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Institutions and the Emergence of Markets – Transition in the Tomsk Forest Sector

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Foreword

This report is the first in a series of case studies that IIASA has initiated in different regions of the Russian Federation. Studies are under way in the Karelian Republic as well as in the regions of Arkhangelsk, Moscow, Murmansk, Krasnoyarsk, Irkutsk, and Khabarovsk. All these reports deal with institutional aspects of the Russian forest sector. The present report on the Tomsk region will be supplemented with a report presenting the results of interviews with representatives of forest enterprises in the region.

The research has been made possible through financial support from The Swedish Council for Planning and Coordination of Research (FRN) and the Royal Swedish Academy of Sciences (KVA). We gratefully acknowledge the help of Dr. Alexander S. Sulakshin, who has served as the local coordinator in Tomsk. We would also like to thank Mrs. Olga Cherkashina, who has been helpful in conducting interviews and colecting data. A large number of people have provided valuable information and given useful comments on earlier drafts of the report. We would also like to thank all those who have spent time on answering our questions and especially Sergei Budlov and Viktor Lukov, Tomsk, who initially gave the project their support.

Lars Carlsson and Mats-Olov Olsson

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About the Authors

Lars Carlsson, Ph.D., is a guest research scholar at IIASA where he is engaged, together with Mats-Olov Olsson, M.A., in a substudy on institutional aspects of the Russian forest sector within IIASA's Forest Resources Project. Dr. Carlsson is an Associate Professor at the Division of Political Science, Department of Business Administration and Social Sciences, Luleå University of Technology, Sweden. Mr. Olsson, is a research scholar at the Centre for Regional Science, Umeå University, Sweden.

1. Introduction

The working hypotheses for this study can be summarized in two statements:

1) The restructuring of the Russian economy can hardly be successful without fully integrating the forest sector.
2) The abundant Russian forests cannot be regarded as a "resource" in an economic sense without the establishment of a suitable institutional framework.

Starting with the latter statement, trees and forests are not an economic resource just as they stand out there in nature. All types of forest use require regulatory systems to constrain the activities of those who use the resource, and, correspondingly, without any regulating mechanisms we can hardly claim that a particular forest is a "resource," neither in an economic sense nor in the sense of representing a use value. As we shall see, the mechanisms regulating the forest use in Russia today is largely deficient or malfunctioning. Thus, as a matter of fact, today the Russian forest sector does not represent such a huge and important economic resource as is often claimed. Statements about Russia's huge forest "resources" that are commonly heard rather reflect the fact that Russia within its territory holds an immense area covered with forests, which, under certain favorable conditions, might generate income and welfare. Therefore, it may be more accurate to say that the Russian territory holds an asset in the form of forests that doubtlessly has the "potential" of serving as a resource for the creation of welfare among the people. But, this is not the same as to equalize the existence of a large forest fund with resource abundance.

Contemporary research indicates that the wood supply from traditional suppliers will probably decline. Russian forests are underexploited and have the potential to fill the expected supply gap (World Bank, 1997:44). Whether they will actually be able to do so or not is, however, primarily depending on whether adequate *institutional arrangements* will be developed in order to smoothen the entrance of the Russian forest sector on this new market. In this context it is important to emphasize that institutional arrangements are not primarily to be understood as formal organizations and formally written laws and regulations. Institutions are "the rules of the game" (North, 1990), i.e., those formal or informal rules that are *de facto* used by a set of actors. With Pejovich (1998:23) institutions can be defined "*as the legal, administrative and customary arrangements for repeated human interactions.* Their major function is to enhance the predictability of human behavior. The prevailing institutional framework in a society consists of formal and informal rules" (emphasis in original). Such an institutional framework, well functioning, is a basic prerequisite for the future development of Russian forestry. Logically, a poorly governed Russian forestry sector will be a severe obstacle for the transition to a market economy.

The aim of this project is to describe and analyze the current institutional framework of the Russian forest sector. This is done through a series of case studies in several Russian regions. In this report we present the results of a study in the Tomsk region in West Siberia. (See map on p. 16.)

Historically, Tomsk has been one of Russia's most important forest regions. Therefore, what happens within the forest sector in this region will presumably mirror a broader set of problems and possibilities related to the current state of economic transition. Tomsk has been selected as one among a number of case studies, the common goal of which is to provide knowledge and insights based on regional experiences that may be useful for policy making ultimately aimed at an institutional restructuring of the Russian forest sector. The knowledge and analyses that these case studies contribute may constitute an intellectual foundation for a series of policy exercises (Duinker, 1997) with federal, regional and other stakeholders in the Russian forest sector. In this way, the result of the research will hopefully make an impact on the development of a modern Russian forest policy.

The Structure of the Report

The report consists of six chapters structured in the following way. In the next section of this introductory chapter the logic and methodology of the study are outlined. In the second chapter we will depict the structure and distribution of the forest resources in Tomsk *Oblast*. Since plenty of good information about the forest resources can be acquired by consulting the results of a number of studies specifically conducted for analyzing such matters, the description made here is rather broad and sketchy. The primary purpose of the description is to establish a general foundation for the discussion in the following four chapters in which we mainly concentrate on institutional questions.

In the third chapter, the socioeconomic characteristics of the region are analyzed. Here the main objective is to clarify to what extent the Tomsk region differs form other regions of the Russian Federation. For example, is the population of Tomsk more educated than the inhabitants in other regions, are they older, healthier, and so forth? Presumably such socio-economic qualities are important prerequisites for successfully developing the forest sector.

The fourth chapter focuses on institutional aspects. Starting with a short summary of the organization of the forest sector in the Soviet system it is described to what extent, and how, it has changed after the collapse of the Soviet Union. In this chapter we also try to clarify the actual size and structure of the Tomsk forest sector.

In the fifth chapter, "Institutional problems and shortcomings," a number of features are discussed that we found during the course of the study and that can be regarded as obstacles for a successful modification of the forest sector. The basic principles for identifying and evaluating whether or not a feature is to be regarded as a "problem" or an "obstacle" are described more thoroughly in the subsequent methodology section of the present chapter. In Chapter 5 problems that have been identified are related to the configuration of the present institutional framework, as it is depicted in Chapter 4. It turns out that some of the problems within the Tomsk forest sector are due to specific regional ways of handling things while others might be attributed to a more general set of problems related to the present transition period.

To achieve an ordered and carefully considered transformation of the old Soviet system is a tremendous task forcing the Russian people to simultaneously grapple with three problems: 1) economic restructuring, 2) state-building, and finally, 3) nation-building, i.e., to establish Russia as a nation (Breslauer, 1995). In our report these more general issues are discussed only when they coincide with, or assist, our analysis of the Tomsk forest sector. Albeit these three tasks are, indeed, intertwined with regional problems the present report mainly deals with the forest sector of Tomsk, not with the general question of restructuring the entire society.

The point of departure for the discussion in the final chapter is that changing the forest sector is basically a matter for the Russians themselves to handle and our aim is by no means to provide readymade solutions to the great number of problems that currently besets the sector. Nevertheless, the report is aimed at contributing results and arguments useful for a wide circle of stakeholders within the Russian forest sector, and especially for those who are particularly interested in the future of the sector in Tomsk *Oblast*.

Methodology

Studying institutional aspects of the Russian forest sector requires a methodology suitable for investigating the sets of rules that govern the actors involved. In the case of Tomsk, a basic question to be addressed is what types of rules and norms do *actually* guide the activities in the regional forest sector. Thus, the question is not how these actors *supposedly* behave (or should behave) according to some *formal* regulation, such as the Russian forest code.

In order to design the case study we have taken the *Institutional Analysis and Development Framework* (IAD) as a point of departure. The IAD framework is a thoroughly tested tool for institutional analysis (Oakerson, 1992; E. Ostrom, 1995, Ostrom *et al.*, 1994; Sabatier, 1991; Thomson, 1992; Bogason, 1994). This framework is sufficiently broad to be compatible with a wide range of theories, such as, collective action theory, transaction cost theory, game theory, and constitutional choice theory. The framework is described in detail elsewhere and will only be briefly outlined here with special emphasis on how we use it as an analytical tool. (For a comparison with other frameworks, see Sabatier 1991 and Sproule-Jones 1993.)

The focal point of the IAD framework is a specific *action arena* (cf. Fig. 1:1), in this case the Tomsk forest sector.

Action arenas are supposedly composed of two clusters of variables: 1) an *action situation* involving participants, positions, actions, information, etc., and 2) *actors* who have preferences, information-processing capabilities, and so forth (Ostrom, *et al.*, 1994:29 ff.).

The IAD framework seeks to understand action arenas with reference to three "factors": *attributes of the physical world*, *attributes of community*, and *rules-in-use*. All together, this constitutes a complex set of relations that can be observed as patterns of interaction. Thus, it can be assumed that physical attributes, such as the structure and amount of forests in Tomsk, affect the forest sector – our action arena – in particular ways. Similarly, a number of attributes of the Tomsk "community" (the second box in the framework), such as people's level of education, their skills, habits, and norms, will affect activities performed within the sector.

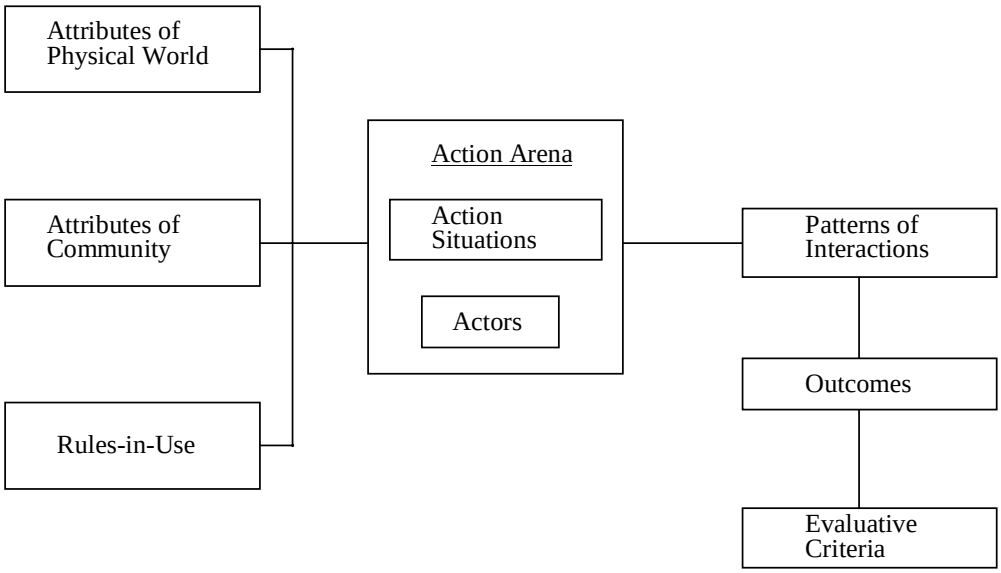


Figure 1:1. A framework for institutional analysis (Source: Ostrom *et al.*, 1994:37)

In this way the IAD framework enables us to capture both social and political order, i.e., to reveal *how* and *why* various actors organize their relations to the forest sector in the way that they do. All together, these activities generate specific *outcomes*, and by applying a number of evaluative criteria, such as economic efficiency, fiscal equivalence, and equity, these outcomes can be assessed. In this study of the Tomsk forest sector a set of rather general criteria is applied.

The arguments for this choice are the following. One should not expect that the Russian forest sector can – or ought to – be changed in accordance with any blueprint provided, for instance, by the forest sector in various western countries. Nevertheless, assessing whether the development is for the "better" or the "worse" will require some evaluation criteria. Since it would be presumptuous to judge Russia simply by comparing it to the situation in western countries the evaluation criteria that are applied in this study are more of a "baseline principles" type. Thus, we assume that a specific institutional configuration is conducive to a sustainable Russian forest sector and useful for the whole economy if the following conditions are met:

- Constitutional rules are acknowledged and transparent.
- The structure of property rights is settled and well defined, i.e., private actors can acquire property or get the right to utilize property for their own benefit.
- Rules and regulations from official authorities are regarded as legitimate, and apply equally to similar actors.
- The market decides prices of property and goods.
- Decision-making regarding collective choice and operational rules is decentralized.
- Private investors can realize the returns on their investments.
- Rules are enacted aimed at preventing the devastation of natural resources.

- Legitimate authorities take measures against violations of rules.

However, it is unlikely that unambiguous statements can be made whether or not individual conditions are really met. Using them for assessing the institutions embedding the forest sector of Tomsk is more a matter of discretion. Thus, in this report the listed criteria are looked upon as devices that indicate how close to an ideal the forest sector has developed.

Data Collection

The guiding principle for the collection of data has been the idea of "tracing the timber from the forest to the market." For every link in this "forest-to-market chain" we concentrate on the various kinds of institutional features that affect the actors involved. The bulk of data that has been collected can be divided into four types:

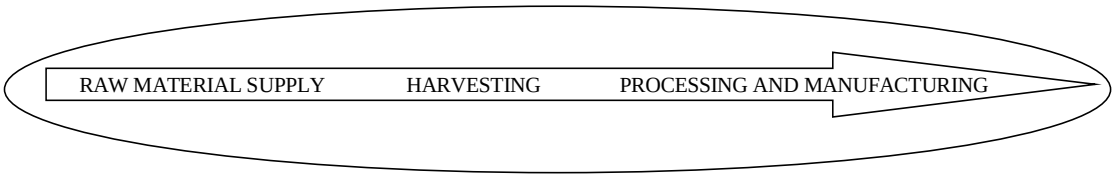


Figure 1:2. The action arena of the Tomsk forest sector, the focus of the study

I) The first kind of information concerns the socio-economic situation of the Tomsk *Oblast*, its economic geography as well as the formal political, administrative structure that relates to the forest sector. Here the *IIASA Russian Forest Study Database*[1] as well as a number of secondary sources have been used.

II) The second type of information consists of forest data. Likewise, for the gathering of this type of data, a number of secondary sources have been consulted. The data have been supplemented with information from the IIASA database.

III) The third type of data is supposed to depict the formal as well as informal institutional configuration of the Tomsk forest sector. Here information has been gathered during field visits and with the help of local collaborators who have collected information according to a specific instruction developed within the project.

IV) Finally, interviews have been conducted with management representatives of 26 enterprises in the Tomsk region. Since the forest sector consists of many sub-sectors and branches the selection of the enterprises has been guided by the idea that the total series of interviews should reflect different aspects of the sector. Thus, the interviewed enterprises are selected in order to cover the whole "forest-to-market chain" (cf. Fig. 1:2). We have also deliberately incorporated both small and large companies, new enterprises as well as old, consultants as well as processing enterprises, and so forth. Accordingly, conclusions solely based on these interviews can only be generalized to the interviewed enterprises themselves. However, by adding this information to the broader set of data

[1] See description of the IIASA Russian Forest Study Database published on internet at URL: http://www.iiasa.ac.at/Research/FOR/dbdoc/fsa_menuframe.html

described above, we assume the result of our analysis to be relevant for the forest sector as a whole. (The result of the analysis of the interview data is being published separately.)

We now turn to report the results of our study of the Tomsk forest sector. Here we will consult and "unpack" the analytical framework described above. In the next chapter we will describe some of the "physical attributes" of Tomsk *Oblast* and, in particular, its forest resources.

2. The Resource Base – Forests in Tomsk *Oblast*

Tomsk *Oblast* is one of the most densely forested areas in Siberia. Out of a total area of 31.4 million hectares 28.5 (or 91%) belongs to the so-called *Goslesfond*, the state forest fund.[2]

Table 2:1. Forest resources in Tomsk managed by the Federal Forest Service (FFS). Area totals and growing stock, 1993.

Forest Resources	Managed by FFS	All Areas
Forest fund (mill. ha)	26.7	28.5
Forested area (mill. ha)	16.8	18.3
Growing stock (mill. m^3)	2562.0	2723.9

Source: IIASA Russian Forest Study Database.

According to the group classification system used in Russia since 1943, this fund is distributed as follows (Table 2:2).

Table 2:2. Distribution of the forest fund in Tomsk by group classification and land user (100 ha), 1993.

Land owner	**Group 1**	**Group II**	**Group III**	
Federal Forest Service	14465	6471	246103	
Former Ministry of Forest Industries	19	41	182	
Agricultural enterprises	1475	13356	0	
Municipal administrations	321	529	254	
Other federal agencies	298	1183	267	
Total	16578	21580	246806	=> 284964

Source: IIASA Russian Forest Study Database.

[2] For a definition, see Appendix 1.

Basically, Group 1 forests consist of lands that are set aside for non-industrial use, such as specially protected forests, municipal forests, parks, etc. The second group, Group 2, consists of lands in densely populated areas with scarce forest resources in which forests must be specially protected. Group 3, finally, consists of forests with a significant industrial potential. In Tomsk the majority of the forests belong to the third group. The percentage distribution among the groups is 8%, 10% and 78% respectively. It must be emphasized, however, that the entire forest fund is not forested. Bogs, pastures, etc. are also incorporated in the fund. In total these non-forest lands comprise 31% of the forest fund.

In Tomsk *Oblast*, as in the rest of the Russian Federation, no forest land has been privatized. As can be seen in Table 2:1 and Table 2:2, the Federal Forest Service (FFS) through its regional organization, the Tomsk Forest Management (*Tomleskhoz*) owns the main part of the forest fund. The responsibility for the management of this fund is divided among 29 state organizations (*leskhozy*), each one responsible for a specific area. Five of these *leskhozy* have no industrial forests (Group 3), on their lands. These *leskhozy* are mainly located around large population centers, such as the regional capital Tomsk. It has been feared that this circumstance, in connection with the general problems within the transportation system, might increase the pressure to initiate logging operations on formerly "protected" areas. This fear is further aggravated by the fact that all major forest industries are located in precisely those areas, particularly around the city of Tomsk.

Species Composition

As can be seen in Diagram 2:1 a significant part of the forests in Tomsk consists of birch (33%). Birch and cedar (*Pinus Sibirica*) dominate the total forest stands (30% and 28% respectively). This relative dominance can be explained by two factors.

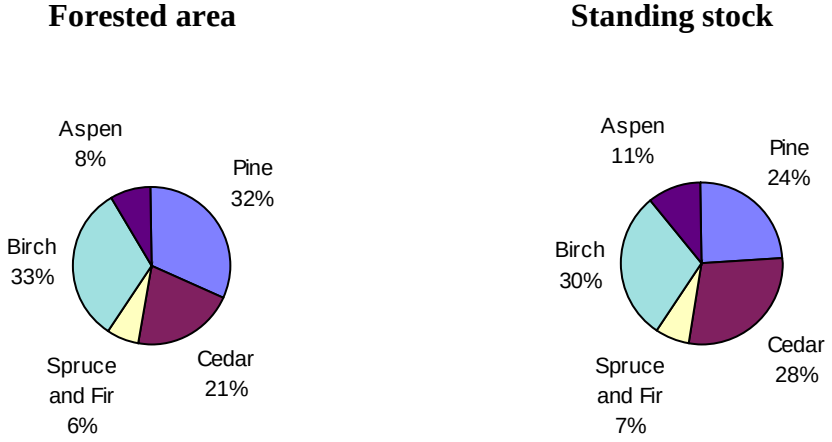


Diagram 2:1. Species composition of the forest fund in Tomsk Oblast (%). (Source: Tomsk Oblast, 1997a:69)

The first is the custom of clear-cutting in combination with poor regeneration programs that has long prevailed. When coniferous species are harvested huge clear-cut areas

open up for an invasion of birch and aspen, which might explain the relative dominance of theses species in comparison with pine and spruce. This kind of forest management was – and still is – governed by the desire to get cheap raw material in the belief that forest resources are inexhaustible (Barr & Braden, 1988). In Tomsk such a systematic over-cut has been conducted mainly along the most important transport lines. However, this type of local over-harvesting is regarded as less severe in Tomsk compared to other Siberian areas (Obersteiner 1997:12).

Reflecting the general decline within the Russian forest sector harvesting has been significantly reduced in Tomsk as well. Between 1988 and 1995, the clear-cut areas were reduced from an annual 49,600 to 13,500 hectares. When the general level of harvesting declines so does clear-cutting but, interestingly enough, in 1995, a higher percentage of the clear-cut areas was left to "natural regeneration" than in 1988. In 1988, around 70% of the clear-cuts were "naturally" regenerated. In 1995, this figure had risen to 91% (Goldin, 1997).

