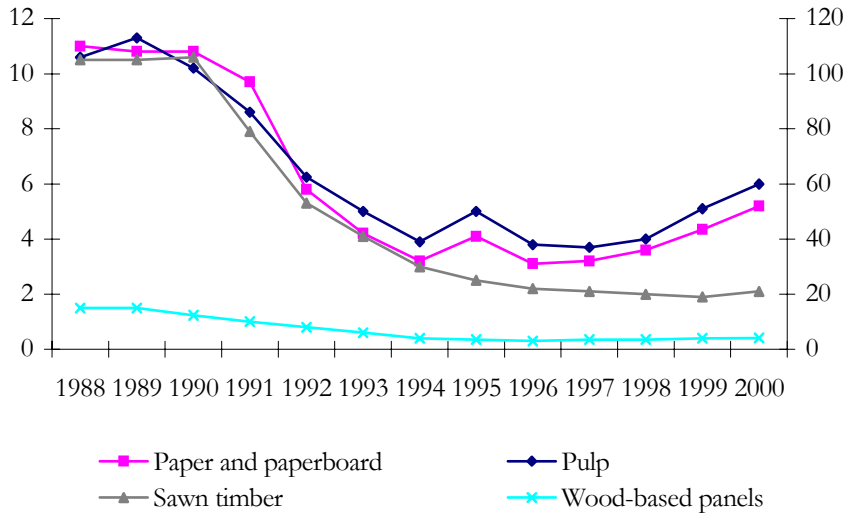
The industrial policy of that period was primarily oriented toward the development of large-scale production with the goal of self-sufficiency within the domestic market and total employment. This resulted in poor efficiency and profitability, low production flexibility, limited product range and intensive environmental pollution. In 1988, for example, Priozersk PPM had to be shut down in order to save the ecosystem of Lake Ladoga due to disregard of environmental issues.

Nevertheless, by the end of the 1980's the forest industry was considered to be among the leading and most rapidly developing industries of Northwest Russia.

The Period of Transition

In the 1990's, as a result of radical economic and institutional reforms, the production of the forest industries in Russia decreased two to three times on average (for some products – such as forest chemicals and standard wooden houses – more than ten times). The decline in the forest industries reached its lowest point in the mid 90's. After the crisis of August 1998, production volumes grew due to favourable world market prices and the devaluation of the rouble, which made domestic manufacturing profitable. The production volumes, however, are still much lower as compared to the pre-reform period.

Figure 3.1 Production of Primary Forest Products in Russia in 1988-2000*



* Right axis: sawn timber and panels, million m^3; left axis: pulp and paper and paperboard, million tons.
Source: Competitiveness of Russian Forest Industry, Jaakko Poyry Consulting Oy, 2002

The sudden reduction of investments in fixed capital led to a lag in the technological development of the Russian forest industry in comparison with companies in developed countries. The share of forest products with a relatively high added value also decreased in that period.

The centralized planning system of the socialist state was dismantled at that time, resulting in the severing of traditional links within the indus-

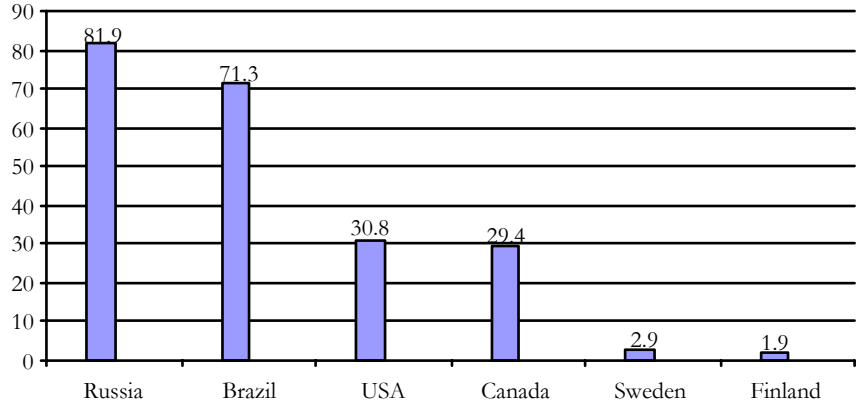
try. This had a significant negative impact on the development of forest industries in the 90's.

Privatisation of the forestry companies in some cases was accompanied by considerable interruptions in production (Vyborg and Segezha PPMs) and numerous conflicts and struggles for influence over the leading companies. At present, corruption is still common, and property is still being redistributed. Currently forest industries are characterized by a very low business transparency.

3.2 The Current Condition of Forest Stock

Russia has by far the largest forest stock in the world. It possesses much more wood resources than any other European country. Large forest stock is the main competitive advantage of Russian forest industries.

Figure 3.2 Forest Stock by Countries, billion m^3



Source: UN ECE/FAO, Forest Products Annual Market Review, 2000-2001

More than a half (54%) of all the forested area of the European part of Russia (about 11% of the total Russian forest stock) and two thirds (67%) of boreal coniferous forests are located in Northwest Russia. This region is of primary interest for forestry companies owing to its proximity to markets of the EU (in comparison with other Russian regions).

The Arkhangelsk region and the Republic of Komi possess the largest forest stock in Northwest Russia. The Republic of Karelia, the Vologda, and Leningrad regions also have considerable forest resources. The territories in which agriculture began to develop long ago (the Pskov and Kaliningrad regions), and also the far northern areas (the Murmansk region and the Nenetsk district), do not have significant forest stock. There are practically no forests in the Nenetsk district.

Table 3.3 Forest Resources of Northwest Russia in 1993 and 1998

	Forested Area, thousand hectares		Total Raw Wood Stock, million m^3		Including Coniferous Wood, million m^3	
	1993	**1998**	**1993**	**1998**	**1993**	**1998**
Northwest Federal District, total	81,251	83,153	8,808	9,102	4,753*	4,810*
Republic of Karelia	8,983	9,267	849	919	764	814
Republic of Komi	29,743	30,042	2,956	2,960	2,510	2,495
Arkhangelsk Region	21,631	22,434	2,392	2,454	N/a**	N/a**
Vologda Region	6,874	7,178	960	990	532	536
Kaliningrad Region	225	228	41	40	14	13
Leningrad Region	3,387	3,475	580	636	401	412
Murmansk Region	4,961	5,026	200	198	172	171
Novgorod Region	3,474	3,483	523	577	224	231
Pskov Region	1,973	2,020	307	328	136	138

* Excluding data on Arkhangelsk region
** Approximately 2,000 million m^3
Source: Goskomstat (Russian State Committee for Statistics), 2000

The AAC (annual allowable cut) in Northwest Russia is about 100 mln.m^3, while the actual harvesting volumes in the 90s were about 1/2 of the AAC. The actual harvesting volumes exceed 2/3 of AAC only in the Republic of Karelia, owing to its proximity to the Finnish market and developed forest road network.

On the one hand, the reduction of harvesting volumes have contributed to the preservation of forest stock and even partially compensated for the almost complete curtailment of reforestation in the past decade. On the other hand, however, the quality of the forest stock is decreasing: the most valuable and easily accessible softwood is first to be cut down, and the natural growth occurs mainly due to the increase in less valuable hardwood (birch, aspen etc.); natural reforestation of boreal coniferous forests takes up to 200-300 years. In addition, the share of over-mature trees growing in more inaccessible areas is increasing, which also lowers the value of raw wood stock.

It is necessary for Russian forestry to develop new solutions on the basis of the positive experience of other countries. The Pskov Model Forest should be mentioned as an example of a new long-term forestry approach.

Table 3.4 Harvesting Volumes of Allowable Cut in Northwest Russia in 1994-1999, %

	1994	1995	1996	1997	1998	1999
Northwest Federal District, total	37.4	40.1	32.5	31.5	33.8	42.3
Republic of Karelia	64.9	66.3	60.3	60.3	65.3	71.6
Republic of Komi	27.6	31.9	21.8	17.8	19.5	25.9
Arkhangelsk Region	40.6	41	36.4	36.7	36.4	47.1
Vologda Region	40	40.6	29.9	30.1	32.3	42
Kaliningrad Region	34.7	49.8	36.6	24.1	26.3	51.4
Leningrad Region	36.5	46.1	36.8	36.8	38.8	49.5
Murmansk Region	25	24.3	26.5	17.5	14.1	23.2
Novgorod Region	36.2	37.9	32.8	32.8	40.7	44.9
Pskov Region	21.2	25	19.4	22.2	25.7	33.5

Source: Goskomstat (Russian State Committee for Statistics), 2000

Box 3.1 Pskov Model Forest – A Sustainable Forestry Model

The Pskov Model Forest (PMF) project was initiated by the World Wildlife Fund (WWF) in the Pskov region of Russia. The project focuses on the development of a sustainable and economically effective model of forest management in a specific forest area and is also aimed at promoting the positive experience of sustainable forestry in Russia.

The PMF project was launched in 2002 on an area of 46,000 hectares in the north of the Pskov region. Specialists developed a database, which included all the information required for sustainable forest management: forest stock conditions, road conditions, ecological limitations, existing and specially created standards, etc. The model helps to calculate economic feasibility of carrying out different kinds of forestry management. Also it also makes possible the forecasting of the profitability of harvesting activities. It enables specialists to evaluate many kinds of forest management from the point of view of different priorities: ecological, economic, and social. In addition, the new model helps to predict how the forest stock will develop in 100 years depending on the forestry decisions that are made today.

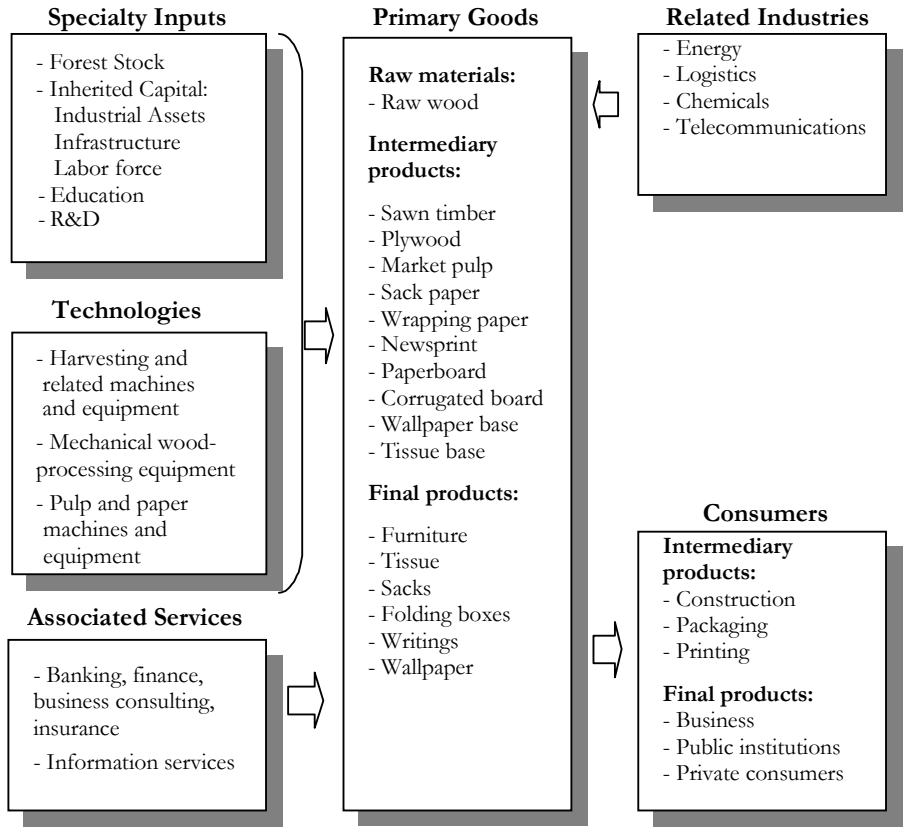
3.3 Cluster Structure

A significant number of small, medium, and large harvesting, mechanical wood-processing, and pulp-and-paper companies operate in Northwest Russia. These are the primary products manufacturers. According to the approach introduced by M. Porter and further developed by the scholars

of business economics and strategic management the regional cluster includes also the companies from the related and supporting industries (chemicals, transport and logistics, energy etc), forest industry equipment and service suppliers, R&D and educational institutions, etc located in same geographic area. In addition, the interaction of the aforementioned elements is implemented and analysed within the framework of the potentially large and already growing domestic and regional market for wood-based products. Existing concentration of the above mentioned companies and the local growing demand create prerequisites for considering the future possibilities of the forest cluster: a large, sustainable regional agglomeration of wood-based companies and supporting industries, built around producers of the most competitive primary goods, which already have a significant share on the domestic and international markets and possess a growth potential.

The structure of the forest cluster of Northwest Russia can be presented in the form of the following cluster chart:

Figure 3.3 Structure of the Forest Cluster of Northwest Russia



The list of primary goods of the cluster reveals the low level of technologies applied by producers. At present, the share of products with a high added value is relatively small, and the product range is rather poor. Among the products with a relatively high added value and a large share in production of the Northwest Russian forest industry, pulp and low-grade paper products prevail. However, pulp is considered rather close to raw materials on the world market. Thus, pulp-and-paper companies cannot gain a significant margin, unless they have a considerable production cost advantage. They achieve such an advantage by means of the exploitation of cheap Russian resources and labour force.

The most significant specialized resources of Northwest Russia are its vast forest stock (which consists of softwood by more than a half) and qualified workforce. The training of specialists is implemented through a well-developed network of specialized educational institutions. The main educational centers of the forest industry in Northwest Russia are St. Petersburg, Arkhangelsk, and Petrozavodsk.

Presently, most of the technologies utilized by the companies of the forest cluster are outdated and the operating equipment requires modernization. The regional manufacturers of equipment specialize primarily in production of harvesting and pulp-and-paper machinery. However, their production volumes have been rather small in the past decade, because the domestic equipment producers are not competitive on the world market. As a result, forest companies prefer to buy imported equipment. At the same time, most of the companies still cannot afford to purchase new imported equipment. It is for this reason that they must either buy second-hand imported equipment, or simply use their old equipment. Other companies (which are in the minority) use new cheap equipment produced by domestic manufacturers, though its performance is rather low.

Companies of Northwest Russia (as compared to Siberia and the Russian Far East) operate with a relatively well-developed transport infrastructure. Its density varies from region to region, being higher in the southwest and rather small in the north and northeast. Railroads and water transport provide most of the forest cargo transportation within the region. Railroads are state-owned, whereas water transport belongs to private companies. The quality of logistics in the region, as in Russia on the whole, is below Western-European standards. Delayed cargo deliveries and the low quality of transportation are typical features of the Russian transport system.

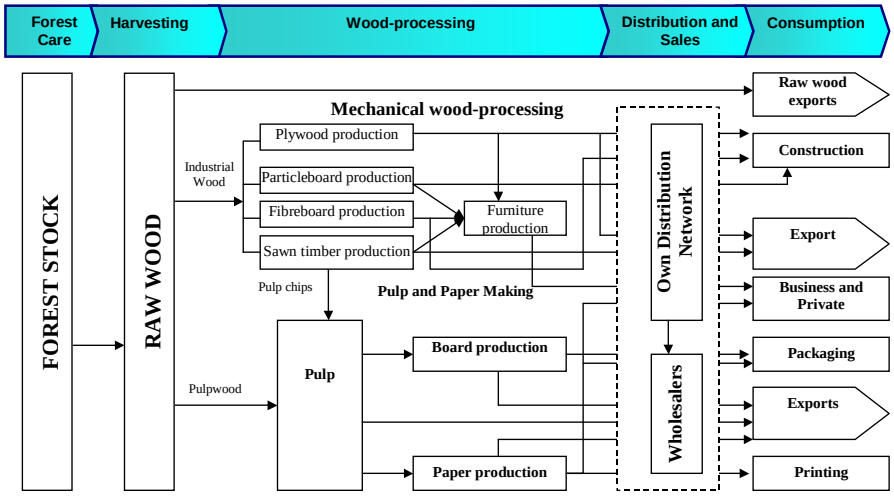
Private companies RAO UES of Russia and RAO Gazprom controlled by state own power generation and distribution networks.

Northwest Russia has a system of hydro-, thermo- and nuclear power plants, which produce today sufficient power, although companies depend on tariffs determined by the regional authorities. The industrial use of energy is quite ineffective in the region. There is a lack of small power-generating facilities, which could utilize the by-products of wood processing. Ever-increasing energy tariffs (as well as transport tariffs) result in a gradual reduction of the price advantage of the Russian companies on the international markets. In the future, however, this may stimulate the companies to improve their own power generation capacities and to use energy more effectively.

There are almost no chemicals produced for the pulp-and-paper industry in Northwest Russia. Presently, regional pulp-and-paper companies depend on imported chemicals (imported mostly from Germany and Finland).

The role of financial institutions, insurance, business and environmental consulting, and information technology has increased substantially for the forest cluster during the past decade. However, at present, their influence on the cluster development is very weak in comparison with European companies but expected to grow fast in the coming years.

Figure 3.4 Flow Chart of the Forest Cluster of Northwest Russia



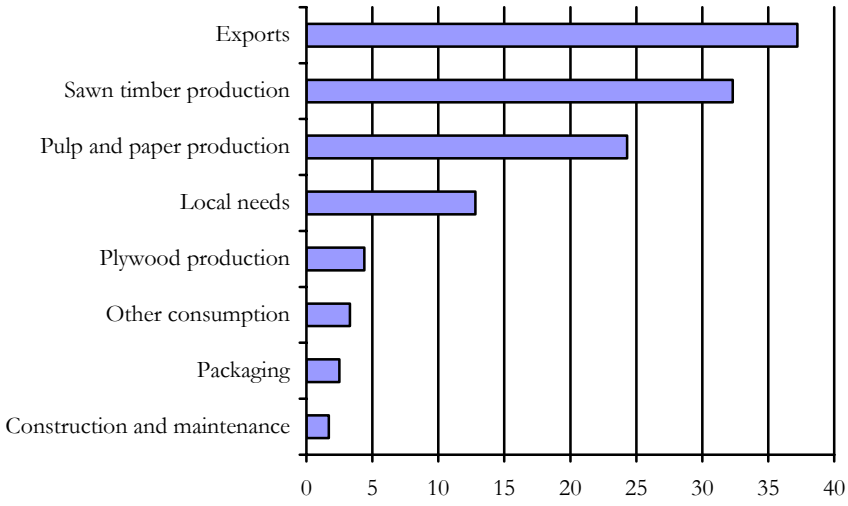
Domestic consumers of the cluster primary goods form an extensive market, which accommodates a wide range of products, including the products that are manufactured utilizing very old technologies. Thus, even fairly ineffective producers can find their market niche. After a sig-

nificant drop in the 1990s domestic demand is now growing. Local companies, however, find it rather hard to cope with the constant fluctuations, thus creating an opportunity for international players to increase their market share, primarily in the better quality products segments.

The key feature of the forest cluster, and one that greatly influences the interactions amongst the companies that form it is its dependence on the main natural resource of the cluster – wood. In course of processing, the wood is consecutively transformed at different stages of the technological chain. Therefore, along with the manufacture of final products, the cluster companies often produce input for other companies occupying later stages of the value chain.

Presently in Russia, about 1/3 of the harvested timber is exported. The largest domestic roundwood consumers are sawmills and pulp-and-paper mills.

Figure 3.5 Roundwood Use in Russia of Total 118.5 mln. m^3



Source: Research and Design Institute on Economics, Production Management and Information for the Forest, Pulp and Paper and Mechanical Wood-processing Industries (2002).

During recent years, corporate strategy within the cluster has led to the establishment of a number of vertically integrated holding companies, which were formed around the largest players of the pulp-and-paper and mechanical wood processing industries. Integration is observed in three main areas:

1. Harvesting → Mechanical Wood Processing
   (examples: Solombala LDK, Orimi).
2. Harvesting → Pulp-and-Paper
   (examples: Ilim Pulp Enterprise, Syktyvkar LPK)
3. Harvesting → Mechanical Wood Processing
   → Pulp-and-Paper
   (examples: Titan Group, SegezhaBumProm)

Integration in the third area aims at strategic coverage of the market. Two processing sub sectors of the forest cluster – mechanical wood-processing and pulp-and-paper – have weak relations with one another. The only example of interaction is the use of pulp chips in the pulp-and-paper industry, which are the by-products of sawn timber production.

3.4 The Role of the Forest Cluster in the Economy of Northwest Russia

The forest industry has traditionally had a significant share in the Russian economy.

Table 3.5 Share of the Forest Industry in the Russian Economy

GDP	2.9%
Russian exports	5.0%
Industrial production	4.8%
Industrial employment	8.0%

Source: Centre for Strategic Research, 2001

Northwest Russia has the most developed forest industry in Russia. More than 50% of Russian forest products are now produced in Northwest Russia. Its advantages are:

- Vast boreal forest stock
- Relatively developed infrastructure
- Qualified labour force
- Proximity to European markets.

There is a high concentration of forest cluster companies in Northwest Russia as compared with other Russian regions. More than one third of Russian harvesting and mechanical wood-processing companies, and a half of the largest pulp-and-paper mills, operate in Northwest Russia. As a result, the region occupies the leading position among the regions of Russia in the manufacture of the main wood products.

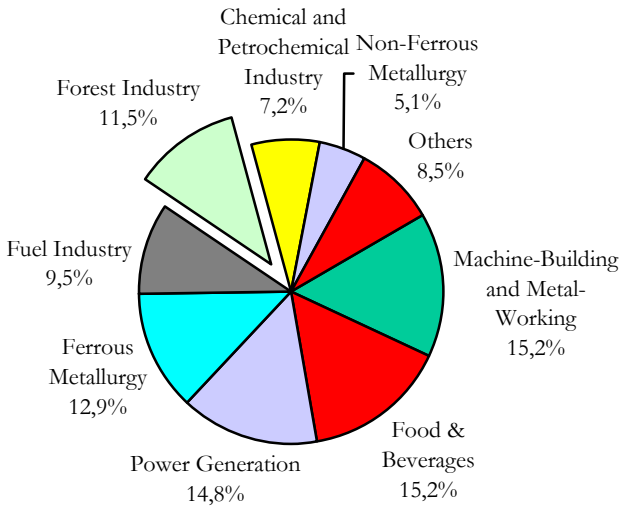
Table 3.6 Shares of Federal Districts of Russia in Total Output of Forest Products, %

	Round wood	Sawn wood	Pulp	Paper and paperboard
Northwest	**35**	**27**	**60**	**57**
Siberian	22	24	32	7
Privolzhsky	16	22	8	27
Far-Eastern	11	5	0	1
Central	8	13	0	6
Urals	7	9	0	1
Southern	1	0	0	1

Source: Goskomstat (Russian State Committee for Statistics), 2001

The forest industry occupies the fifth position among the industries of Northwest Russia in terms of total sales, but its lag behind the leading industries is not large.

Figure 3.6 Share of the Forest Industry in the Industrial Production Structure of Northwest Russia in 1999



Source: Goskomstat (Russian State Committee for Statistics)

It is interesting to compare this data with countries of the Western Europe where the forest cluster takes a significant share.

As we see from comparison in Table 3.7, even the countries with much less significant wood reserves have comparable or even larger share of the forest industry in their total industrial production. The low processing and value added and grey, unrecorded production are the main reasons behind the relatively low share of forest products in the Northwest Rus-

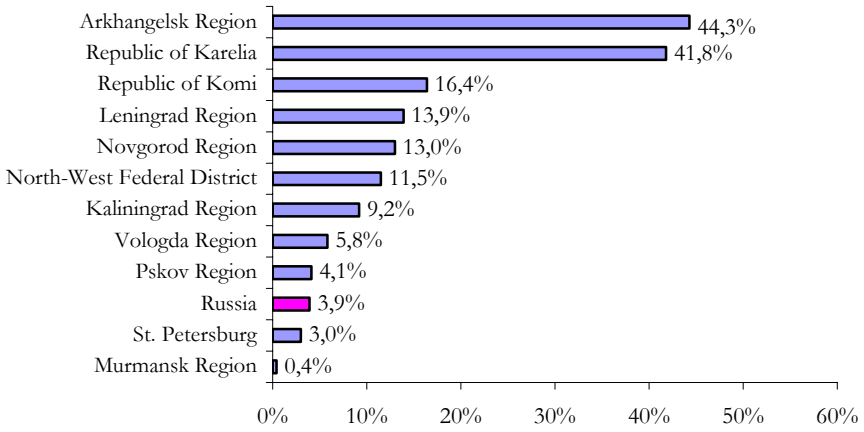
Table 3.7 Share of the Forest Industry in the Industrial Production Structure of Western European Countries

Country	Share of the forest industry, %	Country	Share of the forest industry, %
Finland	33.7	Italy	11.0
Sweden	21.5	France	10.6
Austria	16.5	Greece	8.2
Denmark	15.3	Ireland	5.1
UK	12.9	Luxembourg	3.4

Source: Colin J. Hazley. Forest-Based and Related Industries of the European Union – Industrial Districts, Clusters and Agglomerations, ETLA, Helsinki, 2000

sia industrial production today. We believe that in future the forest cluster will substantially increase its importance in the industrial structure of Northwest Russia and the whole Russia.

Figure 3.7 Share of the Forest Industry in the Industrial Production Structure in 1999



Source: Goskomstat (Russian State Committee for Statistics)

Already today the forest cluster plays a key role in the economy of many regions of Northwest Russia. The forest industry has the largest share in the economies of the Arkhangelsk region and Republic of Karelia. The Republic of Komi is also one of the major producers of forest products in Russia and has a very large forest stock. However, this region lacks the opportunity to exploit its forest resources more effectively due to its poorly developed transport infrastructure and its remoteness from main markets.

The share of every region in total output of the Northwest Russian forest industry is rather stable, and for the last five years there have not been any significant changes.

The specialization of the forest cluster of Northwest Russia (and of Russia as a whole) has been determined by the production of raw materials, as well as by products with low added value. However, in comparison with other Russian regions (Siberia, for example), the Northwest Russian forest cluster is more focused on products of deeper processing.

3.5 Macro Trends in the Global Forest Industry

The forest industry is an important sector of the world economy. According to UN data, the world pulp-and-paper market alone equalled USD 130 billion in 1998; this is comparable with the turnover of the copper and aluminium markets. The Russian share in the world's forest industry today is about 2.3%, which is too small, given the fact that Russia possesses 24% of the world's forest stock.

The experts of FAO UN cite the following trends in the development of the forest industry, which are easily recognizable through the analysis of statistical data of the past decade:

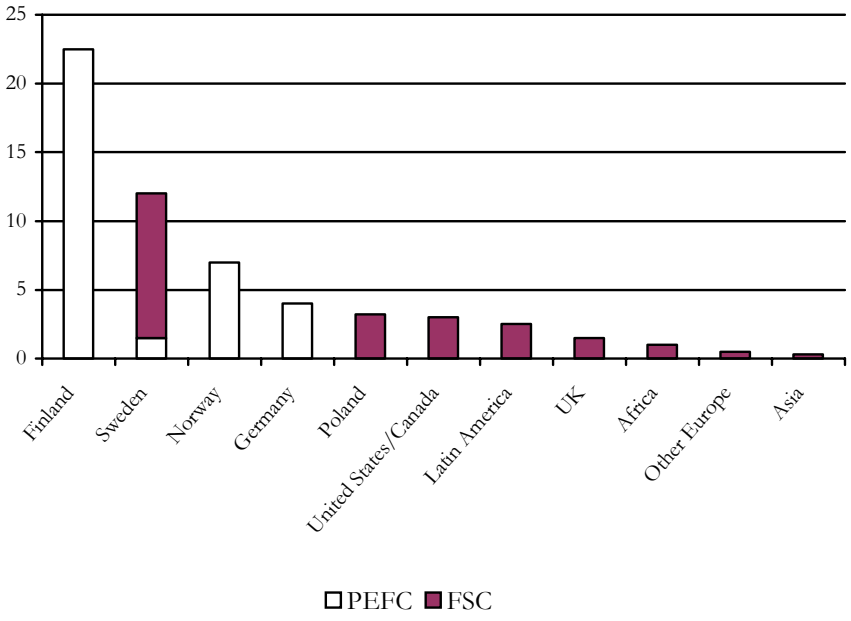
1) **The world's consumption of wood-based products continues to increase.** For example, the consumption of pulp-and-paper products is forecasted to reach 346 million tons by the year 2005, while it amounted to 239 million tons in 1990. However, the markets for different forest products have their own peculiarities of development. The world pulp-and-paper market is of particular importance for Russia because about 50% of Russian pulp and paper products is exported. It is characterized by a high degree of concentration – the share of the five largest producers (companies of the USA, Japan, and Finland) is 20-30%. A business cycle for the pulp-and-paper industry lasts for 3-5 years. During recession years, manufacturers lower the production volumes but the overall price level gradually decreases.
2) **Active development of new markets for forest products and revival of old ones.** The largest new markets arose in Eastern Asia: Korea, China, Malaysia, Indonesia, Thailand, and others. In the countries of Central and Eastern Europe (including Russia) there are signs of economic recovery after the abrupt slump associated with the end of the socialist economy. However, the domestic markets of the former Soviet-block countries are still much smaller as compared with the countries with a developed market economy. The development of the Russian domestic market is especially important for the forest industry of Northwest Russia. In the year 2000 it grew by 7%.
3) **Overproduction is increasing.** Despite the growth of the world's consumption of forest products, overproduction is increasing. This is

already reflected in the reduction of the world price for pulp. New production capacities are being built around the world: plants in Brazil, China[3], in the countries of South-East Asia.

4) **Consolidation of the main players.** A number of large mergers and acquisitions[4] that took place in the world pulp-and-paper industry during recent years is evidence of the general drive for consolidation. Companies interested in increasing their share on the market in the future are likely to give priority to acquisitions rather than to expansion of their production capacities that are already redundant.

5) **Rapidly growing forest certification.** In 2001, the overall area of certified forests in the world exceeded 80 million hectares. Certification is aimed at the improvement of the environment, which has been promoted on the European markets primarily (especially in Great Britain, Germany, and Netherlands). Certification is carried out through several systems that are basically similar.

Figure 3.8 Certified Forests by the Mid 2001, million hectares



Source: ECE/FAO Forest Products Annual Market Review, 2001

---

3 According to estimates of *Expert* magazine, in the coming two years China is expected to introduce a capacity of 7 million tons of pulp a year, while the volume of the world spot market is about 40 million.

4 Abitibi-Consolidated acquired its rival Donohue, International Paper took over Champion, Stora Enso acquired Consolidated Papers, UPM-Kymmene now controls Canadian company Repap, Nippon Paper has merged with Daishowa Paper, and so on.

Box 3.2 The Pan-European Forest Certification System

The Pan-European Forest Certification System (PEFC) provides a framework and a foundation for national forest certification systems. The PEFC was initiated on June 30, 1999. It is a voluntary initiative that focuses on the private sector. Consumers of the PEFC forest products can be sure that these products come from the certified forests that are exploited in accordance with sustainable forestry criteria. These criteria were approved in the framework of the conferences on forest conservation in Europe that took place in Helsinki and Lisbon in 1993 and 1998, respectively.

Sustainable forestry is defined as maintenance and exploitation of forest stock using methods that provide conservation of natural diversity, productivity, reproduction and viability of forests. It is also important to ensure the possibility of managing forests in a way that is economically viable, environmentally appropriate and socially beneficial on local, national and international levels, and not harmful to other ecosystems.

The definition of sustainable forestry that was adopted is characterized by the following criteria:

1. Conservation and appropriate development of forest resources, providing for the increase of their share in carbon cycles on the Earth;
2. Conservation of a healthy and viable forest ecosystem;
3. Conservation of productive functions of the forests (i.e. timber harvesting and manufacturing of forestry products) and encouragement of their exploitation;
4. Conservation, protection and appropriate enrichment of the natural diversity of forest ecosystems;
5. Conservation and development of wood-based ecosystems, such as land and water conservation;
6. Social and economic criteria.

6) **The increase of interaction and interrelations of the markets, the trend of product price homogeneity.**

7) **The increase of capital mobility and the striving of investors to diversify at the global level.** Investors prefer large-scale companies with a limited product range.

8) **The expansion of the trade of products with higher added value, and at the same time, imposition of limitations on exports of non-processed products.** Multinational companies

strive to move production to countries with a cheaper labour force and resources. A question arises for the regional forest industry: should it continue marketing products with low added value, or should it radically change its industrial policy and focus on products with higher added value?

9) **Companies improve logistics at all the stages – from forest harvesting to end product shipping – and, as a result, reduce their transportation costs. This promotes the development of international trade.** This trend is closely connected to the rapid development of the IT sector, which affects all the branches of the forest industry today. In terms of the effectiveness of its logistics, Russia is lagging far behind. The bureaucracy, poor infrastructure, low transparency of business and the existence of a shadow economy are among the main reasons for this lag.

An unfavourable factor for the development of the forest industry is the continuous introduction and penetration of substitutes for wood-based materials and products. These materials, however, cannot compete ecologically. The other unfavourable factor for the forest industry is the probable reduction of paper consumption in the future as a result of expanding electronic technologies.

4 International Trade and Position on the World Market

4.1 Competitiveness and Potential of Import Substitution

Presently, the currency earnings from Russian exports of forest products make up about $4.5 billion, which can be compared to the currency earnings from the exports of non-ferrous metals (about $6.5 billion).

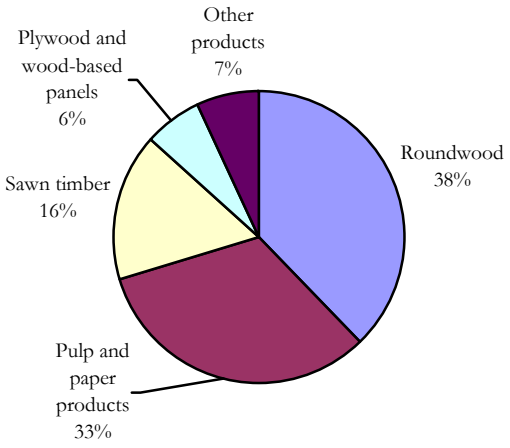
Table 4.1 Total Currency Earnings from Russia's Forest Exports

Year	1995	1996	1997	1998	1999	2000	2001
Billion US dollars	4.5	3.3	3.0	3.1	3.3	4.0	4.4

Source: Goskomstat (Russian State Committee for Statistics), 2001

Roundwood and pulp-and-paper products make up more than two thirds of the total forest exports.

