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CLUSTER ANALYSIS AND RUSSIAN FOREST INDUSTRY COMPLEX

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ABSTRACT: Industrial clusters encompassing factor conditions, rivals, markets and supporting industries have become a popular object of study since the publication of M. Porter's The competitive advantage of nations. In the Soviet economy an equivivalent to clusters were industrial complexes, which through linkages and agglomeration effects provided external economies without the element of rivalry. The forest industry complex was a typical case in point. It consisted of logging and wood processing as well as supporting engineering industries. The complex, which was mostly located in the Russian federation, was orientated towards meeting the needs of the Soviet Union and Socialist countries. In world markets it was competitive only in roundwood and a few semi-finished goods (sawnwood, plywood, pulp, bulk paper grades) but not in technology. In 1991 the USSR disintegrated and market reforms were introduced in Russia. Traditional markets for wood based products collapsed, output and investment plummeted. Transition to market economy has not created an environment favourable for developing a competitive forest cluster in Russia. In exports roundwood and sawnwood prevail. Domestic paper technology base has been maintained by means of cooperation with western companies.

Keywords: cluster, forest industries, Russia

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Teolliset klusterit, jotka kattavat tuotannontekijät, markkinat, kilpailijat ja tukevat toimialat ovat tulleet tutkimuksen kohteeksi M. Porterin julkaistua teoksensa The competitive advantage of nations. Neuvostotaloudessa klusterien vastineena voitiin pitää teollisia komplekseja, jotka kytkentöjen ja agglomeraatiovaikutusten kautta tarjosivat tehokkuusetuja ilman kilpailuelementtiä. Metsäteollinen kompleksi, joka käsitti puunjalostuksen ja sitä palvelevan konetuotannon oli tyypillinen kompleksi. Se oli suuntautunut tyydyttämään Neuvostoliiton ja sosialistimaiden kysyntää, maailmanmarkkinoilla se oli kilpailukykyinen vain raakapuussa ja muutamissa vähän jalostetuissa tuotteissa mutta ei teknologiassa. Neuvostoliiton hajoaminen romahdutti myös Venäjän metsäteollisuustuotteiden traditionaaliset markkinat ja tuotannon. Siirtyminen markkinatalouteen ei ole Venäjällä luonut edellytyksiä kilpailukykyisen metsäteollisuusklusterin synnylle, viennissä ovat yhä vallitsevina raakapuu ja sahatavara. Paperikonevalmistuksessa teknologisen tason säilymistä on auttanut yhteistyö länsimaisten konevalmistajien kanssa.

Avainsanat: klusteri, metsäteollisuus, Venäjä

The Russian term industrial complex did not have a strict definition but it referred to a group of enterprises, which belonged to different branches and were linked together by supplier-client relationship (viz. Khrushchov 1986, 260-261). Complexes, whose nucleus was the engineering industry supplying technology for processing raw materials and semi-finished goods, come closest to the concept of cluster. In the Soviet economy the concept complex was used for both huge linkage systems like industrial military c., energy c., agro-industrial c. but also for more specific systems like forest industry or cotton complex.

In the following attempts are made to apply Porter's diamond model to the Russian (Soviet) forest industries and to find out, to what extent a forest industry cluster existed and still exist in post-Soviet Russia.

2. FOREST COMPLEX

Russia's forest resources are the largest in the world and they have for centuries served as supplies of construction materials and other raw material as well as export products. The level of wood utilization remained relatively low and in the beginning of this century industrial utilization of wood was mainly saw milling, which had been founded as an industry in the 18th century. The Soviet regime aimed at radically improving the situation, wood processing industries were expanded. A rather extensive program of building wood based pulp and paper mills was launched in the late 1920s.

In the post war period the idea of integrating mechanical and chemical wood processing common in major forest industry countries gained ground in the Soviet Union also. In this context the term forest industry complex was launched. It mainly referred to large integrates using a common raw material base. The complex was built around pulp and paper mills incorporating saw mills and other wood working industries, which helped to utilize the wood raw material more rationally. The Bratsk and Syktyvkar complexes were the most illustrative cases in point of this. (Timofeyev 1980, 332-334). However linkages with other industries like machine building were not incorporated into this concept. Another concept including also supporting industries and functions was forest complex (lesnoi kompleks). This comes close to Porter's cluster in structural terms and it seems to have been accepted by several authors (see Timofeyev 1980, Voevoda, Petrov 1985).

Most Soviet forest industries were located in Russia, they were destined to cover the needs of other union republics and also import requirements of such socialist countries as Bulgaria, Hungary and the GDR. The Soviet Union supplied also important quantities of round wood and sawnwood to world markets.

Expansion and diversification of production was accompanied or made possible by introducing domestic technology, machines and equipment. At the same time, however, also imported machines were used.