Table 2:3. Species composition in Tomsk in 1993. Tomsk compared to the rest of Siberia for forests managed by the Federal Forest Service of Russia. (Percent of forested area and percent of growing stock)

	Tomsk		West Siberia		East Siberia		Far East	
Species	**Area**	**Stocking**	**Area**	**Stocking**	**Area**	**Stocking**	**Area**	**Stocking**
Pine	32.01	24.19	35.58	29.84	16.28	22.18	4.43	5.85
Spruce	2.71	2.95	6.26	5.70	5.29	5.65	5.15	11.55
Fir	3.52	4.04	4.66	5.49	4.10	6.02	0.81	1.64
Larch	0.06	0.06	8.30	6.37	39.27	35.29	63.52	63.15
Cedar	20.45	27.87	14.60	21.84	11.71	18.37	1.32	3.62
Hardwood	-	-	-	-	-	-	4.05	4.85
Birch	32.68	30.03	22.62	22.07	12.79	8.48	4.87	3.81
Aspen	8.43	10.81	6.40	8.49	2.80	2.95	0.49	0.59

Source: IIASA Russian Forest Study Database

The Tomsk region is rich in cedar compared to other regions of Siberia (cf. Table 2:3). Its relative dominance can partly be attributed to a federal harvesting ban implemented in 1989. Due to this prohibition, only small amounts of cedar are harvested in Tomsk *Oblast*. This issue is discussed more in detail later in the report.

Harvesting

Since 1988, harvesting in Tomsk *Oblast* has decreased significantly. In 1995, harvesting was only about 25 percent of the 1988 level (Goldin, 1997). In 1994, only 8,3% of the annual allowable cut (AAC) was harvested (Huber *et al.*, 1997). According to recent estimates the current level of harvesting is only 10% out of a possible level of 26.9 million m^3 (Tomsk Oblast, 1997a). Other recent estimates reported in Schmidt *et al.* (1998)

claim that the forest volume annually available for harvest in Tomsk *Oblast* could be 27.3 million m^3 in the year 2008, 28.8 in 2028, 19.4 in 2068, 19.0 in 2168. However, these calculations were made under the assumption that there is going to be no change in management (the authors call it the "baseline projection").

The concept of *Annual Allowable Cut* (AAC) is the measurement used for establishing appropriate levels of harvesting. According to estimates made for a number of areas by Pisarenko and Strakhov (1996), the level of over-harvesting was found to be around 35%. We do not have any similar figures for Tomsk, but, due to the fact that only around 10% of the AAC is harvested, one can hardly talk about any general over-cutting of the forests.

Table 2:4. Forest dieback in Tomsk Oblast compared to the rest of Siberia. Burnt and dead stands as a percentage of total forested areas.

Tomsk	West Siberia	East Siberia	Far East
1.7	1.2	3.8	5.5

Source: Calculation based on Kiseleva, 1996:11.

Like most of the forested areas in Siberia, 60% of the stands in Tomsk can be characterized as mature or overmature (Nilsson & Shvidenko, 1997; Obersteiner, 1997). As an illustration, the accumulated amount of dead (and burnt) stands in Tomsk comprises an area of 281,000 ha[3] (Kiseleva, 1996). This fact has two sides, one positive and one negative. On the one hand, such "natural" forests might, in fact, be desirable from a conservation point of view. However, as is the case in Tomsk, the less productive forests are those which are most densely stocked. As Obersteiner (1997) concludes, this provides an incentive to harvest the most pristine forests. The other side of the coin, however, is that overmature forests are more exposed to pests, diseases, and forest fires. For example, in the period 1988–1990 fires was a serious problem (especially in the forests of the Aleksandrovski, Parabelski and Kargasokski *leskhozy*). In 1989, 40 million m^3 of standing ripe forest burned, and some 0.5 million ha of cedar forests also died in the fire (*Krasnoe Znamia*, 2 Sept. 1997). In combination with the widespread method of clear-cutting and poor regeneration policies one can expect an ever more undesirable age composition of the forests.

Dynamics of the Tomsk Forest Resources

Table 2:5 summarizes some aspects of the development of the forest resource in Tomsk. As can be noticed, despite the introduction of the cedar ban in 1989, significant resources are available for exploitation. It can also be noticed that the total forested area declined between 1988 and 1993. This is explained by the extensive forest fires that struck the *oblast* between 1966 and 1993. It was earlier emphasized that vast areas could be characterized as pristine forests containing huge volumes of older forests. This is reflected in the existence of relatively high volumes of mature and overmature stands. In fact, the proportion of mature and overmature stands has been around 70% of the

[3] This total only contains areas under the management of FFS.

growing stock for the whole period. Table 2:5 also substantiates what has been said earlier about poor regeneration programs. The total area of planted forests amounts to around 200 thousand ha only. This can be compared to the total forested area constituting around 17 million hectares. Finally, it should be noticed that until 1988, a year which can be regarded as the "last stable year," harvesting volumes fluctuated around 8 million m^3. In 1993, final harvest dropped to 4 million m^3.

Table 2:5 Dynamics of the Tomsk forest resource, 1966 – 1993 (Lands under state forest management, incl. long lease)

Year:	**1966**	**1973**	**1978**	**1983**	**1988**	**1993**
Forest Fund (thous ha)	27117.6	26754.9	26761.6	26808.9	26795.7	26688.8
Forested Area (thous. ha)	16317.3	16712.6	16940.7	16979.0	17029.5	16756.8
of which coniferous	8327.1	9276.1	9664.6	9945.8	10108.0	9847.1
Planted forests (thous. ha)	41.4	118.0	158.7	207.7	231.0	241.0
Unforested area (thous. ha)	1399.7	963.0	745.9	695.7	588.3	927.2
of which burnt area	752.8	473.3	317.4	321.6	280.5	587.4
Growing stock (mill. m^3)	2271.4	2479.0	2501.0	2534.8	2576.0	2560.6
of which mature and overmature	1730.1	1883.1	1841.9	1844.2	1877.6	1806.4
Growing stock acceptable for exploitation (thous. ha)	12216.1	14189.8	15175.8	14853.9	14988.9	12530.4*
Growing stock acceptable for exploitation (mill. m^3)	1720.4	2225.5	2314.2	2243.5	2288.6	1748.5*
of which mature and overmature, (mill. m^3)	1362.3	1811.1	1753.4	1683.5	1729.0	1358.9
AAC (thous. m^3)	28911	29808	34272	34373	34373	30108
Final harvest (thous. m^3)	7893	8034	7862	7026	8538	4130

* Not including cedar stands.

Source: Official data of the State Forest Account in 1966, 1973, 1978, 1983, 1988, 1993.

The Forest Sector in the Economy of Tomsk *Oblast*

In the second part of the 19th century Tomsk became the most important center for trade between the western and eastern parts of Russia. From around 1850, the forest sector began to expand and around 1890, by the construction of the railway net, the area strengthened its position. In 1889, the first sawmill in Siberia was constructed in Tomsk (Tomsk Oblast, 1997a). A university was established in 1890 and it was later accompanied by a technological institute. At the beginning of the First World War Tomsk had turned into a prosperous region with a diversified economy and a rich cultural life (cf. Huber *et al.*, 1997).

However, during the course of the evolving Soviet state the economy changed significantly; the food industry dropped, the forest sector increased (to a great extent by the use of prisoners from Stalin time prison camps), and mechanical and other industry were developed. During the Second World War the area became an important supplier of electric engines and mechanical equipment. In 1944, Tomsk was granted the status of *oblast*, i.e., the area became a separate administrative unit within the Soviet Union.

After the war, Tomsk developed into an important provider for military industry. Today, there are eight military plants in the region. Later it became a center for the development of nuclear technology. On the northern outskirts of Tomsk there is the formerly closed city Tomsk 7, nowadays renamed Seversk, which is the home of the *Siberian Chemical Combine*, one of the largest nuclear based industries in the world, containing a nuclear power plant as well as facilities for the construction of nuclear arms. In addition to its military related industry, Tomsk is also known for its universities and a number of other higher educational centers. Many of these centers have recently received the status of universities. In fact, today, there are as many as six universities in Tomsk. From the 1950's until 1993 Tomsk *Oblast* was totally closed for foreigners.

Nowadays, Tomsk plays a less important role in the Russian economy. The *oblast* accounts for only 0.6% of the Russian national income. For the entire West Siberian region the corresponding figure is 1.4%. The per capita national income for Tomsk is 6% lower than the Russian average (Bradshaw & Palacin, 1996:60, 114-115).

The Relative Importance of the Forest Sector

About half a million people constituted the economically active population in Tomsk by the end of 1995. This means a labor force participation rate of approximately 60%,[4] a figure which is lower than the 1995 Russian average which was estimated at 88% (Huber *et al.*, 1997:24). In Tomsk *Oblast* 24.7% of the employed are working in the industrial sector, 9.9% work in agriculture and forestry while 30.2% work in "other sectors," such as culture, health, education and banking (Huber *et al.*, 1997:27). A number of smaller businesses have been added to the economy since 1990, mainly trading firms (Radaev, 1997:15 ff.).

Diagram 2:2 illustrates the relative change in employment among different sectors of the economy. It can be seen that "industry" and "transport & communication" have experienced a substantial decline. Employment decline in "agriculture & forestry" has

[4] The labor force participation rate is equal to the economically active population in percent of the total population in the relevant age groups.

been relatively small compared to other sectors indicating that the forest sector has managed fairly "well" in keeping its working force or that the restructuring of the forest sector has been less rapid than in other sectors. In relation to the whole industrial sector in Tomsk, the forest industry is one of the biggest employers, 20.69%, surpassed only by Machine building with around 32% of the employees (Diagram 2:3).

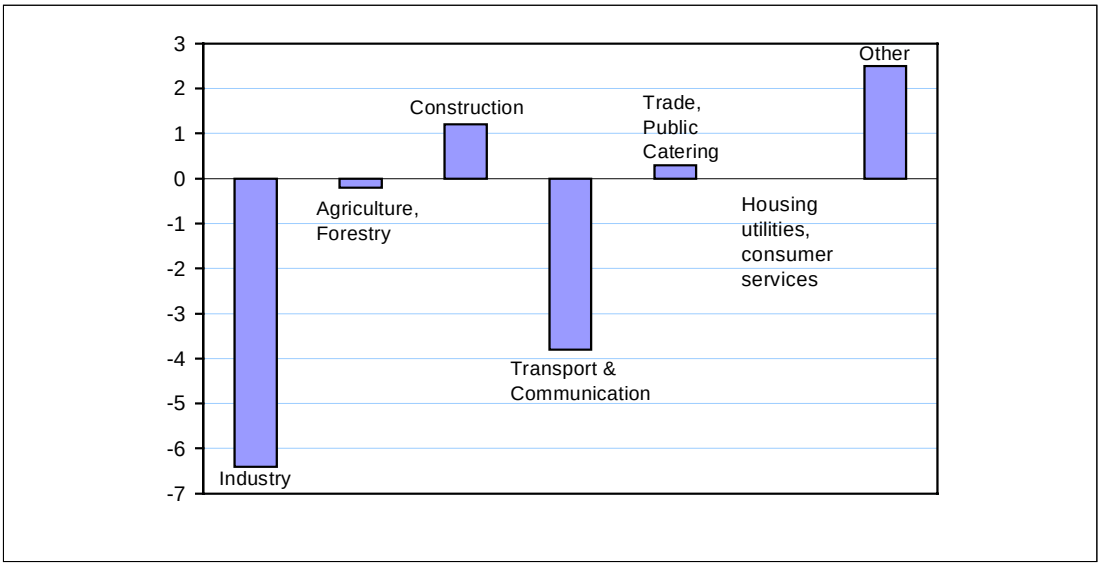


Diagram 2:2. Relative change in employment in Tomsk Oblast between 1985 and 1995, in percent of total employment. (The calculation is based on Huber et al., 1997:27)

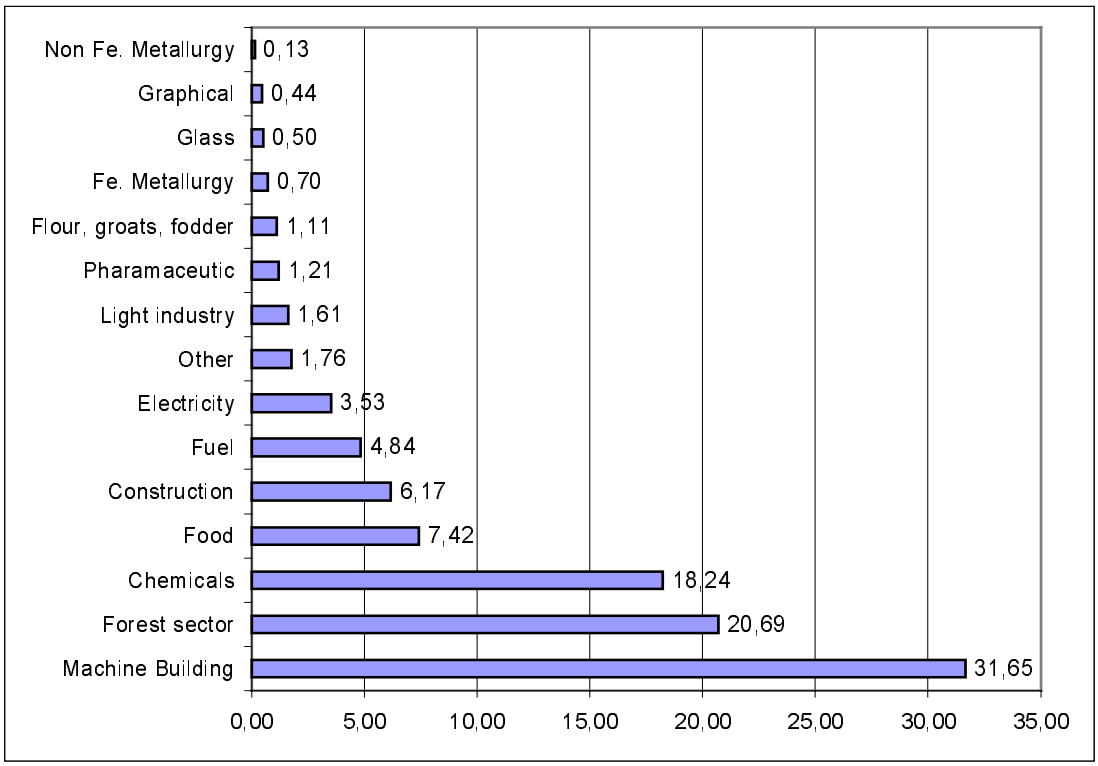


Diagram 2:3. Industrial employment in Tomsk, 1993. Percent. (Source: IIASA Russian Forest Study Database.)

Production

In general, the Russian industrial output has declined dramatically since 1990 – it was reduced by around 50% between 1990 and 1995. In Tomsk this decline has "only" been around 30% for the same period (Huber *et al.*, 1997:81). Bradshaw and Palacin (1996) have made a comparison of the change in industrial production between all regions of the Russian Federation. This comparison gives a somewhat weaker support for the conclusion that Tomsk has had a smaller decline in industrial production than the national average. According to their calculation Tomsk succeeded to keep 53.2% of its industrial production between 1991 to 1995, i.e., a decline of 46.8%.

Thus, from Table 2:4 can be concluded that the relative decline in production has been slightly smaller in Tomsk compared to the Russian average but also compared to West Siberia of which Tomsk *Oblast* is a part. Despite some discrepancies between different sources they all suggest that Tomsk has been better off than the national average.

Table 2:4. Change in industrial production (Volume of output in 1995 in percent of 1991)

Russia	East Siberia	West Siberia	Far east	Tomsk
49.9	56.7	50.7	49.5	53.2

Source: Bradshaw & Palacin 1996:114-116.

The general decline in the Russian industry has been most severe in the "light industry and engineering" while "fuel production" has succeeded fairly well (Hanson & Kirkow, 1997). The fact that Tomsk *Oblast* virtually lacks "light industry" while "fuel production" accounts for around 37% of the industrial output might explain why the decline has not been more dramatic in the region. Tomsk has a more diversified industry. In fact, one of the main characteristics of the industrial sector in Tomsk is its diversity. Only six out of 77 Russian regions have a more diversified industrial structure (Huber *et al.*, 1997:98).

At one time the forest sector was dominating the industry in Tomsk *Oblast* and it is still regarded as a kind of corner-stone of the regional economy by many local representatives. However, statistics indicate a more ambiguous situation. Although about 21% of the working force in the region is occupied in the forest industrial sector, it contributes only 4.8% to the regional output (Bradshaw & Palacin, 1996:73). According to latest reports this figure is now 3.6%, while the oil industry contributes 36%. While "fuel & energy" almost doubled its share of the regional output value between 1992 and 1996, forest sector output was reduced by a factor of three, from 11.7% to 3.7% (Hanson & Kirkow, 1997:24).

The contribution of Tomsk and West Siberia to the total Russian production is rather modest. Out of all production of wood, cellulose, and paper in the Russian Federation, 6% is produced in West Siberia and only 0.9% in Tomsk. This can be compared to the Northern region, which contributes 21% or East Siberia that accounts for 17% of the total production in the Federation (Bradshaw & Palacin 1996:79-82).

Finally, to this picture of the relative importance of the forest sector in Tomsk *Oblast* it can be added that although Tomsk has prevented a severe downfall in production, the productivity of the industry has not been significantly improved. The sector is still far from productive. Using data from 1994, Huber *et al.* (1997) have calculated the productivity of different industrial sectors in Tomsk. They found that in terms of capital as well as labor productivity the forest sector has the lowest figures of all sectors, followed by light industry (Huber *et al.*, 1997:107 ff.). This fact might be explained by the relatively low rate of further processing in the sector, its labor intensity, and a generally weak demand for forest products.

Around 60-70% of the commercial wood is sold locally and in general only limited market information is available for the enterprises, mostly due to an absence (or an understaffing) of market departments (Obersteiner 1997:36 ff.).

Infrastructure

The size and quality of the transportation network influence the ability to access forests as well as to realize their industrial potential. In general, Siberia has a very low road density, in West Siberia 27.3 m/km^2 (Table 2:6). It has also been noticed that the quality of these roads is very low, a significant part of the roads lack hard cover, they are poorly maintained, and so forth. Tomsk has a rich but a geographically rather concentrated system of roads, waterways and railways (see Map 2:1). Much of the 5,193 km. of waterways are navigable and some parts are used for floating. As can be seen in Table 2:6 both road and railway density is fairly low.[5] This is also true for roads on forest lands. The Tomsk figure[6] of 0.08 km of forest roads/km^2 is slightly higher than the West Siberian average of 0.07 km/km^2 (Nilsson *et al.*, 1994), but significantly lower than what is regarded as an optimum, 0.5 km forest roads/km^2 (Strakhov *et al.*, 1996:95). According to current standards the harvesting of one million cubic meters of wood requires 48.5 km of new, permanent roads (Strakhov *et al.*, 1996:94). This means that if, in the future, harvesting in Tomsk would increase to only 50% of the AAC one would still have to construct around 730 km of new roads.[7]

Table 2:6. Road (hard cover) and railway density, m/km^2 (1992)

	Russia	**West Siberia**	**East Siberia**	**Far East**	**Tomsk**
Railways	9.2	6.4	3.5	1.9	3.2
Roads	40.9	27.3	15.1	8.1	18.9

Source: IIASA Russian Forest Study Database

[5] The condition of roads is a big and general problem. In Russia many roads have a short useful life and many are also winter roads. Our data show that, in some cases, the road density has, in fact, decreased over the years. In Tomsk, however, the road density has increased significantly since 1987.

[6] Source: IIASA Russian Forest Study Database. The figure 0.08 does not include winter roads. If these are included the figure is 0.1 km/km^2.

[7] The Annual Allowable Cut is 26.9 million m^3 (Tomsk Oblast, 1997a:71).

Earlier in the report we have discussed the accessibility problem and its connection to harvesting behavior. It was assumed that in the long run local over-harvesting along transportation lines would drive harvesting operations into increasingly remote areas. Thus, the costs for the construction of new transportation roads would affect the profitability in the forest sector. In order to "test" this hypothesis we have calculated the relation between exploitable forest lands and road density. The logic would be that if there exists a local over-cutting one would expect to find a strong, negative correlation between road density and remaining forest resources, i.e., more roads – less forests. Using the variables "kilometer roads per hectare" and "percentage of mature and overmature forests in relation to forested areas" (from the IIASA Russian Forest Study Database) we get a correlation coefficient of -0.65 (Spearman's Rank Correlation ranges from -1 to 1) indicating that there in fact exists a relation of the type "more roads – less forests."[8] Thus, it seems that where one finds the highest density of exploitable forests one also has the greatest need for road construction. Taking into account that the overall road density is very low in Siberia it can be concluded that future forest exploitation will require significant investments in the transportation system. As we have seen this conclusion is also valid for the Tomsk region.