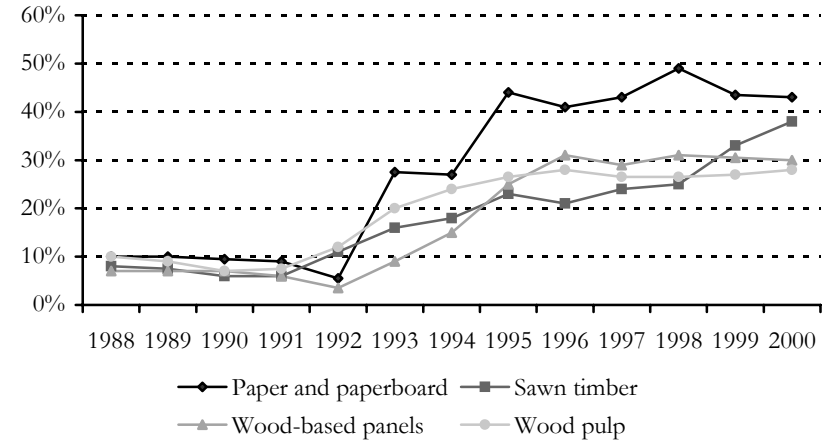
Figure 4.1 Russian Forest Export Structure by Products, %



Source: Research and Design Institute on Economics, Production Management and Information for Forest, Pulp-and-paper and Mechanical Wood-processing Industries, 2002

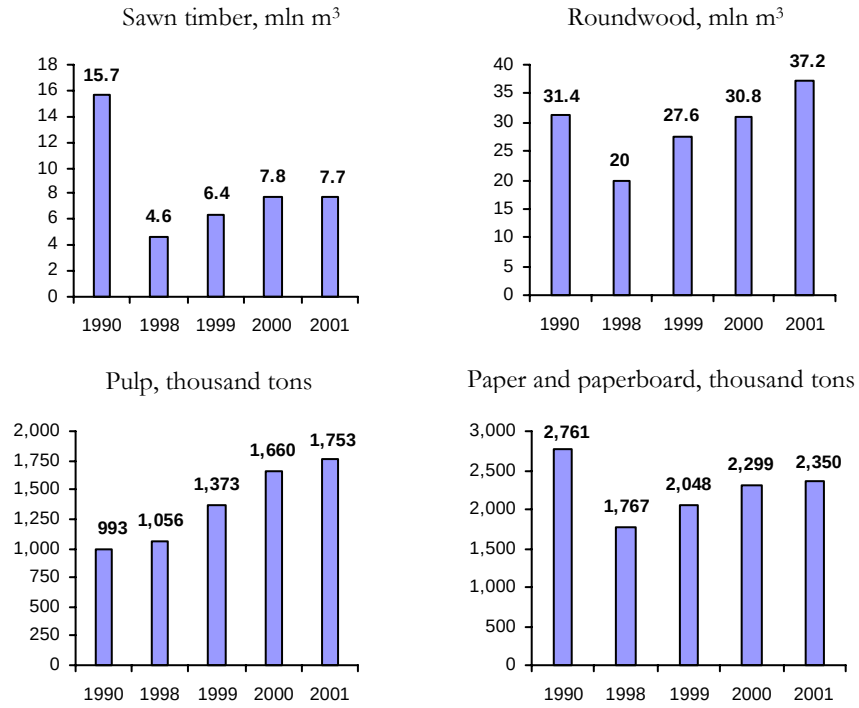
Since 1992, there has been a rapid increase in exports within the total output of Russian forest products.

Figure 4.2 Volume of Exports in the Total Output of the Russian Forest Industry, %



Source: Competitiveness of Russian Forest Industry. Jaakko Pöyry Consulting Oy, 2002

Figure 4.3 Dynamics of Russian Forest Exports



Source: Research and Design Institute on Economics, Production Management and Information for Forest, Pulp and Paper and Mechanical Wood-processing Industries, 2002

This increase in export volume was accompanied by a significant fall in production volumes. At the same time, roundwood and pulp exports have already exceeded the level of pre-transition period.

As a result, the Russian forest industry today is export-oriented.

Table 4.2 Share of Russia in Total Output and Exports of the World Forest Industry, %

	Share in the Output	Share in the Exports
Roundwood	2.5	35.3
Sawn timber	5.0	6.9
Plywood	2.8	5.6
Paper and paperboard	1.2	2.5

Source: Center for Strategic Research, 2001

Viewing at the Northwest Russian forest cluster within the framework of the whole Russian forest industry, and taking into consideration the large relative portion of the Northwest Russian forest cluster in the total volume of production, it is also possible to extrapolate the results of the international trade analysis with high probability.

Table 4.3 Key Figures of Russia's Foreign Trade in Forest Products with OECD Countries

Index	Value
Total Exports, million US dollars	3,414
Share in total imports of OECD countries	1.52%
Total Imports, million US dollars	1,413
Share in total exports of OECD countries	0.67%
Trade balance, million US dollars	2,001

Source: OECD statistics (1999)

The statistics for Russia's international trade with countries belonging to the Organization for Economic Cooperation and Development (OECD) are used in this chapter for analyzing the position of the forest cluster on international markets. This approach, on the one hand, has some drawbacks, since it represents not the entire world market but only a part of it (about 80%). On the other hand, it is characterized by significant advantages for analysis, because the statistics available for OECD countries are rather reliable, and the OECD market is highly competitive. All of this enables us to analyze the competitiveness of Russian forest products more impartially and to extrapolate the results with more

reliability. The detailed information about methodology of foreign trade statistics analysis can be found in Methodology Box at the end of this chapter.

Table 4.4 Competitiveness of Russian Forest Products on OECD Markets

HS #	Product	Share in OECD imports	Exports from Russia, million US dollars	Trade balance, million US dollars
		2-digit level		
44	Wood and articles of wood; wood charcoal.	3.80%	2,416	2,265
47	Pulp of wood and of other fibrous cellulose materials; byproducts, etc	2.78%	460	439
		4-digit level		
4403	Wood in the rough, stripped of bark or sap-wood, or roughly squared	17.89%	1,542	1,524
4906	Plans and drawings for architectural etc, originals drawn by hand and copies	17.34%	33	30
4703	Chemical wood pulp, soda or sulfate, other than dissolving grades	3.60%	438	422
4412	Plywood, veneered panels and similar laminated wood	3.49%	226	222
4801	Newsprint, in rolls or sheets	3.38%	275	275
4407	Wood sawn and chipped lengthwise, sliced, peeled, planed, sanded etc	2.47%	556	552
4804	Uncoated craft paper and paperboard	2.20%	115	111
4704	Chemical wood pulp, sulphite, other than dis-solving grades	1.53%	12.6	12.5
4401	Fuel wood; wood in chips or particles; sawdust and wood byproducts and scrap	1.06%	27.1	27

Source: OECD statistics (1999)

Russia has a positive trade balance with OECD countries in forest products. The share of Russian exports in total imports of OECD countries is 1.52%, and the volume of imports of forest products in Russia is 0.67%. This proves the relative competitiveness of the Russian forest industry on international markets.

In order to carry out a more detailed analysis of the competitiveness of the forest industry, it makes sense to look at the statistics of international trade according to different product groups.

It is evident that Russia has a relatively high competitiveness on the markets of various forest products. Raw wood, plywood, newsprint and pulp are competitive export products of great importance for Russia.

In analysing competitiveness, however, it is useful to study not market shares but also actual market volumes for forest products, as well.

Table 4.5 The Largest Markets for Forest Products and the Position of Russia, HS 4-digit level

HS #	Product	OECD imports, million US dollars	Share in OECD imports	Exports from Russia, million US dollars	Trade balance, million US dollars
4407	Wood sawn, chipped lengthwise, sliced, peeled	22,527	2.47%	556	552
4810	Paper and paperboard, coated in rolls/sheets	17,153	0.00%	0.61	-113
4703	Chemical wood pulp, soda or sulfate, other than dissolving grades	12,167	3.60%	438	422
4802	Uncoated paper and paperboard for writing, punch card stock and punch tape paper	9,828	0.33%	32.7	21
4901	Printed books, brochures, leaflets and similar printed matter	8,821	0.12%	10.5	-24
4403	Wood in the rough, stripped of bark or sapwood, or roughly squared	8,622	17.89%	1,542	1,542
4801	Newsprint, in rolls or sheets	8,146	3.38%	275	274.7

Source: OECD statistics (1999)

The study shows that Russia does not have relative competitive advantages on all large markets for forest products. Russia has strong positions only on the markets of raw materials and products with low added value, such as industrial wood and pulp, and on the newsprint market. The Russian positions on large markets for products with high added value, such as coated paper and fine print paper, are negligible.

In order to investigate the competitive positions of the national forest sector even in more detail, we need to look at the Russian export volumes using a detailed, 6-digit classification. Table 4.6. presents the product groups with significant shares on the OECD markets (more than $1 million), where the portion of Russian forest industries exports exceeds the Russian average of 1.09%.

Table 4.6 Competitiveness of Russian Forest Products, HS 6-digit level

HS #	Product	Share in OECD imports	OECD imports, million US dollars	Exports from Russia, million US dollars	Trade balance, million US dollars
440320	Logs, poles, coniferous	27.89%	4,279	1,189	1,189
440399	Logs, non-coniferous	15.22%	2,087	317.7	317.6
441212	Plywood, at least 1 outer ply of non-coniferous wood (ply's <6 mm)	8.42%	1,865	157	156
441219	Plywood, at least 1 outer ply of coniferous wood (ply's <6 mm)	3.69%	1,200	44.2	44
480100	Newsprint, in rolls or sheets	3.38%	8,146	275	274.7
470321	Chemical wood pulp, soda or sulfate, coniferous, semi-bleached or bleached	3.28%	6,847	224.3	208.6
480411	Paper, kraftliner, in rolls, unbleached, uncoated	3.24%	1,814	58.6	56.2
440710	Lumber, coniferous (softwood) 6 mm and thicker	3.17%	16,490	523	521
470329	Chemical wood pulp, soda and sulfate, non-coniferous, semi-bleached and bleached	2.88%	4,920	141.7	141.7

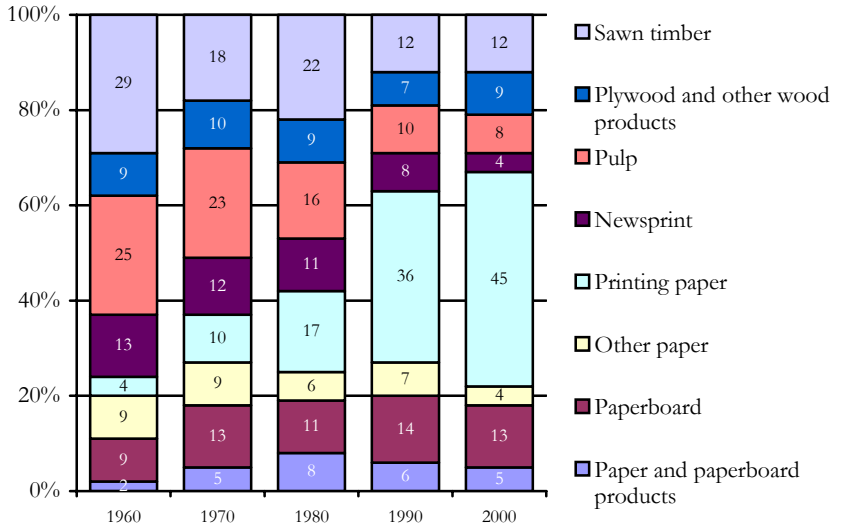
Source: OECD statistics (1999)

Detailed analysis of competitive Russian product groups also shows the obvious focus on raw wood of the forest exports. A careful examina-

tion shows the main export products to be low-processed wood and intermediary products, such as pulp and plywood.

The export dynamics of the Finnish forest industry, on the contrary, demonstrate a steady increase in the share of products with high added value:

Figure 4.4 Structure of Exports of the Forest Industry of Finland by Main Product Group, %



Source: Finnish Forest Industries Federation, 2001

Russia, with its relatively developed forest industry, nevertheless imports large amounts of forest products. This is why opportunities for import substitution should be considered. In order to value these opportunities we shall look at the import volume of Russia in relation to the total export volume of OECD countries in different forest product groups.

The total imports of Russia made up 0.52% of the total exports of OECD countries in 1999. In product groups where the Russian share is higher than the average, there is a relative potential for import substitution (depending on the market capacity and opportunity to achieve the economies of scale in the local manufacturing facilities).

However, as we can see from Table 4.7, the largest volume of exports of OECD countries does not signify actual large volumes of imports to Russia. Later in this section we present an analysis of opportunities for import substitution that takes into account both relative and absolute indicators of import shares to Russia in relation to the total exports of OECD countries.

Product groups that belong to the first cluster are characterized by significant imports to Russia and represent a large share of exports of OECD countries. Thus, the first cluster is considered as markets that have very significant opportunities for import substitution in Russia. The second cluster is also characterized by large imports to Russia but represents a somewhat smaller share in exports of OECD countries as compared with the first cluster. Product groups of this cluster have good potential for import substitution in Russia. In the third cluster, the average volumes of imports to Russia are rather small, and the average share in OECD countries exports is lower than the Russian average (0.52%). Product groups of this cluster do not have much potential for import substitution.

Table 4.7 Relative Potential of Import Substitution of Forest Products in Russia

HS #	Product	Share in OECD exports	Imports to Russia, million US dollars	OECD exports, million US dollars	Trade balance, million US dollars
48	Paper and paperboard; art of paper pulp, paper and paperboard	0.74%	628	85,504	-170
49	Printed books, newspapers, pictures and other product etc	0.73%	159.5	21,820	-107
4814	Wallpaper and similar wall coverings; window transparencies of paper	5.08%	51.3	1,011	-51.2
4813	Cigarette paper cut to size or in form of booklets or tubes	4.32%	26	603	26
4812	Filter blocks, slabs and plates, of paper pulp	2.70%	1.8	66.8	-1.8
4821	Paper or paperboard labels of all kinds	2.33%	43.4	1,864	-43.3
4907	Unused postage, revenue stamps; check forms, banknotes, bond certificate, etc	1.79%	9.5	534.6	-9
4902	Newspapers, journals and periodicals	1.72%	68.2	3,954	-66.6
4418	Builders' joinery and carpentry of wood, including cellular wood panel	1.45%	78	5,372	-60

Source: OECD statistics (1999)

Table 4.8 Import Substitution Potential of International Trade Products

Cluster	Product (HS)	Average imports to Russia, million US dollars	Average share in OECD exports	Interpretation
1	Wallpaper and similar wall coverings; window transparencies of paper; containers, packaging of paper; box files, letter trays, etc. of paper; builders' joinery and carpentry of wood, including cellular wood paneling; other furniture and parts thereof	171.5	2.53%	Very significant potential for import substitution
2	Paper and paperboard, coated; paper, paperboard, cell wadding and web of cell fibs, coated, impregnated etc; cigarette paper cut to size or in form of booklets or tubes; products of paper (sanitary and hospital); paper or paperboard labels of all kinds; other paper products, paperboard; newspapers, journals and periodicals; printed matter, including printed pictures and photographs	58	1.53%	Good potential for import substitution
3	All other articles for wood-based products	507	04%	Insignificant potential for import substitution

The characteristics of products of the first two clusters are summarized in Table 4.9. (products of the first cluster are shown above):

As we see from the Table 4.9. the products with high added value have the most potential for import substitution. Among them different kinds of paper and paperboard products prevail.

Table 4.9 Potential of Import Substitution for Forest Products, HS 4-digit products

HS #	Product	Share in OECD exports	Imports to Russia, million US dollars	OECD exports, million US dollars	Trade balance, million US dollars
9403	Kitchen furniture, wooden	1.62%	406.6	25,120	-375
4819	Containers, packing of paper; box files, letter trays etc of paper	1.96%	150	7,632	-149
4418	Builders' joinery and carpentry of wood, including cellular wood panel	1.45%	78	5,371	-60
4814	Wallpaper and similar wall coverings; window transparencies of paper	5.08%	52	1,011	-52
4810	Paper and paperboard, coated, binder and no other coating	0.59%	113.6	19,341	-113
4902	Newspapers, journals and periodicals	1.72%	68.1	3,954	-66.6
4811	Paper, paperboard, cell wadding and web of cell fibs, coated, impregnated etc	0.94%	68	7,262	-67.8
4818	Paper products, sanitary and hospital; apparel and clothing, paper accesso-ries	0.84%	60	7,178	-58.5
4821	Paper or paperboard labels of all kinds	2.33%	43.4	1,864	-43
4823	Paper, paperboard, cell wadding and web cut to size; other paper products, paperboard	0.80%	42	5,251	-26
4911	Printed matter, including printed pictures and photographs	0.65%	39	5,996	-32
4813	Cigarette paper cut to size or in form of booklets or tubes	4.32%	26	602	-26

Source: OECD statistics (1999)

The potential for import substitution is significant in absolute terms, as well. The imports of forest products of the first two clusters only are about $1.15 billion. In order to make a more detailed analysis of import substitution opportunities we need to use 6-digit level import statistics:

Table 4.10 Potential for Import Substitution, HS 6-digit level

HS #	Product	Share in OECD exports	Imports to Russia, million US dollars	OECD exports, million US dollars	Trade balance, million US dollars
940360	Furniture, wooden	2.26%	189	8,401	-178
481920	Cartons, boxes and cases, folding, of non-corrugated paper or paperboard	3.62%	105.5	2,918	-105.5
490290	Newspapers, journals and periodicals	1.88%	67	3,572	-66
940340	Kitchen furniture, wooden	2.87%	63.6	2,219	-63.2
481011	Paper, fine, wood free, in rolls or sheets, ≤150 g/m^2, clay coated	0.99%	58	5,849	-57.5
481840	Sanitary paper products, including sanitary towels and napkins (diapers) for babies	1.37%	53	3,876	-52.9
940350	Bedroom furniture, wooden	1.71%	49.7	2,901	-44
482110	Paper labels of all kinds, printed	2.66%	40	1,489	-40
441820	Doors and their frames and thresholds, of wood	3.06%	34	1,126	-33.6
940330	Office furniture, wooden	1.90%	33.5	1,767	-31.7

Source: OECD statistics (1999)

This analysis again shows that Russia relies on imports of products with high added value. The main imported products are wooden furniture and paper (fine paper and tissue, especially).

Products that are examined in Table 4.10. have a trade balance that is almost equal to imports of these products to Russia. The imports are rather significant – the ten examined product groups make up about $700 million annually or roughly half of the total forest products imports to Russia. Consequently, there is potential for import substitution for these products in case economies of scale and creation of efficient (in Western European sense) facilities are possible in Northwest Russia. These factors are the function of the domestic market size, infrastructure development, availability of skilled labor force and investment climate.

Box 4.1 Methodology of Foreign Trade Statistics Analysis

For analysis of the clusters' positions on the foreign markets we use statistics of international trade of the countries, belonging to the Organization for Economic Cooperation and Development (OECD), with Russia. This approach is characterized by a number of advantages. First, OECD includes the most developed countries of the world, and thus its statistics allows analyzing positions of the Russian products on the most competitive and large segment of the global market. Moreover, detailed data of the ITCS (International Trade by Commodities Statistics) is available for the OECD countries, including more than 6 000 product groups (classified by HS – Harmonized System), which make possible detailed and comprehensive trade analysis.

We divide the analysis of the Russian foreign trade into two main parts:

- Study of competitive positions of the Russian products on the OECD markets (Russian exports analysis)
- Assessment of the import-substituting potential in Russia (Russian imports analysis)

1. Competitive positions of the Russian products

To assess the competitive edge of the Russian commodities on the OECD markets we estimate average share of the Russian exports in total OECD imports. It is considered that Russia has got competitive edge in those products where its exports share in OECD imports is over the Russian average share and trade balance is positive (separated by cut-off dotted lines in the tables below).

The analysis starts from the brief look on the shares of the Russian products on OECD markets by the most aggregated two digit groups. Here the main sectors where Russia got competitive edge are outlined.

№ HS	*Product Group*	*Russia's share in OECD imports*
Russian average		1,09%
05	Pr. Group 1	3,14%
84	Pr. Group 2	2,10%
34	Pr. Group 3	0,60%
67	Pr. Group 4	0,51%

On the next step we go deeper into classification of the product groups, sketching out competitive positions on the four-digit level.

№ HS	*Product Group*	*Russia's share in OECD imports*
Russian average		1,09%
0504	Pr. Group 1	5,56%
8416	Pr. Group 2	4,78%
5710	Pr. Group 3	1,56%
1905	Pr. Group 4	0,78%

On this level of classification we look also on the largest OECD markets and share of Russian products on them. This is aimed on assessing not only relative indicators of competitiveness, but also absolute figures of Russian exports.

№ HS	*Product Group*	*OECD market, million USD*	*Russia's share in OECD imports*
5603	Pr. Group 1	20 000	0,06%
1209	Pr. Group 2	15 000	0,15%
0504	Pr. Group 3	4 000	0,56%
3402	Pr. Group 4	2 500	0,43%

Finally the most detailed (six-digit) product groups, possessing larger than Russian average share on the OECD markets, are revealed. Analysis on this stage makes it possible to bring study on the level of certain products and corresponding companies, and thus to sketch not only competitive commodities, but also outline competitive manufacturers.

№ HS	*Product Group*	*Russia's share in OECD imports*
Russian average		1,09%
841610	Pr. Group 1	9,86%
500420	Pr. Group 2	5,13%
341790	Pr. Group 3	2,84%
232178	Pr. Group 4	0,89%

2. Import-substituting potential

The analysis of import-substituting potential starts from sketching out commodity groups with highest share of Russian imports in OECD exports. Those products, which have more than Russian average share, are considered as possessing relative import-substituting potential (separated by cut-off dotted lines in the table below).

№ HS	*Product Group*	*Russia's share in OECD exports*
Russian average		0,83%
45	Pr. Group 1	2,45%
08	Pr. Group 2	1,07%
24	Pr. Group 3	0,59%
1208	Pr. Group 1	6,87%
4503	Pr. Group 2	2,45%
0813	Pr. Group 3	0,26%

On the next step we focus on the volumes of Russian imports. The statistical cluster analysis is used for singling out commodity groups with import-substituting potential. All the 6-digit commodity groups are divided into three clusters by volume of

imports into Russia. The first cluster is interpreted as product groups possessing substantial possibilities for creating import-substituting production in Russia. The second cluster includes product groups with a good potential for import substitution. The third cluster is interpreted as product groups with very small possibilities for creating import-substitution production in Russia.

Product groups	*Average Russian imports, million USD*	*Average share in OECD exports*	*Domestic production potential*
4419, 5902 2413	524	3,34%	Substantial
3414, 4218 2911, 4811	256	2,57%	Good
Other	45	0,32%	Insignificant

Product groups with substantial and good potential for creation of import-substituting manufacturing are of interest for the further analysis.

№ HS	*Product Group*	*Russian imports, million USD*	*Russia's share in OECD exports*
Russian average			
4419	Pr. Group 1	712	2,20%
5902	Pr. Group 2	456	2,56%
2413	Pr. Group 3	404	5,50%
3414	Pr. Group 1	305	3,56%
4218	Pr. Group 2	287	2,45%
2911	Pr. Group 3	224	1,05%
4811	Pr. Group 4	208	3,22%

Finally, similar statistical cluster analysis is applied to the most detailed six-digit product groups. This, as in competitive edge study, helps to bring analysis on the level of certain products.

№ HS	*Product Group*	*Russian imports, million USD*	*Russia's share in OECD exports*
Russian average			
441912	Pr. Group 1	457	5,67%
590201	Pr. Group 2	325	4,07%
421835	Pr. Group 1	156	3,56%
341404	Pr. Group 2	123	2,45%
481102	Pr. Group 3	98	3,22%

4.2 The Role of Northwest Russia in the Russian Forest Exports

At present, the share of Northwest Russia in the total Russian exports does not exceed 10%. The share of exports of forest products is substantially higher, however. In 1999, about 29% of Russian industrial wood exports, 35% of plywood exports, and 40% of paper exports were supplied by Northwest Russian companies.

Table 4.11 Key Figures of Northwest Russian Forest Exports in 1998-1999

	1998	1999
Share of Northwest Russia in total exports of Russia	10.4%	9.9%
Share of the Russian forest industry in total Russian exports	4.8%	5.0%
Share of Northwest Russian forest industry in the total Russian exports	1.8%	1.7%
Share of Northwest Russian forest industry in the total exports of the Russian forest industry	37.1%	33.6%
Share of Northwest Russian forest industry in the total exports of Northwest Russia	17.2%	17.1%

Source: Goskomstat (Russian State Committee for Statistics), 2000

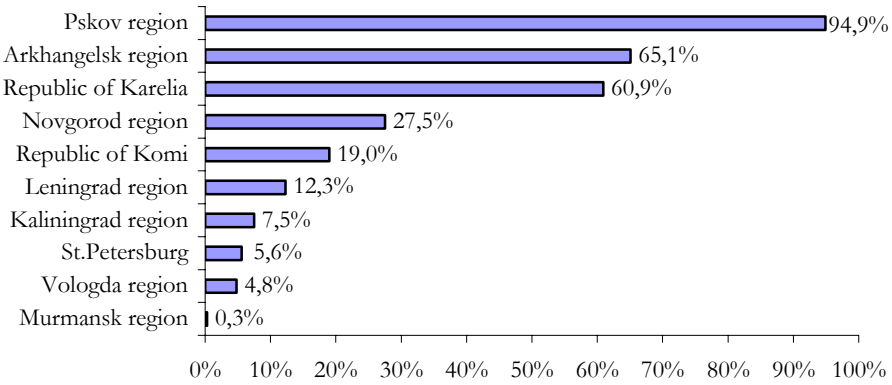
Table 4.12 Exports of the Forest Industry of Russia, Northwest Russia and the Regions of Northwest Russia in 1998-1999

Region	1998		1999	
	mln. US dollars	%	mln. US dollars	%
Russia, total	3,500	-	3,700	-
Northwest Federal District, total	1,299	100%	1,245	100%
Arkhangelsk Region	492.1	37.9%	371.3	29.8%
Republic of Karelia	255.4	19.7%	269.0	21.6%
Leningrad Region	125.0	9.6%	136.7	11.0%
Republic of Komi	140.5	10.8%	132.3	10.6%
Saint-Petersburg	102.4	7.9%	119	9.6%
Novgorod Region	70.1	5.4%	71.8	5.8%
Pskov Region	39.1	3.0%	68.6	5.5%
Vologda Region	52.6	4.0%	53.0	4.3%
Kaliningrad Region	20.6	1.6%	21.4	1.7%
Murmansk Region	1.5	0.1%	1.8	0.1%

Source: Goskomstat (Russian State Committee for Statistics), 2000

In real terms the leading exporters of forest products in Northwest Russia are the Arkhangelsk region, the Republic of Karelia, the Republic of Komi, and the Leningrad region. The cross-border cooperation is of particular importance for the producers of the Republic of Karelia and the Leningrad region.

Figure 4.5 Share of the Forest Industry in the Exports of the Northwest Russian Regions in 1999



Source: Goskomstat (Russian State Committee for Statistics), 2000

Box 4.2 Solombala LDK – Export-Oriented Sawmill Located in the Arkhangelsk Region

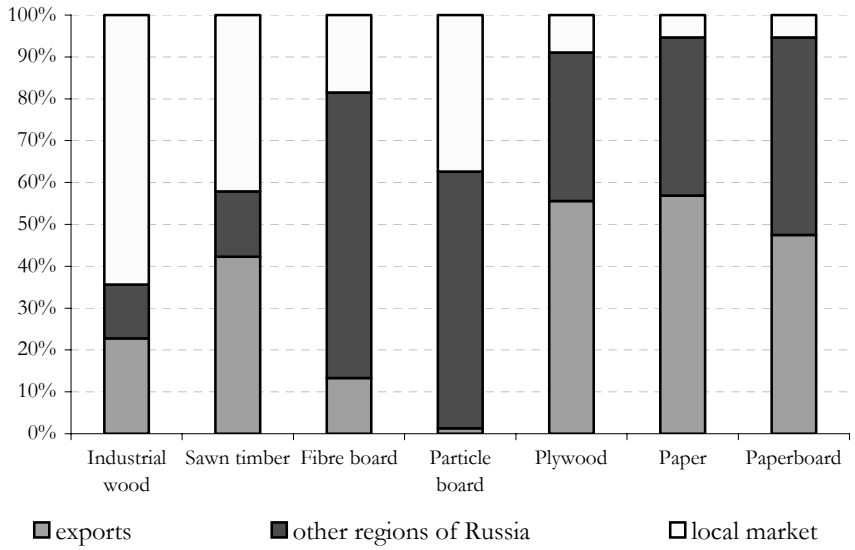
Solombala LDK is the largest sawn lumber producer in Northwest Russia. The capacity of the mill allows for the sawing of 800,000m^3 of roundwood annually, while in 2001 the company processed 639,000 m^3 of timber, and its turnover reached $27.5 million. The share of exports in the total sawn lumber output exceeds 65%. The major customers of the mill are foreign companies (mainly from Denmark, England, the Netherlands, Germany, Belgium, France, Egypt and Spain), and consequently, its performance is considerably influenced by the world market conditions. For example, market conditions worsened in 2001, leading to a decrease in the company's output by 13.1%, as compared with the year 2000. The financial performance of the mill is also affected by unstable exchange rates. For example, a relatively stable RUR/USD exchange rate and a falling EUR/USD rate during 2001 led to a decrease in the company's earnings, because the company sells its products mainly to the European countries with payments in euro.

The Pskov region, however, has relatively small production volumes and is leading solely due to small export volumes of its other industries.

In addition, the favourable world market conditions in 1998-99 allowed this region to increase substantially (by 75%) exports of forest products. The Arkhangelsk region and the Republic of Karelia are traditionally the main lumber exporters of Northwest Russia. The forest industry is the main industry of these regions.

The volume of forest exports in total regional exports is especially high in the Pskov region, Arkhangelsk region and the Republic of Karelia.

Figure 4.6 Product Distribution of the Northwest Russian Forest Industry in 1999*



* market pulp exports data are not available
Source: Goskomstat (Russian State Committee for Statistics), materials of the seminar "Competitiveness of the Russian Forest Sector", 2000

The existing regional imbalance of forest industry exports is the result of production planning during the Soviet period. Export-oriented mills were established in the regions that were characterized by:

- Substantial forest stock and
- Relatively easy access to international markets (which was the key reason for establishing large mills in the Republic of Karelia, the Arkhangelsk and Leningrad regions).

As for forest products, the largest volumes of regional forest exports belong to sawn lumber, plywood, pulp, paper and paperboard.

As compared with other forest-rich regions in Russia, Northwest Russia has the most diversified and balanced export structure (industrial wood is, for example, the main forest export product of the Russian Far East). However, the share of exported products with high value added is still rather small in Northwest Russia, as compared with developed countries.

5 Elements of the Forest Cluster of Northwest Russia

5.1 Cluster Industries and Their Agglomerations

There are three main industries in the forest cluster, each of them manufacturing products to be exported. They are

- Forestry and harvesting,
- Mechanical wood-processing,
- Pulp-and-paper.

Forestry and harvesting companies make up a rather uniform high-density network, without nodes of concentration. The annual turnover of the majority of these companies is rather small (about $100,000 a year) but the establishment of larger structures is not economically viable. This system is supplemented by small wood-processing companies that are of local importance, and above it there is a lower-density network of large mechanical wood-processing and pulp-and-paper companies at the regional and higher levels.

Large processing companies form agglomerations serving as nodes of concentration for forest cluster activities. They contribute to the development of the forest industries within their area due to a more developed infrastructure and the concentration of a specialized labor force. In addition, agglomerations demonstrate the most significant production capacity and export potential in the Northwest Russian forest cluster. The largest agglomerations are:

- Arkhangelsk (Arkhangelsk PPM, Solombala PPM, Solombala LDK, Onega LDK)
- Kotlas (Kotlas PPM)
- Syktyvkar (Syktyvkar LPK)
- Karelian (Segezha and Kondopoga PPMs)
- North-Ladoga (Svetogorsk PPM, Pitkjaranta Pulp Mill, Vyborgskaya Cellulosa).

Figure 5.1 The Largest Agglomerations within the Forest Industry of Northwest Russia

Although there is a higher concentration of producers in St. Petersburg, the Vologda region, Kaliningrad region, and some other regions, their export potential is much smaller.

5.2 Forestry and Harvesting

In itself, raw wood is an important product of the forest cluster. Its importance as a source of Russian export revenues is essential – more than 30% of the harvested lumber in Northwest Russia is exported.

Forestry management (forest care, taxation, calculations of the annual allowable cut, reforestation) is carried out by state-owned forestry enterprises (*leskhozy*), which are at the same time regional executive organs of the state forest administration. In the 90s, the Russian forest management system underwent a number of changes. Nowadays, state control is rather weak, and there are many instances of violations in the exploitation of forests. Reforestation has almost ceased. Legal repercussions for unauthorized harvesting are quite low, which is why illegal cuttings continue to be widespread.

During the 1990s, up to 1998, the total amount of timber harvesting in Northwest Russia decreased; it grew, however, after the devaluation of the ruble, and export revenues increased.

Table 5.1 Production of the Harvesting Industry of Northwest Russia in 1995-1999, million m^3

	1995	1996	1997	1998	1999
Timber removal*	32.8	27.4	25.9	25.7	31.7
Incl. Industrial wood	28.1	23.1	22.0	22.8	28.8
Incl. Round wood	25.3	20.9	20.1	20.6	25.9

* i.e. total timber harvested in the region
Source: Goskomstat (Russian State Committee for Statistics), 2000

Today, harvesting activities in Northwest Russia are carried out both by harvesting companies that are independent players, and harvesting companies that are part of large, vertically-integrated holdings. Among the largest independent harvesting companies in Northwest Russia are Zapkarelles (the Republic of Karelia), the Northern Forest Industry Association and Onegales (both located in the Arkhangelsk region), and Babaevoles (the Vologda region). Among the largest holdings that harvest timber for their processing enterprises are Ilim Pulp, Arkhbum, Solombala LDK, LEMO and others.

Figure 5.2 The Largest Harvesting Companies of Northwest Russia

At the same time, many small companies harvest timber and export roundwood. In the Leningrad region alone, there are more than 1,500 harvesting companies, including *lespromkhozy* that often harvest timber for exports. According to Russian experts, more than 20% of the har-

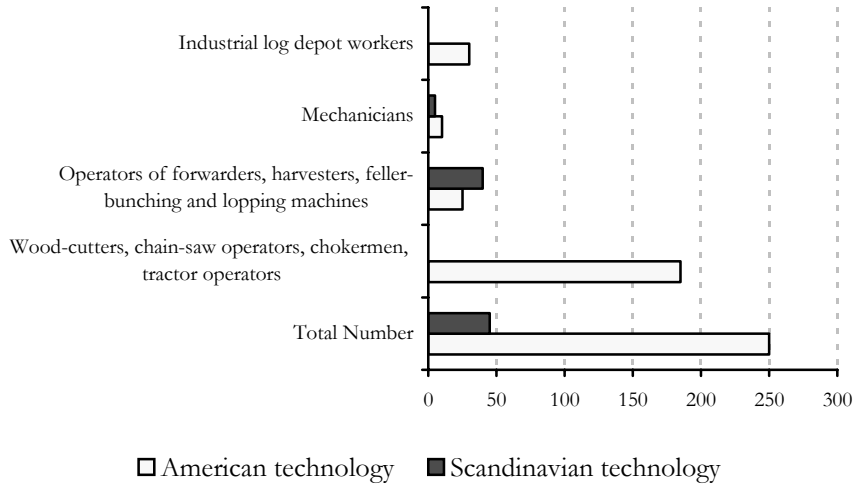
vested timber is smuggled abroad: industrial wood is exported as a subquality product. In addition, a considerable number of vehicles travels with extra freight, which is not declared.

In fact, the major part of the harvesting is controlled by holding companies. This does not generally improve the financial state of the harvesting companies, since the management of large holding companies concentrates cash flow mainly on end products and expansion (acquisitions, etc.). Furthermore, in order to promote their products on the international markets and to maintain an acceptable level of profitability, corporate owners of harvesting companies try to reduce production costs. Minimization of costs is implemented not through increased labor productivity, or the introduction of new resource- and energy-saving technologies, but through a decrease in purchase prices for raw wood. Therefore, harvesting companies were not able to improve their financial state under favorable market conditions, and nowadays are not able to invest in modernization. As a result, harvesting is often carried out by applying outdated technologies and, thus, the quality of timber produced is often very low as also an efficiency of such activities.