The Russian (Soviet) wood processing industry supplied most of its products to markets, where no competition was present (domestic or other Socialist countries). Only a small part of wood based products were exported (sawnwood and plywood mainly) to western markets and were thus exposed to international competition. Quality standards for most products remained lower than they were in competitive markets. Thus also requirements as for wood processing technology remained below the international level.

However, the wood processing industries were linked to related and supporting industries in a way, which resembled Porter's national cluster without the element of rivalry. In the

following this forest complex reflecting the situation of the mid 1980s is fitted into Porter's diamond framework to find out to which extent it corresponded to the idea of a cluster.

Factor conditions.

The wood raw material base offers both quantitatively and qualitatively excellent possibilities for a large scale wood processing industry. On the other hand rich natural resources do not compel to economize resources or to upgrade them. This has been the case also in Russia and the Soviet Union. In the mid-1980s over 70 % of all wood was used for saw milling or fuel, while more value added products like pulp and paper used only 13%. Qualified labour force is a key factor of development. The professional level of the work force can be considered adequate in the industry, thus factor conditions for the development of the forest industry complex can be considered good.

Related and supporting industries

Soviet engineering works manufactured by the 1980s machines and equipment for the wood processing industry beginning from wood harvesting and ending in paper making. The relationship between users and suppliers of technology were different from what they were in a competitive economy. Engineering works were subordinated to other ministries than the wood processing mills they supplied. This caused much extra administrative fuss.Their product range was also rather diversified, only a few were specialized in wood processing technology. Besides, suppliers of technology were in the first place responsible for fulfilling the production plans, not so much for satisfying the needs of clients. In principle these needs were also reflected in plans (one year or five year) but if they were not it was very difficult to e.g. order needed machines at a short notice. Imports were often a more rapid solution (if required currency resources were available). Imported machines represented usually also higher technical level. This brought some element of competition to the engineering industry but it hardly affected much the behavior of domestic engineering companies.

Demand conditions.

Demand as a factor favoring competitive strength can be quantitative (size and/or growth of markets) or qualitative (existence of clients with high quality requirements). Porter stresses the latter as a source of competitive strength. In the Soviet system demand was also a planned parameter derived from calculated needs of the population or production units. Demand was matched with planned supply. For an industry like wood processing there was continuous, even growing demand in any industrialized economy, also in the Soviet Union. Wood based products were needed in construction, packaging and printing. Besides, these needs had to bee satisfied also in Socialist countries with small forest resources (The GDR, Hungary, Bulgaria). The volume of demand was not a critical factor. However, in the socialist system it was not possible to develop segments of demanding customers, who would have pushed for continuous quality improvements.

Firm strategy, structure, rivalry

In the Soviet system the concept of firm strategy was not relevant as decisions concerning strategic issues like the product range, capacity and investments were decided at higher levels of hierarchy.

The typical characteristic of the Soviet system was lack of competition. Few products and producers were exposed to foreign competition. Imports of foreign equipment had some spill over effects on domestic technology (e.g. Soviet frame saws were copies of western analogies).

Lack of competition had also bearing on the structure of industries. Non-optimal size or location structures were maintained as the state subsidized unprofitable production units. For instance in the pulp and paper industry the optimal mill size increased and small units were shut down in market economies. In the Soviet Union however also small, inefficient units were kept in operation along with large, relatively modern mills.

Location decisions were also occasionally made without cost considerations. Mills were erected too far from markets.

In the engineering industry diversified production structure was typical, only a few firms were specialized in wood processing technology.

To sum up, the Soviet forest industry complex showed typological similarities with a cluster however without the element of rivalry. The system also excluded free flows of information and products between companies, a prerequisite for forming networks. The complex was destined to serve the Soviet economy and also participate in the division of labor between the Socialist countries. It was only to very small extent open to real international competition. Lack of competition was also the underlying reason for structural weaknesses of wood processing and supporting industries.

2.1 Domestic Technological Basis for the Wood Processing Industry

In the initial phase of the Soviet industrialization foreign technology was necessary, also in forest industries. In the pre-war years American and Norwegian equipment was dominant in the pulp and paper industry (Sutton 1973, 184-185), fiber board industry was started up with Swedish technology Domestic machines and equipment were however developed for most phases of wood processing. An important step was taken in 1965 with the creation of specialized paper machine industry as a subbranch of the Ministry of Chemical and Petrochemical Machine Industry (Eronen 1984, 43). Much of paper machine manufacturing was concentrated at the Petrozavodsk and Izhevsk works, some specialize equipment was made in Ukraine (Dnepropetrovsk and Verkhnedneprovsk works).

Typical of the machine and equipment for the wood processing industries was small number of specialized manufacturers. Production was dispersed among various ministries such as Ministry for Road Building, for Agricultural Machinery, for Machine Tool Industry, for Chemical Machinery. The engineering works under these ministries primarily supplied sectors other than the forest industry, whose needs were often neglected (Voevoda, Petrov 1985, 141). In many key technologies autarky was not achieved, may be even not aimed at. International division of labor turned out more advantageous. For instance domestic manufacturing of fiberboard equipment was discontinued in the 1960s.