[8] Even if winter roads are excluded the figure does not change significantly (-0.62).

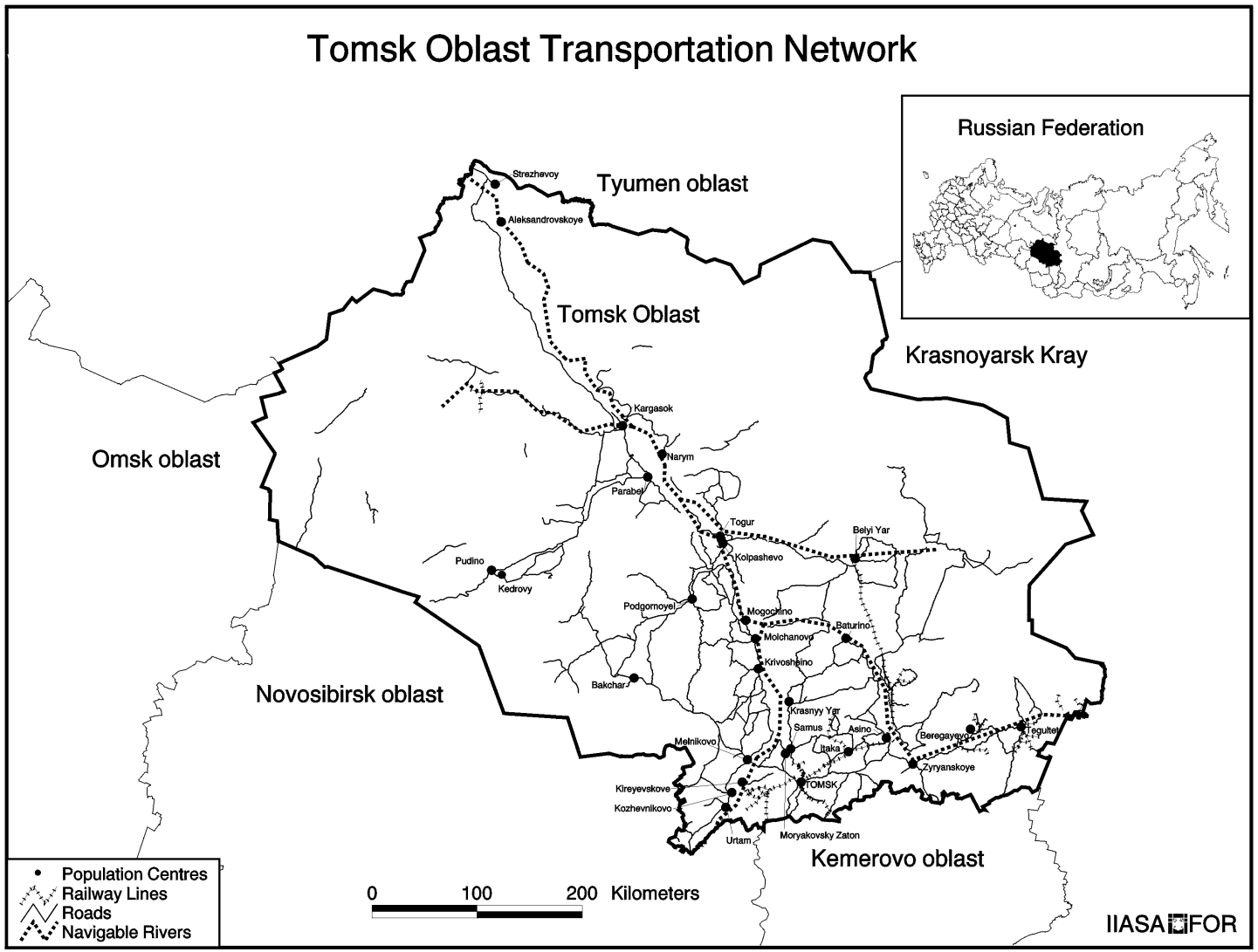


Figure 2:1 Transportation network in Tomsk Oblast (Data sources: Road, railway and population center data from the Digital Chart of the World, Environmental Systems Research Institute, Inc. (ESRI). Oblast boundaries for the Russian Federation from the IIASA Russian Forest Study Database.

Summary:

The situation of the Tomsk forest resource and its physical environment can be summarized as follows:

- Most of the forested lands have not yet been exposed to industrial harvesting and vast forests are available for possible exploitation.
- The present species composition, with its relatively high proportions of birch and aspen, is partly caused by poor regeneration management after clear-cutting the coniferous stands.
- Tomsk is rich in cedar, which is highly valued in the market, but due to a federal ban it is not possible to realize its commercial value.
- Around 60% of the forest fund consists of mature or overmature forests.
- Due to extensive harvesting along the major transportation lines, areas of local overharvesting can be found. A future harvesting in more remote areas will cause increased costs for wood supply.
- Still around 80% of all harvesting is by means of clear-cutting. Lack of deliberate regeneration programs causes a general degeneration of the forests and will possibly affect the future wood supply. Still, measures such as thinning and pruning are used more as experiments rather than as a means of long-term investment.
- Significant losses of forest resources are caused by pests, diseases, and forest fires.
- Due to a relatively diversified industrial structure the general decline in the industry has been less severe in Tomsk than in Russia as a whole. When it comes to the forest sector, however, production has been reduced by a factor of four since 1990.
- The forest sector in the Tomsk region is more important as an employer than as a provider of income for the region.
- In general, the forest sector has a rather low productivity, its export rates are low, and the poor availability of wood is reinforced by an insufficient infrastructure.

3. Socio-Economic Characteristics of Tomsk *Oblast*

In this chapter we describe the socio-economic situation in Tomsk compared to other regions in Siberia and Russia as a whole. With reference to the framework described in Chapter 1, the aim here is to picture the "attributes of the community" in which the forest sector is embedded. Hence, we will especially focus on features that presumably are of importance for the functioning of the forest sector. For example, it can be assumed that a number of variables associated with demography, education, and wages convey information about the socio-economic situation in the *oblast*, but these variables might also indicate what kind of problems and possibilities the forest sector will have to face. Such variables are "fertile" (Davis, 1985) in the sense that they may influence a number of other variables. Education is regarded as one of the most fertile variables and is therefore commonly used in the social sciences to indicate economic potential.

The chapter is organized as follows. First, the demographic situation is described. Second, the general level of education within the work-force is discussed. This is followed by a third section about the provision of education in the region. Then there is a section comparing the wages in the forest sector with the wage level in other sectors of the economy as well as between different geographical areas. The chapter finishes with a general overview in which Tomsk is compared to other areas with respect to a number of indicators reflecting the general standard of living.

Demographic Situation

At the beginning of 1997, Tomsk *Oblast* had 1,074,800 inhabitants. Around 90% of these were Russians. The age distribution of the population is about the same as the Russian average, although the proportion of younger people is somewhat higher. Despite some years of decline the population of Tomsk *Oblast* has been steadily growing since the 1970s. As can bee seen in Diagram 3:1 Tomsk has had the highest population increase in the whole of West Siberia but also compared to other Siberian regions and to Russia as a whole. Thus, in terms of population change, Tomsk has not been as affected by the transition as many other areas in the Russian Federation.

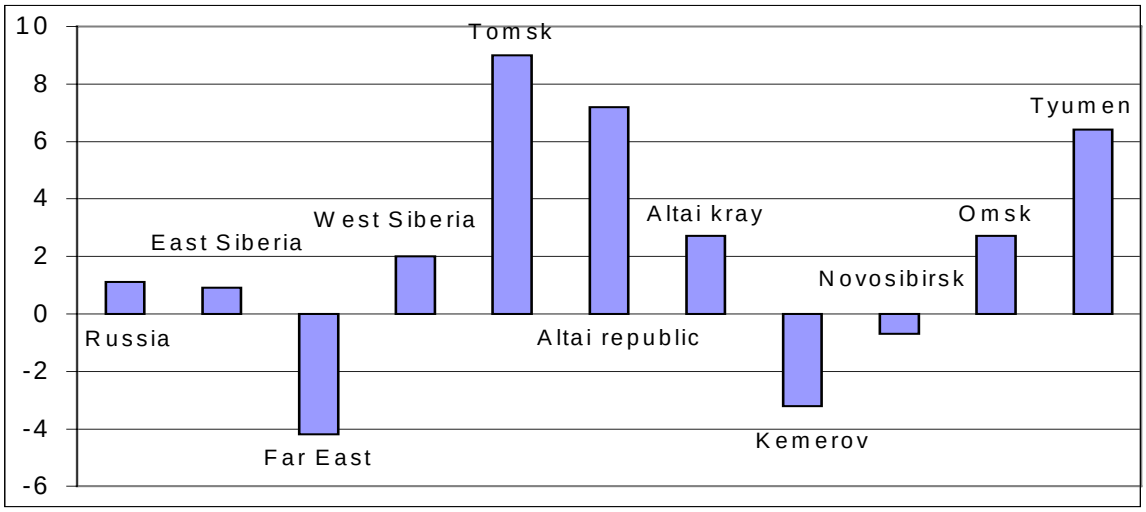


Diagram 3:1. Changes in population between 1987 and 1995, %. (Based on Granåsen *et al*., 1997.)

Next to Tyumen *Oblast* Tomsk is the largest region in West Siberia and, accordingly, its population density is rather low, 3.2 inhabitants per km^2. As can be seen in Table 3:1 this density is lower than that of West Siberia and only one third of the Russian average. Obviously, Tomsk is rather sparsely populated.

Table 3:1. Inhabitants/km^2 in 1994

Russia	East Siberia	West Siberia	Far East	Tomsk
8.7	2.2	6.2	1.3	3.2

Source: Bradshaw & Palacin 1996:30 ff.

Two variables that are commonly used as welfare indicators for a society are birth and death rates. Granåsen *et al.* (1997) have shown that in terms of death rate changes, the Russian population has paid a high price for the dismantling of the Soviet state. During the period 1987–1995 death rates increased by nearly 50% while birth rates dropped from 17.2 to 9 per 1,000 inhabitants. During this period life expectance has fallen by seven years for men and three years for women. In 1991, the increasing population trend was broken and despite a positive migration Russia's population declined by more than one million people. This is an important change in the socio-economic situation caused by Perestroika and the subsequent transition period (cf. for instance Shapiro, 1995).

Basically, the population development pattern observed for the Russian Federation is reflected in Tomsk *Oblast* as well as in the rest of West Siberia, i.e., birth rates have dropped and death rates risen. However, life expectancy in Tomsk in 1994 is one year higher (64.6 years) than the West Siberian average (63.4 years) (Granåsen *et al.*, 1997:31-58) and it is higher than the average for the Russian Federation (64.0 years) (Vishnevskaya, 1997a). Tomsk has the lowest birth rate in the whole of Siberia while, at

the same time, its death rate is somewhat lower than the Russian average.[9] Although the migration balance in Tomsk is negative, actual numbers of people migrating are low and have not significantly affected population size. Another problem is that the marriage rate seems to have fallen significantly. It can be assumed that this problem is coupled to a host of other problems that have been aggravated during the transition, such as the increase in the number of suicides and alcohol related diseases (Huber *et al.*, 1997:6 ff.).

In summary, this means that although the demographic situation *is* problematic, it is somewhat less so in Tomsk than in many other parts of the Russian Federation. Many Russian regions (inside as well as outside of Siberia) have much higher death rates, outmigration, and so forth. This supports the conclusion reached by Bradshaw and Palacin (1996), Huber *et al.* (1997:19 ff.), and others that the more remote parts of the Russian Federation have suffered a comparatively less serious demographic deterioration from the transition than more central parts of the Federation.

Education

Due to its long-standing tradition of higher education Tomsk is said to have a relatively well educated population. As can be seen from Table 3:2 this is partly true. While Tomsk has the highest percentages of educated people in the whole of West Siberia it should be noted that most parts of the Far East have even higher levels. However, such a comparison does not take the military sector into account. Since Tomsk has a significant number of people connected to the nuclear military industrial complex, it can be assumed that the figures in Table 3:2 underestimate the regional level of education. During the general course of the Russian transition the labor force of the military industrial complex seems to be one of the most adaptive groups in adjusting to the new market demands. In short, military experts appear to be useful in a great number of industrial applications and branches of the economy (Holloway & McFaul, 1995). If this is correct, Tomsk *Oblast* might be rather well equipped in terms of educated people needed for the reconstruction of the regional economy.

Typically, the level of education is relatively low in the Russian forest sector. This is reflected in the proportion of workers in the sector. In Siberia the proportion of workers, in relation to all personnel in forest enterprises, is around 87% (Nilsson *et al.*, 1994:54). However, when it comes to silviculture, which is virtually the responsibility of the Federal Forest Service, the relation is reversed; employees with higher education dominate. In Siberia around 80% of the personnel in forest management have higher or secondary education (Nilsson *et al.*, 1994)[10].

[9] With reference to the same year, 1994, Bradshaw & Palacin (1996) report that Magadan and not Tomsk had the lowest birth rate.

[10] Nilsson *et al*. are referring to Isaev, A.S. (ed.) *Forecast of the utilization and reproduction of the forest resources by economic regions of the USSR,* Academy of Sciences of the USSR and State Forestry Committee of the USSR, Vol. 1 and Vol. 2, 1991.

Table 3:2. Higher education in Siberia, 1989

Region/Oblast/Krai	Specialists with higher education 1,000	Population 1,000	Specialists with higher education per 1,000 inh.
Russian Federation	**8241.9**	**148041**	**56**
West Siberia			**52**
Gorno-Altai	8.0	194.2	41
Altai	122.9	2640.5	47
Kemerovo	137.6	3176.3	43
Novosibirsk	167.2	2789.3	60
Omsk	108.1	2151.4	50
Tomsk	62.0	1009.0	61
Tyumen	177.6	3134.4	57
East Siberia			**49**
Buryat	56.7	1048.4	54
Tuva	12.2	313.5	39
Khakasia	24.8	573.0	43
Krasnoyarsk	171.9	3039.0	57
Irkutsk	139.9	2847.6	49
Chita	45.6	1385.2	33
Far East			**57**
Sakha	68.8	1098.9	63
Primorski kray	122.5	2281.1	54
Khabarovsk	103.1	1839.7	56
Amur	46.8	1066.3	44
Kamchatka	30.9	469.8	66
Magadan	39.5	539.3	73
Sakhalin	41.1	713.1	58

Source: IIASA Russian Forest Study Database

Table 3:3. Persons with higher and secondary vocational education in Tomsk per 1,000 employees, 1989.[11]

Sectors	
Agriculture:	177
Forestry:	**183**
Transport and communication:	196
Industry:	224
Construction:	250
Finance, insurance, pensions:	530
All sectors	279

Source: IIASA Russian Forest Study Database

[11] The figures in the table are calculated by using education data from 1989 divided with employment data from 1991. Since the great shift in the Russian economy came in 1992-1993 it can be assumed that this would only cause minor problems.

However, compared to other branches of the regional economy the forest sector has a rather low proportion of personnel with higher education. Even if one adds those with some kind of secondary vocational education the figures give the same impression. As can be seen in Table 3:3 only in agriculture do we find a lower proportion of specialists with higher and secondary vocational education than in forestry. It should also be noticed that the figures for the forestry sector deviate significantly from the regional average for all branches (which is 279 persons with secondary and higher vocational education per 1,000 employees).

Human Capital Supply

In many Western countries expansion of the education sector is used as a counter weight when economies tend to drop. There are many arguments for this kind of policy; restructuring requires educated people, education might be a way for the individual to improve his position on the labor market, education is preferred to unemployment, etc. If a similar policy would have been used in Russia the proportion of students should have increased during the reconstruction of the economy. This has not been the case, however.

As can be seen in Table 3:4, the relative number of students engaged in higher education dropped by 12% between 1987–1993. Among the three Siberian economic regions that we look at here we find the most pronounced decrease in Irkutsk (-17%). Tomsk is close with a decline of -16%. Figures reported by the OECD indicate that the decline in education has continued, -15 % between 1993 and 1994, and -4% 1994–1995 (OECD, 1997, Table 6). However, it should also be noticed that a number of regions, particularly in the Far East, show an *increased* education enrollment during this period.

However, it should be emphasized that Tomsk *Oblast* still is one of the most "dense" regions in terms of number of students engaged in higher education, 357 students per 10,000 inhabitants. No other area in Siberia has such a high proportion of its population engaged in higher education.

As can be seen in Table 3:5 the "education density" of Tomsk is far above the Russian average but the figures are still significantly lower than for cities like Moscow and St. Petersburg. In Siberia Novosibirsk comes closest with 245 students per 10,000 inhabitants.

The high figures for Moscow and St. Petersburg are not particularly surprising, but, as is shown in Table 3:5, these two cities have also been exposed to a quite notable drop, 21% and 17% respectively. In fact, St. Petersburg's figure of 434 students per 10,000 inhabitants is almost exactly the same as that for Tomsk (432) in 1989, at the beginning of the transition.

Table 3:4. Students in higher educational establishments per 10,000 inhabitants 1987-1993, index.

Region/oblast/krai	1987	1988	1989	1990	1991	1992	1993	Students per 10,000 inh. 1993	Change 1987-1993
Russian federation	**100**	**98**	**99**	**98**	**96**	**92**	**88**	**171**	**-12**
West Siberia	**100**	**98**	**101**	**100**	**98**	**95**	**92**	**190**	**-8**
Gorno-Altai	100	97	94	96	103	111	117	169	17
Altai	100	99	104	107	107	105	101	139	1
Kemerovo	100	96	102	99	99	92	90	120	-10
Novosibirsk	100	98	101	98	95	90	85	245	-15
Omsk	100	100	102	101	99	93	87	192	-13
Tomsk	100	97	101	99	93	88	84	357	-16
Tyumen	100	100	100	103	107	105	104	111	4
East Siberia	**100**	**98**	**90**	**98**	**100**	**97**	**94**	**140**	**-6**
Buryat	100	97	100	97	97	95	94	190	-6
Tuva	100	96	93	94	95	94	93	92	-7
Khakass	100	105	110	109	102	99	94	97	-6
Krasnoyarsk	100	98	103	103	120	116	114	190	14
Irkutsk	100	97	100	94	91	87	83	185	-17
Chita	100	97	97	97	97	93	88	83	-12
Far East	**100**	**98**	**101**	**99**	**112**	**110**	**110**	**113**	**10**
Sakha	100	89	86	87	89	92	99	82	-1
Yevrey	na	na	na	na	-	-	-	57	-
Primorski	100	99	100	98	95	90	86	180	-14
Khabarovsk	100	97	99	97	105	97	91	224	-9
Amur	100	98	104	105	110	110	108	137	8
Kamchatka	100	108	123	115	161	141	138	84	38
Magadan	100	96	98	100	155	164	175	93	75
Sakhalin	100	100	102	98	93	93	100	43	0

Source: IIASA Russian Forest Study Database

Table 3:5. Students in higher educational establishments per 10,000 inhabitants in 1993. (In the right column: change in percent between 1987-1993.)

Russian Federation	171	-4
Moscow	505	-21
St. Petersburg	434	-17
Tomsk	357	-5
Novosibirsk	245	-5

Source: IIASA Russian Forest Study Database

In summary, it can be concluded that the transition has struck hard also on the "education density" variable, not to mention how it has affected the maintenance of university buildings and equipment, wage arrears, and so forth. Although the figures are still rather good for Tomsk the decrease in education levels is alarming. This development has implications for the restructuring of the forest sector – a task that will require an increasingly large number of well educated people. However, one should keep in mind that some of the drop in education reflects the aptitude that people have for moving into business instead of acquiring educational degrees. Moreover, the labor market for higher educated people is weak and this is particularly true for the forest sector which cannot compete using promises of high wages. This is discussed more in detail in the next section.

Wages and Unemployment

Huber *et al.* (1997) have concluded that despite the higher level of unemployment, the situation in the Tomsk region is in some respects more favorable than that of the Russian Federation as a whole. For example, the duration of unemployment is shorter, which is a fact that might indicate a more "lively" economy. However, the overall situation in Tomsk is very problematic with the prospect that unemployment will grow to even higher levels in the near future. According to the labor force surveys made since 1992 unemployment increased from 6.9% of the labor force in 1992 to 8.7% in 1996 (Vishnevskaya, 1997b). The level of *registered unemployment* (i.e. people registered with the local Employment Services) increased from 0.6 % to 4.6% in the same period. The gap between the two unemployment estimates is constantly narrowing since registered unemployment grows faster than what is measured by the labor force surveys (Vishnevskaya, 1997b). According to the same source, in 1995, unemployment rates for rural areas were almost twice as high as those for urban areas (18% and 9.8% respectively). The OECD reports that the registered unemployment in some districts was well above 20% (OECD, 1997, Table 28).