At present, nearly all harvesting companies in Northwest Russia use traditional harvesting technology, which is less effective than Scandinavian technology. Scandinavian logging techniques involve felling trees, then automatically delimbing and cutting them to exact log length. Harvesters then pile the logs. Then, the processed logs are loaded from the ground to a bunk and carried to the roadside by forwarders. A combination of machines can also perform both stages. The American logging technology used in Russia is slightly different; trees are felled and delimbed by woodsmen but not cut in the forest. Trunks are drawn by forwarders to the roadside and then hauled by lorries to special log depots, were they are cut to the right length for the saw or pulp mills.

Among the main factors that discourage the introduction of Scandinavian harvesting technology in Russia are poor education, poor infrastructure, low wages, as well as the high cost of new equipment. Only vertically integrated groups can afford to buy modern equipment. For example, in 2001 Ilim Pulp Enterprise bought harvesting equipment for their harvesting companies from Timberjack for $2 million. It should be noted that this was one of the most significant equipment purchase deals in the Northwest Russian harvesting industry in recent years, and it is evident that investments in re-equipment in the industry are indeed very low.

Figure 5.3 Estimated Number of Workers Needed per 1 million m^3 Using Scandinavian and Traditional (American) Logging Technologies*



* Estimated under harvesting conditions in the center of the Republic of Karelia.
Source: www.forest.ru

The availability of cheap labor weakens the incentive of harvesting companies to buy modern high-performance equipment. Moreover, purchasing new equipment is insufficient as such to gain in efficiency – it is also necessary to hire and train personnel, which results in additional costs and is complicated by the other fundamental problems such as low availability, insufficient basic education and poor motivation. Presently, in Northwest Russia, as in the whole of Russia, there are no educational establishments that would train personnel to work with modern harvesting equipment. Thus, the companies would have to bear additional costs for training specialists abroad or for inviting foreign specialists to Russia.

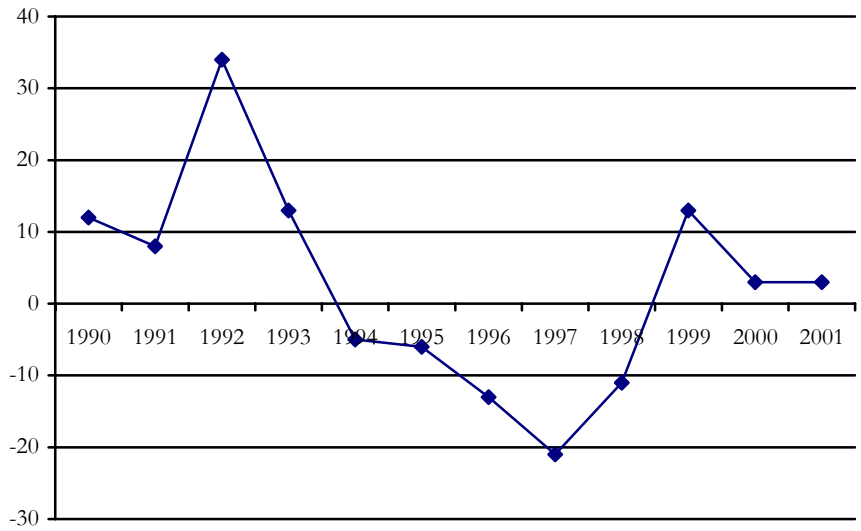
On the whole, the widespread introduction of Scandinavian technology in the region will be possible only if the following conditions are fully or partially met:

- wide-spread implementation of long-term lease of forest stock. The harvesting companies will thus be confident in their future and will be more likely to invest in re-equipment;
- increase in costs of forest resources and reforestation for harvesting companies which will force them to use resource-saving technologies;
- increase in number of well-qualified and motivated workers, able to operate modern equipment;
- tending of seeding stands and improvement of young stands.

According to some experts[5], about half the timber harvested using traditional methods is damaged. Nevertheless, it is unlikely that harvesting companies will introduce new technology at a rapid pace. In the near future, the companies will not be able to afford large-scale modernization, for the funds of the largest players will be concentrated for some time primarily on consolidation and growth by acquisitions. The other important reason why the new, more efficient technologies will not be introduced quickly is an overall neglect of longer term issues by the local businessmen in their planning.

The profitability of the harvesting industry is very low – it has the poorest performance of the forest industry sub-sectors. From 1994 to 1998, profitability even fell below zero. Although there is a room here for skepticism related to possible underreporting of profits by the local companies as the number of companies involved in harvesting and their visible wealth is growing steadily from year to year.

Figure 5.4 Profitability of the Russian Harvesting Industry, %*



* Calculated as profit before tax and interest divided by the sum of fixed assets and working capital.

Source: Research and Design Institute on Economics, Production Management and Information for Forest, Pulp-and-Paper and Mechanical Wood-processing Industries, 2002

The low level of development of forest tracks significantly limits harvesting volumes. Since 1990, there has been a slump in their construc-

5 Source: www.forest.ru

tion. In 1998, for example, only 161 km of new forest tracks were constructed in the Vologda region, whereas in the 1980s, Vologdalesprom, a state-owned harvesting company, built about 500 km of tracks annually.

In 1999, certain forest industry companies were threatened by the loss of European and North American markets because of the requirement for forest certification. A number of exporters of the Arkhangelsk region, for example, were forced to move their exports from the Great Britain to Egypt in 2000, since English consumers had refused to buy uncertified wood.

There are several systems of forest certification to choose from: FSC, PEFC, CSA, ATFS, etc[6]. Almost all the companies of the Northwest Russian forest cluster that have decided to undergo certification of their forest stock use the FSC system. In 2001, the forest stock exploited by LEMO group (St. Petersburg), Arkhbum (the Arkhangelsk region), Vologdalesprom and Babaevoles (the Vologda region) was undergoing FSC-certification. Ilim Pulp is considering the possibility of participating in the program of FSC-certification. By the end of 2001, the total area of Russian forests that met the requirements of the FSC-certification system reached 216 thousand ha that is a significant advancement.

5.3 Mechanical Wood-Processing

The major products of the mechanical wood-processing industry of Northwest Russia are sawn timber, plywood, fiber and particleboard, and furniture.

Table 5.2 Production Volumes of the Mechanical Wood Processing Industry of Northwest Russia in 1995-1999

	1995	1996	1997	1998	1999
Sawn timber, million m^3	5.6	44	4.2	3.8	4.8
Plywood, thousand m^3	255.6	265.5	322.8	408.8	513.5
Particleboard, thousand m^3	408.7	204.2	238.9	322.1	404.1
Fiber board, million m^2	51.3	41.7	53.2	41.8	51.3
Pulp chips, thousand m^3	1,332	931.7	928.9	1,011	1,437
Wooden railroad ties, thousand	1,124	1,013	903	693.2	569.2

Source: Goskomstat (Russian State Committee for Statistics), 2000

[6] FSC (Forest Stewardship Council) is the certification system founded with the participation of WWF (World Wildlife Fund). The PEFC (Pan-European forest certification system) is supported by Finnish producers and is the most common in Europe. ATFS (American Tree Farm System) and CSA (Canadian Standards Association) are widespread in North America.

Figure 5.5 The Largest Mechanical Wood-Processing Companies of Northwest Russia

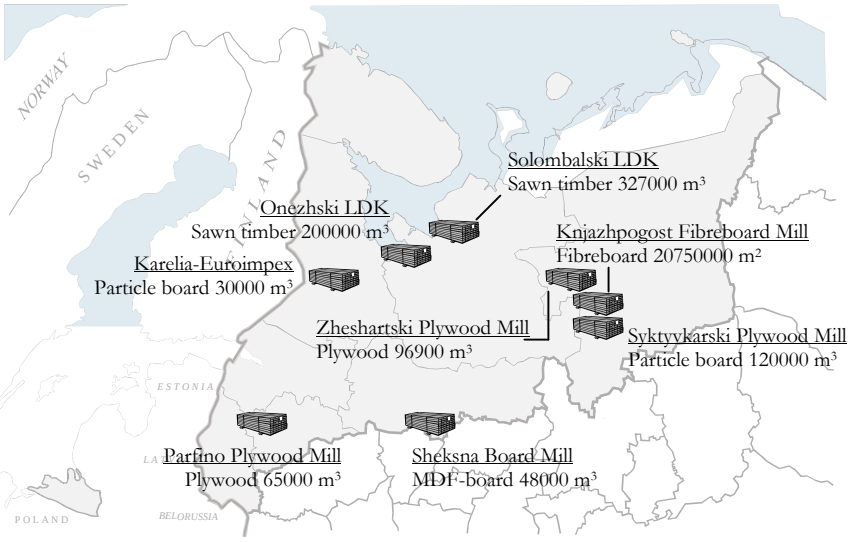
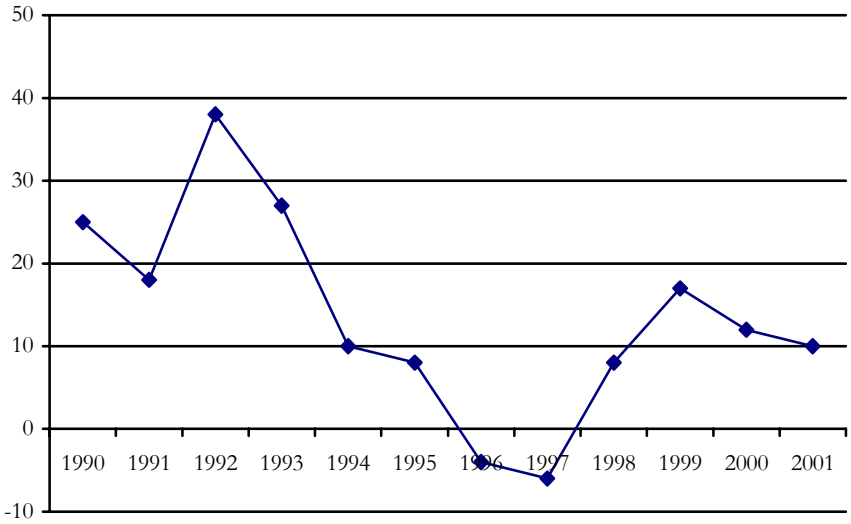


Figure 5.6 Profitability of the Russian Mechanical Wood-Processing Industry, %



Source: Research and Design Institute on Economics, Production Management and Information for Forest, Pulp-and-Paper and Mechanical Wood-processing Industries, 2002

The mechanical wood-processing industry is more profitable than the harvesting industry but less profitable than the pulp-and-paper industry. This fact also points to above mentioned underreporting that is much

easier at the small companies (majority of harvesting companies are small) and decreases as the size of the companies grows, i.e. the true profitability might be different and somewhat more positive then is demonstrated by statistics.

Sawn Timber

In 1999, nearly 25% of all Russian sawn timber was produced in Northwest Russia (about 5 million m^3). Exporting plays a significant role in the sawn timber production of the Arkhangelsk region, where there are 30 mechanical wood-processing mills, as well as in the Republic of Karelia. In the Vologda and Leningrad regions, sawn timber production is less export-oriented.

Table 5.3 The Largest Sawn Timber Producers in Northwest Russia

Company	Region	Turnover, million USD	Personnel, people	Products			
				Sawn Timber	Wood chips	Plywood Sheet	Wooden Houses
Solombala LDK*	Arkhangelsk	28.3	2,300	+	+		+
Onega LDK	Arkhangelsk	26.1	1,700	+			
Arkhangelsk LDK	Arkhangelsk	13.3	1,400	+			
Syktyvkar LPK*	Republic of Komi	n/a	n/a	+	+		
Sokoldrev	Vologda	n/a	340	+	+	+	
DOK-1*	Vologda	n/a	205	+	+		
Kondopoga Lesoexportny Zavod	Republic of Karelia	1.0	287	+			
Belomorsk LDK	Republic of Karelia	n/a	395	+	+		
Iljinski Lesozavod	Republic of Karelia	n/a	926	+			
Shalakusha Lesozavod	Arkhangelsk	n/a	n/a	+			
Lesozavod No.25	Arkhangelsk	n/a	n/a	+			
Vologdalesprom	Vologda	n/a	n/a	+			
Sokol DOK	Vologda	n/a	n/a	+		+	+
Ustjales	Vologda	7.0	n/a	+			+

* LDK – largest sawmill, LPK – saw and pulp-and-paper mill, DOK – sawmill

Table 5.4 Production of Sawn Timber within the EU in 2000, million m³

Country	Sawn Timber, million m³	Country	Sawn Timber, million m³
Germany	16.4	**Northwest Russia**	**4.8**
Sweden	15.0	UK	2.1
Finland	13.5	Spain	2.1
Austria	10.0	Portugal	1.4
France	8.6	Others	2.1

Source: Finnish Forest Industries Federation, 2001

The volumes of sawn timber production in Northwest Russia are substantially lower then those of the leading producers in Europe with comparable fibre stock (Finland, Sweden). Therefore there is a room for improvement, although in practice the level of infrastructure development and difficulties in ensuring safe raw wood supplies will limit growth in this industry.

However, Russian sawn timber is produced primarily utilizing worn-out and outdated equipment with a low level of automation, which makes high-precision processing impossible. Sorting and packaging also do not meet the requirements of consumers in Western Europe. All of this considerably decreases the competitiveness of the sawn timber produced in Northwest Russia.

Plywood

Plywood is the only wood product, of which the sales have been growing continually since 1995. Exports of plywood grew 2.2 times in 1995-1999, and domestic consumption grew by 70%. Nearly 67% of all plywood produced was exported in 1999.

As much as 517.2 thousand m^3 of plywood was produced in Northwest Russia in 1999, which made up 39% of the total Russian plywood production. Twelve plywood producers operate in the region, but there is no obvious leader among them.

The existing product range does not satisfy the demands of plywood consumers. Whereas the majority of plywood producers in the developed countries have shifted to the production of large-sized plywood, Russian plywood mills continue making small-sized plywood, mostly of the size 1525x1525 mm – this makes up 70% of all production. The portion of specialized expensive sorts of plywood, which are in higher demand (laminated, non-flammable, waterproof, etc.), is a very small portion of the total output of the Northwest Russian plywood industry.

Table 5.5 The Largest Plywood Producers in Northwest Russia

Company	Region	Turnover, million USD	Personnel, people	Products			
				Standard plywood	Laminated plywood	Waterproof plywood	Large-sized plywood
Chudovo-RWC	Novgorod	23	N/a		+	+	
Ust-Izhora Plywood Mill	Leningrad	20	2,000	+			
Cherepovets Plywood and Furniture Mill	Vologda	15	1,800	+			+
Zheshartski Plywood Mill	Republic of Komi	14	2,300	+			+
Syktyvkar Plywood Mill	Republic of Komi	n/a	1,100		+	+	+
Arkhangelsk Plywood Mill	Arkhangelsk	n/a	N/a	+			
Parfino Plywood Mill	Novgorod	12.5	N/a	+			
"Novator" Plywood Mill (Veliki Ustjug)	Vologda	8	N/a			+	
Lahdenpohja Plywood Mill	Republic of Karelia	n/a	N/a	+			

Fiber and Particleboard

The production of fiber- and particleboard was never a specialization of Northwest Russia. The production volumes of both types of board are less than 25% of the Russian total. Technology in the companies of the industry is several steps behind the technology of West-European companies.

Presently, no more than 30% of the particleboard produced in the region meets the requirements of furniture companies in regard to surface quality and other characteristics.

As for fiberboard, one of the most promising products is MDF - Medium Density Fiberboard, which is widely used by furniture producers. At present, the main MDF producer in Russia is Sheksna Fiberboard Mill. Its output, however, does not exceed 50,000 m^3 per year, which is not enough to meet the demand of the Russian furniture industry. The

quality of Sheksna Fiberboard Mill products, however, does not satisfy the requirements of the leading domestic furniture producers.

Table 5.6 The Largest Particleboard Producers in Northwest Russia

Company	Region	Production volumes, thousand m³	Turnover, million USD	Personnel
Syktyvkar Plywood Mill	Republic of Komi	120	N/a	1,100
Karelia-Evroimex DSP	Republic of Karelia	110*	N/a	N/a
Cherepovets Plywood and Furniture Mill	Vologda	90	15	1,800
Zheshart Plywood Mill	Republic of Komi	61.2	14	2,300

* designed capacity; the plant was put into operation in 2001

Table 5.7 The Largest Fiberboard Producers in Northwest Russia

Company	Region	Turnover, million USD	Personnel	Products			
				Hard Fiberboard	Insulating Fiberboard	MDF	Furnishing Fiberboard
Knjazhpogost Fiber Board Mill #39	Republic of Komi	N/a	n/a	+			
Arkhangelsk PPM	Arkhangelsk	138.9	7,600	+	+		+
Syas PPM	Leningrad	N/a	3,041		+		
Sokol PPM	Vologda	19	2,800	+	+		
Segezha LDK	Republic of Karelia	N/a	900			+	
Sheksna Fibre board Mill	Vologda	N/a	n/a			+	

According to the VNII Drev[7] estimate (although this projection needs further confirmation and must be better grounded in the valid market data), the MDF-board market capacity in Russia is about 300,000 m^3 and it could grow up to 500,000 m^3 by the year 2005. Presently, following this trend there are several new "greenfield" MDF production projects implemented in (in the Leningrad region and the Republic of Komi) Northwest Russia. At the expert opinion these projects do not match with market demand in terms of quality and temporary oversupply of the lower quality MDF grades could be expected in the near term.

Furniture

In 2000, the total output of furniture production in Northwest Russia reached 2.5 billion rubles (about $90 million). This industry is represented by a significant number of large, medium and small companies that produce all kinds of furniture – cabinet, soft, kitchen, children's furniture and others. The largest producers are located in St. Petersburg and the Leningrad region – the city of St. Petersburg is the main local furniture market of Northwest Russia.

Table 5.8 The Largest Furniture Producers in Northwest Russia

Company Name	Region	Personnel, people	Products					
			Kitchen furniture	Cabinetry	Soft furniture	Whole furniture	Furniture accessories	Office furniture
Sevzapmebel	St. Petersburg	500	+	+	+	+		+
Lenraumamebel	St. Petersburg	500	+	+	+	+		+
Nevskaja Dubrovka	Leningrad	750	+	+		+		
Pervaya Mebelnaya Fabrika	St. Petersburg	165	+	+				+
Ninevija	Leningrad	100					+	
Jupiter-Holding	St. Petersburg	80	+	+	+		+	+
Velikie Luki Mebel	Pskov	N/a	+	+		+		+

[7] Central R&D institution for the mechanical wood-processing industry, located in St. Petersburg.

Box 5.1 Case Study of Pervaya Mebelnaya Fabrika of St. Petersburg

Pervaya Mebelnaya Fabrika (Furniture Factory #1) is now one of the leading furniture producers in the Northwest of Russia. About 50% of its production is kitchen furniture. The company also produces cabinetry, furniture for children, office furniture and furniture accessories. Products are sold through a system of company stores.

In 1993, the company went public. At that time, production had nearly stopped. In order to renew equipment and increase product competitiveness, the new company executives decided to use funds that were raised through trade operations. Since that time, the company has reduced intermediary trade operations and has begun to focus on its own production. Today, the company's policy is concentrated in the domestic market niche for high-quality-furniture. In order to maintain its competitive advantage, the company continually renovates its equipment, the average age of which is presently about 2.3 years.

The company primarily uses imported materials in furniture production; imported materials make up 80% of the total materials used. Their quality is substantially higher than the quality of Russian materials. The company is also trying to establish and enlarge its own production of essential accessories.

Currently, the company has virtually no competitors within its market niche. According to an interview with company executives, the main prospects for its development are domestic market growth and international cooperation. In particular, it has established a partnership with IKEA – Pervaya Mebelnaya Fabrika supplies table parts for this world leading manufacturer.

In the opinion of company executives, one of the factors that hinders development is a shortage of qualified designers. At presents, the company has plans to cooperate with the St. Petersburg State Technical Forest Academy in order to train much-needed specialists.

The companies of St. Petersburg, the Leningrad and Pskov regions provide more than 70% of the furniture exports of Northwest Russia.

This is a function of their proximity to customers in the Baltic States and Finland. Due to the poor design and rather low quality of Russian furniture, however, total furniture exports are very small in comparison with exports of other industries.

The domestic demand for furniture is met in part by imports. Imported furniture had significant share of the furniture market until the ruble devaluation in 1998. After that the ruble prices for imported furniture more than tripled and the domestic demand was re-oriented towards Russian furniture.. As the economic situation has improved and business activity has grown in 2000-2001, furniture imports have also increased again, and the volume of imported furniture has approached the pre-crisis figure. In 2000, sales of imported furniture made up 38% of the total amount of furniture sales in Northwest Russia. Foreign manufacturers (many of others have good international brands) occupy the high-quality segment of the regional furniture market, whereas domestic manufacturers offer normally "no-name" furniture and occupy the lower cost and quality segments. Product differentiation by local producers and promotion of their new brands is only due to take-off and today is delayed and limited by pervasive lack of design and marketing skills as well as by the minor cooperation between the training and producers. There are no local design companies and the manufacturers mainly carry out product development in-house.

5.4 Pulp and Paper

Russia´s pulp-and-paper industry is most developed in the Northwest of the country. In the year 2000, companies of this area produced 60% of the total Russian pulp production and 48% of market pulp production, 59% of the total volume of Russian paper, and 53% of the total volume of Russian paperboard. The pulp-and-paper production of the region is export-oriented – about 80% of market pulp and about 50% of paper and paperboard are exported.

Table 5.9 Pulp-and-Paper Production in Northwest Russia in 1995-2000, thousand tons

	1995	1996	1997	1998	1999	2000
Pulp	2,433	1,799	2,129	2,104	2,659	3,200
Paper	1,589	1,358	1,412	1,436	1,726	1,955
Paperboard	603.4	463.5	612.5	620.0	862.5	1,019

Source: Goskomstat (Russian State Committee for Statistics), 2001

Northwest Russia occupies strong positions in pulp production, which is comparable with the pulp output of developed European countries. The output of paper and paperboard is less significant:

Table 5.10 Production of Pulp in the EU in 1998, thousand tons

Country		Country	
Finland	11,355	Austria	1,492
Sweden	10,541	UK	583
France	2,675	Italy	462
Germany	1,950	Belgium	381
Portugal	1,708	Netherlands	129
Spain	1,608	**Northwest Russia**	**2,104**

Source: Colin J. Hazley. Forest-Based and Related Industries of the European Union – Industrial Districts, Clusters and Agglomerations, ETLA, Helsinki, 2000

Table 5.11 Production of Paper and Paperboard in the EU in 2000, million tons

Country		Country	
Germany	18.5	Austria	4.4
Finland	13.2	Spain	4.4
Sweden	10.6	Netherlands	3.5
France	9.7	Norway	2.6
Italy	8.8	Others	5.3
UK	7.0	**Northwest Russia**	**3.0**

Source: Finnish Forest Industries Federation, 2001

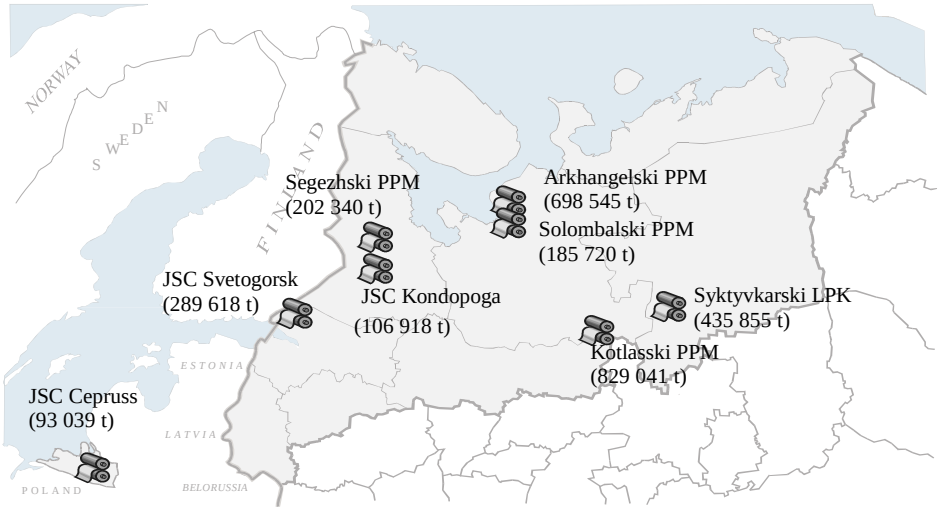
The center of the pulp-and-paper industry in Northwest Russia is the Arkhangelsk region, with three large pulp-and-paper mills: Kotlas, Arkhangelsk and Solombala PPMs. The largest Russian producer of paper bags, Segezha PPM, is located in the Republic of Karelia, as well as the second largest newsprint producer, JSC Kondopoga. The largest Russian producer of newsprint is JSC Volga, which is located in the Nizhni Novgorod region outside of the Northwest.

Table 5.12 The Largest Companies of the Pulp-and-Paper Industry in Northwest Russia

Company	Region	Turnover, million USD*	Personnel, people*	Technology	Products				
					Market Pulp	Newsprint	Packaging Paper	Board, excluding corrugated board	Printing and offset paper
Syktyvkar LPK*	Republic of Komi	242.7	5,400	sulfate		+	+	+	+
Kotlas PPM	Arkhangelsk	240.9	9,700	sulfate sulfite	+		+	+	+
Arkhangelsk PPM	Arkhangelsk	214.4	7,600	sulfate	+		+	+	+
Kondopoga PPM	Republic of Karelia	191.9	6,900	sulfate		+	+		
Svetogorsk PPM	Leningrad	184.8	3,200	sulfate	+			+	+
Segezha PPM	Republic of Karelia	88.2	5,200	sulfate	+		+	+	
Solombala PPM	Arkhangelsk	65.5	2,100	sulfate sulfite	+		+		
St. Petersburg Cardboard Mill and Printing Plant	St. Peters-burg	59.5	1,900	-				+	
Pitkjaranta Pulp Mill	Republic of Karelia	30.9	1,600	sulfate	+				
Cepruss PPM	Kaliningrad	30.6	1,900	sulfite	+			+	
St. Petersburg Gosznak Paper Mill	Saint-Petersburg	29.4	1,100	-					+
Sjass PPM	Leningrad	25.4	2,800	sulfite	+		+		
Sokol PPM	Vologda	24.1	2,900	sulfite	+	+	+	+	
Vyborgskaya Cellulosa (PPM)	Leningrad	19.5	2,400	sulfite	+		+		
Komsomolets Paper Mill	Leningrad	14.2	500	-				+	
Sukhona PPM	Vologda	N/a	2,210	sulfite	+		+	+	

* Syktyvkar LPK is not only a pulp-and-paper mill, but also sawmill.

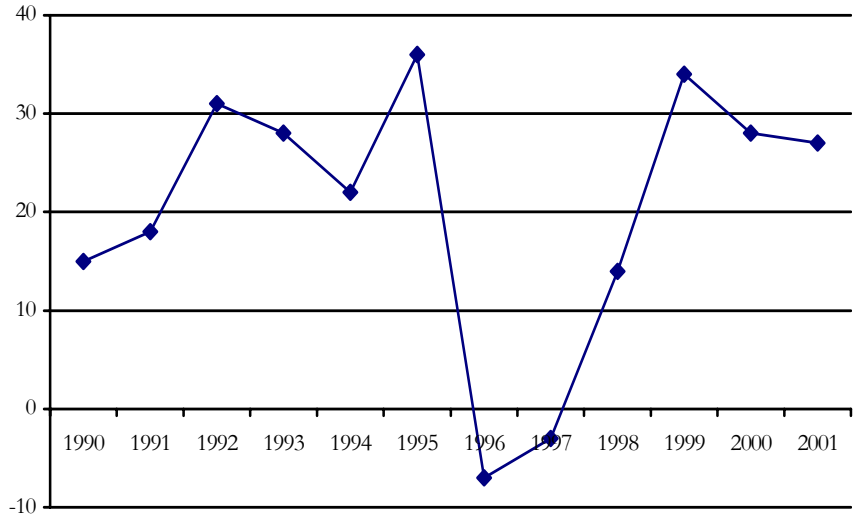
Figure 5.7 The Largest Companies of the Pulp-and-Paper Industry of Northwest Russia*



* Production of pulp in 2000 is presented in parentheses

The pulp-and-paper industry is the best performing sub-sector of the forest cluster. It is also one of the most profitable industries in Northwest Russia.

Figure 5.8 Profitability of the Russian Pulp-and-Paper Industry, %



Source: Research and Design Institute on Economics, Production Management and Information for Forest, Pulp-and-Paper and Mechanical Wood-processing Industries, 2002

From 1990 until 1996, the paper output of the regional companies decreased by more than 50%, and paperboard production fell by two thirds. A gradual revival began only in 1998-99, which was caused by the effect of the devaluation of the ruble.

The favorable world market conditions in 1998-2000 also had a positive influence on the development of the regional pulp-and-paper industry. Today, the main export products of Northwest Russia are pulp, newsprint and packaging board. In 2000, export earnings of regional pulp-and-paper companies rose by 35% as compared with 1999, and reached $1 billion. In 2000, he share of the pulp-and-paper industry in total exports of forest products exceeded 40 %.

Pulp-and-paper mills located in Northwest Russia are narrowly specialized – they manufacture a limited number of products on a large scale. The absence of interregional competition is inherited from the Soviet period. Only in recent years have the companies tried to enlarge their product range, producing new products that are in current demand. For example, the domestic market for office paper has been characterized by rapid growth during the recent years. In 1999, new automatic production lines for office paper manufacturing were installed at two companies – Svetogorsk and Syktyvkar LPK. By 2001, these companies had come to occupy the market niche that earlier was occupied by foreign producers only.

Domestic producers of many other kinds of high-quality paper and paperboard are still far behind foreign competitors in terms of quality and market share, however. Some products are not manufactured in Northwest Russia at all. On the whole, the pulp-and-paper industry of the region specializes in products with low added value.

5.5 Equipment Manufacturing for the Forest Industries

The equipment producers of the regional forest cluster have a rather limited product range and do not meet the needs of the modern domestic market for specialized equipment. The largest equipment producers operating in Northwest Russia are the following:

- Onega Tractor Plant, Petrozavodsk - harvesting and transportation machines, mainly tractors.
- Vologda Machine-Building Plant - equipment for sawing, furniture and particleboard manufacturing.
- Petrozavodskmash - equipment for the pulp-and-paper industry.
- Kaliningradbummash - paper machines.

Table 5.13 Profitability and Labor Productivity per Employee* at Some Machine-Building Plants in 2000

Company	Profitability, %	Labor Productivity per employee, thousand USD	Turnover, million USD
Onega Tractor Plant	5.4	10.5	21.1
Petrozavodskmash	3.6	5.3	17.8
Largest Northwest Russian machine-building companies in total	9.6	15.6	N/a

* Labor productivity is calculated as the company turnover divided by the number of employees.

Source: "Expert Northwest" magazine (22.10.2001)

During the Soviet period, the products of these companies were widely used, satisfying about 80-85% of all the industries needs in machinery, equipment, and spare parts. The rapid slump in production in the 1990s and low quality of products and technologies offered by these companies led to decreasing demand for domestic equipment, and its production fell on the average 10-12 times (for some products as much as 20-30 times). At present, only about 10-20% of the production capacity is used. For example, in the year 2000, Onega tractor plant produced less than 1,000 tractors, while in 1988, the company manufactured more than 12,000 tractors. The company's profits and labour productivity also fell dramatically.

The low quality of domestically produced equipment is the main reason for its low competitiveness. Today, successful forestry companies prefer to buy imported high-quality equipment: new or second-hand. This concerns in the first place the pulp-and-paper industry: in the 90s no new paper machinery was installed in Northwest Russia. This was also true of the furniture industry. For example, Pervaya Mebelnaya Fabrika of St. Petersburg – one of the leading furniture manufacturers in Northwest Russia – uses imported equipment only. At the same time, the harvesting industry even up to the present mainly uses domestic equipment. This sub-sector is in the poorest state financially of all branches of the forest cluster, and, the harvesting companies are therefore looking for lower prices when purchasing equipment.

At the present, Russian machinery manufacturers are not able to implement necessary modernization in order to produce more competitive

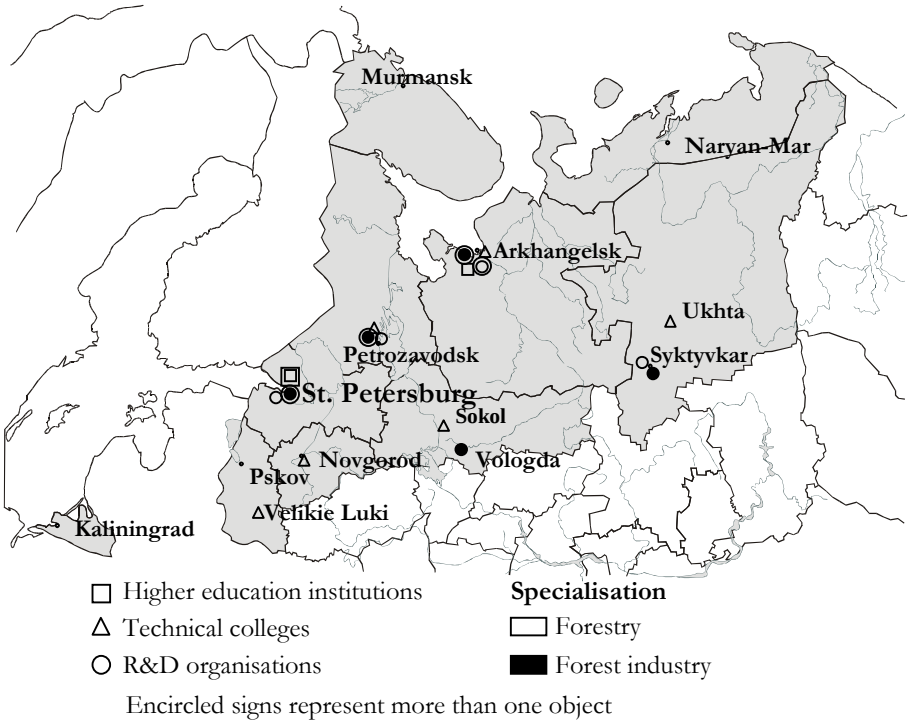
equipment. This is why they either change their profile[8] or cooperate with international partners, specializing in products of the first stages of the value chain. For example, Petrozavodskmash cooperates in casting and metalworking with Metso Paper – a Finnish producer of pulp-and-paper equipment.

5.6 R&D and Education

Research and Development in the Forest Cluster

St. Petersburg and Arkhangelsk are the two centers of R&D for the Northwest Russian forest cluster. The majority of R&D institutions are concentrated in St. Petersburg.

Figure 5.9 R&D and Education in the Northwest Russian Forest Cluster



[8] For example, Kaliningradbummash together with KIA, South Korea, manufactures consumer goods and is involved in automobile assembly for the mentioned MNC.