It turned out, that the share of domestic technology was highest in the initial phases of wood processing (harvesting and saw milling equipment).Relatively high shares were achieved also in plywood and mechanical pulping technology. In particleboard, fibre board, chemical pulp (especially kraft pulp) and paper making imported technology was predominant (in the mid-1980s, viz. Table 1).

Why the domestic machine building performed so poorly in the forest industry complex? This question was often raised in the Soviet press. One answer was, that it was dispersed among too many ministries, for which the wood processing industry was of secondary importance. Paper machines belonged to the ministry of chemical engineering, harvesting and wood working machines were subordinated to ministry of road machine building, ministry of agricultural machines, ministry of machine tool building .Another problem was, that in the Soviet system with rigid vertical command relations it was difficult to develop working relations on horizontal level e.g. between paper machine manufacturers and the paper industry (which were subordinated to different ministries). The paper industry was reluctant to give machine manufacturers the possibility of experimenting their technology and equipment in the paper production (Litvinov, Sokolov 1986). This naturally was an obstacle to technological development and gave an additional competitive edge to western manufacturers of paper machines, who had better connections with paper makers in their countries.

2.2 Transfer of Foreign Technology

As a matter of fact the share of imported technology was higher in the wood processing industries than in most other Soviet industries. According to the calculations of this author imports accounted for appr. 20% of all investments into wood processing machines and equipment in 1971-75 and nearly 30% in 1976-85. This share was almost as high in the chemical industry but in the whole industry it seems to have been only 3-6% in 1970-77 (Hanson 1981).

Soviet wood processing technology seems to have regressed in the 1970s and 1980s. Its share in new acquisitions of technology in the forest industries diminished form appr. 80% in 1971-75 to 70% in 1981-85. Forest industries also lost in importance, their share in total industrial investments declined from 5% to 3.5% in 1966-85

Table 1. Share of Domestic Equipment in Soviet/Russian Forest Industries

	Mid-1980s	1998
	- % -	
Wood harvesting	dominant	92
Sawmilling	dominant	85
Plywood	60-80	65
Particle board	50	52
Fiberboard	15	10
Pulp (Kamyr type)	..	20
		55
Paper, board	33	34

(Eronen 1987, VNIPIEI 1998)

Why did the Soviet Union rely to such an extent on technology transfer in the wood processing industries? Technological gap certainly was the main reason. One reason may have been advantageous (bilateral) trade agreements with major suppliers of technology. Finland was for a long period the most important supplier and the bilateral trade agreement between the countries made purchases possible without the use of scarce foreign exchange.

Similar arrangements prevailed also in the trade with socialist countries, of which Poland was a supplier of wood processing technology especially for wood based panel industries (Erone 1989, 337). The combined share of Finland and Poland in Soviet imports of wood processing machines and equipment amounted to appr.60% in the early 1980s.

Imports were the main form of technology transfer to the forest industries. It had also given impulses to domestic manufacturers, e.g. frame saws imported from Finland in the 1950s started to be made subsequently in the Soviet Union. Copying of western technology was not a feasible way of acquiring sophisticated technology. Cooperation with western suppliers had to be developed. This concerned especially paper making technology. The Soviets had purchased licenses from German manufacturers Voith and Kusters. Production cooperation was started with German (Voith, Escher-Wyss) and Finnish (Valmet, Tampella) manufacturers of paper and board machines in the 1980s. Indeed, several jointly produced paper and board machines were delivered to the Soviet paper industry. In deliveries with Finnish participation the share of Soviet suppliers was 15-20 % (Eronen 1989, 343). Investments into the sector dwindled in the late 1980s, thus cooperation with western partners really never had a chance. The joint venture Petrovoith founded in 1987 with the Austrian Voith company has survived.

2.3 Soviet forest industry complex and international markets

The Soviet forest industry complex was to a great extent a Russian complex as most forest resources and wood processing industries as well as engineering works manufacturing equipment for these industries were situated in the Russian

Federation. Wood processing industries were present also in the Baltic republics, Belarus and Ukraine but as far as foreign trade was concerned enterprises located in Russia were so overwhelming, that Soviet exports practically meant Russian exports. Besides Russia supplied important quantities of roundwood and processed products to other Soviet republics.