Assuming that the geographical distribution of unemployment in Tomsk *Oblast* is correctly indicated by data on registered unemployment we can note that, at the beginning of 1997, unemployment in the forest industrial sector was significant (24% of total unemployment in the region) and entirely dominating in several municipalities (*raiony*) in Tomsk *Oblast*. So, for instance, were more than 75% of all unemployed in Molchanovsk *raion* workers in the forest industrial sector, in Pervomaiski *raion* the share of forest industrial workers in total unemployment was 46%, in Verkhneketski *raion* about one third. In yet four other municipalities the share of unemployed forest industrial workers ranged between 20 and 25% of total unemployment.

An unemployment level of 8-9% might still be seen as artificially low. Quite obviously, a great number of Russian enterprises would simply not continue to exist if normal market economic principles were really deciding if they should continue or discontinue their activity. Under such a regime many enterprises would simply not be considered profitable enough to warrant a continued existence. And yet, despite the fact that unprofitable enterprises have been allowed to continue their activities, there has been a significant increase in unemployment. On the other hand, the mass unemployment rate that was feared to be the result of the Russian transition has not materialized either (Manning, 1995). Some western observers (Layard & Richter, 1995) claim that, in general, it seems that the Russian labor market has been sufficiently flexible to mitigate mass un-

employment of the kind that could (theoretically) be expected. However, other western observers have claimed that unemployment rates might be substantially higher than both the official estimates and the estimates made by some western observers. Thus, in certain regions the real unemployment may well be higher than 30 and sometimes even higher than 50 percent of the economically active population (cf. Hedlund & Sundström, 1996).

Even though there has been an increase of unemployment among people with higher education the increase has been significantly higher among people lacking secondary education, especially in the age group 20-49 years. Thus, better educated people are better off (Radaev, 1997; Vishnevskaya, 1997b). One important contributing factor is that new, small and medium sized enterprises (SMEs) have succeeded in attracting a number of educated people and thus to some extent alleviating the unemployment situation (Radaev 1997, p. 34). In 1996, 23% of these enterprises belonged to the forest sector[12] (Radaev, 1997, p. 19). However, seven out of thirteen regions in West and East Siberia have a higher SME proportion, both in terms of number of firms and employment, than Tomsk (Radaev, 1997, p. 69). It can be assumed that the slower pace of privatization in Tomsk compared to other parts of Russia depends on the dominance of military industries. Many of the military enterprises are not going to be privatized at all, and if they are, the process may be more time consuming than is normally the case (Vishnevskaya, 1997b).

The economic situation is reflected in the level of wages. Although the growth of total wages has been about the same, per capita wages are slightly higher in Tomsk than they are in the Russian Federation. Wages are not the same as income, however. While wages are 5% higher in Tomsk compared to the Russian average, incomes are significantly lower (22%). The latter figure is quite typical for Siberia with three exceptions: Altai, Kemerovo, and Tyumen, are all West Siberian regions with income levels above the Russian average (Bradshaw & Palacin, 1996:120-121).

One way of comparing standards of living is to look at income relative to established subsistence minimum. This will adjust for costs of living which are normally higher in the north-west than in Siberia. Using this measure one can conclude that while the Russian figure is 202%, the figure for Tomsk is "only" 173%. Compared to the rest of Siberia Tomsk ranks no. 8 out of 22 using the same measure (Goskomstat, 1996). This indicates that while Tomsk does have a high wage level, the subsistence minimum level is also relatively high.

Wages in the Forest Sector

The forest industry sector in Tomsk belongs to a group of branches with lower wage levels than the Russian average. In 1995, the sector had the lowest wages of all branches of the regional economy, followed only by agriculture. In fact, wages in the forest industry sector were 44% lower than the average for the economy.[13] Moreover, the growth rate of wages within the forest sector was among the lowest of all branches, ranking no. 14 out of 16. This can be compared to the "Geology" sector, in Tomsk a branch basi-

[12] The whole SME sector has suffered financial losses, the forest enterprises being among the most unprofitable (Radaev 1997, p. 23).

[13] See also OECD, 1997, Table 14.

cally consisting of the oil industry, where wages were almost 40% above the regional average (Huber *et al.*, 1997:134; 142).

If we only concentrate on *forestry* (i.e., the responsibility of the Federal Forest Service) without comparing with other branches, we find that all Siberian regions have monthly wages above the Russian average (see Table 3:6). While West Siberian wages are 14% higher than the Russian average, wages in the Tomsk forest sector surpasses the average with 16 %. As can be seen in the table there are also a number of regions, particularly in the Far East, where wages are much higher. Most likely this has to do with the special reward system that was in effect during the Soviet regime. People who worked in remote areas for a long period were better paid by the authorities. This system is said to have been dismantled. However, there is nothing to substantiate that in our data. In fact, the difference between "low-" and "high-paid" regions were twice as large in 1993 as it was in 1987.

Table 3:6. Monthly wages and total number employees in the forest sector, 1993.

Region/oblast/krai	Monthly wages in the forestry sector	Index	Monthly wages in the forest industry sector	Index	Number of employees
Russian Federation	**43639**	**100**	**52585,4**	**100**	**1927389**
West Siberia	49850	114	54827,8	104	164441
Altai	38693	89	39867,2	76	26039
Gorno-Altai	38294	88	28265,1	54	3000
Kemerovo	51428	118	53678,3	102	24628
Novosibirsk	34650	79	42474,7	81	19706
Omsk	36592	84	42923,9	82	17396
Tomsk	50455	116	47047,6	89	27786
Tyumen	90736	208	77297,8	147	45886
East Siberia	55086	126	65260,6	124	277910
Krasnoyarsk	59216	136	59106,5	112	103772
Irkutsk	62565	143	77417,5	147	118867
Chita	48841	112	44535,5	85	18686
Buryat	43104	99	50202,8	95	24904
Tuva	49721	114	24387,6	46	2977
Khakass	59333	136	42289,1	80	8704
Far East	74733	171	78651,8	150	120807
Primorski	50455	116	65390,9	124	26488
Khabarovsk	77107	177	82340	157	37504
Amur	75066	172	62736,6	119	15509
Yevrey	49941	114	57869,8	110	3644
Kamchatka	111711	256	108027,6	205	4005
Chukotski	156688	359	134954,3	257	62*
Magadan	135723	311	112491,9	214	1750
Sakhalin	78384	180	92730,8	176	21152
Sakha	90265	207	84127	160	10693

*) Figures for the forest industry sector only

Source: IIASA Russian Forest Study Database.

The uneven wage distribution might also indicate that during its change towards a greater market orientation the forest sector has developed differently in different areas. Thus, differences in wages might reflect different levels of enterprise profitability. The overall higher wages in the Far East seems to support this conclusion.

If we look at the *forest industry sector*, i.e., sawmills, pulp and paper industries, etc., a similar pattern is revealed. In 1987, the average wages were 130% higher in Magadan compared to Novosibirsk where the wage level was very low.[14] In 1993, the difference between the highest wage level (in Magadan) and the lowest (in Altai) was 182%. Compared to Tomsk, wages in Magadan were 74% higher in 1987 and 139% in 1993 (IIASA Russian Forest Study Database). Evidently, the transformation of the Russian economy has created an increased wage differentiation among the Siberian regions. In areas with a high average wage level forest sector wages were also proportionally higher.

Thus, it should be noted that although wages in the Tomsk *forestry sector* are higher than the national average, this is not true for the *forest industry sector*. Most regions have higher wage levels in the forest industry than Tomsk, particularly in the Far East. There is, in fact, only one *oblast* (Altai), with a similar sized forest sector (in absolute terms), which has a lower wage level than Tomsk (cf. Table 3:6).

Clearly, it seems that Tomsk can not make use of its wage level to attract people to its forest sector, and due to the fact that wages are higher in many other industrial sectors an outflow of people can be expected (cf. also OECD, 1997, Table 14). As already demonstrated the forest sector has a low education profile. Add its low wage level and one could expect the situation to become particularly problematic in the future. If nothing happens the unemployment rate will continue to increase. A general modernization and thereby a promotion of the efficiency in the sector would mean less workers and require more educated people. One way of meeting this problem is to increase and raise the quality of the education in forestry and related subjects. There are signs that this process has already been initiated in Tomsk.

Summary:

With reference to the description and analyses above the socio-economic situation in Tomsk might be summarized as follows (see also Table in Appendix 3:1):

- Tomsk has similar demographic problems as the rest of the Russian Federation, but possibly to a somewhat less serious degree.
- The education level of the workforce is significantly higher in Tomsk compared to other areas in Siberia.
- During the transition the number of students engaged in higher education establishments has decreased more in Tomsk than in Russia and more than in most other regions in Siberia. (But the proportion of people with higher education of the total population is still higher than the average for Russia).

[14] There are regions that have higher wages but in these areas there are very few forest industries. In calculating the highest and lowest difference we have omitted regions with fewer than 5,000 employees in their forest industry sector.

- The proportion of educated people is lower in the forest sector compared with most other branches of the economy.
- The unemployment situation in Tomsk is as severe as in the rest of the Russian Federation. However, the situation in Tomsk can be expected to deteriorate further in the near future.
- In general the wage level is slightly higher in Tomsk than in the Russian Federation, but taking the costs of living into account, the *oblast* occupies a middle position in Siberia.
- With respect to the relatively high proportion of state employees, the low proportion of privatized apartments, and the relatively low number of new, small, and middle size enterprises, Tomsk has kept many of the features from the old Soviet economy.
- In many ways the population of Tomsk has a higher standard of living than people in the rest of Siberia. For instance, here we find lower percentages of poor households, more physicians, larger housing space, more cars, and fewer alcoholics.

4. Institutional Configuration of the Forest Sector in Tomsk

In this chapter we describe the formal institutional setting that relates to the forest sector in Tomsk *Oblast*. The chapter starts with a short résumé of the Soviet forestry system and how it emerged. We will also give an account of how this system has changed and how it works today. The purpose of the chapter is to provide a basis for an analysis of the interactions between the various actors in the system, dealing with its formal as well as its informal qualities.

The General Organization of the Forest Sector

In 1947, three years after Tomsk was assigned the status of *oblast*, the USSR Council of Ministers adopted a resolution that made forest management uniform in the whole union. After a short period of "decentralization" under the Khruschev era, the forest management system returned to be heavily centralized. The system reached its peak in the first years of the 1970s. The institutional history of the system has been scrutinized in many publications and should not be recapitulated here (see e.g. Nove, 1977; Blandon, 1983; Barr & Braden, 1988; Sheingauz *et al.*, 1995; World Bank, 1997). Here we will concentrate on the situation as it appeared at the beginning of the 1980s.

The Soviet Union was known for its "parallel" system of government, i.e., its intertwined triple lines of political administration – the communist party and the formal political hierarchies and their bureaucracies. Accordingly, the Central Committee of the Communist Party and the Council of Ministers were the supreme units of the forest sector. Since political, administrative, and managerial units were assumed to belong to the same "family" it was sometimes difficult to functionally separate one unit from another. For example, although industrial ministries and committees were authorized to govern all industrial activities while the Federal Forest Service was in charge of silviculture, it was the communist party that in the end confirmed the five years plans under which the whole forest sector operated. The forest sector was governed by political decrees, there existed virtually no special forestry laws between the 1920s and 1977 (Sheingauz *et al.*, 1995:1).

In the beginning of the 1980s, "The Ministry of Timber, Woodworking, Pulp and Paper Industries" (*Minlesbumprom*) was responsible for forest industries and their activities while another central unit, *Gosleskhoz,* the USSR State Forestry Committee (earlier the Ministry of Forest Management, *Minleskhoz*) was accountable for forestry. More chemically oriented forest industries were directly subordinated to the "Chief Administration for Microbiology" (*Glavmikrobioprom*) (Barr & Braden, 1988:20).

The organizational features of the Soviet State were duplicated on lower administrative levels. Through all levels down to the single district the system of government consisted of three parallel hierarchies, the representative units, executives, and the communist party (Campbell, 1995). Another feature that was typical for the system was its principle of "dual subordination" (Nove, 1977:20). For example, the ministry of forestry in the Russian republic was subordinated both to the central ministry of forestry and the republic council of ministers. In cases where the ministries were not organized in this way the local unit was always subordinated to the hierarchical structure of the communist party. The same principle was also applied for the huge apparatus of planning with *Gosplan* as its nucleus. The five-year plans were worked out by central and regional Gosplan authorities. Finally, when the party had confirmed the plans, they received the status of law.

We have previously deliberated on the "forest fund" concept. Formally, *Gosleskhoz* (which is today labeled the Federal Forest Service, *Rosleskhoz*) was the official "proprietor" of this fund from which resources were sub-allocated to enterprises. At the regional level harvesting areas were allocated to harvesting enterprises, timber was allocated to sawmills, board to industries, and so forth. This was a very complicated system with many authorities involved and since there existed no real markets suppliers and users had to be coupled by administrative means. This also means that "users" were, in fact, no customers in the normal sense of the word. As Alec Nove (1977:62) has emphasized "an allocation decision which 'attaches' (prikreplyayet) a supplier to a customer contains within itself an instruction to produce as well as to deliver". Although *Gosplan* and all its subunits elaborated specific production plans the task of assigning, for example, a certain amount of timber to a particular sawmill fell upon another important organization, "The State Committee on Procurement" (*Gossnab*), an organization that still exists at least in some regions of the country. We shall later see to what extent this idea of "attaching" suppliers to customers has survived in today's forest sector.

The forestry management system was, and still is, organized in a hierarchical system from a central, Moscow, level down to the regional and municipal levels. During Soviet times the central level, *Minleskhoz* and subsequently *Gosleskhoz*, had to coordinate its activities with the Council of Ministers of the Union Republics as well as with the parallel party structure. Although the system in operation in Russia today differs in significant ways the main parts of the organizational structure of the FFS are still the same, see Figure 4:1. [15]

[15] There are a number of Federal Forest Service organizations which are not included in Fig. 4:1, such as ten Forest Inventory and Planning units (*lesoustroistvo*), eight forest research institutes and eighteen air forest protection units.

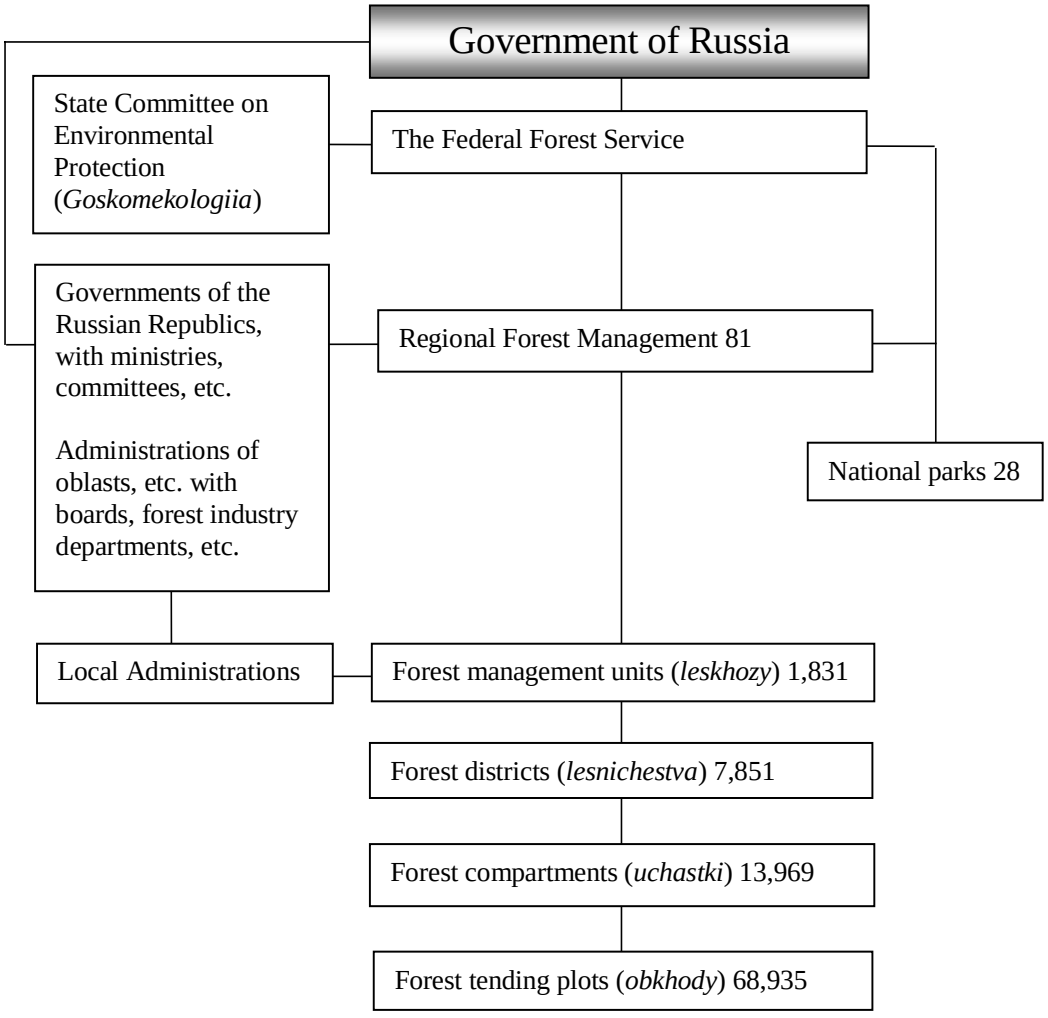


Figure 4:1. Forest Management Structure of the Russian Federation (Based on Strakhov *et al.*, 1996; World Bank, 1997.)

The Federal Forest Service is organized in 81 regional bodies. In Tomsk this forestry committee is today called "The Forest Management of Tomsk *Oblast*" (*Tomleskhoz*). It should be noticed that the old system of "dual subordination" still exists in that the committee is subordinated both to the FFS (or *Rosleskhoz*), the central authority, and to the executive authority of the oblast. On behalf of the central *Rosleskhoz*, these forestry committees are basically responsible for the protection and regeneration of forests. In total, the Federal Forest Service and its committees are accountable for around 94% of the Russian "forest fund." Regional committees, like *Tomleskhoz*, still assign areas for harvesting but nowadays to privatized harvesting enterprises. As was already mentioned, the agricultural sector, the military, and some other authorities possess parts of the Russian forest fund. Almost no forest lands have yet been privatized. Today, the property rights situation with respect to the ownership of the Russian forests is unclear. What is clear is the fact that the forests belong to the state, but it is not clear to which part of the state they belong. In a federation the property rights issue is particularly

problematic. The forest code states that the forest resources are jointly owned by the "Russian Federation and the Subjects of the Russian Federation." Accordingly, the forest lands of Tomsk belong to the Russian federation *as well as* to the *oblast*. This ambiguous situation did not change with the new forests code adopted on January 22, 1997.

At the regional level the Russian forest fund is divided into 1,831 management units, *leskhozy*. The geographical areas they possess often coincide with the lower administrative areas of an *oblast*, the *raion*. For example, Tomsk *Oblast* is partitioned into 29 *leskhozy*. The forest lands that a leskhoz possesses is in turn divided into districts (*lesnichestva*), forest compartments (*uchastki*) and numerous tending plots (*obkhody*). The leskhoz is an entity with independent accounting and separate funding. During Soviet times forest industries, *leskhozy*, sawmills, and state harvesting enterprises (*lespromkhozy*), formed an integrated forestry system. It is this system that is now disintegrating. In the more sparsely forested parts of the union not only silviculture but also logging and timber production was left to the *leskhoz*. In the beginning of the eighties their annual logging was 70–80 million m^3 (Blandon, 1983:85). It should be noticed, however, that during Soviet times harvesting and forest management, e.g. regeneration, was separated and there were basically no financial relations between logging enterprises and the *leskhoz*.

The Harvesting System in the Late Soviet Era

In the beginning of the 1980s *Minlesbumprom* was the central ministry responsible for the forest industrial sector. As was the case in the forestry sector, with its *leskhoz* system, the forest industrial sector was organized in a sophisticated hierarchical administrative complex down to the individual enterprise. The system that was in place in the eighties, just before the beginning of *Perestroika*, was organized in three levels of management (cf. Figure 4:2).