Despite the large number of specialized research institutions in the region, even in the pre-transition period the technological level of the companies of the Northwest Russian forest industry had lagged behind companies of the developed countries. The main reasons for this were:

- Complex and mixed-up priorities set-up within the framework of the socialist economic system;
- The companies were not actually interested in introducing new technologies because of a wish to avoid job cuts and because the state guaranteed sales of their products whatever quality and efficiency they had.

Box 5.2 Giprobum – an R&D Institute's Experience of Survival during the Transition Period

Giprobum, which was founded in 1929, is the leading R&D institution of the Russian pulp-and-paper industry. More than 70% of the pulp-and-paper mills of the former USSR, as well as a number of mills in the former socialist block countries (China, Bulgaria, Slovakia, Romania, etc.), were designed by Giprobum. In 1990, the institute became a joint-stock company, in which all the shares belong to the personnel.

During the past decade, Giprobum experienced the same difficulties that all Russian R&D organizations experienced during the transition period: a sharp decrease in state orders, lack of financial resources, loss of customers, brain drain, lack of young specialists, the necessity of adapting to new market conditions.

Giprobum has managed to overcome these difficulties primarily due to its inherited monopoly on the market of R&D services for the pulp-and-paper industry, and by maintaining its contacts with customers. However, the volume of orders from companies was not enough to sustain the development and the institute directors focused their efforts on cost reduction and diversification of activities. The staff was reduced from 700 people in 1990 to 350 people in 2001. The reduction concerned primarily low-qualified personnel. At the same time, outdated computers and equipment were replaced with modern ones. Giprobum has also significantly broadened its range of engineering services. Presently, in addition to its main activities, the institute diversified into offering services related to environment protection, exploratory, architectural, renovation and general engineering projects. For example, Giprobum specialists have designed several large buildings in St. Petersburg, such as the Ice Palace (built for the hockey championship in 2000) and the Atrium Business Centre. The institute also provides consulting services. All of this has allowed Giprobum to survive on the market.

In the 1990s, the R&D sector experienced great difficulties. Many customers were lost and the number of orders sharply decreased. Because of low wages, many qualified specialists left the institutions, and their personnel decreased more than five times on the average after 1990. The modernization of basic equipment ceased. As a result, the R&D sector virtually dropped out of the value chain of the forest industry. R&D companies have tried to survive in radically changed conditions, discovering new ways of applying their potential.

Today, the large companies of the Northwest Russia forest industry pay more attention to strategic issues of the development, increasing the quality of their products and extending their product range. This gives

Table 5.14 The Largest R&D Institutions of the Forest Cluster of Northwest Russia

Company	Region	Specialization
Giprobum	St. Petersburg	R&D, consulting, engineering in the pulp-and-paper industry Personnel (2001): 300
Lesinvest	St. Petersburg	R&D, consulting, engineering in harvesting, lumber rafting, mechanical wood-processing, industrial and civil construction Personnel (2001): 250
St. Petersburg R&D Institute of Forestry	St. Petersburg	R&D, consulting, engineering in forest care and certification Personnel (2001): 160
Nauchdrevprom	Arkhangelsk	R&D in mechanical wood-processing Personnel (2001): 120 people.
Harris Group International Design and Construction	St. Petersburg	R&D, consulting, engineering in the pulp-and-paper industry Personnel (2001): 100
Bummash	St. Petersburg	Engineering in the pulp-and-paper industry Personnel (2001): about 100
Central R&D Institute of Plywood	St. Petersburg	Engineering in mechanical wood-processing and plywood production Personnel (2001): 83
State R&D Institute for Rafting	St. Petersburg	R&D in lumber rafting and transportation by water Personnel (2001): 38
Giprodrev	St. Petersburg	Engineering in mechanical wood-processing Personnel (2001): 25

Table 5.15 Educational Institutions of the Northwest Russian Forest Cluster

Name	Description	Number of graduates per year
St. Petersburg State Technical Forest Academy	The largest and most reputable educational institution of the Northwest forest industry. Profile: Forestry engineering. Harvesting, wood-processing and pulp-and-paper technologies. Forest specialties: forest engineering, wood-processing technology, chemical wood processing technology, forestry, machinery and equipment for the forest industry, standards and certification, service and maintenance of machines and equipment, process automation.	1,400
St. Petersburg State University of Vegetable Polymers' Technology	The University prepares specialists mainly for the pulp and paper industry of the region. Profile: Forestry engineering. Harvesting, wood-processing and pulp-and-paper technologies. Forest specialties: chemical wood processing technology, packaging, chemical technology of organic substances, environmental protection and sustainable use of natural resources, machinery and equipment for the forest industry, process automation.	500
Petrozavodsk State University	The main educational centre of the Republic of Karelia. Profile: General Forest specialties: Forestry engineering, forestry, machinery and equipment for the forest industry.	200
Arkhangelsk State Technical University	The former Arkhangelsk Technical Forest Institute. Profile: General Forest specialties: Forestry engineering, wood-processing technologies, chemical wood processing technology, forestry, machinery and equipment for the forest industry, process automation.	60
Syktyvkar Forest Institute	A branch of St. Petersburg State Forest Academy. Profile: Forestry engineering, technologies for the harvesting and pulp-and-paper industries. Forest specialties: machinery and equipment for the forest industry, forestry engineering, forestry, and process automation.	N/a
Ukhta Industrial Institute	The institute is located in the Republic of Komi. Profile: General Forest specialties: machinery and equipment for the forest industry, forestry engineering.	N/a

reason to hope that the broken links between production and R&D might be restored, though this trend is still less apparent in the forest industry than in other Russian industries.

Education and Training in the Forest Cluster

The main centers of higher education for the Northwest Russia forest cluster are St. Petersburg, Petrozavodsk and Arkhangelsk. Due to the establishment of a branch of the St. Petersburg State Technical Forest Academy in the city of Syktyvkar, it has become another important center of higher education for the forest cluster. There are also a number of technical colleges in the Northwest Russia that train workers for the forest industries.

The regional institutions of higher education prepare more than 2,000 specialists annually. According to estimates by Russian experts, this exceeds the real need by about three times. Many graduates, however, do not intend to seek jobs in forest industries, preferring other businesses. Many graduates do not want to leave the cities (especially St. Petersburg) and to move to small towns with lower living standards.

Another significant problem is that education often is out of touch with the production process. As a result, graduates are not familiar with actual technologies, and the manufacturing companies must re-educate them. In addition, the weakened connection between education and production in the 1990s has led to a discrepancy between the specialties of the institutions and the specialties actually needed in production. For this reason, some companies now suffer from a lack of much-needed specialists. This concerns above all marketing and information technologies.

6 Factors of Competitiveness

The three previous Chapters contain a review of the existing situation in the forest cluster of the Northwest Russia, covering the cluster's main resources, components, agglomerations, and demand factors. The analysis of the actual competitiveness factors has been carried out against the background of the general conditions, without focusing on their specific importance or development issues. This Chapter contains a detailed analysis of the main factors behind the competitiveness of the forest cluster of the Northwest Russia, and is the key Study section.

We used not only available statistics but also information collected from the case studies as the sources of information. During the case studies phase of research we collected additional corporate level information, views and perceptions of the key persons in the selected companies related to competitiveness. In the framework of this study we carried out totally 14 case studies of selected companies from the forest cluster. The sample of companies was drawn from the list of leading companies in the sector by sales and represents a representative selection of the total population owing to the fact that companies selected were the largest by far in the respective industries. We have also committed not to disclose the names of respondents and companies in publication in order to provide for unbiased and open discussion during the survey. The case studies were carried out as structured interviews with selected managers of the companies. Results of the case studies are presented in the text below and outline the various facets of opportunities, bottlenecks and obstacles to achieving sustainable growth and competitiveness of the forest cluster of the Northwest Russia.

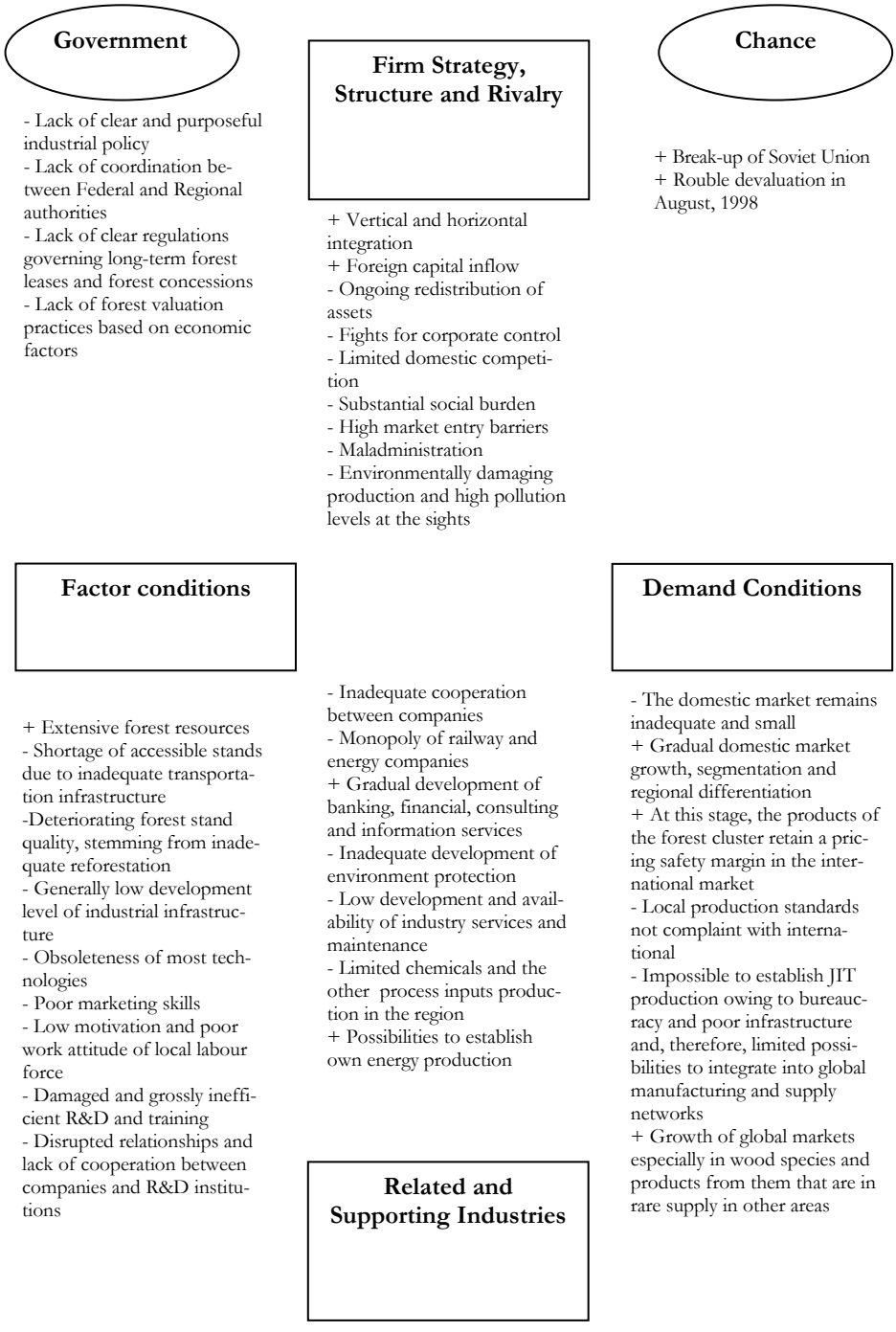
At this time, the competitiveness of the forest cluster is hinged primarily on its production factors, i.e. on the extensive forest resources, production facilities and infrastructure (inherited from the Soviet period), and specialized labor.

At the same time, an unbiased analysis reveals that the competitive potential has virtually been exhausted. In the future, competitive development would involve major investments in infrastructure, technology upgrading, R&D, and professional training of personnel to meet the modern requirements.

The demand factors offer a high development potential, to be achieved specifically through the domestic market development. However, a major increase of the domestic market capacity would be impos-

sible in the absence of the general growth of national economy, accompanied by a substantial increase of the per capita GDP.

Figure 6.1. Northwest Russian Forest Cluster



The related and supporting industries are also offering a huge development potential. The inter-company relationships formed during the Soviet rule have been largely disrupted, and the establishment of the new relationships adapted to the new market conditions would involve both time and major investment.

At this stage, the industry structure is quite unstable. The dynamic asset redistribution process, yielding new market players, is still an ongoing one. The companies are generally slow to adapt to the new economic conditions, which have been drastically altered in the course of spontaneous interference with the ongoing economic processes, practiced by the authorities at all levels, from the Federal down to the local. At this stage, the long-term impact of State interference, implemented against the background of the absence of a defined national industrial policy, has mostly been adverse.

A more detailed competitiveness analysis of the forest cluster of the Northwest Russia is presented below.

6.1 Factor Conditions

One of the most important competitive advantages of Northwest Russia giving good opportunities for the long-tem development is its favourable geographic location. Proximity to the densely populated industrial areas of Central Russia and to the markets of Western Europe[9] makes it possible for the local forest companies to avail themselves of the lower transportation costs as compared to the companies based in Siberia and the Russian Far East. At the same time, the forest cluster of the Northwest Russia, especially the Republic of Karelia and Leningrad Region, the two Regions bordering on Finland, are enjoying good possibilities for over-the-border cooperation profitable for both local and international companies.

As already mentioned, the abundant forest resources constitute a major competitive advantage of the forest cluster of the Northwest Russia. However, the vast forest resources alone are not sufficient to ensure sustainable forest cluster development in the long term, if only for the reason that the existing infrastructure fails to ensure adequate forest utilisation. E.g. after the easily accessible forest stock in the principal export-oriented Regions (Arkhangelsk Region and the Karelian Republic) has been depleted, the leading mechanical wood processing and pulp and paper companies based in the above Regions will begin to experience

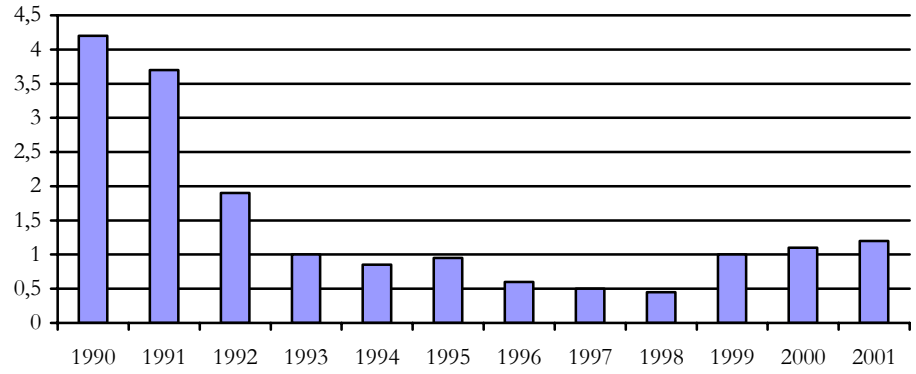
[9] The Northwest Russia Federal Territory is bordering on 7 countries of Central and Western Europe, including Finland and Norway.

raw materials shortages and will be forced to take their raw material procurement activities outside their Regions and even outside the Northwest Russia that increases their costs dramatically. At the same time, the current average allowable cut utilisation factor is max. 50%. Another problem is the deteriorating composition of stands in the easily accessible forests. Over the last decade, reforestation activities have come to a virtual standstill; consequently, the share of softwoods, constituting a valuable raw material for the forest industry, has been shrinking, while the shares of the less valuable species, birch and aspen, have been growing. E.g. in just 1996-2001 the share of aspen in the north-western part of Leningrad Region has increased from 20% to 40%.

At the moment, in terms of transportation, energy, and information infrastructure, the Northwest Russia is well behind the developed economies (even if it is ahead of Siberia and the Russian Far East). The companies are strongly dependent of the State for transportation and energy supply; at the same time, the modern information infrastructure of the forest cluster is just beginning to take shape. Any future development of the infrastructure would involve major investments; however, the unfavorable investment environment is obstructing the potential investment flow. A more detailed analysis of the situation is presented in Appendix 3; the special features of the existing infrastructure in the Northwest Russia are reviewed in Appendix 4.

Most of the equipment in use in the industries of the Northwest Russia forest cluster has been inherited from the Soviet era. The 1990s have seen virtually no upgrading; over the last decade, the sectoral investments have dropped to min. ¼ as compared to the previous years.

Figure 6.2 Investments in the Russian Forest Industry, billion USD



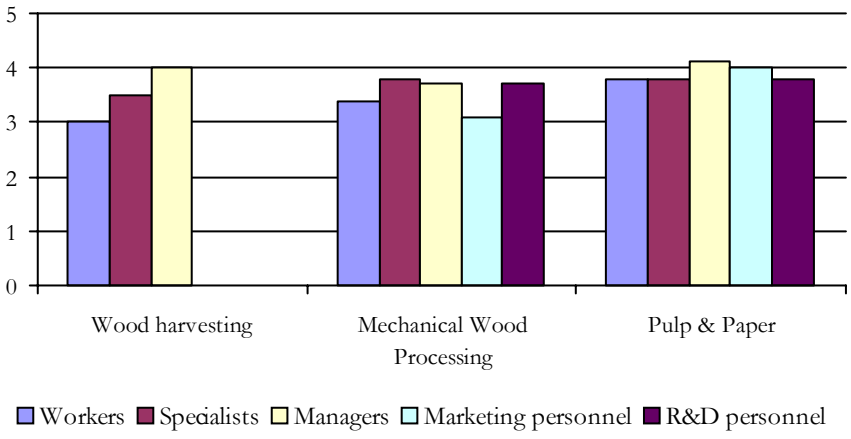
Source: "Ekonomika i Zhizn" ("Economy & Life" newspaper) No. 1, 2002

The pulp and paper industry, which is the most-capital intensive sector of the forest cluster, has been the one most heavily affected. E.g. in 1988, Svetogorsk Pulp and Paper Mill (currently owned by International Paper) was the last mill in the Northwest Russia to install any new process equipment. Consequently, the equipment currently operated by the forest industries of the Northwest Russia is 70-80% worn down and obsolete. The most obsolete units are the process automation and instrumentation systems, which serve to create high value-added in the developed economies. Over the last 10 years, only a few industries (mostly individual furniture mills) have managed major overhauls, which does little to change the overall situation. The main technologies currently implemented within the forest cluster are burdened with a number of disadvantages inherited from the Soviet era, i.e.:

- Wasteful use of raw materials and energy, high production losses, resulting in the extremely high specific power and raw material consumption which is integral to the process technologies and production cycles;
- Extremely high specific labour intensity, integral to the process technologies; virtual lack of process automation systems in most of the industries;
- High pollution, resulting from the neglected environmental issues.

As a consequence, the forest cluster of the Northwest Russia generally fails to meet the international standards and is unable to turn out high

Figure 6.3 Personnel Quality in the Regional Forest Industry (5-point scale)



Source: Interviews involving top managers of forest industry companies (2002).

value-added products, which would be competitive on the world markets. A more detailed analysis of the existing technologies in use in the forest cluster of the Northwest Russia is presented in Appendix 2.

Under M. Potter's theory, the next important factor behind the competitiveness of any cluster is its human resource potential, skills and qualifications included. According to the top of the forest cluster companies who have been polled, the quality level of the companies' personnel is rather high.

In the project team's opinion, the managers are somewhat overestimating their personnel, for the reason that their frame of reference has been limited to domestic companies. An international comparison including the European and overseas business leaders is certain to yield grimmer results, especially where management, marketing, production discipline and culture are concerned.

In spite of the generally high education level of residents and the high availability of professionals, traditionally trained in the many educational establishments of the Northwest Russia, the quality of personnel currently employed in the forest cluster does not quite meet the prevailing international standards, for a number of reasons:

- There is a gap between the academic education and the modern production technologies, which has become especially pronounced over the last decade as a result of the deteriorated relationships between the industries and the educational establishments, and very limited opportunities for students and teachers to learn and comprehend (poor language skills, limited financial opportunities to afford travelling abroad) the best international practise;
- The lack of generational continuance of younger people, disrupted in the 1990s in the course of the reforms, with middle-aged skilled personnel withdrawing from both the forest industry and the related sectors of economy;
- The established Soviet mentality of the underpaid hired employees, who are only marginally responsible for their end results.

As a result, many forest cluster companies are experiencing a shortage of professionals in both the basic and related areas of expertise, as well as in management, marketing and IT. The shortage of professionals is further aggravated by the relatively low salary level prevailing in most of the companies of the forest cluster of the Northwest Russia and by the generally low life standard in most of the Regions, failing to provide any motivation for the new graduates and the established experts to relocate and leave St. Petersburg and other large cities for remote areas.

The 1990s witnessed the deterioration of the relationships between the industrial companies and the R&D institutions, which had been formed during the Soviet rule, with the disruption damaging to both parties. The industries found themselves being bypassed by the innovation process. Faced with the rapidly dwindling flow of orders, the R&D institutions serving the forest cluster were forced to drastically limit their research activities and came to lose some of their best resources. The industry managers are aware of the currently inadequate cooperation of their companies with the R&D institutions. However, faced with the continuing tide of takeovers, large companies are still unwilling to make major investments in the rehabilitation of R&D related to the forest cluster.

There is no doubt that the competitive advantages that have been driving the development of the forest cluster of the Northwest Russia in the last 5 years are generally exhausted. In their present condition, neither the natural resources nor the production facilities can ensure the cluster's competitiveness; therefore, sustainable future development of the forest cluster is hinged on the development of infrastructure, major technology upgrading, improved labor quality and rehabilitated relationships with cluster-related R&D institutions. That, in its turn, in practise means development of targeted industrial policy, including improving significantly investment and overall business climate, committing resources to upgrading the human capital and enabling exploitation of forest resources. As we all well know, the financial and other resources available, at the moment, in the Northwest Russia for the above purposes are limited. Therefore it is of crucial importance to focus development to certain, the most feasible and promising locations from where the best practise could spread further with less effort. Ideas referring to such potential locations are provided in Chapter 7 where the issues related to regional agglomerations in forest cluster of Northwest Russia are concerned.

6.2 Firm Strategy, Structure and Rivalry

In the Soviet era, the forest cluster was developing within the frames of the planned socialists economy. All the industries were owned by the State; resources, energy and labour allocation was fully centralised at state determined prices.

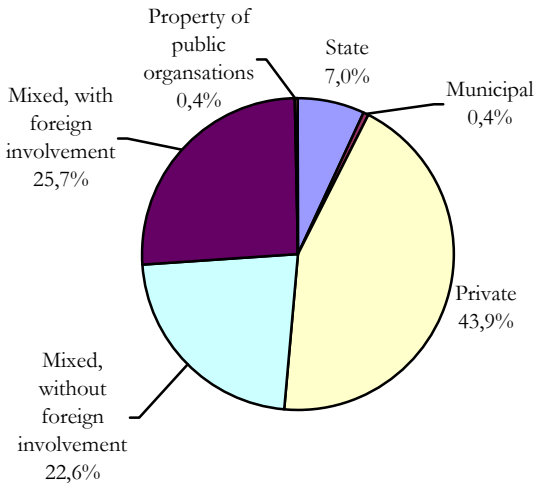
Large-scale pulp and paper mills and wood processing industries were often scattered at distant locations, with no inter-company cooperation envisaged. The mills were designed to turn out specific products within a limited product mix, produced in large volumes to satisfy the massive demand for standard wood-based products throughout the Soviet Union. Consequently, the various producers were not in competition and, as

a result the quality of products and efficiency of processes is still low. The above lack of competition is persisting, constituting a common special feature throughout the Russian forest cluster.

The 1990s witnessed the collapse of the planned socialist economy and the accompanying disruption of both the vertical relationships along the value system of the forest cluster and the companies' producer-consumer relationships. At the moment, the Russian forest cluster, following in the tracks of the nationwide economy, is undergoing a transition phase. The industry structure and relationships are being re-established virtually from scratch in the context of a drastically changed market. The above process is far from complete.

One of the key milestones of the transition phase is the privatisation of State property, implemented in the first half of the 1990s and resulting in a shrunken State-owned stake in the forest cluster.

Figure 6.4 Forest Industry Ownership Breakdown



Source: Research & Engineering Institute for Economics, Production Management & Information for Forest, Pulp & Paper and Mechanical Wood Processing Industries, 2002

On the first tide of takeovers, with the new owners seeking chances to gain control over major assets at a relatively low cost, the acquisitions were not normally conforming to any specific strategy. It was exploited without very much care about the legal side of transactions. The attitude of the new owners, with only a few of them committed to efficient production development, resulted in major problems for the companies.

However, the gradual asset consolidation brought forth the owners with longer-term commitments, more often (not always) keen on business development and cost management.

Thus, in the second half of the 1990s, the forest cluster of the Northwest Russia began to follow the international trend and embarked on the horizontal and vertical integration process. The integration, focused on the leading industries of the forest cluster (Arkhangelsk Pulp and Paper Mill, Syktyvkar Integrated Forest Industry, Solombala Wood Handling and Processing Mill (Solombala LDK), etc.), triggered the establishment of a number of holding companies, controlling industries both inside and outside the territory of the Northwest Russia, boasting substantial turnovers and potentially capable of heavily investing in the development. Ilim Pulp Enterprise became the largest among such groups of companies although its leader position is challenged by hostile takeovers by Base Element and Promstroybank of St. Petersburg at the moment (Summer 2002).

In principle the concentration process is needed in the forest cluster in order to increase the size of companies and their ability to invest in large scale up-grading and new, more efficient facilities (pulp and paper and saw mills, etc) that is urgently needed if the present volumes of production are to be sustained. Unfortunately the consolidation process that is overseen today has not led to investments so far owing to on-going conflicts of control over assets, unstable investment protection and operating environment provided by the regional and federal governments (chaotic and controversial privatization, availability of raw wood resources only for short term, hence impossibility to ensure safe long-term supplies and lack of investment in reforestation and forest roads, etc).

However, the last year has witnessed the second huge tide of takeovers triggered by the nationwide processes. Having resolved the disputes over the main assets in the principal export-oriented sectors, i.e. in the fuel industry and metallurgy, the leading Russian business players started to focus on the forest industry, constituting the next important source of currency earnings. Managers of the forest companies are expecting the second tide of takeovers to last for a few more years and result in a major reshuffling of the cluster. The takeover process, disrupting the investment environment and distorting the companies' strategies by diverting them from improving their production efficiency, is having an adverse effect on the competitiveness of the forest cluster.

The average labour productivity in the companies of the forest cluster of the Northwest Russia remains quite low. Judging by the figures of the

Table 6.1 Top Players in the Forest Industry of Northwest Russia

Players	Owner	Controlled Companies	Turnover in 2000, million USD	Business
Ilim Pulp Enterprise	Zakhar Smushkin, Boris Zingarevich, Mikhail Zingarevich	Bratsk Integrated Forest Industry, Kotlas PPM*, Ust-Ilimsk Integrated Forest Industry, St. Petersburg Paperboard & Printing Mill, Kommunar Paper Mill, Plzenska Papirna Paper Mill (the Czech Republic), 42 logging companies	1000	Market pulp, viscose pulp, offset paper, paperboard, plywood
Titan Group	Vladimir Krupchak	Arkhangelsk PPM**, Podolsk Corrugated Board Mill, Murmansk Paperboard & Packaging Mill, Sawmill No.25, Shalakusha Sawmill, Tsyglomen Sawmill, over 20 logging companies	600	Market pulp, copy-book paper, containerboard, corrugated board
Syktyvkar Integrated Forest Industry	Frantschach AG and Neusiedler, both owned by Mondi Europe (part of Anglo-American Plc)	Syktyvkar Forest Industry (PPM), 13 logging companies	300	Office paper, offset paper, newsprint, paperboard
International Paper	-	Svetogorsk PPM	200	Office paper, offset paper, paperboard
Karellesprom	Ministry for State Property of the Karelian Republic, Segezhabumprom	Belomorsk Sawmill, Kondopoga Sawmill, 18 wood harvesting companies	160	Sawn timber, roundwood, including pulpwood
Segezhabumprom	Managers of Segezha	Segezha PPM, Segezha Wood Handling & Processing Mill, Karellesprom (a 25% stake)	90	Paper sacks, sack kraft, kraftliner, sawn timber
The North-West Forest Company	Igor Bitkov	Nemansky PPM, Nyandomdkaya Forest Company, Kamennogorskaya Paper Mill, Kropotkino Machine Building Works	65	Sawn timber, roundwood, including pulp wood, paper products
The National Forest Company	Sputnik Group controlled by Boris Jordan	Kipelovo Concern, Sokol Sawmill, Ulyanovsk Sawmill, Kovzhinsky Lespromkhoz, Kirillovsky Lespromkhoz, Ustyales	60	Sawn timber, roundwood, pulp wood

Players	Owner	Controlled Companies	Turnover in 2000, million USD	Business
Solombala Wood Handling & Processing Mill	N/a	Arkhangelsk Sawmill No.3, 20 wood harvesting companies	40	Sawn timber, roundwood
Lemo	N/a	Lemo-Trading (wood procurement), Golden Grove (wood procurement), Balt Wood (wood procurement), Vyborg Forest Terminal (export), Lemo-International (export), Stevedore Forest Company, 6 service companies, 9 wood harvesting companies	25	Roundwood, sawn timber
Cherepovetsles	N/a	Belozersky Lespromkhoz, Babayevsky Lespromkhoz, Belozerskles, Chagodakomles, Belousovoles, trading companies	25	Sawn timber, roundwood, including pulpwood
Gosinkor-Holding	Gosinkor State-owned company	Syktyvkar Sawmill, Udorales, Zhdanovsky Lespromkhoz	123,3***	Sawn timber, roundwood

Sources: Expert, AK&M Agency, SKRIN Internet site (*www.scrin.ru*).

* In July 2002, Ilim Pulp Enterprise lost the control of Kotlas PPM, with Kontinental Management, Base Element (headed by Oleg Deripaska) and Promstroybank (headed by Vladimir Kogan) becoming the majority shareholder. However, Ilim Pulp Enterprise remains a minority shareholder of Kotlas PPM.

** The assets of Titan Group are listed as of 2001. At present, Arkhangelsk PPM is not part of Titan Group. In March 2002, Promstroybank acquired a 27.3% stake in Arkhangelsk PPM and became the controlling owner. Other shareholders are Conrad Jacobson (19.5%), Jacob Jurgenson (19.3%), Dollard Investment (12.5%), Winfried Heintzel (12.5%), Vladimir Krupchak (3.5%), Severnaya Tselluloza (3.3%), the State (1.1%), and private individuals (1%).

*** Accumulated turnover of all the companies included in Gosinkor-Holding Company, whose business is not limited to forest industry.

top 25 companies, in 2000 the production value was USD 22 700/person[10], i.e. several times lower than in similar companies of the developed European economies.

[10] The calculation is based on the average annual RUR/USD exchange rate, 1 USD = 28.12 RUR.

Table 6.2 Labor Productivity in the Top 25 Northwest Russian Forest Industry Companies

Company	Region	Sales in 2000, million USD	Personnel in 2000, thousand persons	Production Value, USD per person
Syktyvkar Integrated Forest Industry	Komi Republic	242.7	5.4	44,944
Kotlas PPM	Arkhangelsk	240.9	9.7	24,835
Arkhangelsk PPM	Arkhangelsk	214.4	7.6	28,211
Kondopoga PPM	Republic of Karelia	191.9	6.9	27,812
Svetogorsk PPM	Leningrad	184.8	3.2	57,750
Segezha PPM	Republic of Karelia	88.2	5.2	16,962
Solombala PPM	Arkhangelsk	65.5	2.1	31,190
St. Petersburg Paper-board & Printing Mill	Leningrad	59.5	1.9	31,316
Solombala Wood Handling & Processing Mill (sawmill)	Arkhangelsk	31.9	2.7	11,815
Pitkäranta Pulp Mill	Republic of Karelia	30.9	1.6	19,313
Cepruss PPM	Kaliningrad	30.6	1.9	16,105
St. Petersburg Goznak Paper Mill	St. Petersburg	29.4	1.1	26,727
Onega Wood Handling & Processing Mill (sawmill)	Arkhangelsk	27.0	1.7	15,882
Chudovo-RWS	Novgorod	25.9	0.5	51,800
Syas PPM	Leningrad	25,4	2,8	9,071
Sokol PPM	Vologda	24.1	2,9	8,310
Sovetsky PPM	Kaliningrad	23.1	2.0	11,550
Syktyvkar Plywood Mill	Komi Republic	22.1	1.2	18,417
Vyborgskaya Tselluloza PPM	Leningrad	19.5	2.4	8,125
Severnoe Lesopomyshlennoe Tovarischestvo	Arkhangelsk	18.1	1.8	10,056
Tcherepovets Plywood & Furniture Mill	Vologda	17.4	1.8	9,667
Suojärvi Lespromkhoz	Republic of Karelia	17.4	3.0	5,800
Fanerny Zavod (plywood mill)	Komi Republic	15.6	2.3	6,783
Ust-Izhora Plywood Mill	St. Petersburg	14.7	1.6	9,188
Komsomolets	Leningrad	14.2	0.5	28,400

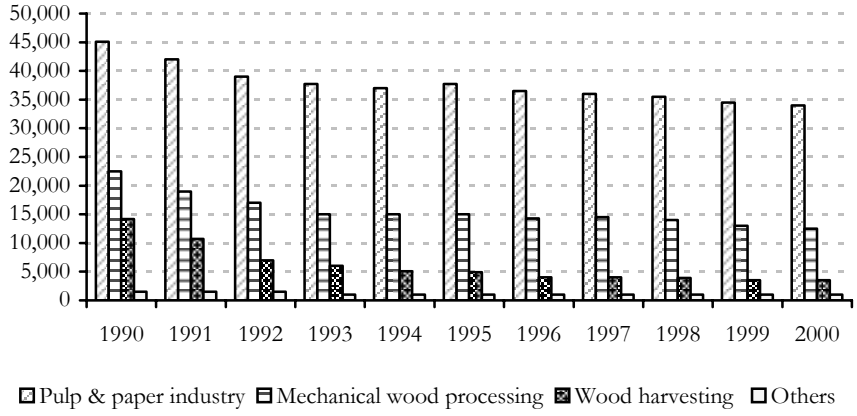
Source: North-West Top 150 Rating, 2001 (carried out by Expert North-West Magazine, 22.10.2001)

The analysis reveals the largest companies are also the most efficient ones: in the first half of the list, labor productivity is above the average in 8 companies; in the second half of the list, in just 2 companies. Productivity is highest in companies controlled by international owners (e.g. in Syktyvkar Integrated Forest Industry, Svetogorsk PPM, Chudovo-RWS Plywood Mill). This is the factual evidence of the beneficial effect of direct foreign investments, instrumental to providing the forest cluster of the Northwest Russia with new technologies, management practices, marketing channels and higher-paid job opportunities.

The development of the Russian forest cluster is heavily obstructed by the companies' burden of social responsibilities. The need to maintain the social infrastructure in the forest companies' locations, a responsibility inherited from the Soviet era, is adversely affecting their performance. As often as not, the local authorities are unable to take care of the social needs, which used to be financed by the State-owned forest industry companies. Therefore, the social responsibilities are largely falling to the companies and disrupting their financial situation. Another social issue, considerably limiting the companies' development opportunities, is their being the mainstay of the related communities and the main employers of the local residents. The companies are hard put to introduce more efficient modern equipment and process automation, which are bound to considerably reduce the personnel requirement and trigger future conflicts with the trade unions and local authorities.