Table 2. Exports of Soviet forest industry complex 1987-88

	1987	1988	%	Of it to competitive markets		
				%	mln. Rubl	%
-	- mln rubl.-					
Paper, board	389	359	15	33	118	8
Pulp	347	359	15	48	172	11
Plywood	124	106	4	62	66	4
Particle board, fibreboard	61	62		30	20	1
Sawnwood	749	780	32	70	546	36
Roundwood	548	708	29	86	609	40
Wood working machines and equipment	54	72	3		..	
Total	2272	2446			1531	

(Calculated from Vneshnie ekonomicheskie svyazi SSSR, 1989)

Exports of the Soviet forest industry complex mostly consisted of roundwood and low value added products like sawnwood. The share of paper and board was 15%, that of ma-

chines and equipment only 3% in 1988. Deliveries were directed to two different markets: socialist countries (mainly Comecon) and world or competitive markets. Low value added was typical of sales to western (competitive) markets. Of paper and board only 1/3 was sold to these markets. Wood working equipment was sold almost exclusively to the Comecon countries like Romania, Bulgaria and Mongolia.

These data clearly show, that the Soviet forest industry complex had not been able to penetrate competitive markets with any high value added products or appropriate technology.

Russia was a major source of wood and forest industry products for other republics of the USSR. As a matter of fact these deliveries exceeded exports in volume terms.

Table 3. Deliveries of roundwood and sawnwood from Russia 1989

	Roundwood		Sawnwood	
	Mln. m3	%	Mln m3	%
To other Soviet republics	36.7	66	17.7	70
To foreign countries	19.0	34	7.7	30
Total	55.7		25.4	

(Lesnoi kompleks SSSR, 1991, (1), 176-177,(2), 114-115

2.4 Development in the 1990s

The Soviet economy had shown clear signs of stagnation since at least the mid-1980s. In the forest industries they were evident even earlier. The level of production was however maintained. The collapse came in 1991, when the fall of the Soviet empire coincided with the change of the economic system. Both together had a devastating effect on most Russian industries.

The state as the main purchaser of final products and investor withered away. Companies, mostly subsequently privatized, were on their own and had themselves to find markets and finance investments. However, demand for forest products had collapsed both within Russia and in traditional markets. Thus the cash flow of most companies remained too small for accumulating investment funds. Bank loans were not attractive or they were not available. 70% of companies in wood processing industries worked at a loss in 1997. New owners showed little interest in long term development of companies (Kondratyuk 1998, 4).

No wonder, then that both the production and investment in the wood processing industries have radically diminished.

Table 4. Capacity Utilization Rate in Russian Forest Industries 1990-96

	1990	1996
	- % -	
Wood harvesting	90	46
Sawmills	74	34
Plywood	86	56
Particle board	86	29
Fibre board	97	41
Chemical pulp	88	38
Paper	93	48
Board	92	29

(VNIPIEI 1998)

Let us try to analyze the situation of the Russian forest industry complex of the late 1990s in Porter's framework.

Factor conditions

Not much has changed, basically good prerequisites still exist.

Supporting and related industries

Investment depression in most branches including wood processing has adversely affected supporting industries. The conditions of different research institutes has deteriorated after most state support has been curtailed. The paper machine industry (Petrozavodskmash and Izhevsk works) has contracted but rebuilds of existing machines, deliveries to former socialist countries and subcontracting to the Finnish paper machine company Valmet and joint venture partner Voith have kept up the technical level and prevented a total collapse of Petrozavodskmash. The saw equipment industry seems to be worse off. It produces frame saw, whose demand has dwindled. ,

Demand conditions

Total demand for forest products has radically diminished both in Russia and in traditional markets (former Soviet republics and Eastern Europe). Compensating markets have been found in the west to a certain extent (for plywood and newsprint) but this has not affected much the global situation. Low investment activity has not even given chances to the domestic engineering industry to develop technology. In saw milling demand has shifted towards small circular saws for local use, which are not manufactured in Russia.

Firm strategy, structure, rivalry

Much has been done to create a competitive environment in Russia (privatization, end to state interference to company level operations). However, it has turned out, that insider privatization became the typical form of ownership change. Old management and staff remain in most cases in charge, outsider owners are shunned. This certainly maintains old

ways of of doing things. No wonder then that not much improvement is visible in the Russian manufacturing industry.

Structural deficiencies inherited from the Soviet period are a heavy burden for the wood processing industry but it is evident, that too small and wrongly located will be gradually eliminated by the market forces.

Role of government

This has radically changed as the state no more directly controls industries and companies. In a market economy the government can encourage competitive strength of industries by favoring education and legislation, which encourages competition. Russian state revenue has radically diminished and there are serious difficulties in tax collection. Thus e.g. support to scientific research and education has been curtailed. The desperate state of public finances accentuated after the collapse of August 1998 indicates, that no support can be expected from the state to the forest industries.

To sum up, negative developments in demand conditions and supporting industries have prevented the favorable factor conditions to be taken into use. The creation of a competitive environment has not helped so far as mistakes made in the privatization (insider ownership prevalent) have maintained old ways of doing things.