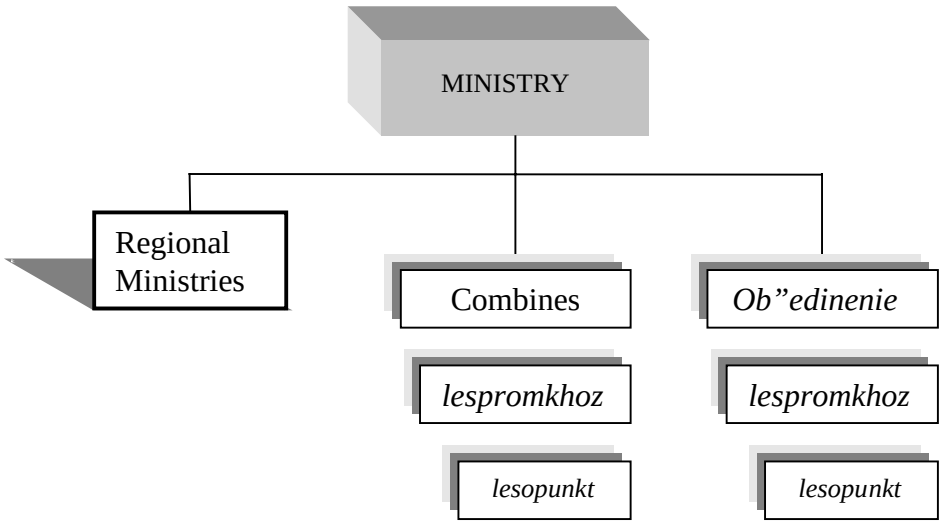


Figure 4:2. Organizational structure of forest harvesting before Perestroika (Source: Blandon, 1983:58)

This system had replaced an even more complicated arrangement composed of five management levels (Blandon, 1983:51). Through its *leskhoz* system the Federal Forest Service formally controlled all logging. The main part of logging activities were, however, performed by *lespromkhozy*, i.e., state owned logging enterprises that were assigned particular harvesting areas. As indicated in Figure 4:2, there was also a management level between the enterprises and the central authorities, either combines or *Ob"edineniia*. The latter units were larger than combines and consisted of a large number of enterprises in a specific region. In some regions there could also be combines that formally sorted under an *Ob"edinenie.* There were also a number of combines under direct control of the Ministry.

In Tomsk *Oblast* there was an *Ob"edinenie* (*Tomlesprom*) with about 44,000 employees. *Tomlesprom* consisted of 35 enterprises, including sawmills, board factories, and forest harvesting enterprises. The *lespromkhoz* worker brigades formed the basis of several settlements in the *oblast*. In the "darker periods" of Soviet history these settlement were populated with a significant number of prisoners. Many *lespromkhozy* were, in fact, once established as prison camps. In the course of time it became common to use a more flexible system where the workforce only stayed a couple of weeks at the logging site.

Actual logging operations were organized in particular *lesopunkty*. A *lesopunkt* consisted of a fishbone pattern of lorry roads and skidder tracks where the main transportation line ended in a landing site along a railway track, a river, or a main road. Most of the roads were built to last for only a fairly short time. Each *lesopunkt* was designed to produce (on the average) between 50 and 150 thousand m^3 of wood annually, but, according to estimates from the 1970s, a significant part of them produced amounts well above the upper limit (Blandon, 1983:58). This practice left the new Russian Federation with "a legacy of overuse" (World Bank, 1997:27). Earlier forest management practices have caused local overharvesting and the need for future road construction to new but more remote forest areas (cf. Chap. 2).

Tomsk Forest Management Before and After the Downfall of the Soviet System[16]

The Forest Management of Tomsk *Oblast* (*Upravlenie lesami Tomskoi oblasti*) was originally formed in August 1947 in accordance with a decree by the Soviet Union Council of Ministers. As a result 27.6 million ha of forests were transferred from the *lespromkhozy* in *Tomlesprom* to form 20 management units (*leskhozy*) with 80 forest districts. At that time forest management had a limited scope. Only 24% of the total forested area was managed. Later, in the period 1951–1959, the forests in Tomsk suffered severe damage by forest fires, diseases, and insect attacks. During these years an air borne forest assessment unit was established. (In 1977, an independent airborne forest fire protection was set up.) In the 1960–1975 period, artificial forest regeneration began. The area in which artificial forest plantation was performed grew from 1.8 ha in 1959 to

[16] The section is based on an article in the Tomsk regional newspaper *Krasnoe Znamya*, 2 Sept. 1997, "The second life of the cedar country" signed by V. Panevin. The article is commemorating the 50th anniversary of the Tomsk Forest Management organization.

9.5 thousand ha in 1965. Due to a shortage of wood, during 1975–1981 great attention was paid to the industrial processing of wood and an effort was made to produce consumer goods.

Before *Perestroika*, in the 1981–1987 period, annual forest harvesting levels were normally around 7-8 million m^3. A drastic increase occurred in *leskhozy*'s harvesting of commercial wood. In accordance with an order (*prikaz*) issued by the RSFSR Ministry of Forestry (*Minleskhoz*) in 1988 the Tomsk Forest Management was reorganized and became Tomsk forestry complex (*LKhTPO, Tomskoe lesokhoziaistevennoe territorial'noe proizvodstvennoe ob"edinenie*). Under the pretext to improve the management structure a number of *lesnichestva* were closed down, an experiment which had particularly serious consequences for the workforce. In March 1991, the Forest Management was reinstituted replacing the LKhTPO.

Towards the end of 1991, in accordance with a joint *prikaz* from the "Russian forest industrialists" (*Roslesprom*) and the RSFSR Ministry of Agriculture forests were again to be managed by entities belonging to the Federal Forest Service and the integrated wood producing *ob"edindnie* system was to be broken. As a result, for example, the leading enterprise of Tomsk *LKhTPO* was reorganized to become Tomsk *leskhoz*. The forest districts (*lesnichestva*) were restored all over the region. Today there are 29 *leskhozy* in Tomsk. The structure of the organization is shown in the box diagram below.

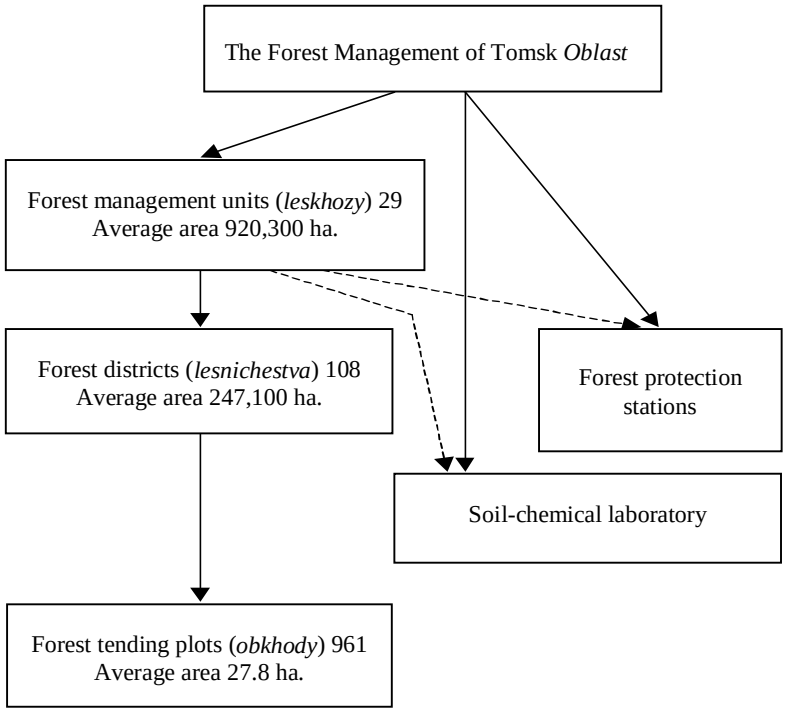


Figure 4:3. The Organization of Forest Management in Tomsk Oblast (Source: Brochure from Tomsk Forest Management)

Today, a total of 1,947 people are working in the Tomsk Forest Management.[17] Of this total 1,216 work as "foresters" (*lesniki*), 105 are "forest wardens" (*lesnichie*) (26 of whom have higher education, 75 intermediate vocational education), 4 were practitioners, and 9 are female foresters. According to the Russian way of classifying foresters the organization has 11 "class I," and 27 "class II" foresters. Five persons are classified as "distinguished foresters."

Breaking up from the old Soviet system of forest management has resulted in a poor funding of the Federal Forest Service which has affected, for example, the level of forest fire fighting (Nilsson *et al.*, 1994). Until quite recently, the Tomsk Forest Management has been able to pay wages to its employees. This is not always the case in other regions. Around 60% of the funding emanates from the budget of the Russian Federation, 30% from other regional sources, and 10% comprise a budget gap (Obersteiner, 1997:33). Strakhov and Pisarenko (1996) report that the federal funding was around 70% in 1993. Since the proportion of federal funding has decreased the Federal Forest Service and its management units (the *leskhozy*) have to increasingly rely on other sources. Every *leskhoz* has its own budget and they should not be engaged in commercial forestry. They are, however, allowed to sell wood produced through so-called "commercial thinning." Today, the *leskhozy* in Tomsk receive their funds from:

- the budget of the Federal Forest Service transferred via its regional establishment, the Tomsk Forest Management (*Tomleskhoz*);
- the *oblast* budget, i.e., from the regional administration;
- their own activities, such as sanitary cutting (thinning), services, the leasing of equipment, and 40% of the charges for the stumpage fees.

The new 1997 Forest Code has not significantly changed the role of the *leskhozy*. However, through the Code they have been given more favorable conditions for procuring their own funds. This is discussed later in the section about leasing and stumpage sale.

The Reorganization of the Tomsk Forest Sector

The separate stages of the institutional restructuring of the forest sector in Tomsk are illustrated in Figure 4:4. It should be noticed that, during the period we look at here, production decreased significantly. After two restructurings, between 1986 and 1991, all *lespromkhozy* as well as most of the forest industries were privatized. Thus, the years 1992–1993 can be characterized as a period of turmoil in which property rights were in a state of flux but during which actual ownership rights were transferred from the state to private individuals or collectives. This privatization has, in fact, been described as a

[17] The organization has had various names and subordination through the years:
1947: the regional forest management was organized
1953: regional management was moved in under the regional agricultural management ("oblselkhozupravlenie").
1960: The Forest Management in the Tomsk Sovnarkhoz.
1961: Department of forestry inside *Tomlesprom*, i.e., the *ob"edinenie*.
1965: Regional Forest Management
1988: Forest management territorial production combine (*ob"edinenie*)
1991: Forest Management

"strange collectivization" (Zalogina 1997).[18] Equity shares were simply transferred to the employees in the respective companies. In Tomsk this process was, and still is, governed by the Department of Privatization and Management of State Property (cf. Appendix 4:1 *The structure of the Tomsk Oblast Administration*). The department was created in 1992. At that time almost all property still belonged to the state.

Today, not taking the Siberian Chemical Combine, which is the main enterprise in the earlier closed city "Tomsk 7" (the size of its capital funds are still secret information), into account, only a very modest share of all property is still state owned. About 40 enterprises are owned by the regional authorities. Most of them are small and have an agricultural profile. Six defense industrial companies belong to the federal authorities and they are not going to be privatized. Furthermore, the regional administration has blocks of shares in some 20 enterprises, i.a., in twelve construction enterprises, a felt boot factory, and the textile factory "Spring". These shares are left to be handled in trust by the state owned company *Tomskstroi*. In addition, the department has one share in the telecommunication company, *Tomsktelekom*. There are also a few federal blocks of shares. The most important of these are the shares in the "Eastern oil company." The importance of the company is indicated by the fact that the head of the regional administration is a member of its board.

In general, however, there only remains very little state property that is related to businesses, and the success of the remaining state enterprises is very limited. For example, Tomskstroi is regarded as practically bankrupt and out of 20 enterprises as many as 14 are either unprofitable or not very far from (Zalogina, 1997). However, nowadays, most of the time-consuming work for the department of privatization does not concern the privatization itself but rather property disputes. Some of the disputes are triggered by the fact that directors as well as ordinary workers only today, it seems, have started to realize that "something" is being left – or not left – to them. Although there have been people sentenced for unlawfully acquired property in Russia this has not yet happened in Tomsk. However, the privatization committee is currently working on a couple of cases.

[18] Zalogina's article is based on an interview with the president of the Committee for the Management of State Property, vice head of administration in the Tomsk Oblast, Mr. Alexander Yakovlevich Petrov. In the figure in Appendix 4.1 this organ is labeled the "Department of privatization and management of State property".

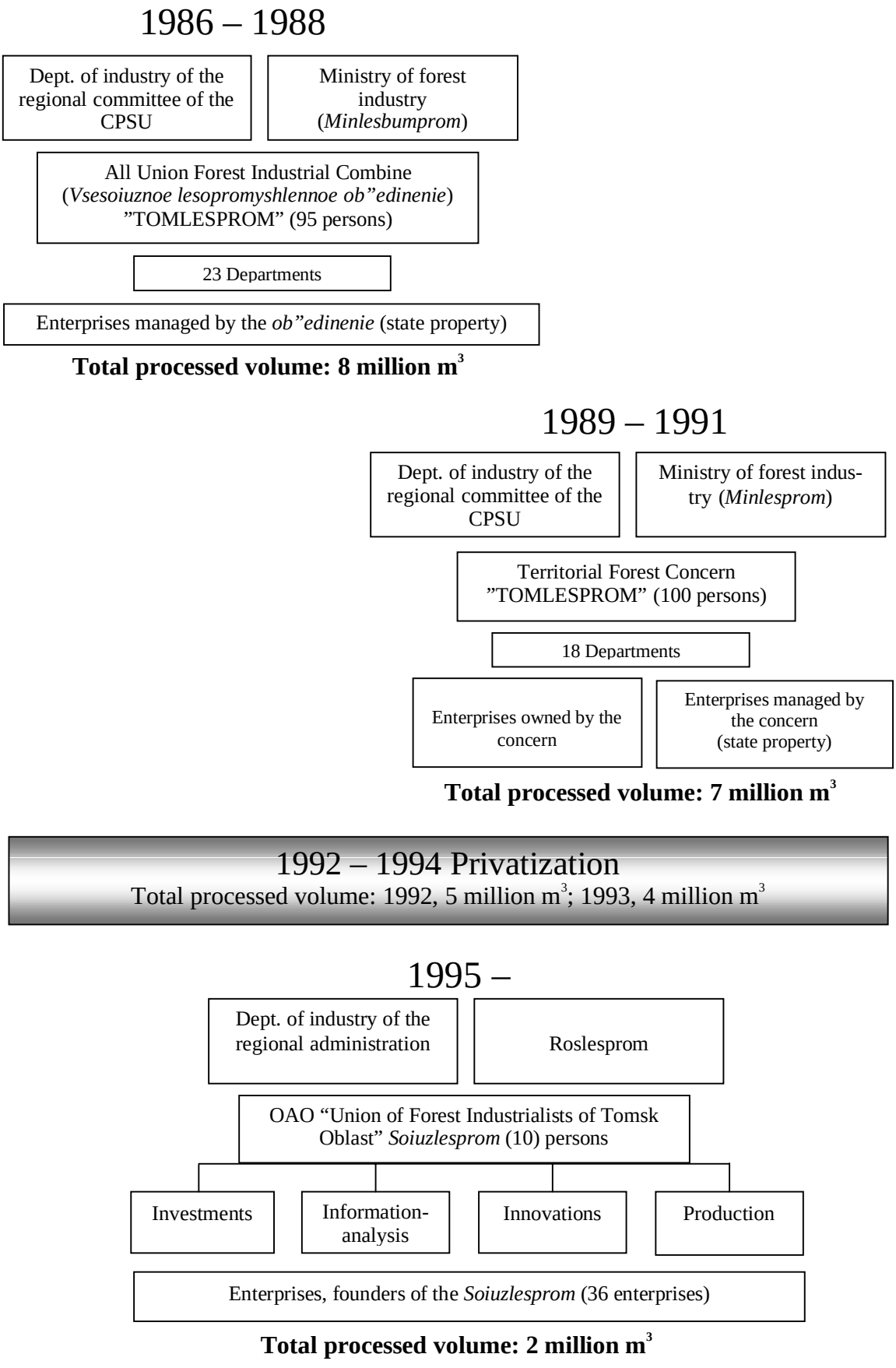


Figure 4:4. Stages in the restructuring of the forest sector in Tomsk

The harvesting enterprises, the *lespromkhozy*, have all been privatized. We shall later discuss more in detail how this group of enterprises has been reorganized. Since most *lespromkhozy* have economic problems there has been a call for a "deprivatization" of some of them. The idea is that the state should buy back the shares which were privatized. This idea appeared during the elaboration of the program for the development of the regional forest complex. Representatives for the Department of Privatization think that the idea is good, but since all enterprises could not realistically be saved by returning them to state ownership, there has to be a selection. The intention would be that credits should be allocated and investments attracted. As for a direct purchase of shares the department has an agreement that each *lespromkhoz* should provide evidence of who is the legal owner of the main part of its shares. However, of more than 30 *lespromkhozy*, whose representatives actively supported the idea at meetings in Tomsk, only ten have so far (April 1997) actually accounted for their ownership structure.

Institutional Setting

As can be seen in Figure 4:4 and Figure 4:5, the privatization of forest industries and *lespromkhozy* resulted in a new umbrella type of organization, namely, the OAO "Union of Forest Industrialists of Tomsk Oblast" (*Soiuzlesprom*). This organization was established in 1995 on the basis of the old forest industrial complex (*Tomlesprom*). The Union is a stock company to which today belong 45 enterprises of various ownership forms. The head of the Union was later also appointed head of the new "Department for the Forest Industrial Complex" when this department was set up in the regional administration in 1996. In other words, this person is "the strong man" in the Tomsk forestry sector.[19] The official purpose of the Union is to promote the transformation of the Tomsk forest sector from the old "command economy" system to a modern market system based on private enterprises.

Among the 45 organizations comprising the Union one finds public institutions like the forest industry department of the regional administration and the Trade Union for Workers in the Forest Sector, educational establishments (like *Uchebnyi tsentr "Tomskaya LTSh"*), a construction firm, a furniture factory, a match producing firm, several *lespromkhozy*, and even a couple of organizations located in the neighboring Novosibirsk.

The Union has elaborated a medium term plan for the restructuring of the forest complex in Tomsk. The plan goes under the title "Sustainable development of the forest industrial complex of Tomsk *Oblast* on the basis of a rational forest utilization and further processing of the forest produce" (Tomsk Oblast, 1997a). The plan was developed with the help of The State Committee on the Forest Industry (*Goskomlesprom*) in Moscow, which is nowadays a department within the Ministry of Economy, and it has been sanctioned both at the federal and the regional levels. The program was approved by the Regional Duma of Tomsk *Oblast* on January 28, 1997.

However, from the very beginning of the reconstruction of the regional forest sector several obstacles for its development have been recognized.[20] The physical constraint

[19] Recently, however, the director of a company which is a member of the Union has been appointed head of the *Soiuzlesprom*, thereby (at least formally) separating the responsibilities of the public authority (the department) from that of the commercial organization (the Union).

[20] This is based on interviews with representatives for the Union and the Department of the Forest Complex, May and October 1997.