The above problem is specific for Russia. Personnel reductions following implementation of new technologies and process automation are typical for developed economies, e.g. for Finland.

Figure 6.5 Number of Personnel in the Finnish Forest Industries and Forestry



Source: Finnish Forest Industry Association

In the developed economies, this process was gradual, with redundant personnel finding employment in other sectors (mainly in the growing services sector). A similar redistribution of labor could be possible also in Russia (one good example is Svetogorsk Pulp & Paper Mill with its advantageous proximity to the Russian-Finnish border). However, one should note that in Russia, with the typically low paying capacity of the majority of the residents, rapid development of the services sector is hardly possible, at least not in the remote areas. The problem is made even more acute by the scale of the staff reductions in the large Russian industries, where major production upgrading would make redundant a huge share of personnel, which would sometimes shrink to a fraction of the original numbers.

The persisting lax domestic competition in the forest cluster of the Northwest Russia is adversely affecting product competitiveness. In effect, any competition is currently among the producers of consumer goods (mainly the small furniture mills based in St. Petersburg); however, at this stage the competition is hardly strong. The high capacity pulp and paper mills could only become competitors if and when they diversify and expand their product mix, adding new products in demand on the modern markets.

Therefore, at this time, the organization of the forest cluster of Northwest Russia is still in its forming stage. The lack of an established industry structure has been a major obstruction, limiting the companies' strategic planning opportunities in a major way. Most companies have been focusing on tactical objectives aimed to achieve their short-term goals. Moreover, the slack competition between the regional suppliers does nothing to motivate the companies to increase their competitiveness.

6.3 Demand Conditions

As numerous studies in the domain of strategic management and business economics theories have already shown, one of the major conditions for the creation of competitive producers in a certain area is the existence of an adequate domestic market, i.e. of a market that would allow the achievement of economies of scale, as well as the existence of demanding consumers, who require diverse and high-quality products, thus facilitating the development of new products and services. Another important factor is the export demand for the products of the industries in question and the export capabilities of domestic industries, i.e. integration into the infrastructure of global networks. An analysis of the forest cluster and markets in chapters 3 to 5 allows us to draw certain conclusions related to the development of domestic and export markets for the

forest products of the Northwest Russian forest cluster as it relates to potential competitiveness.

First, we would like to point out that the transition to the market economy in Russia has a profound effect on the structure of the domestic forest products market. In the Soviet period, forest industry products were distributed through a centralized system of state-owned distributors, where products were assigned to consumers, and the producer rarely had any information about the user of its products, or preferences and demands. In order to avoid difficulties in matching the needs of consumers with products manufactured by companies that had no feedback links from the market, everything was handled through mass standardization and simplification. As a result of standardization, primarily mass-produced goods and lower value-added products were manufactured. There was no motivation for companies to diversify during this period. As we learned from the previous chapters, the key forest companies that operate today were built during the Soviet period, and the problems of low value-added products integrated into their technologies therefore still shape to a large degree the most capital-intensive industries, such as pulp and paper and sawn timber. The old technologies start to be of lesser importance in the least capital-intensive industries, such as furniture and plywood manufacturing. Unfortunately, the general approach to marketing and management in all the forest industries still suffers greatly from the inherited ignorance of markets and consumers.

In the 90s, as a result of the transition to a market-based allocation of resources, an associated decline in industrial production, wealth and purchasing power of the population, the domestic market for forest products decreased in size to a small fraction of what it was in the Soviet period. As a result, the overall per capita consumption of the key product decreased even lower than it had been before the transition, and today is much lower than that of the leading economies of the world. The numbers presented in Table 6.3. below related to the gap between consumption of selected forest products in Russia and that of developed countries. Although they are used in many studies related to the forest industries in Russia, they may be misleading as they may give the impression that the growth potential of the main products markets due to the gap are enormous. In practice, things look much different if the gap in purchasing power and overall well-being of these countries and Russia is taken into consideration. In the authors' opinion, a continuous growth of GDP per capita in Russia that outpaces growth in the developed world for decades is needed to reduce this gap substantially. Therefore, we can conclude here that the structure of the forest products market in Russia will remain different and more oriented towards lower-cost goods for the long term.

Table 6.3 Consumption of Forest Products by Country per 1,000 persons

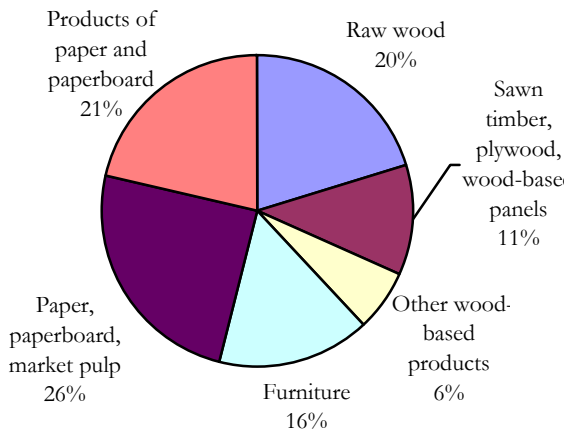
	Sawn timber, m^3	Plywood, m^3	Wood-based panels, m^3	Paper and paper-board, tons
USA	586	64.4	123.5	351
Canada	703	41.5	106.2	261
Finland	917	30.8	90.6	393
Sweden	493	20.9	99.1	205
Germany	244	14.9	131.3	214
Italy	156	11.8	65.9	178
Russia	85	4.2	24.7	26

Source: Research and Design Institute on Economics, Production Management and Information for the Forest, Pulp-and-Paper and Mechanical Wood-processing Industries, 2002

In 2001, the total sales of forest products in Russia amounted to $5.6 billion, including about $2 billion of imports. The structure of sales according to the Russian experts is presented below.

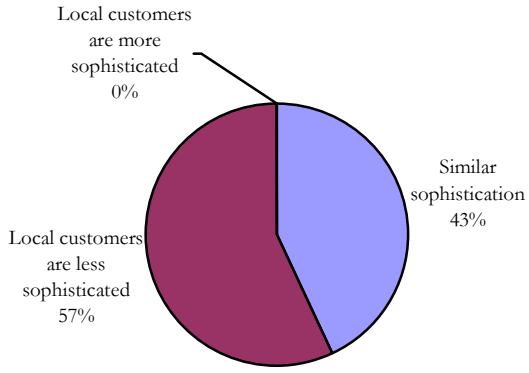
After the initial decline at the start of reforms that was observed in the early 90s, the market for forest products started to grow. We also observed some fragmentation of the market into groups of low and high value-added products, as well as regional concentration. Consumption of the end products in St. Petersburg, the main market in Northwest Russia, differs significantly from other cities of the region in volumes, products

Figure 6.6 The Structure of Forest Product Sales in Russia



Source: Research and Design Institute on Economics, Production Management and Information for the Forest, Pulp-and-Paper and Mechanical Wood-processing Industries, 2002

Figure 6.7 The Sophistication of Local Customers as Compared with Foreign Consumers



Source: Interviews with executives of forestry companies (2002)

and quality range. We believe that this trend, i.e. different market demand, and the concentration of demand for higher quality products in St. Petersburg, will continue for the time being.

Today, the market volume of low-cost and low-quality goods exceeds by far the market for high-quality products. The level of quality and associated services demanded by domestic consumers are still quite low in comparison to those in the developed markets. This was also one of the findings of our case-study survey.

As a result, on the domestic markets, one can find products manufactured using extremely outdated technologies, some even having originated in the 19th century. Nevertheless, this situation is gradually changing. The quality requirements of the consumers of final products, such as writing and office paper, tissues, furniture, etc. are growing. Such consumers are concentrated in St. Petersburg and several other large cities, where the highest growth of economy and wealth is observed. The relative cost advantage of domestic producers is soon to vanish completely if they are not able to introduce new, better quality, and more diverse products, as was the case in the period preceding the financial crisis of 1998. We believe that the portion of low quality and cost of forest products will gradually decrease.

Domestic markets of forest products differ significantly from one another. The overall growth of industrial production (especially of all the wood processing industries) and domestic construction is of primary importance for the harvesting and sawn timber manufacturing industries.

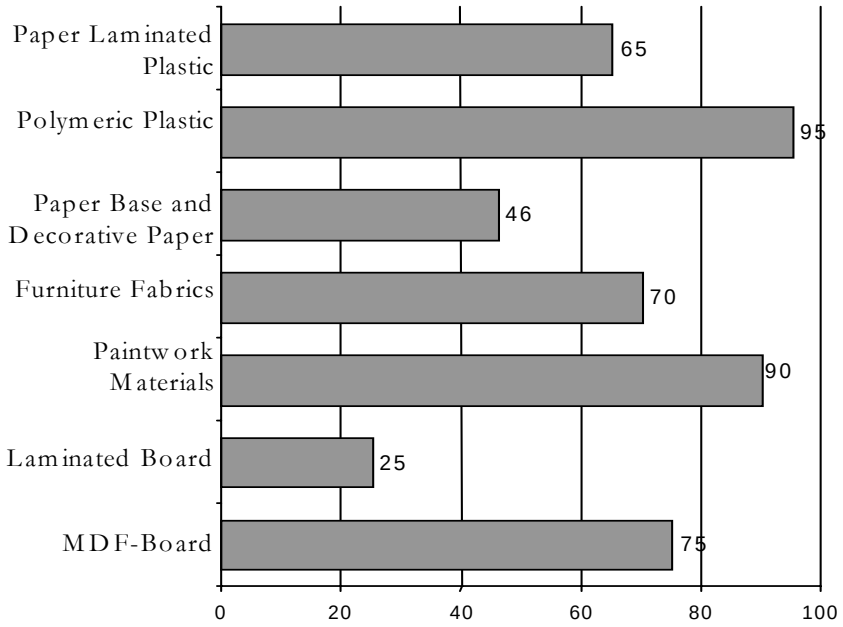
Unfortunately, today the prospects for rapid recovery and further growth of overall industrial production and construction and, correspondingly, of raw and sawn timber production in Russia are doubtful. A further expansion of export markets for the raw timber is also highly unlikely, due to the protectionist approach of the Russian authorities. On the other hand, exports of sawn timber could grow substantially if domestic producers are able (in addition to their cost advantage) to provide competitive quality and delivery terms, which, in its turn, is highly dependent on developments in industrial policy, infrastructure and the training of skilled labor. The substantial growth of mechanical wood-processing and harvesting production in the near future could be achieved only after new and large investments are made, which will be possible only when significant advances in improvement of the investment climate are be achieved.

The key customers for wooden boards and plywood are the furniture and construction industries. Therefore, a driving force in diversification and quality improvement of wooden board and plywood is the demand of final consumers and consequent diversification of the construction and furniture manufacturing industries. In the recent years, construction rapidly diversified although the total volumes of production in this industry are still much lower than in the pre-reform period. In contrast to the Soviet period, the most dynamically growing market segments today are high- and medium-quality housing and office space building and renovation. In this segment, a wide range of imported products is used. Thus, there is potential for growth and import substitution. It is also important to mention that in construction, the market, although diversified, is still heavily concentrated in mass housing that is built utilizing old technologies and materials inherited from the Soviet period. In the medium term, it is expected that demand for housing and finishing materials will shift to the higher quality segments, which will create a corresponding demand for forest products.

We have observed roughly the same situation in the furniture market as that which prevails in the plywood and wooden boards markets. Diversification of production is also a major market trend in this industry, as well, although the market volume is presently heavily concentrated in the mass, low-cost segment. Product segmentation here is driven by the wide gap in purchasing power between different customer groups. The trend is that the higher quality segment will grow much faster in the medium to long term. It is important to stress here that the wealthy consumers are heavily concentrated in the cities and, primarily, in St. Petersburg. Therefore, the other trend is that further development of the manufacturers of high-quality products will also concentrate here and the

presently successful companies in these locations will gradually shift to the manufacture of their own brands and quality products. At the moment, the leading furniture producers import components, accessories and equipment. There is a potential for import substitution in these product groups. The potential could be measured for furniture manufacturing by segments as it is presented in Figure 6.8.

Figure 6.8 Share of Imported Components in Furniture Production, % of Total Consumption



Source: Wood-processing magazine, #2, 2001.

As regards the domestic market for pulp and paper, one can also observe a substantial structural change that is similar to the one observed in the consumer-oriented industries, i.e. demand is growing, it is significantly more diverse and quality-sensitive than in the Soviet period. The market, on the other hand, remains segmented and the high quality segments are relatively small in size, which still does not allow for achieving economies of scale for the producers if they are not integrated into the global networks and, thus, able to export efficiently. Integration into the global networks is very difficult due to continuous struggle for control over the leading manufacturers (hence lack of investment) and various infrastructure-related obstacles, such as unreliable transport and complicated export procedures. Another substantial obstacle for increasing the share of the global market is the lack of marketing power and commit-

ment of the leading Russian manufacturers. Such commitment is needed in order to take over shares of the global market from the well-capitalized and consolidated multinationals. On the domestic market, the growth in demand is concentrated in packaging and corrugated board, wrapping paper. This is connected to the overall growth of the food and other consumer-oriented industries, and the consequent growth in demand for packaging materials. In our opinion, this trend will persist for the time being. There is also potential for rapid growth of the market for high quality graphic and printing papers. Unfortunately, in practice it is hampered by the preferential treatment by Russian customs and other authorities of imported printed products over domestic ones. If this situation changes (these issues are widely discussed in Russia today), the domestic market for high-quality printing and graphic papers will grow rapidly.

There is also a tendency for gradual increase in demand for higher quality tissue products and carton boards that is concentrated in the large cities, primarily in St. Petersburg, although in total it remains on a much lower level of per capita consumption than the developed countries. We could say that these slow changes in the domestic market structure is not stimulating diversification of the pulp-and-paper manufacturers. Their product range has not changed much in the recent decade.

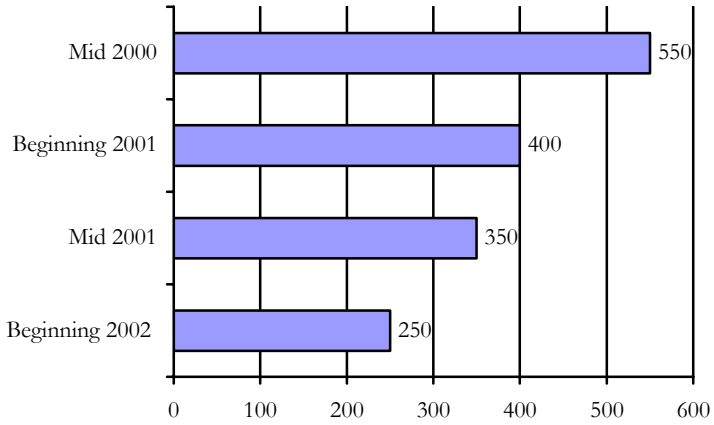
On the whole, we can conclude that the volume of the domestic market in all industries of the forest cluster remains insufficient for sustainable development of the regional forest cluster. This analysis of statistics (see section 4.1) shows that the total imports to Russia from OECD countries in the product groups where the highest import substitution potential is concentrated is equal roughly to the annual turnover only of one of the five leading producers in the Northwest Russian forest cluster. Therefore, without substantial growth in the size of the domestic market, which is possible only in the event of significant growth of the GDP in Russia, it is hardly possible to envision a situation in which the prospects for the competitiveness of the forest cluster in higher value added products will improve in the short term.

The portion of exports in the total production output of the forest industries in the Soviet period was rather small. In the 90s, along with the general decline of production, the share of exports increased substantially (see section 4.1). This may be explained by the rapid decrease of domestic market size and payment discipline: foreign customers in contrast to the Russian customers are more accurate.

The overall structure of sales on the international markets is roughly the same as in the companies product range, i.e. raw materials and low value-added goods prevail. So far, Russian products have sustained the

relative cost advantage that is provided by the low costs of energy, transport and labor, as well as proximity of the companies of the Northwest of Russia to European markets, as compared to their counterparts from the other regions of Russia. These factors allow for generating profit even in circumstances of very low prices on international markets.

Figure 6.9 Average Prices for Russian Pulp on the World Market during 2000-2002, USD per metric ton



Source: Delovoy Peterburg newspaper 11.05.2001, Expert magazine 21.01.2002

Unfortunately, as we know from international practice, these factors are hard to sustain in the long run. The costs of production will inevitably converge with the costs in corresponding activities in the developed countries, as a result of the growth in raw material, labor, energy, and transport costs, and the profitability of exports will dramatically decline. This would lead to consequent evaporation of advantages and an overall decline in the forest industries of the Northwest of Russia if long-term advantages do not add to the list as a result of industrial policy and investments. Among the advantages that have a relatively longer effect on the competitiveness are marketing skills and networks, an infrastructure with characteristics compatible with the requirements of customers from developed countries, in terms of reliability, speed and promptness of deliveries, as well as technologies and processes that meet the consumer requirements for flexibility, quantity and quality, packaging and marking, standards and terms of delivery. Today, there is a public discussion in Russia concerning measures and actions necessary to provide for more sustainable development of forest industries. Unfortunately, such discussions do not deal with the practical and useful measures that need to be undertaken urgently. Therefore, a trend that may be observed in the

short to medium term is that the pace of growth in overall industrial production in the Northwest forest cluster will not be sufficient to outperform competitors from other countries until necessary measures are actually implemented.

Substantial investments and the commitment of the decision-makers in Russia is needed to reverse the present state of affairs in the forest cluster of Northwest. It is very difficult today to envisage substantial improvement in the investment climate and commitment. Building the confidence of the investment community, and achieving visible results in infrastructure development and integration into global networks, will require substantial time and effort. As a result, it could be that the less investment-intensive and consumer-oriented (domestic consumers) industries will develop relatively faster initially. The development of these industries will nevertheless follow the general trend of the GDP per capita growth in Russia. On the other hand, investments and growth of the more capital-intensive industries, such as pulp-and-paper manufacturing, is bound to take off later as healthy progress in the infrastructure and investment climate is achieved. It is likely that for the time being, the growing demand on the domestic market will be serviced by imports.

6.4 Related and Supporting Industries

Existence of well developed and competitive related and supporting industries is a key element needed to ensure the competitiveness of the companies – the primary products manufacturers in the medium and long term. Adequate related and supporting sectors are able to provide the producers with extra competitive advantages, an important one being the opportunity to use the products or services (or product and service combinations) offered by the companies within the related and supporting sectors, making its possible to turn out primary products with a higher value-added.

The main related and supporting sectors with an impact on the forest cluster development are: Logistics; Energy; Processing Equipment Manufacture; Chemicals; Auxiliaries Manufacture; IT; Banking and Finance; Insurance; Business Consulting, and Environmental Services.

Logistics and Energy

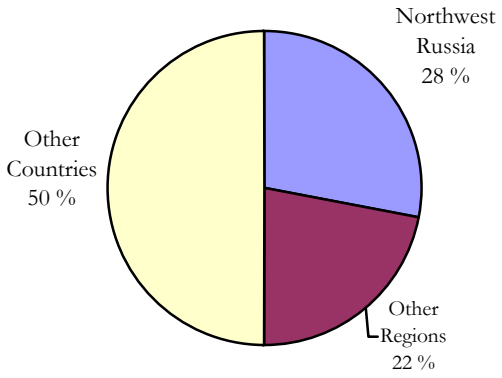
At this stage, the Russian power industry and railways are still controlled by the State. The company managers interviewed in the course of the Study work tend to view the continuously climbing transportation and energy tariffs and fuel prices as a factor having a strong adverse impact on the development of their companies. However, the project team be-

lieves that the tariff hikes as such are only natural during the transition from the closed socialist economy to the open market system. At the same time, the sector in question lacks competition, thus depriving the companies of the opportunity to select the suppliers of services. In the short term, any reforms aimed at doing away with the monopolies will be limited to the electrical energy industry, with the energy generation and supply companies to be privatized. The railways and the gas industry are likely to remain monopolistic in the next few years. A more detailed review of the logistics and energy issues is presented in Appendix 4.

Processing Equipment Manufacturing

In the Soviet era, the Russian manufacturers of equipment for the forest cluster were offering products meeting the requirements of the then-contemporary market. At this time, the equipment manufacturers are unable to satisfy the altered demand. Consequently, the producers who seek to turn out high quality products prefer to import foreign-made equipment. The only companies still in the market for domestic equipment are those focusing on low-priced products.

Figure 6.10 Geography of Main Suppliers of Equipment for the Forest Cluster of Northwest Russia



Source: Interviews with top managers of forest companies (2002).

The project team does not expect the situation to change in the short or medium term. Any significant upgrading of machine-building factories would involve major investments; the prerequisites of such investments are currently lacking, the main reason being the shrunken domestic market.

Banking and Finance

The Russian banking and financing sectors are in their initial development stages. The development process has been obstructed by the frequent crises with which the Russian economy has been afflicted in the last decade, combined with the inefficient State regulation.

The inadequate financing and banking sectors are having a special impact on the forest cluster development. In view of the high capital intensity and the extensive payback term typical for new projects related to the forest cluster, many banks are not willing to take the risk of loaning funds to finance long-term projects. At the same time, the short-term and medium-term loans the forest industry companies need to increase their working capital are also hard to secure, as the companies' assets are often not accepted as a collateral. Another obstacle in the way of obtaining loans is the missing mechanism of mortgaging the forest fund. One must also note that a company's chances of securing a loan are hinged on the private connections of its managers, rather than on the company's financial situation.

As to the securities market, at this time it fails to provide an efficient environment enabling the forest industry companies to be active in securing funds to finance their development needs. At the moment, the Russian securities market is inefficient. Consequently, the industry owners are reluctant to put their assets on the public market. Due to the extremely low development rate of the Russian securities market, it is unlikely to become a widely used instrument of attracting funds to finance the development of the forest cluster companies in the short term.

Insurance Services

During the Soviet rule, there used to be just one insurance company serving both private individuals and corporate entities. It was Gosstrakh (with Ingosstrakh, its integral part, serving exporters). However, the disintegration of the Soviet Union deprived Gosstrakh of its monopolistic position, bringing to life numerous small-scale insurance companies whose assets are mostly insufficient to provide full-scale insurance to the industries. Both the existing range and the quality of services offered by the Russian insurance companies are well under the standards typical for the developed economies, thus constituting a key factor behind the unfavorable investment environment. At the same time, the activities of the international players on the Russian insurance market are restricted.

Business Consulting and IT

Business consulting in Russia is not sufficiently developed to ensure the use of best practices and offer advisory services based on the experience

of the world's most competitive companies. At the same time, the customers are still unprepared to extend the financing needed to ensure quality services. The Consulting companies are mainly being engaged as auditors or as advisors during the implementation of joint projects involving foreign partners. Otherwise, the forest cluster companies prefer to use their own staff. Any expansion of the consulting sector would be hinged on the general growth of the national economy and on the gradual adoption of the international business standards by the Russian companies.

Information technologies, which are currently a must for any noticeable efficiency improvement at all production and company management levels, are, in effect, just getting a foothold in the forest cluster companies. A more detailed review of the issues involved in IT implementation within the Russian forest cluster is presented in Appendix 4.

Chemicals, Auxiliaries Manufacture

The development of other forest cluster-related sectors with an import substitution potential, e.g. production of chemicals for the pulp & paper industry, accessories for the furniture industry, etc., would be hinged on a major expansion of the domestic market capacity and a toughening of the domestic consumer demand, and would involve major investments.

Environmental Services

Until now, Russia has not been paying enough attention to environment protection and biodiversity conservation issues. Technologies long abandoned in the developed economies due to the high environmental risk are still widely used within the forest cluster, especially in the pulp & paper mills. The current lack of an efficient environmental services sector has been adversely affecting the competitiveness of the Regional forest cluster in the conditions of the rapidly toughening certification requirements and the various environmental activities going on in the international market.

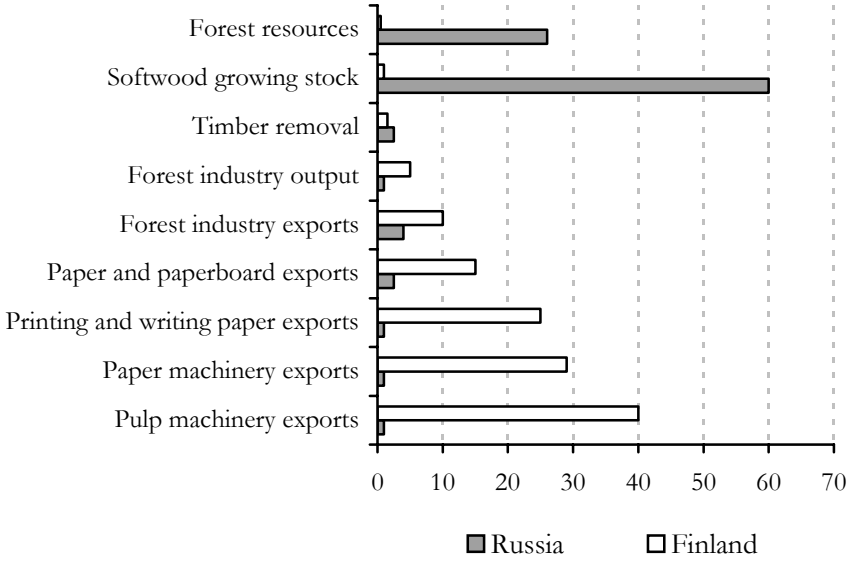
To summarize, one should note that at this time, the relationships of the forest cluster companies with the related and supporting sectors are limited to the basics, i.e. to the raw materials and low value-added products. There is very limited development of the essential services such as maintenance of industrial facilities, measurement of incoming wood and outgoing products, trading and distribution, and necessary input materials and products in the Northwest of Russia forest cluster. This does not allow forest companies of the regions to outsource and concentrate on the core competences as well as increase their flexibility and efficiency. In this sense it is envisaged that the long-term development of the forest

industries in the Northwest Russia will most probably go through regional agglomeration of activities in areas where availability of infrastructure and services will be the best. The preconditions of a major improvement of the situation are also a much more favorable investment environment and a wider market to improve the situation.

6.5 Government

The experience of developed countries shows that the implementation of the long-term clearly stated policy helps to achieve impressing results on the world market. Finland's example is especially convincing. State measures that were taken helped the companies of the Finnish forest cluster to increase their competitive advantages, and now the country occupies the leading position by the manufacturing and export of forest products and especially in technologies development.

Figure 6.11 Finnish and Russian Shares in the World Figures



Source: Finnish Forest Industries Federation, 2001, ECE/FAO Forest Products Annual Market Review, 2000-2001, Materials of the seminar "Competitiveness of the Russian Forest Sector", 2002

As another positive example of the purposeful state industrial policy focused on development of the national forest cluster an experience of Ireland can be evaluated.

Box 6.1 Development of the Forest Cluster Focused on Mechanical Wood-Processing in Ireland

Only 8% of the area in Ireland is covered with forests (total – 570 thousand hectares). In the early 1980's the program of the reforestation and forest development were introduced in the country. It was supported by EEC, which promoted its success – only in 1993-1998 more than 80 thousand hectares were covered with forests, and this process continues.

Presently there are about one hundred sawmills and four fiberboard producers in Ireland. As there are no pulp-and-paper mills in the country, the wastes of mechanical wood-processing are exported to Great Britain. Raw material of pulpwood size also goes to fiberboard production, making Ireland one of the leading fiberboard producers per capita in Europe. This product has the main export share among all Irish forest products. Focusing on manufacturing of the products with high added value resulted in high quality characteristics of the fiberboard: Ireland MDF is a quality standard in Europe. At the same time, production of OSB (oriented strand board) has also developed – the factory in Waterford producing this type of boards is the largest in Europe.

Nearly all harvested industrial wood in Ireland is processed by domestic mills and makes up 60% of all raw material demands of the Irish wood processing industry.

Irish fiberboard producers have the very modern equipment. Two largest world producers of fiberboard (both established in 1996) are located in this country. Their main competitive advantages are favorable location near West European markets, and high quality of local raw materials (mostly spruce).

Russia is in a different situation. At this time, the top managers of the forest cluster companies are unanimous in their negative assessment of the State's role is the cluster's development. The adverse impact is caused by the lack of an actually implemented industrial policy, by the extreme inconsistency of the authorities' decision-making, and by the all too common corruption. It is not uncommon for the unfavorable investment environment to be aggravated by the policies implemented by Regional authorities: in some Regions (e.g. in the Republic of Karelia, re. Appendix 3), the authorities, discouraged by the previous failures, have developed a hostile attitude towards any potential foreign investors.

In the 90's the Russian forest industry has undergone sweeping privatization. However, the influence of the government remains significant. The land and forests are still owned by the state and, besides, there is a share of municipal and state-owned companies (see part 6.2).

The Russian forest management system that is operating nowadays is not rational in many aspects. In particular, this irrationality can be seen in

forest stock rent evaluation before it leased to companies. The main drawback of this evaluation is the fact that the factor of economic expediency of harvesting is not taken into consideration. The forests located in the Republic of Karelia with a high-density transportation network had the same rent rates as those of the difficult to access areas in the Republic of Komi. It was the reason of overexploitation of easily accessible forest stock and low pace of development of infrastructure for forest transportation. In the nearest future the situation is expected to change, because the government plans to carry out a cadastre assessment of the lands with economic factors taken into consideration.

Long-term Leases

Presently, most of the leaseholders of forest stock cannot be sure in the future of their business. The forest stock is given to harvesting companies mostly by means of short-term lease, and entrepreneurs do not risk investing in transport infrastructure on the land, which in several years can be taken away. For example, in the Leningrad region only 12 from 100 largest leaseholders managed to lease the forest stock for the maximum period – 49 years, and about 20 leaseholders – for 20-25 years. The rest have got only a five-year lease.

The abovementioned problem is closely connected with another – insufficiently developed forest concession legislation. The concept of concession exists in the Forest Code of the Russian Federation, but nevertheless, there are no legislative acts that describe the procedure of concession granting and other conditions. That is why there has not been any concessions set up in Northwest Russia so far.

Transport Infrastructure Development

In the context of the Russia's great territory, the State retains a major role in the development of the national transportation infrastructure. At the same time, in the course of the last decade all types of road-building activities have dwindled. The shrunken forest road construction volumes have proved to be a development with an especially adverse impact on the forest cluster. At the moment, the State lacks the funds required to finance the transportation infrastructure development, while the companies are cautious in their investment decisions due to the high investment risks. This is the specific reason behind the continuously delayed construction of Belkomur Railway.

Forestry Activities

The other problem of State regulation is financial relations between local, federal budgets and state-owned forestry companies ("leskhozes"). These companies transfer money, which are collected from the forest stock rental payments for the harvesting areas, to the budget. The State, in turn, finances reforestation arrangements and other related activities that are implemented by "leskhozes". However, the State often doesn't fulfill its obligations related to financing of the forestry activities. For example, the Leningrad region finance reforestation by 30% (according to the data of 2000), though the money it receives from forest rents is one and a half times higher than the costs planned for reforestation.

Customs

The development of processing sub-sectors of the regional forest cluster is also limited by the customs policy. For example, as the government strives to support wood-processing companies, custom duties for imported equipment have grown from 5 to 20% during the last five years. At the same time, duties on sawn timber exports are considerably higher than for round wood.

Another related problem are the repeated border-crossing hurdles. Due to the frequently changing Russian regulations, which are not reconciled with those of the neighboring Finland, the border-crossing points (which are all too few) are forever plagued by long queues and grossly delayed deliveries.

Constant Changes in State Forest Management

The frequent changes in bodies responsible for State regulation of the forest cluster have taken place during the recent years. It had a negative impact on the overall forest cluster development. The bright example is the recent transformation of the Ministry of Economics into the Ministry of Economic Development and Trade. It resulted in a move of the Department of the Forest Industry to the Ministry of Industry, Science, and Technology and led to breaking of links that had been established between the State and the forest industries. On the whole, as a result of frequent changes, the role of State in the industry's co-ordination has decreased significantly during the last decade.

To summarize, one must say that at this time, the State's pursuit of priority development of the forest cluster, which is a backbone of the Russian economy, is more of a declaration than an efficient practical effort. The project team believes that in the short term one could not rea-

sonably expect any major slackening of the State's role in shaping the industrial development. To increase the competitiveness of the Russian industry in general and specifically of the forest cluster, it is important and necessary for the State to abandon its sporadic interference, concentrating on creating a favorable investment environment and on introducing regulations promoting conscientious and rational use of natural resources (especially since forests are one of the few renewable resources).

7 Conclusions and Policy Proposals

The analysis of competitiveness in the present study has demonstrated that there are no obvious and sustainable advantages in the Northwest Russian forest industry cluster today. To achieve the sustainability of existing advantages, significant investments and efforts from industrial policy makers and business leaders are required. The present advantages of the forest cluster are based on the low costs of the basic production factors, i.e. raw wood, cheap labor, energy and transport. Unfortunately, the available raw material resources in Northwest Russia are largely depleted, and energy, labor and transport costs are bound to rise in the near future. Therefore, there is a high probability that existing advantages will disappear if corrective measures are not taken by government and business leaders in the near future.

As we described in preceding chapters, the technologies and processes used by the capital intensive industries (pulp-and-paper) of the forest cluster are worn-out and obsolete. The majority of the companies of the cluster were built during the Soviet period, when allocation decisions and technological solutions were a function of political will and not of economic considerations. As a result, a shift in the location and product range of the forest cluster already occurred in the period of transition when markets became free in Russia. Although upgrading of industrial assets in less capital intensive industries, such as mechanical wood processing and furniture manufacturing, has been going on for some time, old industrial assets and locations are still in use and predominate. One of the trends envisioned for the near future is that a shift to more feasible locations and better technologies will rapidly gain momentum, provided the investment climate is favorable enough.

The development of related and supporting industries is necessary in order to provide more stability to the forest cluster in the long term. Integration into global networks and, respectively, the development of the transport and information infrastructure is necessary if forest companies are to gain access to higher value-added export markets. Unfortunately, in Russia, and in Northwest Russia in particular, there is much to be done in this area. We believe that here, as well, there is room for purposeful industrial policy and government investment, coordinated with business. The existence of well-developed machine-building and metal-processing industries in Northwest Russia, as well as a long history of equipment manufacturing, predetermine the possibility that new local equipment manufacturers will be created in the medium to long term,

which will gain competitiveness from a better knowledge of customer needs and flexibility due to proximity.

In the forest industry R&D, a substantial leap forward is in order. Local engineering has mostly lost its competitiveness and is not capable of providing advances in research and development for the industry today. There is room for new start-ups or spin-offs from old institutions. It is not at all clear that the majority of the existing companies will survive in the medium to long term in their present form. The development of venture capital in Northwest Russia and the creation of a National Innovation System could facilitate advances in this area.

On the demand side, a tendency towards overall diversification and gradual market segmentation is noticeable. The development of the consumer market for forest products follows a general trend of population stratification into groups, according to their annual income and wealth. In the present situation, the gap in incomes has grown very large. As the number of prosperous companies and individuals grows, the market for high-quality products increases. Nevertheless, mass-produced and low-cost goods still occupy the largest portion of the total and are expected to cede their position to better quality goods at a pace roughly corresponding to the overall GDP growth, except in certain high quality segments where rapid developments are still possible. New construction materials might represent such a segment, if domestic builders gradually adopt modern technologies. Other segments where rapid growth of demand might be expected in the near future are graphic papers and tissues.