2.5 Areal Complexes

Location aspects are also important when analyzing industrial complexes and clusters. In industries where linkages and networking are important companies tend to be drawn close each other or to agglomerations. Wood processing companies represent a harvesting type of industry drawn to forest regions. Besides companies often compete for the same resource, wood, which means, that proximity to others does not offer any special advantages. An exception are companies, which use the same raw material source but different assortments (logs for sawmills, pulp wood and saw mill residues for pulping or panels). Such industries benefit from proximity. Common use of wood and economies of scale have encouraged the creation of large integrates incorporating mechanical and chemical wood processing. Also concentrations of e.g. saw mill industry has attracted pulp and paper mills utilizing saw mill residues as a raw material.

Despite the benefits of concentrating wood processing around big pulp and paper mills in the form of integrates or looser linkage systems forest industry as a whole is rather dispersed through the forest belt. In saw mill and panel industries increasing costs of wood procurement and transportation limit the size of optimal mill capacities.

Dispersed location pattern is typical also in Russian forest industries. This has been encouraged by the industrial location policy of the Soviet period when raw material orientation and industrialization of remote regions were favored. Still concentration of forest industries in certain regions of the taiga belt can be discerned.

In North-Western Russia (Karelia, Komi republics, Arkhangel and Leningrad provinces) most of the largest pulp and paper integrates and export sawmills are located. This region accounts for over a half of Russian pulp and paper output. As also the leading engineering companies manufacturing pulp and paper and saw milling equipment are located there (Petrozavodsk) or in near by regions (paper machines in Izhevsk, saw mill equipment in

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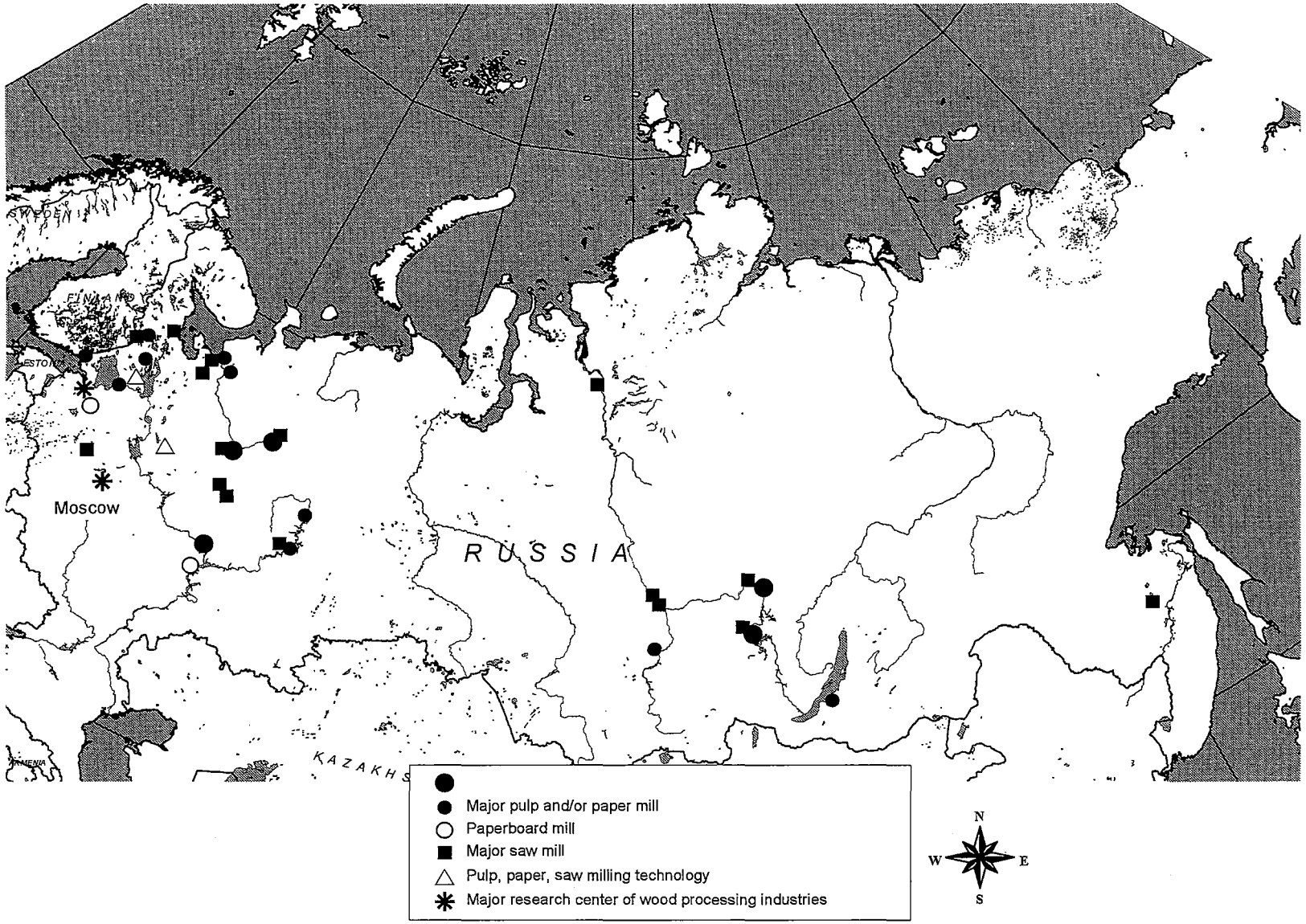

Vologda), thus elements of a regional forest industry complex are there. Of course the present deplorable state of the industry does not allow the complex to be really workable.