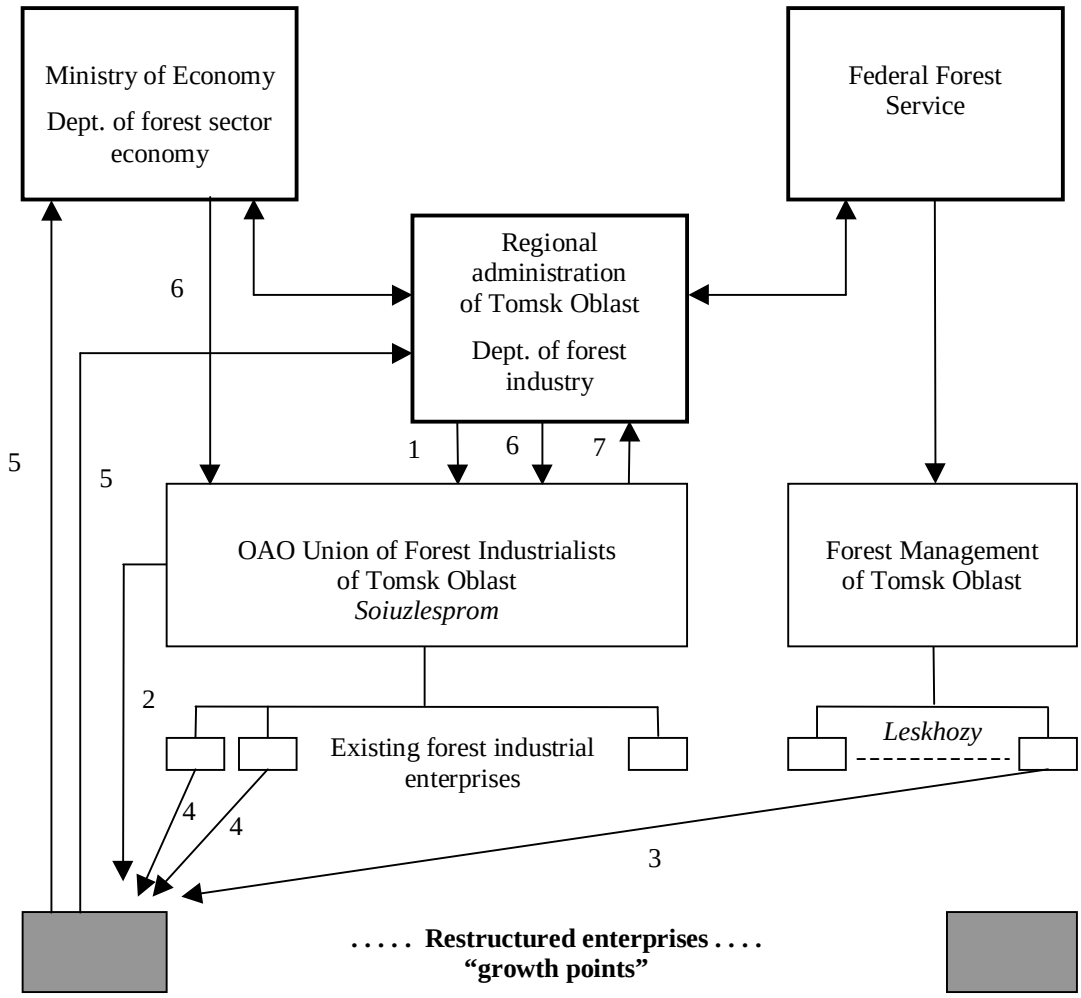
of long distances to markets is the overriding problem for which there is no easy solution. Earlier existing subsidies for all modes of transportation have now disappeared. Some transport modes (like river transport and railway) are still monopolized and currently they maintain a prohibitive pricing policy causing forest enterprises to use road transports which currently is the cheapest mode of transportation. The transport sector is also affected by payment arrears. Since customers do not pay in time for transport services the work of the transport providers is eventually halted altogether.

The current taxation legislation is mentioned as another obstacle for the development of the "market mechanism." Although there is an ongoing work to revise the taxation system in Russia it is not anticipated that fundamental changes would result since the tax base is not expected to change. Although changes are made now and then in the government the budget is not affected since the "budget base" remains the same. Changes like these will take a long time to achieve. Enterprise credits are also regarded as an especially difficult problem. Enterprises cannot turn to the banks for credits since they have too weak a liquidity and banks charge interests on loans that many enterprises are unable to pay. There are more than 30 banks on the regional market (Chikunov, 1998).

In general, the forest sector is highly problem ridden and despite many efforts to come up with organizational solutions remnants of the old system are still affecting the situation. This is illustrated in the very organization of the sector. Many of the organizational units already mentioned participate in and form the structure of the sector, while they, simultaneously, are a part of the problem.

Figure 4:5 gives a broad illustration of how the regional forest sector reorganization is comprehended. The figure is based on how the Union of Forest Industrialists and the authorities envisage the future configuration of the sector. The idea is that the Union shall play a central role in reshaping the sector. (For more details regarding how these plans apply to the organization of the Union, see the figures in Appendices 4:2 and 4:3.) In concert with the regional authorities, the Union is supposed to select and restructure certain forest industries in order to create a number of new "concerns" (*ob"edineniia*) or "growth points" as they are labeled. As can be seen in Figure 4:5 there is a large number of relations between the different authorities and the forest enterprises.

Already from this short description it can be realized that the general restructuring of the forest sector demonstrates a clear "path dependency," that is, institutional solutions have a tendency to follow old tracks. Thus, the Union of Forest Industrialists fulfills the old role of an administrative coordination center deciding the "degrees of freedom" for single enterprises as well being in charge of political administrative contacts. We will return to this in the last chapter of the report. What might not be as clearly indicated in Figure 4:5, however, is the significant number of enterprises which are *not* members of the Union (around 200 enterprises) whose activities are not coordinated by means of administrative procedures. Nor are there any patterns of informal contacts indicated in the figure or the circumstance that the "social sector" (i.e., housing, schools, health care, etc.) still in many cases is largely supported by the enterprises. We will come back to these issues later.



1. Tax, insurance dues, investment and products credits, state orders, body of regional legislation;
2. Business planning, credit resources, innovation, information-marketing consulting, control;
3. Agreements of leasing or the use of forests, forest preservation, fire fighting;
4. Agreements on joint activities, establishment of new enterprises or concerns;
5. Equity shares (up to 25% of total stock) as guarantee payments, refund of credits from the [regional] budget or from other sources, tax payments, lease payments, and stumpage fees for the forest resources;
6. Transfer of state equity shares in trust;
7. Results of the continuous monitoring of the forest sector.

Figure 4:5 The reconstruction of the Tomsk forest complex (Source: Union of Forest Industrialists, Tomsk)

The Political Profile and the Forest Sector

In terms of political preferences the population of Tomsk is fairly similar to the Russian average. There are certain differences, however. While the communist party received 22.3% of the votes in the 1995 State Duma election the corresponding figure for Tomsk was 18,77%. However, "Yabloko," "Women of Russia," and "Derzhava" are parties which received somewhat higher support in Tomsk compared to the Russian average. Thus, it could not be argued that Tomsk is more "conservative" or "radical" than the rest of Russia. However, in the 1991 referendum concerning the preservation of the Soviet Union the population in Tomsk was somewhat less in favor of keeping the union; 71.34% of all Russian voters voted for a preservation of the union. In Tomsk the corresponding figure was 63.89%. In the referendum in December 1993 concerning the new constitution the population of Tomsk gave a greater support (66.26%) for the new constitution than the Russian average (55.22%). In the 1996 presidential election it was also demonstrated that Tomsk gave Boris Yeltsin a somewhat greater support (59.24%) than the rest of Russia (53.7%).

Table 4:1. Result of the State Duma election in 1995

	Russia	**Tomsk**
Turnout	64.37	62.95
Communist Party	22.30	18.77
Our Home Is Russia	10.13	9.15
Liberal Dem. Party	11.18	10.48
Yabloko	6.89	10.37
Women of Russia	4.61	6.91
Communist-working Russia	4.53	4.28
Party workers' self government	3.98	3.50
Russia's choice	3.86	3.09
Congress of Russia's communists	4.31	4.59
Agrarians	3.78	2.23
Derzhava	2.57	4.11

Source: http://www.nupi.no/russland/elections/StDum95_1.htm (5 October 1998).

In the latest regional elections in Russia there has been a tendency that party representatives lost their positions to non-political candidates, such as businessmen. The 1997 election to the regional Duma in Tomsk followed the same pattern.[21] The business lobby took 30 of the 42 seats (NUPI, 1998). Accordingly, there was an almost total absence of political struggle between political programs. Candidates launched by "The voters' initiative group" collected the main part of the votes. The vast majority of the 176 candidates ran as independent. This was true also for the speaker, Boris Maltsev. As a result the Duma got a non-political character containing 21 chief executive officers of enterprises and authorities, 1 principal of a higher education establishment, 3 bank managers, 1 newspaper editor, 7 vice heads of departments, and 4 heads of local administrations.[22]

[21] The turnout in the election was only 38%.

[22] Source: Dr. M.S. Kaz, Tomsk State University, 15 May 1998.

In total, the majority can be regarded as representatives of commercial organizations. Out of the total number of deputies, ten could be said to constitute a special "forest lobby."

In summary, while the party political profile of the regional Duma has faded, new business groups have strengthened their position. This situation have two plausible explanations. The first is that the entrenchment of business people in the political center reflects the present situation in which enterprise managers are involved in constant deliberations with the authorities. In this situation access to the political arena is essential for the survival of the enterprises. The second, but related, explanation is that people invest their hopes in candidates whom they think are able to solve their immediate needs rather than those who act as traditional party representatives. For example, those who are losing their jobs in the forest sector or those who are victims of wage arrears are more apt to vote for a person who "speaks for the sector." As we shall see enterprises have lots of links to the political-administrative authorities and the latest election has strengthened these links.

"Tomderevo" – an Illustration of Leasing and Stumpage Sales

In order to illustrate how different authorities are coupled it is instructive to use leasing and stumpage sale as an example. It is advisable to recall the content of Figure 4:5 as well as the previous description in order to understand how different units relate.

To exemplify how the leasing system works we will use the fictitious company "Tomderevo." This company might be imaginary but the assumed history of the company and its relations with the authorities are quite realistic. It should be noticed that the term "concession" applies to a leasing arrangement for a longer period of time in more remote areas while "leasing" reflects a more common understanding of granting land for short and long term use. Both arrangements can be free of charge. The Federal Forest Code stipulates that leasing and concession agreements should run between one and forty-nine years.

1. Tomderevo is an old harvesting enterprise, a former *lespromkhoz*. It is owned by four people, who initially acquired their shares from the stocks distributed among the employees. The company is one of the founders of the Union. As a consequence the Union is also a shareholder in the company. Since Tomderevo only a few years ago was an integrated entity in Tomlesprom its managers can benefit from long-standing personal relations with a number of people in different segments of the forest sector. These relations can be utilized in different ways. Tomderevo harvests and sells its wood through a Moscow based export organization (with which the Union has a contract) for final destination Turkey (see also Appendix 4:4). All wood that Tomderevo acquires comes from the same *leskhoz* which has assigned the company an area for harvesting.
2. The procedure of acquiring a harvesting agreement is the following. Tomderevo applies to the Regional Administration of Tomsk *Oblast*, its department of forest industry. Based of the Federal Forest Code and Regional Forest Acts, this authority has already decided a minimum price for every sold parcel of timber. It has now to decide whether Tomderevo shall a) be granted a plot or not, b) how much timber they can cut, and c) where.

3. Tomderevo has to bid on the timber and if another company is prepared to pay a higher price the plot would go to this buyer. However, in the present era of shrinking production no real competition exists. Tomderevo deliberates with the authorities and will eventually get its leasing agreement around the minimum price. According to Article 34 in the Forest Code some enterprises, i.e., companies that have been harvesting timber for a long period of time, have a special priority and are exempted from the bidding. Tomderevo does not belong to this group.

4. As the winner of the bidding the company receives the right to enter an agreement and the *leskhoz* should then draw up a *forest license.* This license should be approved by the FFS district agency, i.e., the Tomsk Forest Management. Now, Tomderevo has to develop a management plan containing a description of harvesting methods, methods of regeneration, etc. As soon as the plan is approved by the *leskhoz* a leasing agreement is signed. Finally, the *leskhoz* issues a cutting permit which gives Tomderevo the right to start harvesting.

   The leasing agreement should contain the following type of information:[23]

   - the designation of the actual *leskhoz*, and the lease holder,
   - a description of the area based on inventory data,
   - dates of beginning and expiration of the agreement,
   - stipulations regarding the use of the forest, amounts of wood, and types of harvesting, etc.,
   - rules and standards to be applied to the forest resources,
   - stipulation how the lease holder should carry out regeneration,
   - financing,
   - conditions of monitoring and the payment for this,
   - financial conditions, reimbursements in case of violation of the agreement,
   - description how the leasing fee is calculated and charged, and finally,
   - general rights and responsibilities of the company and the leskhoz.

   Tomsk is a region which is rich in forest resources. If the leasing agreement would allow an annual harvest of more than 150,000 m^3 it would have to be approved on the federal level by an interdepartmental commission of ecological experts. This commission should line out how the operation would comply with ecological demands. Its decision is binding for all forestry bodies. However, the only legal document that regulates the terms and conditions of the leasing contract, and which the lease holder is obliged to follow, is the agreement signed together with the *leskhoz.*

5. An alternative to leasing would be to use stumpage sales, i.e., to buy standing timber in fixed parcels. Thus, our fictitious company, Tomderevo, has the possibility to participate in auctions arranged by the a special commission within the regional administration. The auction is organized by the Tomsk Forest Management belonging to the Federal Forest Service (FFS). These are announced in local newspapers. Even here

[23] This list is borrowed from Petrov, 1997.

the forest authorities have decided a minimum price but since there are few buyers the price is *de facto* fixed administratively and the final price might be the outcome of negotiations rather than bidding.

To sum up; in its daily activity our fictitious company entertains many relations with various authorities, with banks, and others. The image of a ”forest family” in which tasks, duties, and rewards are distributed is apparent. This image is strengthened by the fact that there exists a significant “personnel union” among the units involved. For example, the Department of the Forest Complex of Tomsk *Oblast* holds the position of a founding member (owner) of the Union of Forest Industrialists and the head of the department initially became the managing director of the Union. In the council (*kollegiia*) of the department one finds, for instance, the head of the Tomsk Forest Management, the chairman of the regional trade union for the forest sector, but also directors from larger enterprises (some of whom simultaneously having leading positions in the board of the Union). In addition, many of these people are shareholders in the individual forest enterprises they have to deal with. By reading the resolution through which the Department of the Forest Complex of Tomsk *Oblast* was established it becomes obvious that this public authority mainly functions as a managing and coordinating body rather than as an administrative authority. According to its statutes (Tomsk Oblast, 1997b) the department should *inter alia* deal with the following:

> 1.4 The Department exerts state regulations and coordination of the activities of the enterprises in the region belonging to the forest industrial complex irrespective of their administrative (“vedomstvennaya,” “departmental”) subordination and form of ownership.
>
> […]
>
> 2.1 Guidance, coordination and regulation of the activities in enterprises, facilitating their sustainable functioning in the territory of the oblast, identification of strategies for their development, coordination of the scientific-technical and investment policies, collaboration in the creation and organization of new organizational-economic structures for production of any form of ownership.
>
> 2.6 Coordination of the activities of joint stock companies, small businesses and other organizations, irrespective of their chosen form of ownership, of the provision of raw materials to wood processing enterprises.
>
> 2.7 Providing harvesting companies with forest resources, control of forest leases, forest management activities.
>
> […]
>
> In accordance with what was stated under section 2 of the present statutes about tasks, the department carries out:
>
> 3.3 Operative leadership (“operativnoe rukovodstvo”) of enterprises’ activities on issues within the competence of the department;
>
> 3.4 Personnel placements in the enterprises together with municipal and town administrations, share holders;
>
> 3.7 Examination of materials presented by city, municipal administrations, enterprises, and taking appropriate measures in order to look after the interests of the region.

Fees and Taxes

As can be seen in Figure 4:5 (point 1–7) there exist a number of relations besides the ones related to the acquisition of timber. For example, point 1, 6, and 7 indicate that the regional administration have commitments way beyond relations (according to western

standards) between a public authority and its subjects. Still using the fictitious company as an example it can be demonstrated how the system of monetary and fiscal relations is configured in the Tomsk forest sector.[24] Thus, in order to conduct normal activities the company is supposed to pay the following types of taxes and fees:[25]

- Income tax (≈12-30%), tax on profit (≈35%), value-added tax (20%), property tax (≈2-5%), charges to the regional and federal budget. Lease holders also pay local (*raion*) tax.
- Tax on housing and cultural facilities maintenance: 1.5% of the sales value of the company's products.
- Transport tax: 1% of the companies' wage fund.
- Road tax: 1.5% of the sales value.
- Other local and regional taxes: such as taxes on vehicles, tax of car purchase (28%) advertising tax, water utilization tax.
- Stumpage fees: defined by local authorities out of which 60% goes to the regional administration, and 40% to the Federal Forest Service. The difference between the minimum fee and what is actually paid is given to the *leskhoz* to cover its costs for forest management.
- Leasing and concession: fees are paid to the *oblast* and *raion* administrations.
- Import tariffs: ≈15% of the import value.
- Customs fee: 0.05% of the value if paid in foreign currency.
- Payments for education needs: 1% of the wage fund
- Payments to the pension fund: 28% of the wage fund
- Payment to the employment fund: 1.5% of the wage fund
- Payment to the medical insurance fund: 3.6% of the wage fund
- Payment to the social security fund: 5.4% of the wage fund.

The following types of taxes might also be found. However, they are not used in Tomsk for the moment:

- Forest tax: all forest users except concession holders pay forest tax per m^3 utilized wood. These taxes are regulated in the tax regulations but the actual levels of them are decided by regional authorities; different for different types of wood.
- Timber conservation tax: 5% of timber sales goes directly to the federal budget.
- Special tax: 1,5 % of the price of the timber.

[24] For a more general description of the flow of funding in the forest sector, see World Bank, 1997:56-57.

[25] Source: Strakhov *et al.*, 1996; Petrov, 1997; Gareyev *et al.*, 1997; Radaev, 1997, and consultation with expert on taxation in Tomsk (May 14, 1998).

- Transportation fees: each forest user is charged a tax per km. of transported wood. (Taxes are about 100 % higher for non local users.)
- Export tax: differs substantially for different types of wood.

Comment

So far, the report has provided a multitude of facts regarding the structure of the forest sector in Tomsk. In earlier chapters we have also dealt with socio-economic and other problems of significance for the sector. With reference to the analytical framework, launched in the first chapter (Figure 1), one can say that so far we have dealt with the "unpacking" of the framework. Thus, central "attributes of the physical world," such as the quality and content of the forest resource, and infrastructure, have been described. In Chapter 3, "Socio-economic Characteristics of the Tomsk Region," the aim was to capture some basic "attributes of the community" that might influence the forest sector. Finally, in describing formal regulations as well as the organizational and institutional configuration of the forest sector we have initiated an analysis of what types of rules really govern the sector, "rules-in-use." This analysis will continue in the next chapter.

During the course of the project a number of interviews with representatives from the regional administration in Tomsk, enterprises, and scientific communities have been conducted. We have also made a smaller survey with a selective number of forest enterprises in Tomsk. (The results of this survey will be published later.) This information coupled to what has been gathered from IIASA's own databases as well as from secondary publications have revealed a rich interplay of problems. In the next chapter we take a closer look at these problems.

Summary

- Even though most forest enterprises are privatized the forest management system in Tomsk is to a significant extent structured by the principles established in the former Soviet Union.
- The forest management is heavily centralized giving few opportunities to adapt to local circumstances.
- Due to a relatively low profitability forest enterprises are especially affected by the general problems of the fragile Russian market economy, e.g., ambiguities in the legislation, poor enforcement of business rules, and "draconian" taxation policy.
- In general, however, serious processes have been initiated in order to continue the reorganization of the forest sector in Tomsk. The results of these efforts are still to be assessed.

5. Institutional Problems and Shortcomings

This chapter focuses on a number of central institutional problems that are likely to exert a profound influence on the performance of the forest sector in Tomsk. The analysis is based on what has been revealed during the course of the study and what has been described in the previous chapters. The focus of the analysis is institutions and institutional aspects. Keep in mind that we talk about institutions and institutional features in a broad sense, meaning not only formal administrative units and organizations but primarily the set of rules, formal as well as informal, that governs the behavior of the actors.

One of the keys to a deeper understanding of the institutional problems of the Russian forest sector is the insight that social institutions affect strategic choice. The behavior of each actor depends on his or her expectation of what other actors may do and these expectations are socially determined. After more than seventy years of Soviet forestry and forest industrial activity a sophisticated pattern of *social expectation* is established.[26] In this chapter we shall see to what extent such a pattern still exists and how it might foster a particular type of behavior.

Typically, institutional problems have multi-level qualities. An individual's behavior is affected by constitutional rules as well as by collective choice and operational choice type of rules. Higher level arrangements (rules) affect actions at lower levels while at the same time "micro-behavior" (the behavior of individuals) is the building block for those social institutions. In correspondence with the analytical framework described in Chapter 1, we assume that every action arena is structured not only by norms and rules, but also by social and physical as well as cultural circumstances. In order to illustrate the multi-level quality of the problems that the regional forest sector will have to face we use the harvesting behavior as an example. This analysis will be followed by several sections in which specific problems are further elaborated.