In our analysis of the competitiveness of the Northwest Russian forest cluster we have outlined major tendencies that could shape the development of the forest cluster in the future. We view the improvement of the investment and business climate, increase of foreign direct investments in the forest industries along the lines specified below as one of the most urgent issues for the development of the cluster. Regional concentration and specialization of activities dictated by the logic of resource allocation and the feasibility of operation, and not by political fiat, as was the case during the Soviet period, is another major trend in the forest cluster. We present the vision and trends that could possibly shape the forest cluster of Russia in the coming years in the remaining part of this Chapter.

In spite of abundant forest resources unmatched by those of any other European country, Northwest Russia is able to boast but a marginal share of the European forest product markets. To a certain extent this is due to the unfavorable climate, but the main reasons are of an economic nature; some of which have been inherited from the Soviet era, some shaped during the transition phase of the Russian economy.

To ensure the sustainable development of the forest cluster when Northwest Russia is being integrated into the free international market, major investments, both domestic and foreign, are imperative. At this stage, however, the unfavorable investment environment is retarding the inflow of investments. Currently, investments focus on urgent activities necessary for maintaining existing operations, rather than at high capacity green-field industries (the one exception being the plywood and wood panel industry, with its investment projects aimed at starting up new facilities).

The authors of the study believe that in order to ensure the far-reaching improvement of the investment climate and increase in foreign direct investment, and thus to make the forest cluster of Northwest Russia more competitive, certain key issues must be addressed:

1) Land and Forest Ownership

The experience of Finland and some other developed economies suggests that widespread private ownership combined with the efficient state regulation of activities would have a positive impact on the efficiency of the forest cluster. For example, as private ownership takes hold, illegal cuttings, currently taking place in Russia on quite a large scale, would dwindle. At the same time, private ownership would promote forestry activities involving the resumption of reforestation operations and a generally more conscientious use of forest resources. However, one should note that over the preceding century, Russia has lost its private ownership traditions, and it is likely that the newly established private ownership practices will need a long time in order to take hold and become efficient.

The Canadian forest cluster development model, with its prevailing government ownership of natural resources and efficient government control of national forestry in the market economy, might be the best model for implementation in view of Russian conditions (e.g. great distances, and low population density). In this case, to ensure a long-term wood supply for wood-processing industries, one would need to elaborate clear regulations governing long-term utilization of wood resources within the framework of forest concessions or forest leases. At the same time, due to the extensive boreal forest vegetation period typical for Northwest Russia, it would be feasible to increase the maximal forest utilization term from 49 years to 99 years. In this event (just as in the case of private ownership, but with lower starting investments), companies would be in a position to develop the basic part of the sectoral transportation infrastructure, i.e. a network of forest tracks (which is a precondition for any further utilization of forest resources) on their own.

This brings up another important issue: putting in place an economically substantiated forest cadastre, a substantially reduced price for the growing stock that is hard to access with use of the existing infrastructure would provide a strong motivation for companies to invest in infrastructure development.

2) Adjusted Role of Government in the Development of the Forest Cluster

To ensure sustainable development of the forest cluster, the government must switch from its current, purely declarative, policy to actions aimed at improve the investment climate, and to establish clearly defined long-term rules of the industry game, to be followed by international and domestic players in Russia[11]. At the same time, it is of fundamental importance that federal policy and rules take precedence over regional policies in determining the general and comprehensive framework for the development of the forest cluster in order to prevent local authorities from hindering economic development by following their personal likes and dislikes. It is important to stress here that the forest cluster of Northwest Russia presumes cooperation between regions in many areas. Therefore, comprehensive interregional regulations are absolutely necessary for the development of the forest industries. Also essential to the development of federal and regional industrial policies is the need to move from direct measures, such as providing tax incentives for harvesting and processing enterprises, to the long term measures, such as ensuring longer (more then 49 years) forest leases, rational pricing of forest stock to be leased according to its economic accessibility, improving supervision and control of forest use and reforestation, motivating forest users to maintain their forests properly, directing infrastructure development programs to certain areas where the best results can be obtained, developing training and R&D through indirect measures, and concentrating efforts on the most promising institutions instead of expending effort on small institutions, unable to support all possible beneficiaries, etc.

3) Development of Related and Supporting Industries in the Context of Overall Infrastructure Development

The obsolete infrastructure is a key competitive disadvantage of the forest cluster of Northwest Russia. The highlights of infrastructure development are:

---

[11] As one of the most urgent issues, the situation with protection of property rights in the Russian forest industry should clearly be addressed.

- Extension of the network of forest tracks;
- Inter-company and company-government cooperation aimed at the establishment of new transportation routes (e.g. the Belkomur[12] Railroad project; if implemented, would enable commercial operations in the previously unutilized forest blocks in the Arkhangelsk Region and the Republic of Komi);
- Promotion of small-scale energy generation plants within the industrial processes and use of wood as a fuel to reduce the companies' dependency on outside energy supply and increase efficiency of manufacturing;
- IT implementation at all levels of management, production and sales organization;
- Development of the banking and financing system, insurance system, and business consulting based on the most successful practices.

The authors of the study believe that any government or private investments in infrastructure should be aimed primarily at the existing agglomerations of the forest cluster, where investment efficiency would be highest as a result of lower costs.

The principal advantages of agglomerations are:

- The existing industrial infrastructure, better developed than in other areas;
- Higher availability of skilled labor.

Any new wood-processing industries would also be feasible within the agglomerations. This would be of special importance to foreign investors, since the new companies would not be burdened with any specific problems inherited from the Soviet era. At the same time, Russian production experience reveals that modern production and management practices are much easier to implement in newly established companies than in "old-timers."

4) Implementation of New Process Technologies Throughout Forest Cluster Industries

Presently, the forest cluster of Northwest Russia lacks the prerequisites necessary for widespread modernization of process technology. The reason for this is the high profitability achieved by companies that capitalize on their competitive advantages, i.e. cheap raw materials, cheap energy and cheap labor. In fact, these factors have an adverse effect on the

[12] See Appendix 4 for more information.

long-term development of the forest companies, as they encourage heavy overuse of timber, low quality and cost of labor leading to low quality of products and productivity, as well as discouraging the inflow of young, skilled labor into the forest industry. In the short term, the importance of the above factors is likely to diminish significantly, changing the situation and forcing the company owners willing to remain on the market to look for cost reduction methods, of which process modernization is one of the most important. An important link in this chain is the development of domestic banking and equity markets that would allow for better leverage opportunities and loans to the industry, which are only starting to take shape in today's Russia. The introduction of ISO 9000 standards is also of great importance for the long-term development of domestic forest industries, as the norms integrated into the GOST national standards that still regulate the forest industries are seriously outdated.

5) Improved Personnel Training

In spite of the excessive number of forest cluster specialists graduating annually from the educational establishments based in Northwest Russia, the quality of training does not meet the current international standards and requirements. In order to change the situation, a matter of priority would be to bring training and industry together, focusing the training process more specifically on turning out specialists who are fewer in number, but better equipped with applied knowledge and production skills. Companies should consider heavier investments in the training of necessary specialists and participate in the training of personnel, taking an active part in implementing special training programs jointly with educational establishments. There is a need to curtail dramatically the large number of existing educational institutions, down to one or two. In this case, the remaining institutions will benefit greatly from the concentration of the best resources, which are spread today among a large number of remotely located institutions, none of which is capable of offering a quality education. At the same time, special attention should be paid to improving production efficiency by motivating employees to be concerned about the results of their efforts, as well as to the establishment of corporate ethics and traditions.

6) Reconstruction of Ties between the Industry and R&D

At the moment, the high potential of the R&D serving the forest cluster of Northwest Russia is virtually untapped. The industries found themselves outstripped by the innovation process. Faced with a rapidly dwindling flow of orders, the R&D companies serving the forest cluster have been forced to drastically limit their research activities and have lost

some of their best resources. As a result, the R&D potential is rapidly deteriorating, and unless there is a radical change in the situation in the next few years, it could be lost altogether.

Just as in the case of process technology upgrading, the reconstruction of the disrupted relationships between the industries and the R&D institutions would require a radical reshuffling of the companies' priorities, bringing forth the issue of strategic planning aimed at improving product competitiveness. So far, against the background of the continuing redistribution of the forest cluster assets, this has not been possible. Consolidation of efficient owners with the option and intention of making long-term commitments to forest business would serve to revive the innovation process.

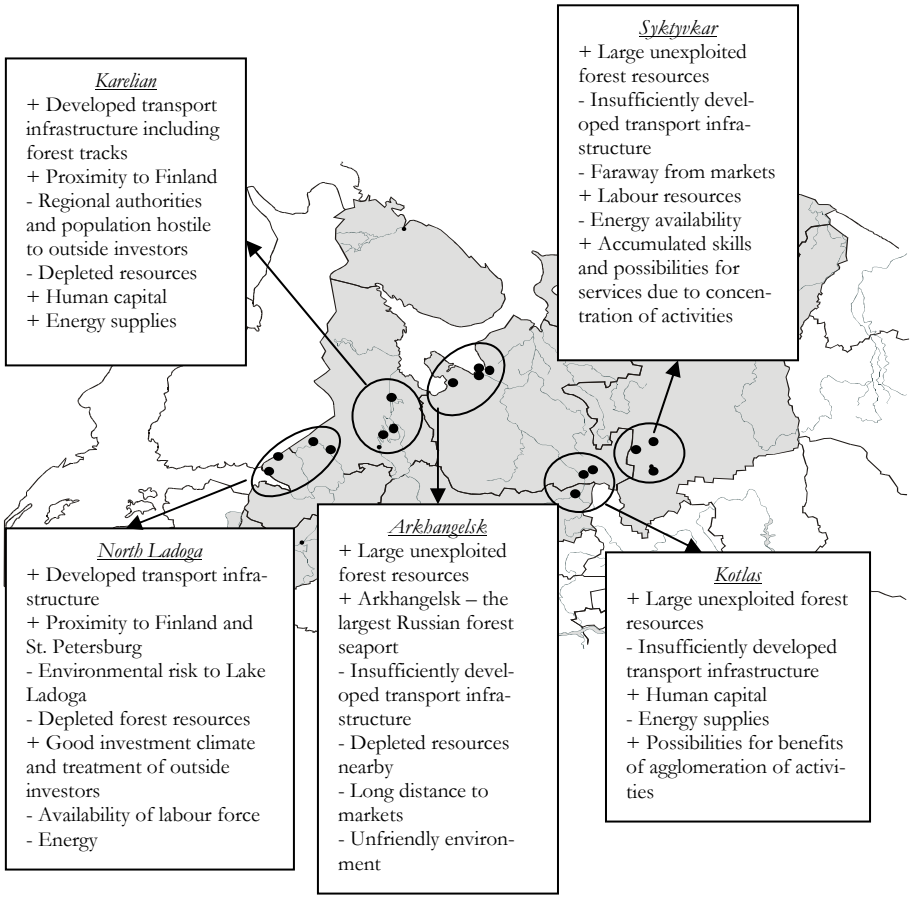
7) Environmental Issues

The slow change in the environmental awareness of Russian industrialists' is caused by the pressure exerted by independent environmental organizations and by the forest certification requirements imposed by the international forest product markets, which are growing more stringent every year. Any major changes would depend on government involvement: the regulations governing reforestation, discharges and emissions and the related recording system need to be changed, and efficient environmental penalties devised. This is the only way to motivate companies to invest in environmental technologies and environment protection activities. Increased environmental awareness of residents and a newly established tradition of caring for nature and natural resources are also issues of the utmost importance. Promotion and introduction of the ISO 14000 standards, i.e. Environmental Management Systems, the development of such programs as "Clean-up Production," etc., could greatly facilitate improvement of environmental protection and awareness among the forest cluster companies.

Regional Issues

As mentioned in the previous chapters, one of the features of the Northwest Russian forest cluster that will dramatically influence its further development is the regional concentration of its activities. The forest cluster of Northwest Russia is heterogeneous, with major distinctions between individual Regions and agglomerations contributing to both the present situation and the future development of the forest cluster. Herewith, we summarize the key matters in the development of the regional agglomerations in terms of their advantages and disadvantages.

Figure 7.1 Competitive Advantages and Disadvantages of Agglomerations



The factors that will shape future development of the Karelian and North Ladoga Agglomerations are:

- The most highly-developed (as compared to the other regions comprising the Northwest Federal Territory) transportation infrastructure, including the network of forest tracks;
- Proximity to Finland, fostering opportunities for cross-border cooperation.

At the same time, of great importance for the North Ladoga Agglomeration is its proximity to St. Petersburg, offering a huge domestic market for final products, a seaport and a large training and R&D potential. A number of forest cluster industries turning out high value-added products targeting the domestic market are based in St. Petersburg.

An important competitive disadvantage of the Karelian Agglomeration is the current attitude of the regional authorities, who are apprehensive of potential outside investors. The North Ladoga Agglomeration is the one for which the environmental issue is of the highest priority, as compared to other agglomerations of Northwest Russia. Along with comparatively modern industries (e.g. Svetogorsk and Vyborg Pulp & Paper Mills), the North Ladoga Agglomeration includes some rather obsolete industries operating in the water catchment area of Lake Ladoga, which heavily pollute the lake. In addition, the forests in both of the above agglomerations and in the neighboring areas are significantly depleted.

However, the Arkhangelsk and Kotlas Agglomerations, the two agglomerations in the territory of Arkhangelsk Region, have a vast wood resource potential, including the most valuable, spruce. Unfortunately, their transportation infrastructure, i.e. forest roads, railways and public roads, is clearly underdeveloped, presenting a major hurdle for forest utilization. On the other hand, alongside the main transportation routes, i.e. navigable rivers and rivers used for timber rafting, there are virtually no pristine forests left.

An important competitive advantage of the Arkhangelsk Agglomeration, the largest forest cluster agglomeration in Northwest Russia, is the large Arkhangelsk seaport (among the leading Russian sea ports) and its second largest forest-related training and R&D center. Typical for both agglomerations are significant wood-processing industries, which have both its advantages and disadvantages (the latter stemming from the inadequate process flexibility and the high environmental risks).

In contrast to the neighboring Kotlas Agglomeration, the economy of the Syktyvkar Agglomeration in the Republic of Komi includes a substantial mechanical wood-processing sub-sector in addition to chemical wood processing. The agglomeration abounds in forests; however, wood resource utilization is hindered by the underdeveloped transportation infrastructure. As compared to other forest cluster agglomerations of the Northwest Russia, the Syktyvkar Agglomeration is the one most remote from the markets of Western Europe. In the future, following the development of the remote oil- and gas-production areas in the Republic of Komi, new local focal points of the forest cluster might spring up.

The Vologda Region, another region with substantial forest resources, is currently lacking major forest cluster agglomerations. The wood processing industries are mostly medium-sized or small, and utilize obsolete equipment. The competitive advantages of the Vologda Region, which could promote the construction of large new facilities in the future, are its extensive navigable inland waterways and its proximity to the major

consumer markets, i.e. to Moscow and St. Petersburg, in the context of the budding growth of the domestic market.

In addition to regional peculiarities, the specific nature of individual industries is also of great importance. Various industries of the forest cluster differ strongly from one another, as previous chapters have demonstrated. The authors of the study consider it necessary only to stress what are in their opinion the most important issues today. In particular:

- In the forestry: inadequate development of the network of forest tracks;
- In sawn timber manufacture: inferior quality of sawing, as well as products and packaging failing to comply with the requirements of international standards;
- In plywood manufacture: large supplies of birch-block plywood (the only case of obvious competitive advantage);
- In wooden board manufacture: dependence on the volume of consumption and demand in the furniture and building industries;
- In the furniture industry: underdeveloped feedback from the consumer, as well as the absence of brand varieties;
- In pulp-and-paper industry: ongoing property ownership disputes, distracting the attention of proprietors from issues of strategic production planning.

There are also issues of general importance for all the forest industries such as

- Investment climate in the regions and locations, including an overall attitude to outside investors, including foreign ones
- Availability of energy and transport networks as well as their reliability
- Availability of raw wood and other resources (kaolin, etc)
- The clear and transparent rules and regulations of activities
- Necessity not only to declare commitment to industrial development on the regional and federal government levels but also visible results and actions such as signing and implementing of investment protection agreement between Finland and Russia that being delayed deter integration and investment in Northwest Russia.

Visions and Trends

In conclusion, the authors would like to emphasize possible long-term trends and scenarios for the development of the forest industry cluster.

The pessimistic scenario implies the perpetuation of the current, highly unsatisfactory investment climate, or its possible deterioration. If the situation materializes thus, the forest industry cluster has no perspectives for development, and is bound to atrophy, due primarily to the retreat of capital-intensive production. In this event, the regional concentration of activities in areas where public institutions, government and business have struck a balance and reached an understanding will develop faster, and further substantial concentration of activities in certain areas can be envisaged.

The optimistic scenario presupposes significant improvement of the investment climate, as a result of successful development and implementation of industrial and economic policy. This would entail an acceleration of industrial development, growth of the GNP and, consequently, the expansion of the domestic market. Following this scenario, the development of the forest cluster of Northwest Russia will steadily approach the level of efficiency of forest clusters of developed countries.

In the authors' opinion, an intermediate, more moderate scenario is likely to take place. The investment climate will improve, but not in all respects. In addition, significant differences in incentives for investment and the rate of development between regions will remain.

The authors consider the following to be among the most important possible tendencies in this scenario:

- The emerging of privately owned land and forests, while government-owned property still prevails (remote, sparsely populated areas are likely to remain 100% government-owned);
- The extension of forest-leasing terms and the appearance of long-term concessions;
- Raising of the average allowable cut to 60-70% in selected regions that focused efforts on the further industrial development and investment climate improvement;
- The completion of reforming of the government power-industry system, reforms of the railroad, and a significant increase of transportation and energy tariffs;
- The improvement of transportation infrastructure and construction of Belkomur Railroad with the participation of governmental and private capital;

- The conclusion of large-scale property ownership disputes, lowering of criminality and increase of transparency in business, appearance of new, "fair" actors;
- Graduate change of territorial structure of manufacturing that took shape during the Soviet period- liquidation and bankruptcies of small-scale unprofitable companies, appearance of new manufacturing plants based on long-term factors of competitiveness (proximity to consumers, specific raw materials, etc.);
- Potential new agglomerations in the forest cluster of the Vologda region and the Republic of Komi;
- Gradual development of inter-cluster ties with consumers, related and supporting industries, R&D, and education;
- Persistence of general technological disparity between Russia and technologically advanced countries;
- Gradual diversification of goods, growth of the higher value added products markets and manufacturing, appearance of international brands manufactured in Northwest Russia;
- Gradual development of domestic competition;
- The lowering of portion of exports and growth of domestic market, primarily for the higher quality products;
- Preservation of large portion of imports in the group of high added-value products;
- Persistence of lower wages (in comparison to developed countries) on the worker and middle management levels and higher labor-intensity in manufacturing;
- High salaries (more then in comparable positions in Europe) and foreigners hired for the top management and marketing positions at the larger forest companies;
- Development of activities aimed at more complex utilization of resources (CTMP for processing of aspen, MDF, LVL and OSB manufacturing);
- Increasing attention to environmental protection issues (the creation of and effective legislative foundation within this period is highly unlikely, however).

It is envisaged that listed above tendencies will allow the Northwest Russian forest cluster to maintain the market positions it occupies today, and even, quite possibly to strengthen it, primarily due to the expansion

of the domestic market and increase of exports of products by the foreign investors that integrated these goods into their global value chains. In addition, the discrepancy in production efficiency between the forest clusters in Russia and in developed countries will decrease during the next ten years.

It is essential to point out, however, that if the relatively unstable political situation in Russia persists (primarily on the regional level), the reliability of *any* economic forecast is fairly low. Politics remains a factor of uncertainty in general, and in the forest cluster in particular. The authors of this study hope that the bottlenecks and potential areas of development in the forest cluster that have been outlined in this work will provide useful grounds for making industrial policy decisions and in forming business-strategies for companies connected to this cluster. There is no formulated industrial policy targeted to develop the forest industries in Russia and in the majority of regions. There is pervasive unpredictability and lack of commitment by the key decision makers to the industrial policy in the forest cluster. We also hope that this work will provide an additional positive impulse and contents for the purposeful development of the forestry; its importance in the long-term development of the economy of Northwest Russia cannot be overestimated.

Appendix

1. Regional Forest Stock–Reserves of Raw Materials

The total area of Northwest Russia is 1677.9 thousand km^2; 831.5 thousand km^2 (49.5% of the total area) is covered with forests. The north of the Murmansk region, the Nenetsk autonomous district and the arctic islands Novaya Zemlya and Franz-Joseph Islands have a polar climate, and forests do not grow in these areas. The rest of the Northwest Russian territory has a boreal humid climate, which is favorable for the forest vegetation. On the whole, the climate becomes warmer and more humid from the north and northeast to the south and southwest. Moving in this direction, conditions for forest vegetation become more and more favorable. Soils in Northwest Russia are mostly podzols and are rather bad for agriculture. Large areas are covered with marshes, which create unfavorable conditions for forestry. There are also more fertile soils that cover limestone - southern species that are exotic for this region can be found there.

Forests with a predominance of softwood species (spruce on clay soils and pines on sandy soils) are typical for Northwest Russia. In Russia such woods are traditionally called taiga. There is a northern, intermediate, and southern taiga. Climate conditions in the southern taiga are the most favorable for forest vegetation, and this type is characterized by the highest raw wood stock. The northern taiga grows in a cold climate, which creates adverse conditions for forest vegetation. This type is char acterized by the lowest raw wood stock. The raw wood stock of the in-

Table A1.1 Types of Forest

Region	Prevailing types of forest
Murmansk region	Northern taiga
Republic of Karelia	Intermediate and northern taiga
Arkhangelsk region	Intermediate and northern taiga
Republic of Komi	Intermediate and northern taiga
Vologda region	Southern and intermediate taiga
Leningrad region	Southern taiga
Novgorod region	Southern taiga
Pskov region	Southern taiga and mixed forest
Kaliningrad region	Mixed forest

Source: Atlas of the forests of Soviet Union, State Institute for Forestry Designing, Moscow, 1973

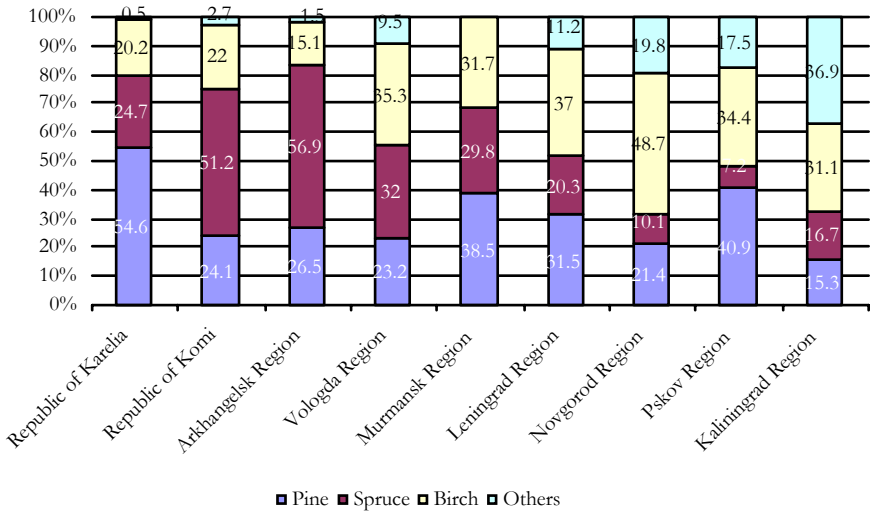
termediate taiga is greater than in the northern taiga but less than in the southern taiga. In the southwest, which is characterized by the mildest climate in the region, the taiga gives way to mixed forest, where both coniferous and deciduous species are found.

Table A1.2 Forest Resources of Northwest Russia in 1998

	Total Area, thousand hectares	Forested Area, thousand hectares	% of total	Total Raw Wood Stock, million m³
Republic of Karelia	17,240	9,267	53.8	919
Republic of Komi	41,590	30,042	72.2	2,960
Arkhangelsk Region[13]	58,740	22,434	38.2	2,454
Vologda Region	14,570	7,178	49.3	990
Murmansk Region	14,490	5,026	34.7	198
Leningrad Region	8,590	3,475	40.5	636
Novgorod Region	5,530	3,483	63.0	577
Pskov Region	5,530	2,020	36.5	328
Kaliningrad Region	1,510	228	15.1	40

Notes: Recent figures are calculated by Goskomstat on basis of 1973 figures and appropriate coefficients.
Source: Atlas of the forests of Soviet Union, State Institute for Forestry Designing, Moscow, 1973

Figure A1.1 Prevailing Species



Source: Atlas of the forests of Soviet Union, State Institute for Forestry Designing, Moscow, 1973

[13] Including Nenetsk District and arctic islands, which are barren.

The Republic of Komi and the Arkhangelsk region have the highest raw wood stock; cumulatively they represent more than 60% of the total forest stock in Northwest Russia. Another two regions with significant forest stock are the Republic of Karelia and the Vologda region.

Softwood species (spruce and pine) prevail in Northwest Russia and make up more than 2/3 of all the forests in the Republic of Karelia, Republic of Komi, Arkhangelsk and Murmansk regions, about 50% in the Vologda, Leningrad and Pskov regions, and about 1/3 in the Novgorod and Kaliningrad regions.

A total of five growth classes of forest are traditionally delineated in Russia. They differ in height and tree diameter, raw wood stock and growth. Forests of the first growth class have the highest productivity characteristics, while forests of the fifth growth class have the lowest.

Table A1.3 Prevailing Forest Growth Classes by Region

	Pine	Spruce	Birch
Republic of Karelia	4-5	4-5	4
Republic of Komi	4-5	4-5	4-5
Arkhangelsk Region	5	4-5	4-5
Vologda Region	4	3	3
Murmansk Region	5	5	5
Leningrad Region	4	3	3
Novgorod Region	4	2-3	3
Pskov Region	3	2-3	3
Kaliningrad Region	2	1	1-2

Source: Atlas of the forests of Soviet Union, State Institute for Forestry Designing, Moscow, 1973

Among the regions of Northwest Russia, the Murmansk region (the most northerly) is characterized by the lowest wood stock quality, which leads to small raw wood reserves despite the relatively large forested area. The climate becomes warmer towards the south of Northwest Russia creating more favorable conditions for forest vegetation; as a result, the quality of wood improves. At the same time, the forested area is smaller in the south (and the portion of softwood species even lower) due to active agriculture and harvesting.

Murmansk Region

The southern and western areas of the Murmansk region are covered with the low, sparse forest of the northern taiga. There are no forests in the north and in the east of the region - these areas have tundra flora.

Due to small raw wood reserves, the forest industry has never played a significant role in the economy of the Murmansk region. Timber is harvested only in the southwest of the region, but the harvesting volumes are relatively small. There is no reason to establish large processing enterprises using local raw materials in this area. The optimal usage of the forestland in the Murmansk region is to sustain its development in order to maintain the natural landscape.

Republic of Karelia

Pine prevails in the forests of Karelia. This is due to good water permeability of the soils, which have developed mostly on sand and rock. Spruce prevails only in the south and southeast of Karelia, and also in the far northwest. The Republic of Karelia is one of regions with a traditionally developed forest industry. Forest harvesting and processing are developed nearly everywhere in this area. However, the potential for further development of the region is still high. The advantages of the forest industry in Karelia are its proximity to the Finnish market and relatively well-developed transport infrastructure (especially forest ways) as compared with the Arkhangelsk region and the Republic of Komi.

Republic of Komi

The Republic of Komi has the largest raw wood reserves in Northwest Russia and the largest spruce reserves in Russia. At the same time, the south of the region (which is characterized by the high quality of its primary forests) has a large portion of secondary birch-aspen forests. Pine forests dominate along the main rivers – Pechora, Vychegda and Mezen with their confluents. Spruce prevails within areas located between the rivers. Taiga forests give place to tundra flora in the far north of the region. Development of the forest industry in the Republic of Komi is hampered by a poorly developed transport infrastructure (even by Russian standards) and its location, far from the European forest markets. Presently, natural forest growth here considerably exceeds harvesting volumes.

Arkhangelsk Region

The second largest Northwest Russian raw wood reserves, spruce in particular, are concentrated in the Arkhangelsk region. However, they are exploited quite unevenly. Primary taiga forests have been for the most part cut down along the main railroads and inland water routes – Severnaya Dvina and Onega with their confluents. Due to poor reforestation, the quality of new forests degraded and now secondary birch-aspen and pine forests grow in these areas. At the same time, vast spruce forests

between the rivers remain unexploited. In the north of the region, forests are sparse brush, growing in river valleys, where the microclimate is warmer, and they have no industrial importance. The port of Arkhangelsk (the largest forest port in Russia) plays an important role in the development of the regional forest industry.

Vologda Region

The forests in the central areas of the Vologda region (between the cities Vologda, Cherepovets and the lakes Beloe and Kubenskoe) have been lumbered, for the most part. Secondary birch-aspen forests prevail in the south of the region and along the main forest-floating river Sukhona. Considerable softwood forests have remained only in the north of the region. There are no large pulp-and-paper mills and sawmills in the Vologda region nowadays. Timber is supplied mainly to consumers in other regions, mostly to the Arkhangelsk region. Due to the high quality of the primary forests, the region occupies the third position in Northwest Russia in raw wood reserves, being slightly ahead of the Republic of Karelia.

Leningrad Region

The Leningrad region is characterized by the uneven distribution of the raw wood stock. Forests around St. Petersburg have been considerably depleted through lumbering. The forested area in the central and southwestern regions is also relatively small; secondary forests (mainly birch-aspen) prevail in these areas. In contrast, on the Karelian Isthmus and in the east of the region there are substantial areas covered with primary softwood forests – pine prevails on the Karelian Isthmus, while spruce grows mostly in the east of the region. The east of the Leningrad region is characterized by significant but still not well-used forest resources. Development of the harvesting industry on the Karelian Isthmus is not viable – its beautiful landscapes make it a prime area mainly for recreational purposes.

Novgorod Region

The Novgorod region has the smallest portion of softwood forests; birch prevails here (about 50%). Primary pine and, to a smaller extent, spruce forests remain only in the northeast of the region. There is a lack of forest stock to the southwest of Ilmen Lake. This is the result of active agriculture in the region and continuous harvesting activity. As a consequence, today the raw material base of the Novgorod region is not large. Recovery of the primary taiga flora will take much time.

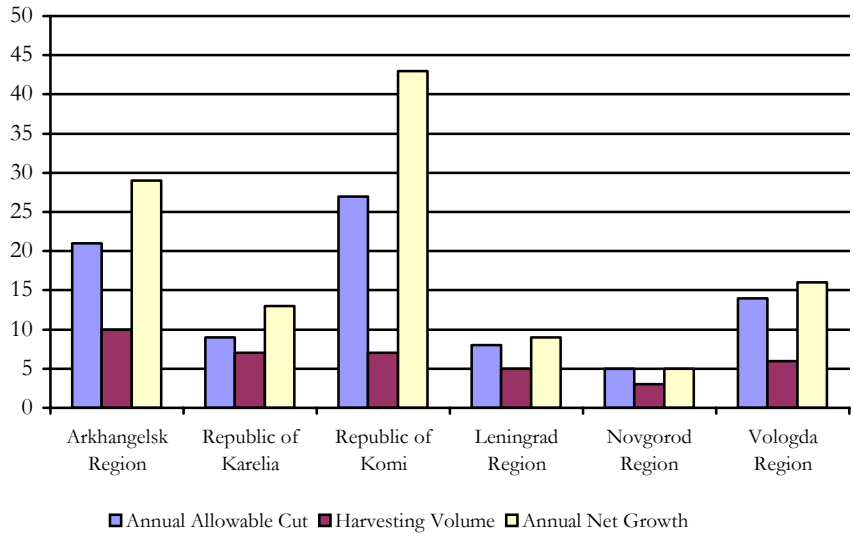
Pskov Region

The Pskov region has traditionally been the main agricultural area of Northwest Russia. Forests have been largely depleted in the region, especially in its central part. Large areas of pine and birch forests remain only in the north and southwest of the region. The portion of spruce is the smallest in comparison with other regions of Northwest Russia. The raw material stock for the forest industry is very small in the Pskov region. Pine forests in the southwest are of recreational importance – Sebezh national park is located here.

Kaliningrad Region

The Kaliningrad region nowadays has no raw material base for forest industry development. The region has the smallest forested area and raw wood reserves of all the regions of Northwest Russia. This is a result of active agriculture and harvesting in the region. Further forest harvesting could have a negative effect on local landscapes. Reforestation activities would be very valuable in many areas of the region.

Figure A1.2 Harvesting Volume, Allowable Cut and Net Growth in the Main Forest Regions of Northwest Russia in 1999, million m^3



Source: Competitiveness of Russian Forest Industry, Jaakko Pöyry Consulting Oy, 2002

During the last decade harvesting volumes in Northwest Russia have decreased by more than two times. Only about 25% of the annual allowable cut was achieved in the Republic of Komi, and in the Arkhangelsk

and Vologda regions less than 50%. As a result, the annual net growth significantly exceeds harvesting volumes. Nevertheless, the quality of forest resources on the whole has degraded. The share of overmature forests is increasing in remote and difficult to access areas. Birch and aspen are primarily growing as secondary forest due to lack of reforestation. Reforestation has virtually stopped in the last decade.

To increase harvesting volumes it is necessary to develop a transport infrastructure, especially an all-year-round forest-track system. In the last decade, forest-track building decreased significantly. Another way of increasing harvesting volumes and improving efficiency of this activity in the future is to establish new processing enterprises and, thus, increase local demand for all available species in Northwest Russia, which would use both softwood and birch-and-aspen wood. Today high shares of birch and aspen in the total wood stock are the obstacles to development of many areas as the transport of these species to the existing processing facilities are too high.

Our preliminary analysis shows that the following measures could facilitate and substantially improve the raw material base, i.e. forest stock and returns on that. These are:

- Reforestation and thinning;
- Focused, committed and coordinated development of selected areas, including investments in forest road and road, electricity and telecom networks;
- Development of industrial policy and facilitation of industrial activity (through basic education and professional training), improvement in laws and regulations, and their enforcement;
- Informing the public.

2. Applied Technology and Renewal Needs

Historical Background

During the Soviet Period, government bodies (the State Committee for Science and Technologies and the Ministry of the Forest Industry) developed plans for the modernization of the forest industry. According to these plans, the State was to finance the introduction of new technologies, research and development activities, and re-equipment of the companies. However, such plans were not based on the principles of market economy, i.e. market-based allocation of resources, and implied that resources were not traded, but allocated on the basis of decisions by the state and the Communist party according to a different set of criteria (social development, full employment, country's self-sufficiency in certain products,

regional development, etc.). The products of domestic equipment manufacturers were directly assigned to specific processing companies by the state plan and the companies had no opportunity to choose or change equipment suppliers and technical solutions. On the other hand, they were able to afford to purchase excessive and unnecessary machinery because of planning distortions (there was no guarantee that the planning system would assign the necessary equipment to the particular manufacturer when they were needed). As one could see the many distortions and misbalances in existing wood processing facilities were created through the above processes in the Soviet period. Today this misadministration imposes a heavy restructuring burden on majority of the old companies.