Another regional grouping of forest industries exists in Eastern Siberia. The Irkutsk province is specialized in pulp (appr. 30% of Russian output), also sawnwood is important. The adjacent Krasnoyarsk province has several large export sawmills. Eastern Siberia however lacks a local technology basis.

The pace of output decline in the 1990s has varied between regions. The core areas, North-West and Eastern Siberia have slightly lost their shares in sawnwood but gained in paper production. The Urals, Western Siberia (which does not have pulp and paper industry) and the Far East (including Sakhalin) have lost in both. The Far East seems to be losing almost all of the wood processing capacity.

2.6 Forest Industry Production 1990-97

Russian forest industries collapsed in the 1990s. The decline was especially dramatic in roundwood, sawnwood and wood based panels. In these the output diminished to ¼ of the level of 1990. The situation was better in the plywood, pulp and paper industries, whose products have enjoyed relatively good demand in international markets. Exports have been especially important for plywood and newsprint (over 60 % of output in 1996). In roundwood and sawnwood export deliveries have accounted for about 1/5 of the output, which has not prevented the deep decline.

Table 5. Russian Forest Industry Production 1990-97

	Roundwood	Sawnwood	Particleboard	Plywood	Pulp	Paper, board
	- mln m^3	- mln m^3 -		- mln. m^3 -	- mln tons -	
1990	304	75	5.6	1.60	7.53	8.33
1991	269	66	5.4	1.52	6.40	7.39
1992	238	53	4.5	1.27	5.68	5.77
1993	175	41	3.9	1.04	4.40	4.49
1994	119	31	2.6	0.89	3.31	3.42
1995	116	27	2.2	0.94	4.20	4.07
1996	97	22	1.5	0.97	3.08	3.22
1997	79	18	1.5	0.95	3.17	3.33

(Rossiya v tsifrakh 1998, 186)

2.7 Russian Forest Complex in International Markets

The external market environment for Russian exporters changed radically in the early 1990s. The bilateral trade agreement system with former Comecon countries was scrapped and these markets became competitive and strongly western oriented. The collapse of the Soviet Union has meant that former Union republics have become foreign markets (CIS and Baltic states), The transition process has been slower in the CIS area, emergence of working market structures has lagged behind. Low level of demand, partial barter trade and payment delays has discouraged business in these countries, why also Russian exporters have looked for more lucrative markets. If in 1992, after the break up of the Soviet Union 63% of Russian sawnwood exports went to former Soviet Republics in 1996 the share was

below 20 %. In pulp the share dropped from 43 to below 5 %, in plywood from 37% to near zero.

Exports of forest industry products amounted to over 2.4 bn USD in 1996. Most of the sales went to competitive markets. The share of low value added products still prevails but it is lower than in 1988 as the export volumes of roundwood and sawnwood have diminished (even if deliveries to former Soviet republics are not taken into consideration). Paper (newsprint) and plywood exports have increased in volume and share. There has been some demand for Russian forest industry technology in Eastern Europe and China. Paper machine parts have been delivered to old Western partners Voith and Valmet.

Table 6. Exports of Russian Forest Complex 1996-97

	1996	1997		1996	1997	
	mln USD		%			
Roundwood	929	1017	39	15.6	17.7	mln m^3
Sawnwood	515	653	25	4*	5*	- " -
Plywood	197	212	8	0.59	0.63	- " -
Pulp	426	383	15	1.05	1.01	mln t.
Newsprint	369	331	13	0.78	0.84	- " -
Equipment	20*	20*	1			
Total	2456	2616				

* estimate
(Rossiiskii statisticheskii 1997, Vneshnyaya torgovlya 1998, 63)

2.8 Investments in the Forest Industry

The output decline in the forest industries has been more dramatic than most other branches. In most forest products the output had fallen below a third of the level of 1990. In the best performing branch, plywood, the output was halved. The capacity utilization rate, which was around 90% in the industry in 1990 (except for sawmilling, in which it was 74%), went down to near 30% in sawnwood, particleboard and paperboard in 1996. The highest rate, 56%, was achieved in the plywood industry. At the same time capacity has also been dismantled or scrapped. Some new acquisitions of machines and equipment have been made at existing mills. No major new greenfield investments have been made in the industry. Net investments have been negative.