The Institutionally Embedded Legacy of Overuse

In its position analysis of the Russian forest sector the Word Bank used the expression "legacy of overuse" (Word Bank, 1997:27). The empirical reality behind this expression has been described in the previous chapters and will not be recapitulated here. The expression "the legacy of overuse" pertains to a harvesting policy based on an image of the forest as an almost inexhaustible resource. This, coupled to a traditionally strong bias towards industrial production, together with poor regeneration programs, have

[26] The concept of *social expectation* is elaborated by Knight (1994:48).

caused large scale problems as well as more limited deterioration in the form of local overcuts and embogging of land (Shvidenko & Nilsson, 1997). Essentially, this did not happen through a systematic violation of the law. It is rather the consequence of actors' compliance with the legal principles of the planned economy. The remnants of this system still affect the Russian forest sector and also, consequently, the forest sector of Tomsk, which is the action arena under focus in this report.

What institutional qualities can explain the legacy of such an overuse and the corresponding undesirable outcomes, and to what extent is this system still in operation? Although our example is harvesting, this segment of the forest sector arguably illustrates a broader complex of problems that is not restricted merely to harvesting. We also argue that the mode of analysis illustrated here, focussing on harvesting as a nested enterprise embedded in a broader institutional framework, is useful for understanding the entire Russian forest sector. Following the logic of the IAD framework (see Chap. 1) our analysis proceeds by focusing the factors that are supposed to influence and structure the *action arena* of harvesting.

THE ACTION ARENA

Generally, an action arena is composed of *actors* and the different *situations* in which they perform their activities. The Russian forest sector is a huge arena consisting of a large number of individual and corporate actors, such as public authorities, *leskhozy*, *lespromkhozy*, traders, transportation units, and industries. During Soviet times the communist party as well as the enormous planning apparatus might also have been included. Altogether these actors constituted (as they still do to some extent) an integrated, political-administrative system in which one unit was depending on another. In this context it can be assumed that the *social expectations* of harvesting enterprise managers, for example, reflect the entire system in its current state. The system itself creates a need for specific types of *information*. So, for example, there is an emphasis on the planning of production volumes rather than an analysis of actual demand, how to negotiate with political authorities is more important than acquiring marketing skills, etc. The behavior of individual actors is rewarded and sanctioned accordingly. However, in order to narrow our analysis and reduce the size of the action arena, one might focus on harvesting enterprises, the *lespromkhozy*, and see how their behavior fits into the system.

What qualities do the *actors* related to harvesting have? The managing personnel of the *lespromkhozy* is trained and educated in the Soviet type of forestry. Their main concern is production and, specifically, to produce a certain amount of timber and pulp wood. Silviculture is left to the *leskhozy* to handle. During Soviet times workers might have been assigned to a *lespromkhoz* by the authorities, for example, in the form of forced labor (prisoners). Thus, cheap labor is traditionally regarded as something natural for the business. With the exception of managers, who were individually rewarded for the fulfillment of the production goals, no one had any incentive to contribute more than necessary to the performance of the enterprise. Consequently, the types of *actions* that are regarded as "normal" are those that mean large scale harvesting for assigned customers. Generally, there were better rewards for reaching planned goals than to strictly obey the limits set by the Annual Allowable Cut (AAC). But even if people would comply with the rule of AAC, there would still be no guarantee for sustainability.

This compliance with the formal rules of AAC indicates a strong correlation between individuals' behavior and the other "boxes" of the framework, such as the system of rules and the quality of the community. However, before we proceed to identifying factors that structure the harvesting arena it should be appreciated that today's action arena is, basically, populated with the same individuals, engaged in the same types of activities, as before. Forestry and related activities require a special competence and even if it would be desirable to substitute people with adequate competence for the individuals currently working in the sector this would not be feasible in the short term. We shall now see how this action arena of harvesting is structured, not only by *Rules-in-use*, but also by *physical factors* and *Attributes of Community*.

ATTRIBUTES OF THE PHYSICAL WORLD

The most apparent physical feature of the forests in Tomsk is its abundance. The very existence of this rich resource has made it possible to perform actions and adopt rules that are based on the image of inexhaustibility. In addition, West Siberia's relatively flat topography and lands stocked with predominantly coniferous forests, has made it feasible to set up and operate large scale harvesting enterprises. This can be compared to high mountain areas, for instance, where such possibilities are limited by physical circumstances. The Siberian climate, with its long, cold winters and frozen waters is conducive to the construction of winter roads on terrain which is swampy at other times of the year. This has made it practicable to develop a seasonally dependent harvesting system. Today, this system affects the availability and supply of timber. Before the demise of the Soviet Union harvesting took place during the winter and processing was done during the summer. These rules do not work any longer mainly because of credit restrictions. Enterprises cannot wait until summer to be paid. As one of the major consequences, harvesting in Tomsk has decreased heavily and the local demand for timber can only be covered to 30%.

There are also other types of physical attributes that structure the action arena. For example, the character of the harvesting equipment, the machinery, as well as the quality and density of the transportation system are all circumstances that affect rules-in-use as well as communities. The forest legislation (and its related practice) is tailored to fit the types of harvesting that are actually being conducted and the technology that is normally available. This also affects the skills of the personnel as well as the configuration and contents of related educational programs. For example, the wide-spread practice of final felling and clearcutting requires another type of equipment and skills than what is required by a forest management which is highly based on thinning, secondary forestry, and deliberate regeneration programs. The physical attributes of the action arena also affect many other things. The large scale harvesting system based on an abundance of wood has not only produced specific types of competence and other individual qualities, it has, in fact, *created* entire communities, often totally dependent on the forest sector.

ATTRIBUTES OF COMMUNITY

To what extent do attributes of community affect the action arena? First it can be assumed that the legacy of overuse is widely accepted among people, especially in those

communities that are totally dependent on a continuation of the existing harvesting system. Twelve of the 16 municipalities (*raiony*) in Tomsk *Oblast* have a practically monocultural production structure, one way or another connected with forest harvesting and timber processing (Tomsk Oblast, 1997a). The fact that the social sector is frequently merged with the forest sector – housing being the most apparent example, the provision of electricity another – imposes limits on the actors. The relatively low percentage of privatized apartments in Tomsk is one indicator of this.

As indicated above, people's skills and the education level might be high in Tomsk but the Soviet harvesting complexes required special types of skills and these qualities are transferred with the same people to the forest sector of today. This is true for the processing industries as well, the personnel of which traditionally is more production oriented rather than concerned with efficiency issues, profitability, development of products, etc., qualities that are of central importance in any market economy. It can be assumed that the whole composition of the forest sector workforce, in terms of skills, expertise and education, is supportive of the Soviet type of forest management and not modern market oriented forestry. This pattern cannot change in a short time. Wages constitute one dimension related to this problem. For example, the low wage level in the forest sector affects the supply of labor. Experts prefer, if they can, to turn to other sectors with higher salaries and better prospects for a carrier.

Thus, the qualities of community is the quality of its people. Many authors have emphasized the cultural aspects of the Russian people as one important "variable," and perhaps also an obstacle for a smooth transformation of the society and the economy (Kaminsky, 1992; Kharkhordin & Gerber, 1994; Benham, 1995; Obolonsky, 1996; Gareyev *et al.*, 1997; Jensen, 1997; Kennaway, 1997). Two main attitudes prevail, one emphasizing the burden of almost eighty years of "Soviet thinking" and the other stressing the inheritance from the period before this, from Tsarist times. In essence, however, both lines of argument are based on the same idea of a still existing collectivistic type of attitude not in favor of the current transformation of society. This attitude tends to foster and retain rules which are not suitable for a market oriented forest sector.

To sum up, the "attributes of community" in Tomsk affect both rules-in-use and essential attributes of the physical world of the forest sector, such as the level of technology and the quality of the forests. At the same time, however, most aspects of the community are affected by physical circumstances, as was described above. This interdependence quality of the institutional arrangement of the Russian forest sector is also manifested in the rules-in-use, the last "box" of the IAD framework remaining to be unpacked.

RULES-IN-USE

The rules structuring the forest sector of Tomsk *Oblast* consist of *constitutional* rules, *collective choice* rules and *operational* rules. Starting with the constitutional rules it must be remembered that, according to the previous Russian constitution, all natural resources belonged to the Soviet state. Accordingly, the State was the legal owner of the forest fund. The State was its manager, its controlling agent as well as the supreme juridical instance for adjudicating conflicts. Today, the State, that is, the Russian Federation, is still the legal owner of all forests. At the same time, however, the forest resource

also belongs to the "subjects of the federation," a source of conflict that we have already mentioned.

During Soviet times all collective choices regarding the forests, such as those made by *Gosplan*, the Ministry of Forest Management (*Minleskhoz*), or by particular segments of the communist party, were dependent on this basic constitutional feature of state ownership. Since the State was regarded as equivalent to the communist party the constitutional rules-in-use effectively reduced the "degrees of freedom" for decision bodies in the regions and municipalities, for *leskhozy*, *lespromkhozy*, and industrial management. This was an unfeigned system of *patrimonialism* in which political authority was seen as an extension of the rights of state property ownership without any restrictions for political authority (Jensen, 1997; Kennaway, 1997). As a consequence, it was possible to develop operational rules that were the result of a line of command that effectively implemented the rules of industrial forest management favoring timber before regeneration, quantity before quality, idealized reports to the top level before reality, etc.

The reminiscences of this system still structure forest management even at the operational level, in methods of harvesting and other management procedures.[27] For example, quite in accordance with the new forest code, licensed harvesting in an area is maximized to 49 years, which is too short a period to give its users an incentive to cultivate the resource.[28] This system is constructed for users that "squeeze the juice out of the fruit" automatically expecting to be given more of the same thing. This kind of behavior was also a central feature in what has been called the legacy of overuse.

Moreover, indirectly the new leasing system is also a precondition for clear-cutting and unsustainable forest management. For example, leasing contracts specify in detail how the harvesting is supposed to be performed, even technically, types of machinery, and so forth. Most rules are based on the old practice of clear-cutting, tree-length hauling, etc., and includes a number of related obligations for the forest user, such as cleaning of the area of all debris. Compliance with the contract would cease if other harvesting methods than the "normal" would be used. This has been noticed by several researchers. The Russian forestry rules are extremely specific in their regulation of both intensity and method of felling. "In practice, most fellings (95%) takes the form of clear felling. This is due to the *complicated instructions*, low economic profitability and unsuitable machinery for selective or continuing fellings." (Strakhov, 1997:61, emphasis added).

Russian forest inventory and management planning (*lesoustroistvo*) is performed along the borders of *kvartaly*, i.e., in areas which do not necessarily coincide with forest qualities, such as age distribution and species composition, which often forms the basis of planning in contemporary forestry (Strakhov, 1997:60). In Siberia, as well as in most parts of Russia, exploitation of natural forests is the primary source of wood. Other types of management systems would require technological skills not yet available on a sufficiently large scale. In short, there is a lack of knowledge about how to establish large scale secondary, industrial forests based on the principles of sustainability.

To summarize, the rules-in-use structuring the forest management in Tomsk and in most other areas of Russia constitute a system in which one level decides the degrees of free-

[27] These examples are discussed more in detail in Strakhov *et al.* (1996); World Bank (1997); Obersteiner (1997), and in Gareyev *et al.* (1997).

[28] In Tomsk, however, long-term leasing of forest lands has not yet been practiced.

dom of the other. It is obvious that a prerequisite for changing operational rules related to harvesting would also require that collective rules would change, etc. It can also be concluded that the rules that are *de facto* used, and consequently sanctioned, affect both the quality of the resource as well as social behavior. As indicated several times the old structure seems to retain some of its basic qualities. The above discussion is summarized in Figure 5:1.

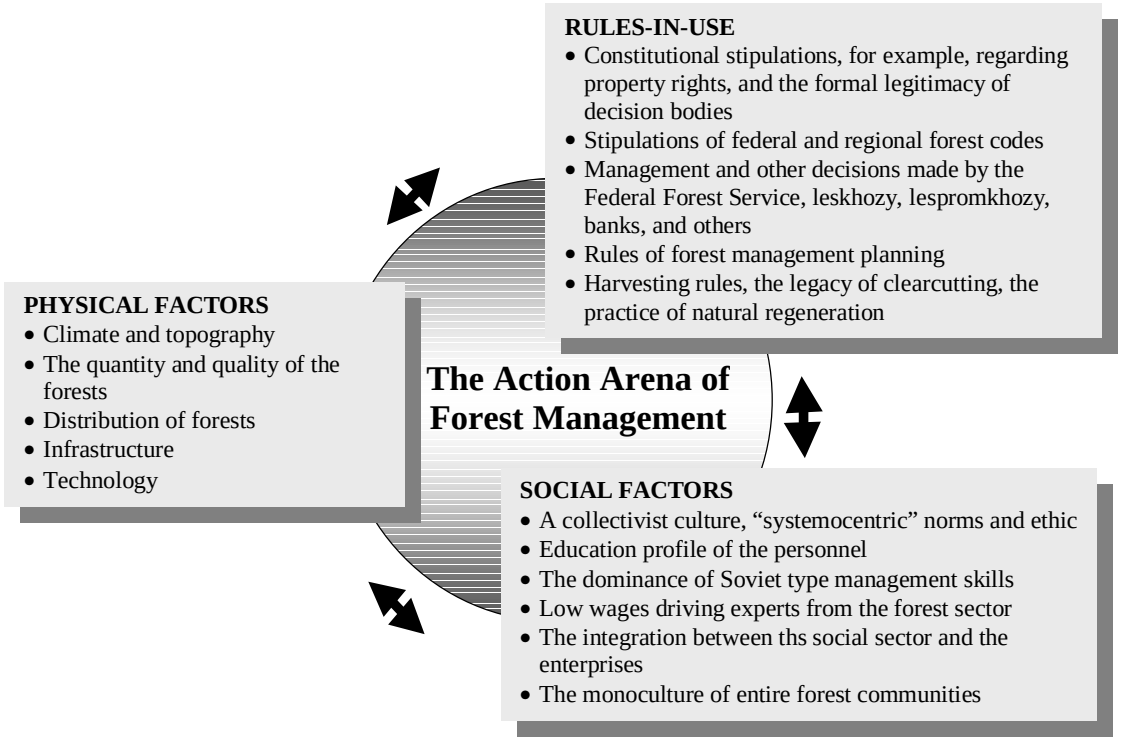


Figure 5:1. The action arena of Russian forest management, relations between factors affecting harvesting.

Institutional Dead-Lock

In our interviews with managers of forest enterprises we asked what they regarded as the most severe problems for their activity.[29] The most frequently mentioned issues were the taxation system, transportation costs, the incoherence in rules, and the economic policy in general. When asked to elaborate it became clear that one problem was seen to be related to another. Suggestions how to change the situation were, however, rather general. Indeed, "the whole economic situation" is not possible to change by single recommendations. This demonstrates one of the central institutional features of the forest sector, namely, its composite character.

Thus – and this is the lesson from the previous analysis which dealt with harvesting only – the institutional foundation of the legacy of overuse had, and still has, a nested character. One factor is affected by another forming an integrated pattern which is not easily broken. Our interviews verify this view. For example, individual enterprises,

[29] The results of the enterprise interview analysis will be published separately.

which try to introduce Nordic technology and harvesting methods, are automatically fined because these methods do not comply with the system of rules that has its origins in a Soviet type of institutional framework. At the same time the Federal Forest Service has problems with monitoring and sanctioning of infringements of rules, and, since harvesting companies rather pay fines than comply with rules, its authority is instantly undermined. Recalling the general economic problems of the Russian public sector (wage arrears being of particular importance) it is also evident that not only the Federal Forest Service, but also the taxation authorities and others have strong incentives to find "external" sources of income. In systems ruled by numerous regulations, like the forestry sector, it can always be argued that some rule or other has been violated. This, however, affects many other types of behavior and pushes the forest sector into a kind of "deadlock."

A final example might illustrate this situation. In a market economy it is desirable that companies keep good records over their economic transactions, the value of their assets, etc. This is required not only by banks, arbitrage, and branch organizations, but also by public authorities, such as taxation units. Thus, a rhetoric question might be posed: Why should one keep good records if this mainly provides opportunities for those who want to squeeze money out of the firm? Of course, deficient accounting practices also provide opportunities for unlawful manipulations by enterprise owners and managers and leave the field open for corruption and organized crime. It goes without saying that the defective accounting practices in Russian enterprises are a severe obstacle for attracting serious foreign investors (who traditionally have transparent accounting) to the Russian forest sector.

Taxation Policy

In all societies people complain about the burdens of taxation. In Russia, however, the situation is special. First, taxation is something relatively new and people's impression that they are getting something back is weak. Second, taxes are numerous and have an *ad hoc* character. This was demonstrated earlier. Third, taxes are not only too numerous, but, more importantly, the system is incomprehensible and full of weird add-on affects, sometimes resulting in taxation levels of around 90% of the profit (Nilsson & Shvidenko, 1997:42). Between 1991 and 1996 the taxation code has been changed 256 times (Rogfalk, 1996:17). This gives the system a quality of unpredictability. Moreover, the tax penalty regime is "draconian" with fines of 100% for the first violation, 200% for the second, etc. (Rogfalk, 1996:7 ff.). Such rulings severely affect the forest sector in Tomsk, which already has a poor profitability. In 1995, 58.5% of all forest enterprises were running at a loss, and at the end of 1996 the sector's debt to the regional budget was 54.4 billion roubles.[30] At the same time around 100,000 people were directly dependent on the result of the forest sector (Tomsk Oblast, 1997a).

Two problems related to taxation have a direct negative effect on the development in the forest sector. The first is the lack of transparency and predictability, which in practice makes it impossible for forest enterprises to plan. The possibility of calculating the profitability of investments is essential for any long-term planning. If the costs of taxes are very difficult, or impossible, to predict, long-term planning is impossible, and, logically, this will stimulate a more short-sighted behavior, which is exactly the opposite of

[30] All figures given in roubles refer to the situation before the currency reform in January 1998.

what is badly needed in Tomsk (and in other Russian forest regions). Thus, to the extent that regional authorities can influence taxes they should strive to make the system simple and transparent.[31]

The second problem of the taxation system, directly affecting the performance of the forest sector, is that it promotes political intervention, rent seeking, and other types of behavior, which are counterproductive for the development towards a market economy. As a rule, enterprises, especially large ones, negotiate with the authorities in order to be exempted from particular taxes and fees. As a result of such deliberations taxation arrears might be "traded" for shares, thus, in effect, making the regional administration a joint owner of the enterprise. This causes a counter-current of de-privatization and a politicization of the forest sector, while, at the same time, the political rhetoric is full of statements regarding the desirability of market solutions. This problem has also to do with how the forest sector in Tomsk is organized. The Union of Forest Industrialists is the most powerful lobbying group. Being composed of trade union committees, public authorities, and enterprises the Union has a corporativistic character. Clearly, the present organization reflects the old Soviet type of network composed of directors of forest enterprises and official authorities. Such a configuration might be conducive to the appropriation of privileges from the political-administrative system but hardly for the establishment of free trade and independent firms. A reasonable taxation system would reduce this problem.

Weird Pricing – the Example of Transportation

In interviews with representatives of forest enterprises transportation costs are mentioned as a great problem. One of the larger forest industries in the region can serve as an example. The plant produces 100,000 m^3 of board per year. In 1980–1991, there was an increase in output volume with a peak in 1985 of 126,000 m^3. In 1990, total production of board in Siberia and the Far East amounted to 940,000 m^3. Today, total production is only 150,000 m^3. The reasons for the decline in the Tomsk plant are numerous but related: 1) shortage of raw material; 2) problems at the chemical plant which provides chemicals necessary for the board production; 3) the "general economic situation" making it difficult to sell the products at reasonable prices. In total, the plant has debts of about 9 billion roubles. According to the management of the plant, foreign companies want to buy their products, but if the price should cover actual production costs the products would be 20% more expensive than if they were bought from European companies (US$ 130/m^3 in Europe, 180/m^3 in the Tomsk plant). The average monthly wage in the Tomsk plant is US$ 200, but taxes, energy and transportation costs are regarded as the main factors accounting for the relatively high price.