Another big problem that complicates development of the companies is the low efficiency and quality of machinery they have inherited from the Soviet period. Because investment decisions were made by the appropriate state authorities, there was no connection between sales revenues and raising funds to finance modernization. All the equipment produced by domestic producers was always allocated to somebody. As a result, the equipment producers had no incentives for improving the quality and characteristics of their products, their production volumes did not reflect the true demand for their products, and excessive production capacity was created on one hand. On the other the forest companies were stuck with out-dated and inefficient equipment. The user-producer feedback between the producers of equipment and the customers was very low, and as a rule, the products and machinery the customer actually received rarely met his needs.

The system of state planning collapsed when the transformation period began in the late 1980s. As a result, by the 1990s the processing companies in the forest industry found themselves to be owners of outdated solutions and excessive capacity.

It is also important to note that in the Soviet period, due to the policy of self-sufficiency and superiority of the Communist party, Russian science and education aimed to create their own schools in each and every sector, to produce and use only their own technologies, machinery, tools and educational materials, and to limit technological exchange and cooperation with their Western competitors. For these reasons, the overall quality of the forest sector deteriorated substantially. Deterioration in the training of workers and middle managers was especially dramatic.

Current Conditions

The current low level of applied technology and training, which largely deteriorated during the Soviet period, has led to low product quality. This

is why the margin of domestic forest companies on domestic and international markets is rather low (the prices for Russian wood-based products on the world market are 10-40% lower than the market average). Thus, the fulfillment of their investment plans depends mainly on market conditions. For example, the improving market conditions during 1999-2001 allowed many companies to carry out partial modernization of their equipment.

Financial markets and investors also are not able to provide forestry companies with sources of financing for modernization, as the investment risks of the Russian economy and the domestic forest industries, and especially the pulp-and-paper industry, are considered to be too high. At the same time, the Russian stock market is unable to afford the forestry companies the opportunity to raise funds, as the majority of companies are presently undervalued and their managers avoid listing them. The accumulation of cash flow for modernization is also hindered by the fact that many of the companies were privatized and sold at a fraction of the true cost of assets. The government also did not cared much about to whom to sell the stock. As result the bold, fit and strongest were capable with very small cash to take-over the major producers. Operating managers were among the first who did. These owners in most of cases were not interested in long-term development of the companies. They either did everything either just to preserve their jobs or stripped the assets and redistributed revenues from sales or both. Now the companies need to repay their debts, which leaves them no chance to carry out further modernization - they are only able to do hole-patching and solve only the most urgent problems.

The lack of well-motivated and well-trained personnel impedes the timely introduction of new technologies and solutions. Presently, the system of specialized personnel training is in a deep crisis. Another obstacle for modernization is insufficient infrastructure development. The existing transportation system does not allow for the use of modern harvesting machinery. For example, the width of forest tracks, which was standardized in Russia, does not comply with the requirements for the utilization of modern forest vehicles. At the same time the energy infrastructure and IT sector are also unable to support the introduction of new technologies at operating mills. All the aforementioned factors have led to the low pace of equipment renewal in the regional forest industry, and at present, it is characterized by extremely outdated technology and equipment, as compared with the developed countries.

Further, we will examine the state of applied technologies and re-equipment needs in other sub-sectors of the forest industry.

Table A2.1 Level of Equipment Depreciation* in the Forestry Sector of Northwest Russia in 1999, %**

	Forestry Sector, Total	Harvesting	Mechanical Wood-Processing	Pulp and Paper
Republic of Karelia	44.3	58.9	35.0	39.9
Republic of Komi	52.3	52.0	35.1	55.2
Arkhangelsk Region	61.5	58.9	54.3	64.1
Vologda Region	45.5	43.0	42.0	58.0
Kaliningrad Region	48.0	42.9	63.0	47.7
Leningrad Region	49.3	49.7	34.6	50.5
Murmansk Region	54.3	70.8	50.1	30.4
Novgorod Region	51.5	72.2	46.7	64.4
Pskov Region	47.5	71.0	41.1	55.7
St. Petersburg	39.4	-	46.4	34.0

* Russian statistics calculates the level of depreciation as : (actual age of operating equipment/normative age of equipment)*100%.
** By large and medium-sized companies.

Source: Goskomstat (Russian State Committee for Statistics), 2000

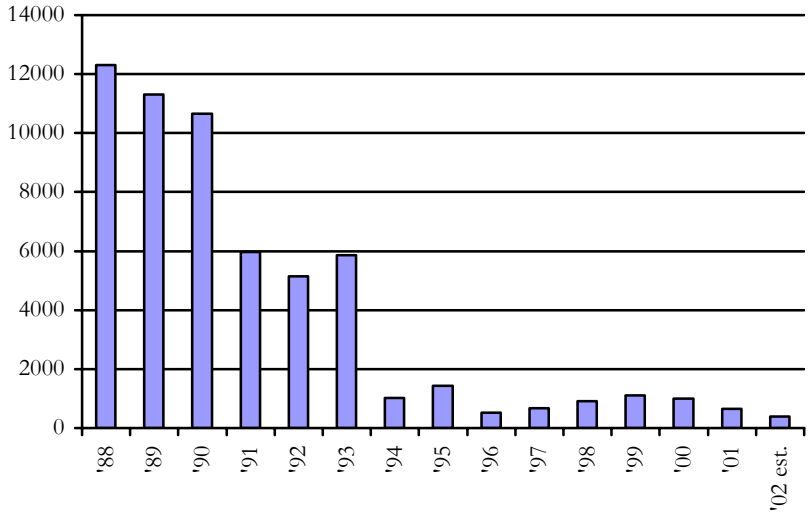
Equipment Manufacturers

The crucial state of the depreciation of equipment in regional companies of the forest industry and the lack of financial sources for modernization have led to a deepening crisis in the manufacture of domestic equipment for the forest industry. It is well known that Russian equipment producers, at the present moment, are lagging considerably behind western companies.

As stated before, the process of transition to the market economy had a significant bearing on the position of the Northwest Russian producers of harvesting equipment on the market. When foreign companies appeared on the Russian market, local companies began losing their markets due to the low quality of their products. The system of specialized education ceased to function properly, and since that period the forest industry has suffered from the lack of a highly skilled labor force in specialized R&D and equipment manufacturing. The effect of the 1990s crisis on producers of harvesting equipment within the forest cluster had two outcomes. On the one hand, the companies faced a rapid decline in demand for their products due to the general decrease of investments

into forestry company equipment. On the other hand, the low investment budgets of the harvesting companies led to an inability to purchase expensive imported equipment, and they had no other choice than to purchase low-priced domestically produced equipment, despite its low quality. The equipment producers, however, were not able to take advantage of the situation and did not supply the market with cheap and reliable equipment that would meet the demands of customers. Thus, during the 1990's, equipment manufacturing for the forest industry experienced a deep crisis, the effects of which are still felt today. The slump was significant, as the majority of companies decreased their production volumes by 50-70%. This is graphically illustrated, for example, in the production volumes of the Onezhski Tractor Plant.

Figure A2.1 Production of Tractors by Onezhski Tractor Plant, units



Source: www.crisis.valmi.ru (12.2001), www.lesprom.ru.

The lack of comprehensive solutions, poorly organized after-sale services and the low price/performance ratio prevent the local equipment producers from achieving price competitiveness on the world market. The only niche that can presently be occupied by the Russian producers of forest equipment is the manufacture of low-tech components for complex equipment produced by the western companies. Despite the low profits of such production, it may help the companies to accumulate their own cash flow for further investment into re-equipment and to attract foreign investments.

Harvesting

The Russian harvesting industry suffers from the lack of modern technologies and equipment to a greater extent than any other sub-sector of the regional forest industry. Most regional companies nowadays use machinery and equipment produced in the 1950-1980s[14], and the applied technology corresponds to this period. Currently, traditional (American) technology dominates the Russian harvesting industry, because of its intensive development during the Soviet period. At the same time, the potential of Scandinavian technology had been underestimated until the transition period began. At the present time, some local harvesting companies have started to introduce Scandinavian technology, and its penetration is predicted to reach 20% of the total harvested timber in 10-15 years. Among the main reasons for the introduction of Scandinavian technology are the doubtless success of the Scandinavian designers and engineers who created reliable and high-performance equipment, the crisis in specialized research and development, which otherwise would have been able to support the present technology with innovations, and the impact of the crisis in equipment manufacturing on the traditional technology. The positive attitude towards the Scandinavian technology in Russia is evident from the fact that during the last several years specialized R&D institutions conducted a great deal of research concerning the introduction of this technology into Russian companies, while there was practically no research in the field of traditional technology.

Despite all the benefits of Scandinavian technology, its introduction in Russian harvesting companies is hampered by the lack of financial sources for modernization. The low domestic purchasing prices for raw wood, quoted by processing industries, do not provide the harvesting companies with a significant margin for investment in re-equipment. Only large lumber exporters (as they are not dependant on domestic wood processing and generate sufficient cash flow) and larger holding companies can afford to purchase new harvesting equipment. In general, the consolidation of forest companies creates good grounds for development in the sector. For example, in March 2001 Kotlas PPM, which is a part of the Ilim Pulp group, purchased three Timberjack harvesters and five Timberjack forwarders for its harvesting divisions[15]. This deal, worth $2 million, has been the largest equipment purchase in the Russian harvesting industry in recent years. The majority of small and medium-sized

---

[14] The harvesting industry is the only sub-sector of the Russian forest industry, the development of which was determined solely by domestically produced equipment in the Soviet period.

[15] About 600 harvesters and forwarders, produced by Finnish Timberjack, were in operation in Russia in 2000.

companies, which cannot afford to purchase new imported harvesting equipment, must either purchase second-hand equipment made by foreign producers or be satisfied with the domestically produced low-tech/low productivity equipment. However, many Russian harvesting companies lack any opportunity at all for modernization of equipment, and a disturbing trend of returning to hand sawing and chokers can be seen.

The other obstacle for introducing Scandinavian technology in Russia is related to personnel training. At present, there are no specialized educational institutions in Northwest Russia for training potential workers for dealing with modern equipment. The companies that purchase such equipment must in addition pay for training their workers abroad. It is also difficult to find workers ready for such training. For example, when Kotlas PPM purchased the harvesters and forwarders, the managers began the selection of workers for further training. Finally, it was discovered that only ten workers could get used to joysticks and other accessories of modern machines.

Currently, in the regional forest sector there is a trend of involvement of Finnish teams, which use Scandinavian technology and high-performance foreign equipment, in harvesting activities. The teams are distinguished by the high reliability and speed of their work. There are also fewer delays at all stages of technological chain (cutting, transportation) in such cases. The harvesting volumes for these brigades are estimated at a level of several million m^3 annually.

Mechanical Wood-processing

In mechanical wood processing, the re-equipment needs vary significantly depending on the sub-sector.

In sawn timber production, presently applied technologies do not allow producers to provide customers with sawn timber of appropriate quality. The age of the operating equipment (sorting lines, drying units, protective processing equipment) varies from 15 to 20 years on average, while the level of automation in sawn timber production is very low. The geometric and other characteristics of sawn timber do not comply with international standards. As a result, the world prices for Russian sawn timber are significantly lower than the average.

Plywood production is also characterized by relatively old applied technology and equipment. The majority of plywood mills operate using equipment that was installed before 1990. The average age of the equipment at plywood mills is estimated to be 20-25 years. Although in this field some major up-grading projects (Lahdenpohja and Ust-Izhora Plywood Mills) and "greenfield" (Chudovo-RWS) were successfully carried out.

More than 50% of all particleboard in Russia is made with the help of imported technologies. However, the most part of particleboard production lines were put into operation 15-40 years ago and for the most part were not modernized after that. As a result, some products do not comply with international standards for toxicity and quality. For example, most domestic particleboard manufacturers cannot solve the problem of reducing formaldehyde emissions of their products to comply with the requirements of E1 emission class.

In fiberboard production, the mills that utilize the "wet" method use, as a rule, worn-out and outdated 25 to 45-year old equipment. However, the modernization of old mills and construction of new modern mills has also taken place. Special attention was given to the production of MDF board, which is widely used in furniture production. Several new mills that utilize the "dry" method of MDF production have been established in Northwest Russia in recent years. The mills operate largely with imported equipment.

The furniture industry is the most advanced in terms of modernization, as it produces products with a high added value, for which the domestic demand is growing. For example, the First Furniture Factory, which is located in St. Petersburg, carries out modernization of its equipment every 3-4 years. Nearly all the equipment is purchased abroad, because there are no competitive offerings on the domestic market. However, only market leaders have sufficient funds to invest in the purchase of new high-performance equipment. There is also a great number of small and medium-sized furniture producers that cannot afford to buy imported equipment. Usually they purchase second hand equipment when they modernize, or just continue to use the existing worn-out and outdated equipment. As a rule, such companies focus on the low-price market niche.

Pulp and Paper

At present, a significant number of regional pulp-and-paper mills operate with old, worn-out equipment. During the past two decades, the production capacities of pulp-and-paper mills of Russia, and of Northwest Russia in particular, have not been substantially modernized, and their depreciation level significantly exceeds the normative indices of their use and service life. In Russia, 98.3% of paper and paperboard machinery, and 100% of pulp boiling units, have been in operation for more than 25 years; 30% of them have been in operation for more than 45 years. The level of existing technologies in pulp-and-paper companies of Northwest Russia can be gauged by looking at the dates of installation and modernization of the currently operating equipment. On the whole, it varies in

Table A2.2 The Age of Operating Equipment in the Pulp & Paper Industry of Northwest Russia

Company	Region	Pulp-making technology	Year of commis-sioning	Age of operating equipment*		
				Pulp-boiling units	Paper machines	Paper-board machines
Syktyvkar LPK	Republic of Komi	sulfate	1969	1969-1970, 1995	1970 (1995), 1982 (1998, 2000), 1985 (1998, 2000), 1987	1969 (1986)
Kotlas Pulp and Paper Mill	Arkhangelsk Region	sulfate /sulfite	1961	1961, 1964 (1986), 1965, 1974	1964 (1982, 2000), 1972 (1979, 1992)	1965 (1995)
Arkhangelsk Pulp and Paper Mill	Arkhangelsk Region	sulfate	1940	1975, 1967 (1985), 1972	1960, 1961, 1986	1968, 1971, 1992
Kondopoga	Republic of Karelia	sulfate	1929	1965, 1972, 1981, 1984, 1987, 1989	1929 (1984), 1937, 1963, 1965, 1981, 1978	-
Svetogorsk	Leningrad Region	sulfate	1887	1963, 1975, 1978, 1983	1975, 1983	-
Segezha Pulp and Paper Mill	Republic of Karelia	sulfate	1939	1975 (1979), 1977 (1981)	1972, 1973, 1979	-
Solombala Pulp and Paper Mill	Arkhangelsk Region	sulfate /sulfite	1936	1969, 1970, 1977-1979	1938 (1985)	-
St.-Petersburg Carton Board Mil and Printing Plant	Leningrad Region	-	1982	-	-	1976 (1998-2000), 1972 (1998-2000), 1982
Pitkjaranta	Republic of Karelia	sulfate	1914	1940 (1959), 1970	-	-
Cepruss	Kaliningrad Region	sulfite	1945	1977, 1987, 1973, 1988, 1983 (2000)	1934 (1971)	1960
Saint-Petersburg Gosznak	St. Peters-burg	-	1818	-	1977, 1980, 1999	-
Sjasski Pulp and Paper Mill	Leningrad Region	sulfite	1928 (1969)	-	1928, 1968	1977
Sokol Pulp and Paper Mill	Vologda Region	sulfite	1899	1994	1899 (1980), 1928 (1966-1973), 1978, 1918 (1980), 1915 (1960), 1928 (1986), 1932 (1970), 1938 (1987), 1932 (1990)	-
Vyborgskaya Tsellulosa	Leningrad Region	sulfite	1936 (1988)	1988, 1973, 1972, 1974	1988	1927 (1988)

Komsomolets	Leningrad Region	-	1869	-	1947, 1948	1950
Sukhonski Pulp and Paper Mill*	Vologda Region	sulfite	1914	1917-1925	1950, 1951	1956
Neman Pulp and Paper Mill	Kaliningrad Region	sulfite	1914	1983, 1984, 1986, 1987, 1977, 1969	1933-1934 (1968), 1911 (1975, 1981), 1950 (1976), 1953 (1963), 1952 (1980), 1951 (1976) 1974, 1985	-
Sovetsk Pulp and Paper Mill	Kaliningrad Region	sulfite	1903	N/a	N/a	1998
Lyaskelya Paper Mill	Republic of Karelia	-	1900	-	N/a	-
Suojarvi Kartontara	Republic of Karelia	-	1946	-	-	N/a
Kamenogorsk Offset Paper Mill	Leningrad Region	-	1949	-	1949 (2000), 1904 (2000)	-
Kommunar Paper Mill	Leningrad Region	-	1844	-	1970 (1990), 1970 (1988), 1969 (1988), 1969	-
Svetogorsk Tissue	Leningrad Region	-	1988	-	1987	-
Krasnogorod Paper Mill	St. Petersburg	-	1716	-	1958, 1979, 1959, 1957, 1978, 1978	-
Bumaga Paper Mill	St. Petersburg	-	1840	-	1891 (1934), 1907 (1958), 1974	-
Proletariy paper Mill	St. Petersburg	-	1963	-	-	1962, 1982, 1982, 1983
Kartontara	Pskov Region	-	1960	-	-	1960
Velgiysk Paper Plant	Novgorod Region	-	1888	-	1937, 1947	-
Okulovka Paper Mill	Novgorod Region	-	1856	-	1914 (1960), 1929 (1962)	-
Suda Paper Mill	Vologda Region	-	1905	-	1930	-
Voloshka Pulp Mill	Arkhangelsk Region	sulfite	1939	1938	-	-
Plesetsk Pulp Mill	Arkhangelsk Region	sulfite	1940	N/a	-	-
Kartonol Paper Mill	St. Petersburg	-	1868	-	-	1938

* information about all operating units is presented; years of the last modernization are in parentheses.
Source: CBK magazine database (2001).

the Northwest region from the end of the 19th century up to the 1980s (see Table A2.2).

Sulfite technology is used in most pulp-and-paper mills operating in the region, which are mainly small and medium-sized companies. As a result, the environmental pollution by the operating mills is very high, at present. However, the largest companies use a sulfate method, which is why sulfate pulp has the largest share in the total pulp output of the region. The environmentally non-friendly technology of chlorine bleaching, used by the majority of Russian PPMs, elicits objections from European ecologists. For example, according to GreenPeace, the release of organic chlorides by Cepruss PPM, which is located in the Kaliningrad region, is comparable to 30% of the volume released by all the European pulp-and-paper mills, and dioxins discharged by Cepruss are estimated to be three times higher than those of all the PPMs located in Sweden.

Some countries (Germany, for example) refuse to buy pulp that is bleached using molecular chlorine. By the year 2003, most of the countries of the European Union intend to stop buying such pulp and pulp products. Thus, in the event that there is no improvement in technologies, only developing countries will likely remain among the consumers of most of the Russian pulp-and-paper mills in several years. The consumers from such countries, however, are not able to afford the present European purchasing prices, nor are they able to maintain the current purchasing volumes. For this reason, Russian PPMs that export their products are likely to lose a significant part of their earnings.

Summarizing the facts mentioned above, we can briefly describe the present state of, and trends related to, the applied technologies in the regional forest industry:

- During the last two decades, the majority of the regional companies have not modernized their equipment. By the end of perestroika era[16] many companies found themselves with non-competitive, worn-out and outdated technologies and equipment.
- Outdated technologies do not allow the regional companies to manufacture high quality products and to gain the necessary profitability rates on the world market. The overall level of applied technology dates from 1960-80s. The most outdated equipment is used in the harvesting.
- The relations of companies with equipment producers and R&D institutions were broken during the years of reforms. The production volumes of most regional equipment producers, which nowadays cannot provide competitive market offerings, fell tenfold.

---

[16] Perestroika, which started in 1987, meant a profound renewal of the Soviet society toward a market-oriented system.

- When purchasing equipment, local companies prefer second-hand foreign equipment to domestic equipment, because it is reliable and relatively cheap. The majority of companies at the present moment, however, just resort to hole patching.
- Due to export barriers related to environmental issues (which were set by developed countries) regional companies are losing their markets. The introduction of international environmental standards has just begun in Russia and is expected to require substantial time, commitment and investment.

3. Investment Risks in the Forest Industry

Presently, investments into the economy of Russia, and Northwest Russia in particular, are characterized by high investment risk in comparison to developed countries, and often even compared with the countries of the former Soviet bloc (Poland, Czech Republic and others). Investment in the Russian forest industry, which is one of the most capital-intensive industries in the national economy, require special attention, thorough analysis and assessment of investment risks. The most significant problems that hamper foreign investment inflow into the Russian forest industry are the following:

- Legislation shortcomings, including specific forest-related laws and regulations.
- Enforcement and protection of property rights.
- Low transparency, undeveloped financial markets.
- Inherited high social burden.
- Criminality. A substantial amount of crime and poor law enforcement.
- Institutional risks. High dependency on the will of political leaders and government officials.
- Political risks. Changing political leaders tend to replace many levels of administration.

The aforementioned factors will be further observed in detail and their influence on the investment process in the regional forest industry will be shown.

Legislation and Institutional Risks

Investment legislation of the Russian Federation and its regions is still in the process of development. Investors often find out that guarantees provided, for example, by the Federal Laws "On Foreign Investments in the Russian Federation" or "On Investment Activities in Form of Capital Investments" are in practice rarely applied. There is still no legal and organizational

scheme for implementation of provisions of the federal legislation concerning high priority investment projects, for which favorable conditions should be created at the outset. The state bodies that are specifically responsible for taxation refuse to acknowledge the "unclear" provisions of the law, relating to the restriction in applying changes in legislation unfavorable to investors – the so-called Grandfather's Clause. In addition, in many cases foreign companies are not subject to the same treatment and standards that local companies are. For example, tariffs for water, electricity, and transport are usually higher for foreign companies than for local ones. That is why, for example, Finland has tried to make an investment protection agreement with Russia between Russia and Finland, which should in principle guarantee equal treatment for Finnish companies in Russia.

Although all regions of Northwest Russia have their own, sometimes rather progressive legislation (for example in the Leningrad region), which regulates investment activities, lack of respective regulation on the federal level generally counteracts the positive effects of such regional investment laws. The regional investment incentives rely strongly on the political will of particular "good" administrators. This fact creates the opportunity for some local administrators to exaggerate their personal role in the projects and to use them as their political investments. For these reasons foreign investors would normally also invest their efforts in additional study and preparation of legal documents and appropriate decisions, as well as tend to avoid entering into binding commitments prior to forthcoming regional elections. In the event that there are changes in political leadership, a company might lose this kind of relief if it were not well-grounded in legal documentation.

It should be mentioned that despite the fact that the new Land Code has been passed, there are still no legal acts that determine the procedure for transferring the land into the possession of investors in most of the regions of Northwest Russia. In many cases, they simply lease the land or privatize the land plots, on which the facilities of companies are located.

Implementation of new projects related to exploitation of regional forest stock is complicated by the lack of an effective scheme of long-term leasing. Strategic investors are often interested in "green field" projects, which presuppose the construction of new production capacities on Russian territory and the exploitation of significant forest stock. Long-term forest concessions could be one of the most viable means of investment within the framework of such projects. Nevertheless, the concept of concession, as stated in the Forest Code of the Russian Federation, is not confirmed by other legislative acts. At the present time, the notion of concession in Russia presupposes significant investment, but offers no privileges or guarantees to companies-concessionaires.

Property Rights and Criminality

One of the most significant impediments to investment inflow in the forest industry is the protection of property rights in Russia. Currently, it is difficult to secure ownership rights in Russia, and property redistribution is often carried out with serious violations of the owners' rights. Some companies gain control over other businesses using gaps in legislation for a fraction of the true cost. The other widely used approach to redistributing of property rights by force is to use political force and law enforcement agencies for this purpose. A vivid example of the above is the Federal Law on Bankruptcy. By manipulating the shortcomings of this law, the bankruptcy procedure can be initiated for any company, even a successful one. According to estimates by state authorities, about a third of all bankruptcy procedures were initiated in order to eliminate competitors, or to gain control over other businesses. In 2002, the State Duma plans to pass a new law on bankruptcy. Nevertheless, the draft of the new law is also far from perfect, and it is very likely that the situation will not change dramatically in the near future.

Complications concerning the protection of property rights are especially acute in the forest industry. Presently, the situation is exacerbated by the fact that the Russian companies carry out aggressive strategies of mergers and acquisitions in the second wave of property redistribution. Whereas during privatization in the 90s, property redistribution had a spontaneous, chaotic character, today, the strategies of the largest players strive for horizontal and vertical integration. At the same time, large financial groups have started to pay attention to the forest industry since the potential of the oil-and-gas and metallurgy industries has been exhausted. All of this has led to strong competition for the assets of the forest companies. The main players use both financial and political influence in order to achieve their goals. Thus, there is a higher risk that the operating companies of the regional forest industry will become objects of hostile takeovers or be victim to other unfriendly acts.

Under such conditions, when the forest industry of the region has become one of the "hot spots" of property redistribution, the risks have increased significantly for the foreign investors who intend to enter the sector through acquiring a share in an existing company. As for shareholders rights, the many well-publicized corporate scandals during the period 1997-2002 illustrate that infringements of ownership rights of shareholders and portfolio investors in general have been most widespread within the framework of the reorganization of juridical persons. Above all, attempts have been directed towards pushing out individual minority shareholders into new companies in a less favorable financial situation, or transferring valuable assets to other entities, thus leaving only impaired assets in

the original shareholding structure. Investors also face the problem of unfair interference of minority shareholders into the company's management. Arkhangelsk and Kotlas PPMs are examples of how owners of even nominal shareholdings (even less than 1%) managed to disorganize the company's activities using flaws in corporate and remedial legislation. Such shareholders contested the decisions of shareholders meetings, including decisions related to elections of the board of directors. The law allows them judicially to suspend the powers of elected directors, to prevent the appointed directors from managing the company, to dismiss some or all elected or appointed directors, and to seize the property and accounts that are used for the company's day-to-day operations. The companies have to bear considerable losses until they are able to cancel such juridical rule-outs (related to seizure, dismissal of directors, etc.) and, in some cases, even illegal findings of the arbitration courts. Even when the judges were free of political influence or pressure on behalf of the authorities, it was not always possible to prevent unlawful court decisions, due to incompetence, and disordered and contradictory regulations.

Privatization Shortcomings

The situation has become more complicated, since a large number of violations took place during the privatization. The Clearing House of the Russian Federation has discovered various violations, or at least loss of tax revenues by the government, in many large companies of the forest industry. Thus, any investor who wishes to purchase stocks in a Russian forest company might face that problem when legal violations in the privatization process may lead to a situation in which previous transfers will be disputed or canceled. For example, violations of privatization procedures were discovered in such companies as Svetogorsk, Syktyvkar LPK, Kondopoga and others. All of this, under conditions of widespread bribery in government bodies and the lack of legislative acts that secure the results of privatization, might in the future lead to property redistribution. The good news here is a ruling that nullifies many of these potential claims if they are not properly raised within a certain period (3 and 10 years) that is soon to run out for the majority of privatization deals.

Forest industry companies resort to various methods in order to protect themselves from hostile takeovers, from restricting unauthorized access to corporate custodians, to transfer of capital or key functions to outside entities. (This was done by the managers of Arkhangelsk PPM, who transferred the functions of raw material procurement and distribution to a new juridical person – JSC Arkhbum.)

To summarize the facts stated above, foreign investors need to take into account the privatization history of their investment targets.

Transparency of the Companies and Financial Market Development

Partly due to fear of hostile takeovers and loss of control over businesses, and partly due to controversial transactions, many companies of the forest industry limit public information about their activities. This leads to very low levels of transparency in the companies for potential investors, and an absence of conditions for attracting capital in their development. Thus, local businesses do not appreciate the opportunity to become public. The stocks of public companies are not liquid enough. Despite rapid dissemination of international business standards in Russia, many companies still do not use international accounting principles. The preparation of the required documents is costly and may bring to light unwanted information about dubious past transactions. The other side of the problem of due diligence is the fact that a successful company's operations in Russia depend not only and not primarily on existing production capacity and its utilization, but also on such non-formal factors as personal contacts of the companies' managers in business and political groups, and their relationships with suppliers of resources and consumers of the products. It is difficult to assess these factors in Russia before the company has been acquired. Therefore, the acquisition of operating companies is characterized by higher investment risk as compared to "greenfield" investments.

Political Risks

Links between local businesses and authorities are very strong in the forest industry. As this industry forms the foundation of economic development in many regions in Northwest Russia, most large mills formally or informally coordinate their activities with local and regional government authorities. Both economic results and activity in the social sphere (the employment policy of the company, support of the social infrastructure) are of mutual interest. The implementation of the investment projects without the support of regional authorities is rather complicated and usually leads to additional expenses. Cooperation with government becomes difficult, however, when newly elected leaders tend to replace all the levels of administration. In this case, all the established links are broken and need to be restored again.

The problem of ineffective management is also related partially to political risks. Normally, managers are valued more for their contacts in local business and among the political elite than for their professional abilities and skills. Political capital, in the form of contacts with regional authorities, can help the company to gain privileges or can have a negative effect on the company's image in the event that the authorities are dismissed from their posts.

Social Responsibility

The strong links with regional government inspire the companies to pay more attention to social issues. The employment policy of a forest company is often determined by the fact that it promotes urban growth in its immediate environment, and thus has great social importance - it provides the means of subsistence for most of the local population. As migration within Russia is quite low, restructuring at such companies often results in a rapid increase in local unemployment. This is why plans for restructuring that presuppose layoffs of personnel are in most cases not supported by the regional governing bodies.

Thus, foreign investors should be prepared to accept social responsibility when they acquire a Russian forest company. They should take into consideration the fact that any activities that result in layoffs of personnel and reorganization of the social sphere might be viewed as a threat by the regional government. This is why it is necessary to first discuss plans for a company's restructuring with the local government and to enlist their support. The good news here is that in many cases, well-argued and well-planned layoffs are successful.

In summary, we can delineate the following key points related to the investment risks in the forest industry of Northwest Russia:

- The overall Russian investment legislation has not been fully elaborated; there are many gaps and unclear provisions. However, some regions of Northwest Russia have their own, rather progressive investment legislation.
- The specific forest legislation does not promote long-term forest leasing. The concession scheme is stated in the Forest Code, but not actually used due to the lack of supporting legislative acts.
- The majority of the forest companies limit information on their operations and do not have sufficient incentives to go public, because financial markets are underdeveloped.
- It takes additional effort and expertise to secure property rights in Russia for the moment due to gaps in legislation.
- Investors should pay significant attention to social issues and must cooperate closely with the regional authorities in order to succeed. However, when the key authorities are replaced, a wave of new appointments usually takes place and the links with regional government must be re-established.

On the whole, the successful experience of operating forest companies with foreign participation in Russia shows that if a project is planned

carefully, and factors that influence the investment are duly considered and analyzed, with all possible consequences taken into consideration, investment projects in the forest industry can be very successful.

Box A3.1 Case Svetogorsk PPM – International Paper Successful in Entering the Russian Cut-size Office Paper Market

JSC Svetogorsk, located in the Northwest of the Leningrad region, is one of the largest pulp-and-paper mills in Russia. Svetogorsk PPM began operating in 1887 (Enso PPM). From 1972 to the 1990s, the last large-scale modernization of its production took place with Finnish participation at the mill. In 1995, the Swedish company Tetra Laval acquired a controlling interest in Svetogorsk. In 1995-1999, an investment program with a budget of $127 million was implemented at the mill, resulting in an increase of production volumes, higher reliability of equipment, and closing or modernization of polluting units. Svetogorsk was the first Russian mill to use chlorine-free pulp bleaching.

Currently, the company employs about 3,200 people. This is far less then what it started from after privatization and acquisition by TetraLaval. It became possible to avoid social conflicts in the process of lay-offs owing to careful planning and open discussions with the personnel of the Company. It was also associated with substantial increase of earnings for those who remained designed by the Tetra-Laval. Many families in Svetogorsk were dependent on earnings by the members of the family from the factory and it was important that even when some from the family ceased employment the earnings of others covered for such loss. Many of the workers joined the growing service sector that today is among the most well-developed in the region. The Company enjoys also a good cooperation with the city authorities. The city and its inhabitants finally gained a lot from such cooperation – they have cleaner environment (the most polluting facilities were either closed or upgraded), higher income and better city to live as the increased tax revenues are spent to improve maintenance and services.

In December 1998, the Svetogorsk mill was acquired by International Paper, the world leader in printing paper production. The above-mentioned investments and positive developments allowed new owner to launch successfully new production line at the mill. On June 9, 1999, the International Paper-Svetogorsk officially started a new production line for A4 cut-size paper. After that the strategy of Svetogorsk focused on the Russian office-paper market. In 2001, a new production line for A3 paper was put into operation. The Svetogorsk is designed to produce up to 20,000tons of A3 paper a year. Hence, the company will produce a total of 140,000 tons of paper a year (both A3 and A4 formats), about two thirds of all printing paper manufactured in Svetogorsk, making the company the leader on the Russian office-paper market. Presently, paper under the Xerox trademark is also manufactured in Svetogorsk. In 1999, production of Xerox Performer (class C) office paper began at the mill, and a year later Svetogorsk became the first company in Russia to produce Xerox Office B-class paper.

The Company is said to be the best performing unit of the International Paper in Europe today.

Table A3.1 Investment Risk and Investment Potential of the Regions of Northwest Russia in 1999-2000*

		Novgorod Region	Kaliningrad Region	Nenets autonomous District	St. Petersburg	Murmansk Region	Leningrad Region	Republic of Karelia	Pskov Region	Vologda Region	Arkhangelsk Region	Republic of Komi
Investment Risk Rating	1999-2000	2	3	9	11	16	30	31	33	35	62	68
	1998-1999	7	5	26	2	30	17	31	37	27	71	67
Average Weighted Risk Index (Russia=1)	1999-2000	0.755	0.803	0.882	0.892	0.915	0.965	0.965	0.985	0.994	1.186	1.241
Change in Risk Index, Increase (+), Decrease (-)	1999-2000 as compared to 1998-1999	-0.033	0.043	-0.009	0.223	0.013	0.114	0.058	0.042	0.102	0.054	0.138
The Constituents of Investment Risk in 1999-2000	Legal Environment	2	1	41	22	39	16	18	56	44	42	30
	Political	16	50	75	83	6	69	45	18	10	59	40
	Economical	2	29	7	28	13	18	22	48	12	42	40
	Financial	7	13	62	3	27	10	52	35	11	21	38
	Social	8	14	22	4	13	25	29	48	53	78	72
	Criminal	58	9	13	45	4	65	24	63	20	41	75
	Ecological	29	33	19	48	82	71	70	21	81	75	83
Investment Potential Rating	1999-2000	62	42	85	2	26	29	59	68	38	43	33
	1998-1999	64	42	89	2	31	22	62	67	41	51	44
Share in Russian Potential, %	1999-2000	0.480	0.765	0.070	4.885	1.068	1.018	0.541	0.411	0.806	0.734	0.840
Change of share in Russian Investment Potential	1999-2000 as compared with 1998-1999	-0.024	-0.031	0.014	-0.002	0.080	-0.196	0.003	-0.074	-0.001	0.048	0.097
Constituents of Investment Potential Rating in 1999-2000	Consumer	54	53	84	4	34	42	61	67	39	41	24
	Labor	69	55	85	3	41	25	59	64	48	32	40
	Industrial	52	58	74	4	29	24	47	70	16	38	27
	Infrastructure	30	3	87	2	51	10	45	16	60	69	73
	Financial	61	54	81	3	20	32	47	70	28	38	26
	Innovation	60	49	78	3	35	18	64	67	47	46	54
	Institutional	50	31	82	2	58	19	40	72	29	47	37
	Natural Resources	79	41	75	89	12	59	38	76	65	22	24

* Refers to the position among all 89 Russian regions, the smaller the number the better position.