Table 7. Capacity Development in Russian Forest Industries 1990-96

	New Capacity built	Divestment	Net Capacity change
Wood harvesting mill m3	11	138	-127
Sawnwood mill. m3	7	45	-38
Plywood 1000 m3	89	187	-98
Particle board 1000 m3	769	2227	-1458
Fibreboard mill. m2	47	98	-51
Chemical pulp mill tons	188	674	-486
Paper, board	603	1382	-779

(VNIPIEI 1998)

Following investments have been undertaken in the industry in the 1990s as reported by VNIPIEI, 1998:

Wood harvesting

Major investments have been made at three harvesting enterprises in Siberia and the Far East:

Katinsk (Irkutsk province)	capacity 100 000 m^3/a of wood
Salym (Tyumen province)	50 000
Selemjin (Amur province)	200 000

Sawmilling industry

Most sawmills are equipped with old, used up frame saws.

Minor replacement investments of obsolete equipment have been undertaken. A few joint ventures have also acquired foreign equipment.

Plywood industry

Only rebuilds of existing facilities have been undertaken

Particleboard industry

Two new production lines have been built at existing facilities

Skhodnen furniture factory (Moscow prov.)	cap. 110 000 m^3/a
Uva mill (Udmurt republik)	110 000

Rebuild of the Sheksna mill has been undertaken

Capacities have been raised by rebuilding existing equipment at the Syktyvkar forest industry complex by 30 000 m3/a and at the Tomsk particle board mill by 30 000 m^3/a.

Fibre board industry

The German Bison company has delivered equipment for following mills:

Novo-Yeniseisk	(Krasnoyarsk prov.)	cap. 13 mill. m^2
Balabanovo	(Kaluga prov.)	13
Yug	(Kranodarsk prov.)	13

Pulp and paper industry

In chemical pulping one new line of 100 000 t/a has been built at the Sokol pulp and paper mill.

Two new paper machines have been installed in the 1990s, both by the Petrovoith joint venture: a newsprint machine with a capacity of 220 000 t/a company to the Balakhna pulp and paper mill in 1990 and a printing and writing paper machine to the Arkhangelsk pulp and paper mill in 1997.

Some rebuilds of paper machines have been carried out mostly at the Kondopoga and Svetogorsk mills.

2.8.1 Foreign Investments

In the late 1980s when the Soviet economy began to liberalize the authorities started to attract foreign investors in order to modernize the industry and bridge the technology gap. The operation mode proposed to foreign investors was joint ventures, which were possible since 1987. The investment climate was too turbulent though and in the manufacturing industries the results remained modest. Two cases in the forest industries are worth mentioning, though. A Japanese-Soviet joint sawmill was built in Eastern Siberia and a Finnish-Soviet plywood mill at Chudovo, in the Novgorod province.

The economy was further liberalized in the early 1990s and new forms of foreign participation and ownership became possible. Simultaneously the domestic market collapsed and the investment climate deteriorated further. Still some foreign companies showed interest in portfolio investments in the sector. In the pulp and paper industry the share of foreign ownership has constantly increased since 1992, exceeding 40% in 1997 (this figure includes also joint ventures, viz. Ignatov 1998, 14). Following companies acquired important stakes

Herlitz International (Germany), Balakhna (renamed Volga) paper mill
Tetra Laval (Sweden) Svetogorsk mill
ASSI (Sweden), Segezha pulp and paper mill
Knauf (Germany) St. Petersburg board and printing combine

Herlitz invested 150 mln. USD e.g. to a new paper machine but its short term profit targets were not realized. The company retired from the management of the firm in 1997 without finding buyers for its equity. Tetra Laval showed more long term interest by investing over 100 mill. USD in the Svetogorsk company but in June 1998 it sold its share to the US owned International Paper, which has shown interest in continuing the investment program started by Tetra Laval. (Västberg 1998, 23). An American company acquired shares in the Vyborg pulp and paper mill but sold them soon to a British company, which also soon retired from the deal (Kostina 1998, 40). Knauf company acquired an important stake of the St. Petersburg board and printing combine in 1994 but in 1996 the Russian Ilim Pulp Enterprise became the major owner of the mill (Savva 1998, 6).

Frequent changes in ownership point at insecure investment climate and low level of demand in the country. Foreign players have not yet ventured into large scale investments and modernization of the production apparatus.

3. SUMMARY AND CONCLUSIONS

The Soviet industrial system stressed the importance of creating domestic technological base for all major industries. Raw material processing industries among them wood processing formed complexes with their supporting industries, especially with engineering industries. Such complexes bore certain resemblance with Porter's clusters although such important elements as rivalry or firm strategy were lacking. The Soviet system also maintained firm or industry structures, which did not meet the requirements of economies of scale or cost effective locations. Engineering companies serving the forest industries had

diversified production programs and they did not make use of the advantages of specialization.

Competitive strength was not developed in such an environment. Most branches of the forest industries grew till the middle-1980s but their growth was increasingly based on imported technology. Domestic engineering industries stagnated. They were strong only in the initial phases of the wood processing (harvesting and transports, saw milling). No internationally competitive cluster ever emerged. However, a working forest industry complex with extensive wood processing and supporting technological basis was created in the Soviet Union (mainly in the Russian Federation).

In the 1990s the situation radically deteriorated. The complex shows increasing signs of disintegration. All wood processing industries have substantially contracted. Low level of investments has not given much chances to the domestic suppliers of machines and equipment. In major investment projects reliance on foreign technology has continued.

In the conditions of sluggish domestic demand prerequisites for a competitive cluster hardly exist. Internationalization seems to be the most feasible way to rescue the best part of the Russian forest industry complex. Indeed export demand is vital for most of the forest industry products. Exports account for over a half of plywood production, over a third of chemical pulp, a fourth in paper, about a fifth in sawnwood.

Inward operations (imports of machines and equipment) have for decades been vital for bridging the technology gap. Imports of machines and equipment have continued also in the 1990s but on a modest scale. Technology transfer takes place also within joint ventures like Petrovoith started in 1987. In paper machines and equipment Petrozavodskmash has been able to penetrate new markets, often as a subcontractor to Voith and Valmet but volumes have been modest. It is obvious, however, that in the long run the future of the Russian pulp and paper machine building is tied to the fate of the domestic pulp and paper industry. This applies to other wood processing technology also.

Appendix

Major engineering works manufacturing wood processing machines and equipment

Pulp and paper technology

Petrozavodskmash

boilers, board and paper machines, defibers etc.

Izhevsk works of paper making equipment

board and paper machines

Kineshma works of paper machines

Board machines

Gatchina works of paper making equipment

Kaliningrad works of paper making equipment

Saw milling technology

Severnyi kommunar works, Vologda

frame saws

Minor manufacturers of saw milling and wood working equipment

Petrozavodsk machine tools works

Danilov works of wood working machines (Yaroslav province)

Rybinsk works of wood working machines (Yaroslav province)

Kuvshin works of wood working machines (Sverdlov prov.)

Kropotkin works of wood working machines (Krasnodar prov.)

Tyumen machine tool works (Tyumen prov.)

Yaroslavl works of wood working equipment

Moscow works of wood working machines and automatic lines

Stavropol machine tool works

Kurgan works of wood working machines

Borovich works of wood working machines (Novgorod prov.)

Kostroma works of wood working machines

References

Eronen Jarmo (1984) Location Strategy and Patterns. An Empirical Investigation Investigation of the Soviet Pulp and Paper Industry.

■ " - (1987) Teknologian siirto Neuvostoliiton metsäteollisuuteen.
■ Helsingin kauppakorkeakoulun julkaisuja D-92

■ " - (1989) Technology Transfer to Soviet Forest Industries.
■ Int. Journal of Technology Management, vol. 4, No 3

Hanson Philip (1981) Trade and Technology in Soviet-Western Relations. London

Ignatov I. A. (1998) "Tseli predstoyashchego perioda vosstanovleniya tsbp Rossii" Tsellyuloza bumaga karton No 9-10

Khrushchov A. T. (1986) Geografiya promyshlennosti SSSR. Moskva

Kondratyuk V. A. (1998) "O predstoyashchei restrukturizatsii lesopromyshlennogo kompleksa Rossii" Derevoobrabatyvayushchaya promyshlennost' No 4

Kostina Galina (1998) Shans na modenizatsiya. Ekspert No 44

Lesnoi kompleks SSSR (1991) Statisticheskii spravochnik. Chast´ 1. Moskva

Litvinov S., Sokolov V. et al. (1986) "Kogda okonchitsya pogonya za importnoi tekhnikoi dlya industrii bumagi?" Lesnaya promyshlen nost´4. 10.

Petrov A. P., Burdin N. A,, Kozhukov N. I. (1986) Lesnoi kompleks. Voprosy teorii i praktiki. Moskva

Porter Michael (1990) The Competitive Advantage of Nations. Worchester

Rossia v tsifrakh (1998) Goskomstat Rossii. Moskva

Rossiiskii statisticheskii yezhegodnik (1997). Goskomstat. Moskva

Savva V. K. (1998) "Ne ostanavlivatsya na dostiognutom" Tsellyuloza bumaga karton, 9-10

Sutton Anthony (1973) Western Technology in Soviet Economic Development 1943 to 1965. Stanford

Timofeyev N. V. (ed.) (1980) Lesnaya industriya SSSR. Moskva

Vneshnie ekonomicheskie svyazi SSSR (1989). Moskva

Vneshnyaya torgovlya (1998) No 7-9

VNIPIEIlesprom, special report, 1998

Voevoda I. N., Petrov A. P. (1985) "Effektivnost´ lesnogo kompleksa". EKO No 3

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