Source: Expert Rating Agency (Published in *Expert Northwest* magazine: June 18, 2001).

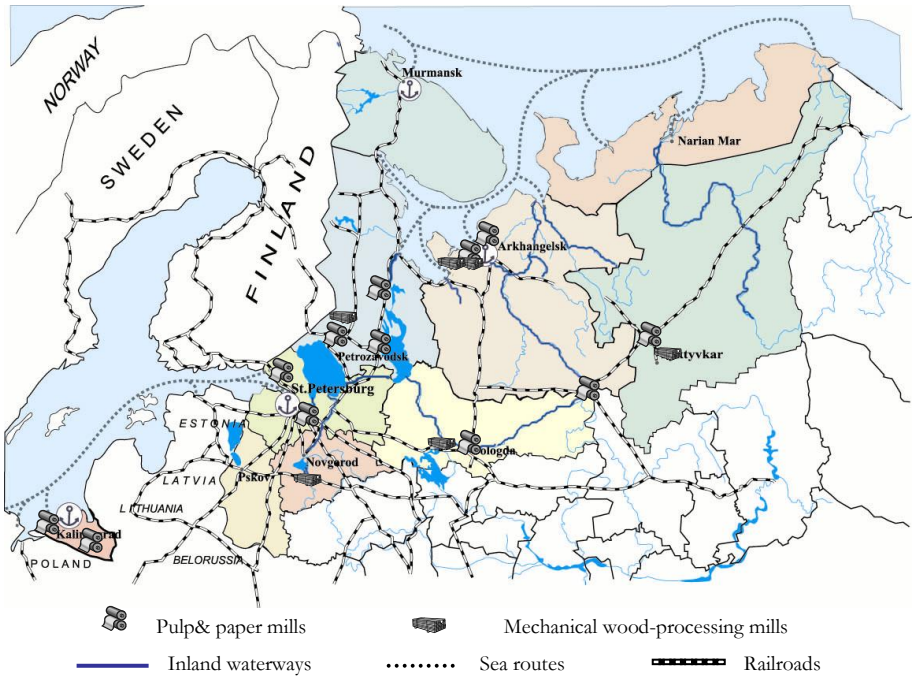
4. Infrastructure-Serving Investments: Logistics, Energy Supply, Information Technologies

The sustainable development of the Northwest Russian forest cluster requires infrastructure-serving investments. In this study, the current situation and investment conditions are considered in terms of logistics, energy supply and information technologies. These related industries are currently those of greatest importance to the Northwest Russian forest cluster.

Logistics

The transport infrastructure of Northwest Russia is relatively well developed, compared to other Russian forest-rich regions—Siberia and the Far East. Nevertheless there is much to be done to make it truly efficient. There is a system of transportation routes of all kinds in Northwest Russia. The main navigable rivers are Severnaja Dvina, Suchona, Pechora, Mezen, Onega[17] and the system of rivers, lakes and canals that

Figure A4.1 Scheme of the Main Transportation Routes in Northwest Russia



[17] These rivers and also many smaller rivers in the Republics of Karelia and Komi, the Arkhangelsk and Vologda regions, in the east of the Leningrad region are used for timber rafting.

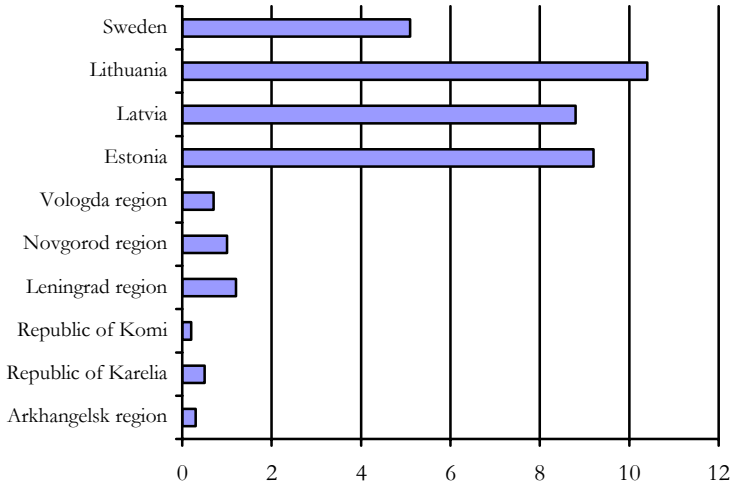
connect the Baltic and White seas with each other and with the river Volga. The main railroads are: St. Petersburg-Moscow, St. Petersburg-Helsinki, St. Petersburg-Murmansk, St. Petersburg-Vologda, Arkhangelsk-Moscow, and Konosha-Kotlas-Vorkuta. At present, there are 8 railway

Table A4.1 Density of Transportation Routes in the Regions of Northwest Russia in 1998

Region	Density of railroads, km/ 10,000 km²	Density of highways, km/ 1,000 km²	Length of inland navigable waterways, km
Republic of Karelia	122	37	3,645
Republic of Komi	41	11.5	2,962
Arkhangelsk region	30	11.7	3,221
Nenetsk district	0	0.7	387
Vologda region	53	79	1,581
Murmansk region	61	17	0
Leningrad region	327	121	1,888
Novgorod region	208	154	627
Pskov region	198	179	503
Kaliningrad region	377	302	357

Source: Transport and communications in Russia, Goskomstat (Russian State Committee for Statistics), 1999

Figure A4.2 Density of Road Network in Northwest Russia, Baltic States and Sweden, miles/ha



Source: Competitiveness of Russian Forest Industry. Jaakko Poyry, 2002

border crossings with the Baltic States and Finland (these countries have the same gauge of railway as Russia) in the region. The largest seaports of Northwest Russia are St. Petersburg, Murmansk, Arkhangelsk and Kaliningrad. There are some smaller seaport terminals as well.

The density of transportation routes varies considerably by region, and even in regions with the highest density of transportation networks is significantly lower than that of developed countries.

The Arkhangelsk region and the Republic of Komi (which are the major forest regions in Northwest Russia) are characterized by very low density of railroads and highways. This is partly compensated by the considerable length of inland navigable waterways. Large investments in the development of the transportation system between the rivers are needed in these regions.

Box A4.1 The Transportation System of the Arkhangelsk Region

The transport infrastructure of the Arkhangelsk region includes all kinds of transportation: sea, river, railroad, air, and motor vehicle.

The main railroads are: Arkhangelsk – Konosha – Vologda – Moscow, Kotlas – Konosha – Vologda, Arkhangelsk – Obozerskaya – Murmansk, Kotlas – Kirov, Arkhangelsk – Karpogory. The railroad density is 30 km per 10,000 km^2.

River transport provides for transportation mainly within the region. The total length of exploited waterways is more than 3,200 km. The main navigable rivers are Severnaya Dvina, Onega and Mezen with their confluents. They are also used for lumber rafting.

Sea transport plays the main role in foreign trade and delivers cargos to distant coastal regions and the Arctic islands. Important cargo ports are Onega, Mezen, and Naryan-Mar; but the most important is the port of Arkhangelsk. This is one of the oldest ports of Russia (founded in 1584). Its freight turnover has a universal character – containers, bulk cargos, metals, carton board, pulp, sawn timber, roundwood, oil and oil products. Presently, less than 50% of the port's capacities are used. In 2000, the freight turnover was 14 million tons.

Motor transport provides most regional transportation of cargo and passengers. The Arkhangelsk-Moscow highway is the main road, proving local motor transport with access to Russian highways. The density of highways is 11.7 km per 1,000 km^2.

Air transport provides transportation mainly for passengers and expedited freight deliveries, for which other types of transport cannot be used. It is also used for forest supervision. The main airports are located in Arkhangelsk (total passenger turnover – more than 110,000 passengers in 1998) and in Kotlas.

The density of transportation routes in the Vologda region is also very low. The Leningrad region has the highest density of transportation networks of the regions of Northwest Russia. The role of the Leningrad region as the major traffic center of Northwest Russia will increase significantly after the new seaports (Ust-Luga, Vysotsk, Primorsk, Lomonosov, etc) are put into operation. In the Republic of Karelia, the density of railroads is relatively high, and the total length of inland navigable waterways is rather large. The long border between Karelia and Finland is favorable to the development of highways, as motor transport is the most effective means of transporting different kinds of freight (including timber) for short distances.

Among the new projects for developing the transportation system of Northwest Russia, the largest is a plan to construct the new Belkomur railroad.

Box A4.2 Belkomur – a New Railroad

The new Belkomur railroad will connect Arkhangelsk with Perm and provide faster delivery of Ural and Siberian cargos to the port of Arkhangelsk. Another purpose of the railroad is to increase the development of the forest resources and minerals of the Republic of Komi. There are plans to transport coking coal from the Pechora basin and bauxites of the Timan deposits to the Ural metallurgy enterprises by Belkomur. The new railroad will make possible the increased extraction of titanium and manganese ores, as well as chromites. For the forest cluster, Belkomur is also of great importance: it will allow access to rich forest resources in areas between rivers in the Arkhangelsk region and the Republic of Komi. These forest resources have almost not been used before.

The length of the new railroad will be 1,251 km. It will connect Arkhangelsk, Karpogol (both in the Arkhangelsk region), Vendinga, Mikun, Syktyvkar (all in the Republic of Komi), Kudymkar and Perm (both in the Perm region, outside Northwest Russia). Construction will take no less than 10 years. Finnish companies are interested in the project, as well. They intend to invest in construction of the new railroad in order to begin harvesting in new areas. Presently, Jaakko Poyry Consulting is developing a business plan for forest harvesting along Belkomur.

Most forest products and timber are transported by railroads and waterways. Russian railroads are part of a state monopoly. Two monopolies control the railroad infrastructure in Northwest Russia -Oktyabrskaya and Severnaya Railroads. In addition, there is a large number of forwarding companies. They have their own railroad-car fleet, including specialized cars, containers and other necessary facilities for freight delivery.

For example, the largest Northwest Russian forwarding company - Eurosib SPb - has its own railroad-car fleet of more than 1,000 cars. In 2001, this company transported 18.3 million tons.

Overall, railroad transport is of low efficiency. Among its main drawbacks are:

- High deterioration rate of the railroad-car fleet;
- Shortage of specialized cars (including those providing transportation of sawn timber and other forest products without sustaining damage);
- Inefficient logistics - regular delays and even freight losses;
- Low level of operations transparency.

Railroad transport is unprofitable because of the present tariff system. Tariffs regulated by the government, however, are still much lower than those in developed European countries. Besides, there are tariff discounts (up to 50-70%) for some largest producers. The government explains this as a function of the necessity to support industry in geographical conditions of the vast Russian territory: the average length of cargo transportation by Russian railroads is 3-5 times greater than in the countries of Western Europe. On one hand, low tariffs are an important factor in the competitiveness of Russian companies; on the other hand - they do not motivate companies to increase efficiency and lead to production allocation decisions that would not be possible if the true costs are concerned. In the future, tariffs are expected to increase gradually; however, the government is likely to continue the policy of tariff control in order to prevent the collapse of most of the largest industrial companies or at least to soften their problems. This situation has an adverse effect on the long-term competitiveness of the companies and could lead to major changes in the industrial landscape of Northwest Russia already in the near term.

The role of water transportation is growing as the use of lumber rafting decreases. River transport is relatively cheap compared to other types of transport, but it has a number of drawbacks: the navigation period is short (i.e. only when rivers are not frozen) and it is impossible to increase considerably the length of the routes and to change their directions. River transport is owned by the regional river-shipping companies, which operate within major river basins and systems of canals. The vessels of the companies are worn-out, and their hydraulic structure also needs renewal. Lack of financing for maintenance of waterways and dredging works leads to the gradual shortening of navigable waterways, with the rivers returning to their natural conditions.

Sea transport in Northwest Russia is of special importance for international trade (including forest products). There are three large private companies – the Baltic, Murmansk and Northern sea shipping companies. The Baltic sea shipping company has practically dropped out of the market: the total dead-weight of its vessels in 1998 was just 32,000 tons (only 2 vessels). The Murmansk and Northern sea shipping companies occupy better positions, but the number of their vessels has considerably decreased during the last decade as well, and foreign carriers dominate in providing sea transportation for Russian freights (more than 95% of the total).

Russian terminals, on the contrary, have been developing during recent years. For the forest cluster, the seaports of Arkhangelsk and St. Petersburg are of most importance. Some forest cargos are also exported through smaller ports (for example, Vyborg and Vysotsk in the Leningrad region). The ports of Murmansk and Kaliningrad do not specialize in forest products.

Box A4.3 Petrolesport –

the Forest Terminal of the Port of St. Petersburg

The port of St. Petersburg is the largest seaport in Northwest Russia. Its freight turnover during recent years exceeded 30 million tons. The role of St. Petersburg increased significantly after Russia had lost ports located in the Baltic States. The port has a complex structure and is oriented towards operations primarily with dry and container cargos. The port has specialized terminals, including a forest terminal – Petrolesport.

Petrolesport specializes in:

- Stevedore services connected with forest products (round wood, sawn timber, plywood, pulp, paper), containers and some other cargos;
- Drying and packaging of sawn timber;
- Forwarding services;
- Carrying out customs procedures.

The port's mooring lines are equipped with its own system of railroad tracks. The length of mooring lines exceeds 1,500 m; the depth is over 10 m. The port employed 1,400 people in 1999.

The freight turnover of Petrolesport in 1999 was more than 1.7 million tons, including 766,000tons of forest products, 630,000tons of ferrous metal scrap, 323,000tons in containers.

Construction of new specialized ports is presently underway in the Leningrad region. One of these new ports - Ust'-Luga - will have a forest terminal, but the forest terminal in Ust'-Luga is not the first one to be constructed.

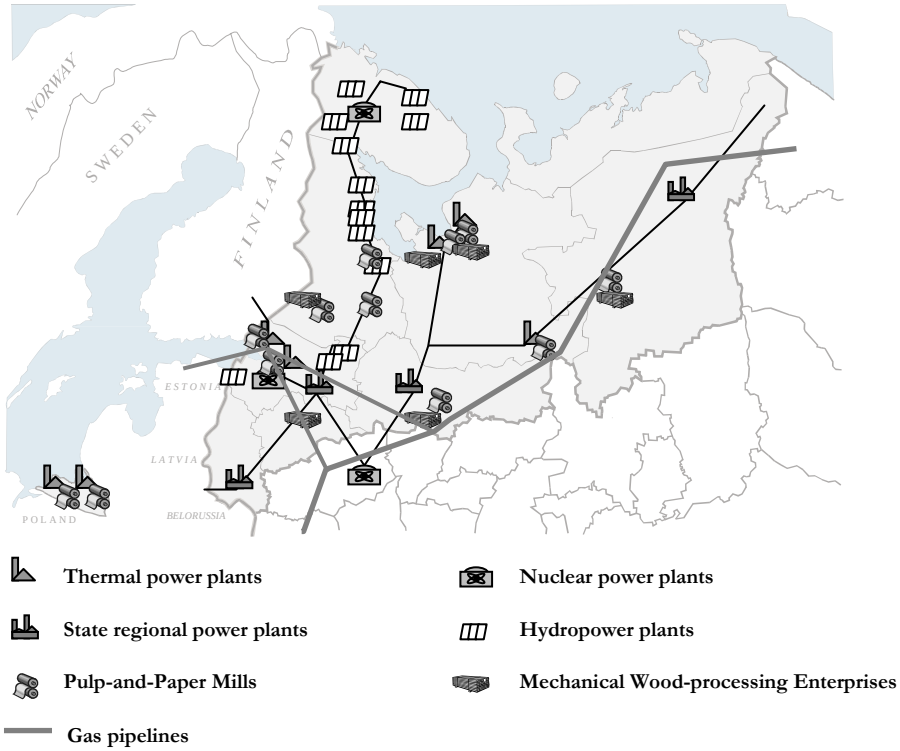
Overall, Russian terminals are of low efficiency. Port facilities require substantial modernization. A significant portion of shadow business takes place, and the quality of stevedore services is also rather low. In addition, there are frequent problems with customs. This is why some cargo owners prefer to use ports of Estonia and Finland where the goods are delivered by rail.

Electric Energy Supply

The government controls the production and distribution of electric power in Russia and owns majority stake in the Russian electricity company RAO UES of Russia that has energy utilities-subsidiaries located in the administrative centers of the regions. The other federal company – Rosenergoatom - manages the Leningrad and the Kola Nuclear Power Plants, which together generate more than 40% of the electric power in Northwest Russia. Moreover, Northwest Russia partially consumes the energy produced by the Kalinin Nuclear Power Plant located in the Tver region (outside Northwest Russia). Reform of the RAO UES of Russia and the electric energy industry in Russia is to be carried out until the end of 2004. This reform will result in the open and free market for electricity in the country. It is envisaged that electricity prices will substantially increase. High depletion of the major producers of the electric power in Northwest Russia – nuclear power plants – will in the medium term lead to substantial changes in the fuel mix and allocation of the new generating facilities as it is highly improbable that these nuclear power plants will be rebuild.

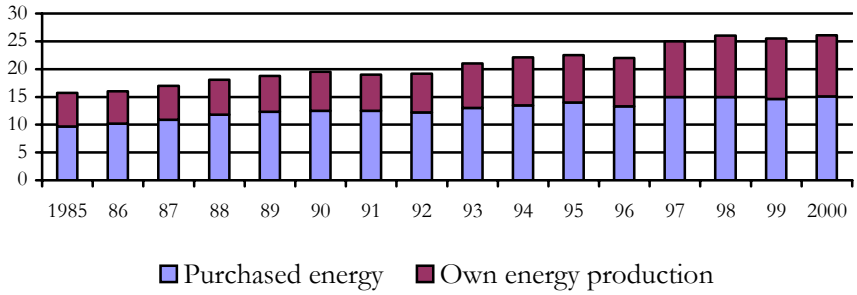
Power production is more highly developed in the Leningrad and the Murmansk regions. There are a number of power stations in the other regions, but their production is comparatively small. The hydropower potential of Northwest Russia is relatively small due to the flat terrain in most areas. The Republic of Komi and the Nenetsk autonomous district have large fuel resources – coal, oil and gas. The power producing capacities here could be significantly increased if new large processing enterprises were established. Further development of nuclear power production is also of great importance for Northwest Russia.

Figure A4.3 Scheme of the Energy System of Northwest Russia



Low tariffs for electric power is an important factor in the competitiveness of Russian industry in general, and the forest cluster in particular. Technological processes at large companies, especially pulp-and-paper mills, are highly power consuming. Presently, the companies satisfy their needs for power by purchasing it from the wholesale market. The share of fuel and energy in the cost structure of the companies does not exceed 15%. In the future, due to the inevitable growth of tariffs and the increase in the portion of electric power in the total cost structure of the companies, they will be forced to develop their own power-production facilities, using wastes from wood-processing. They will need to join their efforts in implementing larger energy projects aimed at decreasing their dependency on the outside energy supply. This practice is widely spread in Finland where power generation facilities owned by companies supply a large share of energy they need.

Figure A4.4 The Consumption of Electricity in the Forest Industry of Finland in 1985-2000, billion kWh



Source: Finnish Forest Industries Federation, 2001

Box A4.4 The Finnish Experience of Industrial Energy Supply

Already in 1920-30s, Finnish industrial companies were actively constructing hydropower plants on rivers in the south of Finland. Rouhiala, Etela-Suomen Voima and Lansi-Suomen Voima are typical examples of the cooperation between sectors of that time.

In 1943, a consortium of companies, including Yhtyneet Paperitehtaat, Kajaanin Puutavara, Kymi-Kymmene, Enso-Gutzeit, Veitsiluoto, Oulu, Rauma-Raahe and Kemi, founded the Pohjolan Voima energy company. The purpose of establishing this was to guarantee an energy supply to the participating companies.

The establishment of a joint energy company was part of a strategy aimed at energy independence, adopted by the Finnish forest companies. Such a strategy was unique even for developed market economies – government ownership of power production, limited only by monopoly laws, was quite common.

The attempt of Finnish forest companies to gain independence in their energy supply was motivated by the high level of energy consumption in the production of wood-based products. This is especially important for paper manufacturing – the energy consumed in the production of one ton of products exceeds 2,000 kW.

In 1955, a group of wood-processing and metalworking companies founded Atomienergia Oy for lobbying for the construction of nuclear power plants. The establishment of Teollisuuden Voima and the construction of nuclear power plants of 1,500 MW in the 1970-80s demonstrated the high effectiveness of cooperation within the sector, and between different sectors of Finnish industry.

The Finnish forest industry also initiated the utilization of natural gas for power production. At the end of 1973, when the Soviet Union started to supply natural gas to Finland, Enso-Gutzeit, Ahlstrom, Kaukas, Kymi, Rauma-Repola and Tampella became its first consumers.

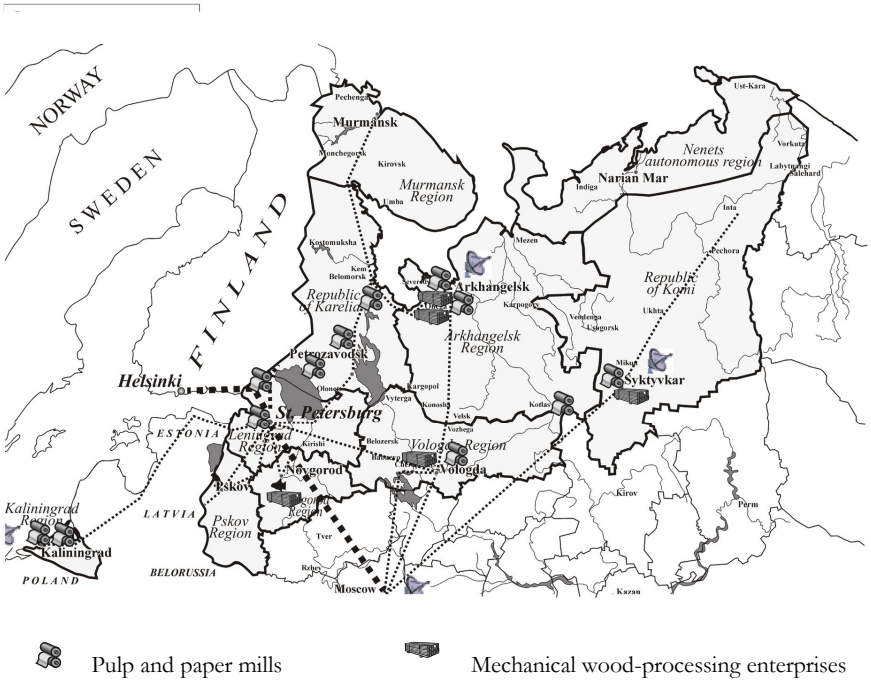
In addition, Finnish companies not only invested in the construction of power plants, but also increased their activities in other energy sectors, including joint use of power plants, energy transmission and fuel purchases.

The production of power from biomass is of considerable significance for the forest industry. The main domestic fuel used by the forest industry has been, and will continue to be, the waste produced in pulp cooking. The forest industry obtains nearly a third of all its factory fuels from this source. Considerable industrial use is made of roundwood and wood chips, as well, accounting for 12% of all fuels consumed. Due to the forest industry, Finland occupies first place among the EU countries in terms of the proportion of biomass in power production, and its significance is sure to increase still further if carbon dioxide emissions are to be reduced.

Information Technologies

Presently, the use of information technologies in the forest cluster of Northwest is very low. Information systems are installed only at the largest pulp-and-paper and mechanical wood-processing companies. However, these systems cover only individual technological processes and elements of production controls. There are no complex (integrated) information systems, and no systems that provide informational interactions between different companies, or between a company and consumers.

Figure A4.5 Scheme of the Data Networks of Northwest Russia



Russian forest companies that strive to be competitive on domestic and international markets need an integrated information system. The process of complex automation, however, must start not from automation itself, but from development of a system of effective management, which together with installation of information technologies would help to create higher added value. It also requires developed networks and well-running communications systems.

The process of installation of western corporate information systems without management restructuring generally turns out to be unsuccessful. First, the management that should provide data to the software are not properly organized. Second, during the last 20-30 years, major achievements in the field of information technologies have undergone significant qualitative changes. While western companies have had the opportunity to become gradually familiar with these software products, Russian companies purchase the latest versions, which are hard to apply. As a result, according to statistics, 50% of western corporate information systems cannot be applied, and in the other 50% of the cases, only half the modules are introduced, which is considered a good result. It is easier to install Russian corporate systems because they reproduce the evolution of western systems and lag behind them by 10-20 years.

As mentioned above, only certain parts of the technological chain and several accounting functions are automated in the forest industry today. At the same time, modern information systems cover all functional components of management and all the stages of supervision. They are absolutely necessary to provide for competitiveness of the companies on the global markets. In order to overcome this discrepancy, Russian companies need to go through a process of step-by-step automation. This would include the introduction of orgware[18] and workflow[19] integrated management systems and local automation of particular management elements. Introduction of such systems requires upgrading of systems not only inside the companies but also of the domestic education (starting from basic education and ending with the professional training) that is shall provide an up-to-date training enabling graduates to deal with complex software and controls (including appropriate language skills). The other essential component to close this gap is the communicational infrastructure that is needed to make connection to the global networks technically possible and reliable. These issues are to be of primary importance to the industrial policy decision-makers in Russia.

---

[18] Special software, designed for solving problems connected with organization of the management system of an enterprise.

[19] Technology for supervising business processes.

Box A4.5 The Finnish Experience in Automation of the Forest Cluster

The Finnish forest industry is characterized by the highest level of automation at all stages (forestry, harvesting, mechanical wood-processing, pulp-and-paper production, wood chemicals) of all developed countries.

Computer equipment in harvesters optimizes harvesting operations. Piles of harvested lumber can be located by GPS-receivers. The volume and characteristics of harvested lumber are automatically recorded in databases for further use by both harvesting companies and lumber consumers.

As wood materials used in the mechanical wood-processing industry are more expensive than raw materials for the wood chemicals and pulp-and-paper industries, technologies of mechanical wood processing are more complicated. Such technologies, including sensors, software with elements of artificial intelligence, modeling programs and computer vision, are used for monitoring, control and regulation of production processes.

Pulp-and-paper equipment must run continuously. It requires high precision and reliability of all elements of the equipment. Currently, Finland is the world leader in the field of equipment monitoring and control in the pulp-and-paper industry.

The highlights of a preliminary analysis of the effectiveness of infrastructure-serving investments are:

- The need to develop an infrastructure first of all within existing agglomerations of the forest cluster. This will be more effective than developing new areas.
- In addition to new railroads and highway construction, the need to develop a forest-track network is of particular importance for the forest cluster. This will enable the exploitation forests that are far from the main routes.
- The need to develop stevedore, forwarding and shipping services.
- Given the fact that tariffs for electric power will steadily grow, companies need to expand their own power production capacities and make more active use of wood-processing wastes for power production.
- The need to introduce automation into production using modern information technologies.

References

1. Annual rating of the largest industrial companies of the North-West of Russia - Expert North-West magazine, 22nd October, 2001.
2. Asanuma, B. (1989), "Manufacturer-supplier relationships in Japan and the concept of the relation-specific skill", Journal of the Japanese and International Economies, 3: 1-30.
3. Asheim, B.T. and Isaksen, A. (1997), "Location, Agglomeration, and Innovation: Towards Regional Innovation Systems in Norway?", European Planning Studies, Vol. 5, No. 3, pp. 299-330.
4. Atlas of the forests of Soviet Union, State Institute for Forestry Designing, Moscow, 1973.
5. Barney, J. (1992), "Integrating organizational behaviour and strategy formulation research: a resource based analysis", Advances in Strategic Management, Vol.8, Shristava P., Huff, A., Dutton, J. (eds.). JAI Press: Greenwich, CT; 39-62.
6. Barney, J., Griffin, R., (1992). The Management of Organisations: Strategy, Structure, and Behaviour. Houghton Mifflin: Boston, MA.
7. Brown, A.N., Brown, J.D. Does Market Structure Matter? New Evidence from Russia, Center for Economic Policy Research, Discussion Paper, No.1946, August 1998.
8. Cockburn, I. M., Henderson, R.M., Stern, S. (2000), "Untangling the origins of competitive advantage", Strategic Management Journal, 21: 1123-1145.
9. Colin J. Hazley. Forest-Based and Related Industries of the European Union - Industrial Districts, Clusters and Agglomerations, ETLA, Helsinki, 2000.
10. Competitiveness of Russian Forest Industry Report, Jaakko Poyry Consulting Oy, 2002.
11. Dahmen, E. (1950), Entrepreneurial Activity and the Development of Swedish Industry 1919-1939, American Economic Association Translation Series, Homewood, 1970.
12. Dahmen, E. (1988), "Development Blocks in Industrial Economics", Scandinavian Economic History Review, 36, pp. 3-14.
13. Dahmen, E. (1991), "Development Blocks and Industrial Transformation: The Dahmenian to Economic Development", B.Carlsson and R.G.H. Hendriksson (eds.), Almqvist & Wiksell, Stockholm.
14. Database of CBK magazine, 2001.

15. Dyer, J.H. (1996), "Specialized supplier networks as a source of competitive advantage: Evidence from the auto industry", Strategic Management Journal, 17: 271-292.

16. ECE/FAO Forest Products Annual Market Review, 2000-2001.

17. Feser, E.J. (1998a), " Enterprises, External Economies, and Economic Development", Journal of Planning Literature, Vol. 12, No. 3, pp. 283-302.

18. Feser, E.J. (1998b), "Old and New Theories of Industrial Clusters", in M.Steiner (ed.), Clusters and Regional Specialisation, pp. 18-40, Pion Limited, London.

19. Finnish Forest Industries Annual Review in 2000, Finnish Forest Industries Federation, Helsinki, 2001.

20. Forest industry companies trust in the Government of Russia - Business Petersburg Newspaper, 11th May, 2001.

21. Forest sector of the North-West of Russia and the Kirov region, Goskomstat of the Republic of Komi, 2000.

22. Forest sector of the Russian Federation in 2001, Research and Design Institute on Economics, Production Management and Information for Forest, Pulp and Paper and Mechanical Wood-processing Industries, 2002.

23. Gibbons, M. and Weijers, T. (1992). "Position paper on User-Producer Relations", Six Countries Programme Workshop on User-Producer Relations in the Innovation Process, Espoo, Finland, November 26-27, 1992.

24. Harrison, B. (1992), "Industrial Distrcits: Old Wine in New Bottles?", Regional Studies, Vol. 26, No. 5, pp. 469-483.

25. Heidenreich, M. (1996), "Beyond Flexible Specialisation: The Rearrangement of Regional Production Orders in Emilia-Romagna and Baden-Wurttemberg", European Planning Studies, Vol. 4, No. 4, pp. 401-419.

26. Hernesniemi, H., Lammi, M., Ylä-Anttila, P. Advantage Finland – The future of Finnish industries. Taloustieto Oy, Helsinki, 1996.

27. Holmes,John (1992) "The Organisation and Locational Structure Of Production Sub-contracting." In M. Scott and A.J. Storper, eds., Pathways to Industrialization and Regional Development," London, Routledge, pp. 80-106.

28. Isaksen, A. (1997), "Regional Clusters and Competitiveness: The Norwegian Case", European Planning Studies, Vol. 5, No. 1, pp. 65-76.

29. Jacobs, D. and de Man, A.-P. (1996), "Clusters, Industrial Policy and Firm Strategy: A Menu Approach", Technology Analysis and Strategic Management, Vol. 8, No.4, pp. 425-437.

30. Kaufman, A., Gittel, R., Merenda, M., Naumes, W. and Wood, C. (1994), "Porter's Model for Geographic Competitive Advantage: The Case for New Hampshire", Economic Development Quarterly, Vol. 8, No. 1, pp.43-66.

31. Kolosovsky, N.N. (1969), Theory of economic regions, Moscow.

32. Krzhizhanovskaya, S. Current conditions and prospects of development of the Russian furniture industry - Wood-processing magazine, 16th March, 2001.

33. Lavritshev, A. Economic geography of the Soviet Union, Moscow, 1986.

34. Lundvall, B. (1992), "Innovation, The Organised Market and Productivity Slowdown", Technology and Productivity, OECD, Paris.

35. Lundvall, B.A. (1990), "User-Producer Interactions and Technological Change" Paper presented to OECD_TEP Conference, Paris (La Vilette), June.

36. Main directions to increase Russian forest products competitiveness. Centre for Strategic Research, Moscow, 2001.

37. Materials of the seminar "Competitiveness of the Russian Forest Sector", Moscow, 2002.

38. Nelson, R., and Winter,S.(1982)."An Evolutionary Theory of Economic Change," Cambridge, MA, Harvard University Press.

39. Nelson, R.R. (1993), National Innovation Systems: A Comparative Study, Oxford University Press, New York.

40. OECD database, 2001.

41. Ohmae, K. (1995), The End of Nation State: The Rise of Regional Economies, Free Press, New York.

42. Park, S.O. and Markusen, A. (1995), "Generalizing New Industrial Districts: A Theoretical Agenda and an Application from a Non-Western Economy", Environment and Planning, Vol. 27, No. 1, pp. 81-104.

43. Penttinen, R. (1994), "Summary of the Critique on Porter's Diamond Model – Porter's Diamond Model Modified to Suit the Finnish Paper and Board Machine Industry", ETLA Discussion Papers, No. 462.

44. Porter M. The Competitive Advantage of Nations, Houndmills, London, 1990.

45. Regions of Russia, Goskomstat, 2001.

46. Reunala, A., Tikkanen, I., Asvik, E. The Green Kingdom - Finland's Forest Cluster. Otava Publishing Ltd, 1999.

47. Rothwell, R. (1992). "Issues in User-Producer Relations: Role of Government", Paper for Six Countries Programme Workshop on User-

Producer Relations in the Innovation Process, Espoo, Finland, November 26-27, 1992.

48. Russo, M. (1986), "Technical Change and the Industrial District: The Role of Interfirm Relations in the Growth and Transformation of Ceramic Tile Production in Italy", Research Policy 14, pp.329-343.

49. Steiner, M. (1998), Clusters and Regional Specialisation, Pion Ltd., London.

50. Storper, M. (1997), The Regional World. Territorial Developments in a Global Economy, The Guilford Press, New York and London.

51. Storper, M. and Salais, R. (1992), "The Division of Labour and Industrial Diversity: Flexibility and Mass Production in the French Automobile Industry," International review of Applied Economics 6 (1), pp. 1-37.

52. Storper, M. and Scott, A. (1989) "The Geographical Foundations and Social Regulation of Flexible Production complexes" In J. Wolsch and M. Dear, eds., The Power of Geography; How Territory Shapes Social Life. London, Unwin Hyman, pp. 21-40.

53. Transport and communications in Russia, Goskomstat, 1999.

54. Vinkov, A., Zhelobanov, D., Sivakov, D. Large-scale jobbery - Expert magazine, 21st January, 2002.

55. von Hippel (1987), "Cooperation between Rivals: Informal Know-how Trading", Research Policy 16, pp. 291-302.