[31] Such efforts are currently going on in many Russian regions: "Saratov Oblast wants to replace the six land taxes in the current draft federal tax code with a single tax. Both systems seek to collect about 40,000 new rubles ($7,000) per hectare of land each year for a total of about 360 million new rubles ($60 million) under the unified tax system, or 320 million new rubles ($53 million) under the old system. In 1996, the tax service only collected 150 million new rubles because farmers did not have cash to pay their taxes. Advocates of the new system say its simplicity will make it easier to collect taxes and stimulate more efficient use of land. The Finance Ministry is opposed because it wants a consistent tax code throughout the country. However, Agriculture Minister Viktor Khlystun and Yeltsin both support the introduction of the single tax." (*Kommersant Daily*, 13 February, in IEWS Russian Regional Report, Internet Edition, Vol. 3, No. 7, 19 February 1998.)

There are good transport possibilities via the River Tom, by railroads and lorries. The plant purchases its wood from a place some 300 km. away, and pays 50,000 roubles/m^3. However, transportation cost is 150,000 roubles. The plant is constructed for receiving wood by railway, tracks go directly onto the premises, unloading facilities for railway cargo exist, etc. However, transporting 50 m^3 of wood by train today will cost 1.2 million roubles while the same amount transported by lorry would cost 0.8 million roubles! As a consequence of this situation transportation costs constitute a substantial share of the product price. At the same time, however, at least on paper, there is a system of price reductions for different kinds of railway transports practiced by the Railway Ministry (*MPS*) which is supposed to stimulate the export of raw materials.

While forest products prices in Russia have increased by a factor of 4,732 between 1990 and 1997, railway tariffs have increased by a factor of 20,917 (Nilsson & Shvidenko, 1997:26). Analyses of Finnish wood imports from north-west Russia reveal that the Russian wood in most cases is not significantly cheaper for the Finnish end user (Strakhov *et. al.*, 1996:110). Taking the relatively long distances in Tomsk into account, both to the markets and from forested areas to processing industries, it seems unavoidable that transportation costs would be a major problem. We should also keep in mind what was demonstrated in Chapter 2, namely, that the practice of harvesting along major transportation lines has created an increased need for road (or railway) construction to more remote areas of the region. This will further increase costs of transportation and, accordingly, the price of wood.

In order to overcome the problems encountered in the board plant its management wants to establish a specific harvesting unit inside the firm. Presumably, this would decrease the costs for raw materials by 30–40%, not only because taxes will be lower but also because transports will be cheaper. It is obvious that even if this solution is rational in the current situation it is being provoked by a weird institutional system and not being based on long-term economic reasoning. Today, many western forest industries get rid of their harvesting capacity. By buying these services from external enterprises the industries do not have to defray the cost for the renewal of machinery, they can select the cheapest provider, and so forth.

There are two alternatives for the authorities. The first would be to deliberately reduce tariffs and transportation taxes on river and railway transports. This would withdraw income for the railway company and from the regional budget, but, on the other hand, there are also unavoidable costs for maintaining an underutilized transportation system, especially since its workforce have few alternative employment opportunities. The second alternative is to make the transport sector more efficient, to invest, reorganize, and to increase competition. This latter alternative is the one suggested by most scholars and consultants who have analyzed the Russian forest sector (see e.g. World Bank, 1997). However, given the described institutional "dead-lock" of the forest sector, both types of solution will cause problems in other parts of the sector. Breaking the "dead-lock" should be a major goal. No one benefits from a pricing scheme that makes Siberian wood unnecessarily expensive for the end user.[32]

[32] Sometimes one can hear the opinion that the railway system "profits" from other sectors by "unfair" pricing, etc. The logic of this would be that the transport sector should be very prosperous, which is not the case. This sector is as problem ridden as many other sectors of the new Russian economy. This is, once again, an illustration of the nested character of the institutional aspects of the Russian forest sector.

Managerial Adaptation to Poor Market Mechanisms

As was described in the previous section one way for enterprises to cope with increasing costs is to acquire control over different functions outside their normal activities, such as timber harvesting, transport, etc.

The logic would be the following: The board plant in our example is part of a process that can be seen as a sequence of activities from the forest owner to the end user. Every step can be characterized as an exchange situation that is associated with specific *transaction costs* (cf. Figure 5:2). For example, the managers of the board plant have to spend much of their time and resources in negotiating and contracting with providers of wood. The same logic applies to the other actors in the chain; harvesting companies negotiate with the forest owners (*leskhozy*), transportation companies with the industries, and so forth. All these activities consume resources that presumably could be used alternatively. The board plant holds a position toward the end of this chain. In the present situation of unclear property rights, *ad hoc* rules, weird transport pricing, etc., the plant, and eventually the end user, has to bear the costs for all these transactions. Due to the inefficient market mechanism, such an integration "backwards" along the chain might be a rational decision. In this way the managers of the plant may gain a better control of the transactions and as a consequence reduce the total costs. It must be emphasized, however, that this "solution" is triggered by an absence of vital markets for forest products. Under other economic circumstances, however, such an integration may even raise both transaction and production costs.

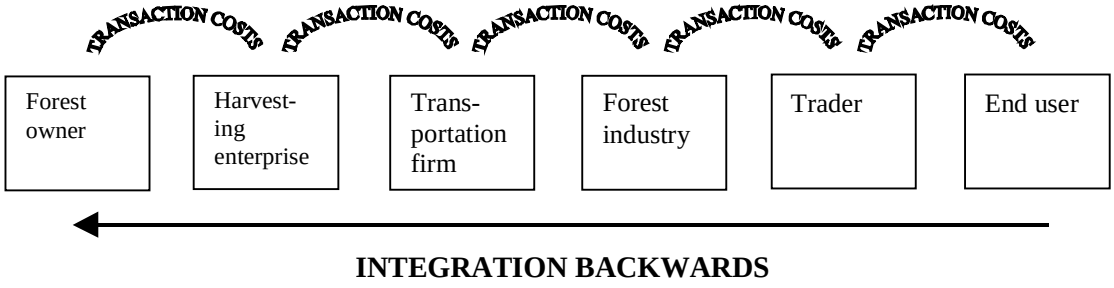


Figure 5:2. Integration in the forest-to-market chain

This is a good example of the fact that the concept of property rights are not the same as ownership but rather has to do with how actors define their relations to one another and to the resource in question. "Property rights are the relations among individuals that arise from the existence of scarce goods and pertain to their use" (Pejovich, 1998:57). The economic relevance of property rights depends on how well these rights are recognized and enforced in society. How well a single actor, like the board plant, will manage the use of resources depends on the amount of control, external as well as internal, that the actor can execute.

> *External control* depends on the property rights of an actor or, in other words, on how his or her institutional environment – constitutions, statutes, regulations, norms, enforcement, and sanctions – constrains and directs both the actor in question and outsiders. *Internal control* is established by the actors themselves through various investments aimed at gaining control over scarce resources, involving monitoring, fencing, hiring, private guards, checking reputations, and other measures.

> The term *transaction costs* refers to an actors' opportunity cost of establishing and maintaining internal control of resources. (Eggertsson, 1996:8)

We have already demonstrated that the possibilities of executing external control in the forest sector are hampered by a number of severe problems that affect all players in the sector. For example, the existence of specific norms or constitutional ambiguities are difficult for a singe industry, like the board plant, to alter. However, in case of an integration backwards, the enterprise increases its abilities to execute internal control, as defined above. After the integration the opportunity costs – these reflect the value of what has to be given up to "pay" for the control – will be lower compared to a situation with lots of independent companies to handle.

To sum up, the behavior of the board plant fits very well into established theory of property rights, but, at the same time, this example clearly demonstrates the dimensions of the institutional shortcomings in contemporary Russia, e.g., a general inability to take advantage of the division of labor and specialization in modern society.

Transparency of Rules and the Problem of Predictability

One fact that bothers forest enterprises are the inconsistencies in the formal juridical framework that applies to the forest sector. The major legal contradiction that indirectly affects the enterprises is the one between the constitution and its subsequent legislation. One example is the paragraph in the constitution stating that the Russian forests are owned by the Russian Federation and its "subjects" (Article 72). In reality this means that there is no single owner of the resource (Petrov, 1997). This would have been acceptable if one could still regard the whole nation as "one big family," like during Soviet times. Now, however, there is a strong desire to increase regions' scope for action. Another source of confusion is Article 9 of the constitution (and Article 212 in The Civil Code of the Russian Federation) stating that natural resources can be in different kinds of ownership at the same time as the Forest code omits this possibility. Nevertheless, some regions (e.g., the Karelian Republic) have enacted their own rules allowing private ownership.[33]

Since the situation is unclear, regional authorities might have opportunities to advance their position towards the center. This is also done, but not so clearly in Tomsk.[34] As is

[33] "The Federation Council failed to override Yeltsin's veto of the land code on 18 February [1998]. The decision de facto allows the purchase and sale of land in Russia. Although there is no federal legislation on the issue, the Constitution expressly permits it. The State Duma remains opposed to land sales, overriding the veto last October, while Yeltsin strongly supports them. In the Federation Council, 67 members voted to override, while 70 opposed the motion. In the debate, Saratov Governor Dmirty Ayatskov strongly supported land sales as the only way to help the peasants, while Krasnodar Governor Nikolai Kondratenko complained that 'Jews and Armenians' were buying land in his krai rather than 'Russians'. Samara and Tatarstan are quickly moving toward adopting their own regional land codes to fill the federal vacuum." (*Russkii Telegraf* as reported in *IEWS Russian Regional Report*, Internet Edition, Vol. 3, No. 7, 19 February 1998).

[34] Many international organizations work directly with the regions. Some of them, for example the USAID supported study conducted by the Center for International Environmental Law (Teets & Saladin, 1996), are even involved in the process of drafting new regional codes. During the conference "Dialogue on Sustainable Development of the Russian Forest Sector" organized by IIASA in Moscow in November 1996, such efforts were heavily condemned, as being "illegal," by representatives of the central Federal Forest Service. The comprehensive OECD project recently conducted in Tomsk can also be regarded as

the case in forestry, measures regarding environmental issues can also be decided at the regional level if there are no rules at the federal level which govern the topic. Rules crafted at the regional level must be enacted at the federal. However, there are about 400 groups of decisions related to environmental issues. The *oblast* is trying to work out its own policies.[35] One example is the agreement that the Department of Environment in Tomsk regional administration has made with the military authorities regarding the dumping of rocket fuel. There is also an agreement with the oil and gas enterprises forcing them to consult the Department before starting new operations. In practice, however, the Department of the Environment can hardly stop or change, for example, an harvesting operation. It can only affect undertakings related to floating which is regarded as an environmental issue.

There are also other sources of confusion and instability in the system of rules that affects the forest sector. The 256 changes of the taxation rules, already mentioned, is one example, retroactive law-making is another. As for forestry there is a gulf between the existing body of laws and what is actually implemented by the Federal Forest Service. This is mainly due to a lack of resources for monitoring and enforcement. These problems are also recognized in the regional program for the forest sector approved by the State Duma of Tomsk on January 28, 1997. The program (Tomsk Oblast, 1997a:21-22) lists a number of "contradictions," such as those:

> between the increasingly aggravated social, environmental and economic problems and the absence of elementary efforts to monitor and analyze the problems of the forest sector, the absence of organization and coordination between the agents in the forest activity to stimulate a solution to these problems
>
> […]
>
> between the insufficient and (or) contradicting existing statistical data, characterizing the situation and the development of the forest complex and the demands for developing and implementing a unified forest policy for Tomsk oblast
>
> […]
>
> between the principally new and specific social, environmental and economic situation in the forest industrial complex and the outmoded normative-legislative base of forestry and logging, the legislation concerning employment and taxation, which do not take the existing specifics of the forest complex into account
>
> […]
>
> the practical absence of a normative-legislative base for forest utilization on the federal and regional levels corresponding to current demands, the obvious insufficiency of the legislation in the sphere of employment and taxation.

These inconsistencies and a number of similar ambiguities leave the field open for discretion, for *ad hoc* decisions, and inequity. If formal rules are numerous and contradicting, which ones should be used and how would the forest enterprises know which ones to follow? This lack of transparency of rules, contradictions between political administrative levels, unclear property rights, and lack of means (or intention) for imple-

an effort that appreciates the relative sovereignty of the regions. (Reports from the OECD study can be found on the internet, see URL: http://www.oecd.org/sge/ccnm/programs/tomsk/.)

[35] Interview with Mr. Ravil T. Tukhvatulin, Deputy Head, Department of the Environment, Tomsk Region Administration, 13 September 1997.

menting the rules and decisions actually taken, is a more serious problem than might immediately be realized.[36] It affects predictability.

The political and economic history teaches a paradoxical lesson, namely, that dynamic business loves stability! Why is that? In a market economy firms and other actors in, for example, the forest sector, are used to calculate the risks of performing particular economic actions. One difference between the concepts of uncertainty and risk is that risks can be calculated and be insured against. While commercial risks can be traded and shared, for instance in financial markets, etc., "political" risks are uninsurable. These are the risks associated with qualities of the political system. Eliasson *et al.*, (1994:13 ff.) distinguish between three types of political risks: collapse of the entire political system, breakdown of the economy, and unpredictable behavior by governmental authorities.

Although these three types of political risks are interdependent, it is mainly the third type of risk that bothers us here. Political risks "are 'systemic' in the sense that rules governing economic transactions can be abolished, or changed, without enforcement possibilities" (Eliasson *et al.*, 1994:15). However, entrepreneurial behavior and long-term financial commitments in the Tomsk forest sector would require that enterprises mainly should deal with business risks, those emanating from mistaken decisions, bad calculations, misjudgments, and so forth. Therefore, "it is the *task of political authorities to minimize or eliminate political risks as a means of achieving economic growth*" (Eliasson, *et al.*, 1994:13 emphasis in original).[37]

Thus, it can be concluded that as long as there exists a confusing or contradicting system of regulation, *ad hoc* decision making, intermittent enforcement of rules, and other expressions of unpredictability, in the forest sector of Tomsk its problems will continue. Therefore, the regional authorities and others should by all democratic means promote institutional stability and, thus, transparency of rules, which in the end would facilitate predictability. In fact, it can be argued that sometimes it would be better to have inappropriate but stable and enforceable rules rather than rules which are nicely tailored but are often changed. Stupid rules can perhaps be evaded, but in a situation where all rules are in a state of disorder such possibilities are limited as well.

Problems Related to the Organization of the Forest Sector

The last issue to be discussed in the present context is to what extent the current way of organizing the forest sector has something to do with the identified problems and their

[36] This is a general problem in Russia: "In assessing the results of 1997, Irina Khakamada, the chairperson of the Committee to Support Small Business, charged that most of Russia's declarations of support for small businesses had not been implemented. The state program only received 53% of the funds that had been budgeted for its activity. First Deputy Prime Minister Boris Nemtsov stressed the need for regional governments to develop plans to employ greater numbers of people in small businesses. Now 13 million people work in the small business sector, producing 12% of Russia's GDP. Nemtsov wants the figure to rise to 30 million people who produce 25% of GDP." (*Russkii Telegraf*, 17 February, as reported in *IEWS Russian Regional Report*, Internet Edition, Vol. 3, No. 7, 19 February 1998).

[37] The empirical reality behind this statement contradicts a widespread idea that the introduction of a market economy would automatically mean the same as having a passive government. This is discussed in Hodgson (1989). Se also Eggertsson (1990:59 ff.).

solutions. However, we must distinguish between problems (and their solutions) which have been imposed upon the region from the outside and those that have emerged at the *oblast* level.

Problems Imposed from the Outside

As was described in Chapter 4, many institutional features of the Tomsk forest sector have their origin at the federal level. The constitution of the Russian federation as well as the civil and the forest codes designate the jurisdiction of authorities dealing with the forest sector. Some rules are not crafted to suit local circumstances. The national cedar ban of 1989 is one example. This ban forbids all harvesting of cedar in forest stands with more than 25% of cedar. We have already seen that Tomsk is rich in cedar and that the region therefore possesses a valuable, but unexploitable, resource. Moreover, since the 25% rule in fact allows harvesting of secondary cedar stands the rule itself undermines the regeneration of the forests. In Tomsk this has led to a situation with huge areas of dead or dying cedar stands while, simultaneously, there are no secondary stands.[38] The devastation of cedar forests is not as severe in Tomsk as it is in the Far East (where a harvest ban might have been an adequate measure) and most local actors think that the policy ought to be changed and that such a change would be beneficial for the condition of the cedar forests as well as for the regional economy.

The cedar ban is an illustration of problems associated with an institutional framework unable to adjust to local circumstances. As earlier emphasized, another problem that is difficult for the region to change is the fact that some jurisdictions overlap. In addition, the rule of "dual subordination" contributes to the incoherence of the institutional system. However, all these features are the results of decisions on political administrative levels beyond the influence of the *oblast*.

Problems That Have Emerged on the *Oblast* Level

Not all institutional problems are, however, imposed from the outside. An analysis of the organization charts of the forest sector (cf. Chapter 4 and appendices) combined with the interview answers given by enterprise representatives in the region gives the picture of a highly centralized system with many information barriers between various organizational levels. Many respondents to our interviews call for better "coordination" of raw material supply, pricing, and trade. In the regional forest program it is argued that the hasty and (practically) all-encompassing privatization that took place in the forest sector – a sector which was characterized by "state subsidized planned unprofitability" – resulted in a "loss of administrative management levers." All took place in a situation where no market coordination mechanisms were yet in place and led to what is said to have been a "complete destruction of state linkages (economic, technological, co-operational, informational) where owners of majority shares of stock often neither can invest nor have a strategy and tactics for a stabilization and development of their enterprises" (Tomsk Oblast, 1997a:22).

[38] The whole history of the attempts to stop the devastation of Russia's cedar forests is a story of political administrative failure and a demonstration of the shortcomings of centralized planning. This issue is described in detail in Sheingauz *et al.* (1995:19-20). See also Obersteiner (1997:10 ff.).

Can the perceived loss of coordination and steering capability be reestablished with the help of the current organization of the forest sector in Tomsk? We have already discussed the problems associated with the corporativistic character of the Union of Forest Industrialists and its central position in the sector, the negotiated character of the economy, the problems with predictability, and so forth. Looking at a single enterprise outside the Union, what capabilities does such an enterprise have to gather information about markets, about the availability of raw material, prices, etc? Few firms are members of the Union, especially smaller firms have found no reason to become so. Although these enterprises share many of the same problems as those perceived by larger enterprises (regarding taxes, credits, transportation costs, prospects for export, etc.) they operate under a somewhat different logic. The "organizing" of trade may serve as an illustration.

The Organizing of Trade

In Tomsk, around 60-70% of the commercial wood is marketed and sold locally. In general, only limited information on markets is available to enterprises, mostly due to the absence or understaffing of marketing departments (Obersteriner, 1997:36 ff.). Almost all exports from Tomsk is organized via the Union of Forest Industrialists but for "far abroad countries" (such as Japan) the Union uses Moscow based brokers. These brokers, in turn, are members of other central "unions," such as the "Union of Timber Exporters" or the "Union of Timber Industrialists." Established in 1992 by ministry insiders, these organizations have the same corporativistic character as the Tomsk union. Lehmbruch (1997) suggests that these organizations might have been established more as a result of "old bureaucrats frantically trying to create new organizational roofs for themselves" (p. 35) rather than as a result of commercial needs. By its very nature, this way of organizing trade preserves information barriers and, consequently, market competence can only accumulate slowly in the region. Furthermore, every step between the enterprise and the foreign buyer costs money and thus leaves less to the selling enterprise.

Small independent enterprises are in a different situation. Although some of them export their produce to the "near abroad" most operate on an extended local market. Dealing directly with their customers and thus relying less on "administratively" decided prices, they presumably benefit more from trade than other enterprises. However, these enterprises are not included in the coordination efforts and price agreements made by the Union. Nor do they expect to benefit from "state orders," "guarantee payments," "special tax exemptions," etc. Hence, they have to rely on their own ideas of how to become prosperous. Through their own means they must also try to generate a "social capital" that will make their future interactions smooth and cost effective. This capital is based upon deliberate confidence-building; prompt payments, non-violation of contracts, mutual understanding, and commercial networking.

The point made here is that, in principle, the type of administrative coordination-building that has been described might in fact, if it is kept as a permanent mode of operation, be counterproductive for the development towards a more market oriented forest sector. Markets and hierarchies are two opposite ways of coordinating actors and in a market economy the price mechanism has an indispensable coordination function. However, since one cannot expect the transfer to a market economy to happen instantly, we should not disregard the efforts made by the authorities to reorganize the forest sec-

tor in Tomsk. Much of the old structure is still deciding the scope for action for the "new" enterprises and independent actions might sometimes be almost impossible. For example, the almost total absence of wholesale trading enterprises (*optovaia torgovlia*) in Tomsk means that one important coordinating feature is totally missing. Thus, even on the local market producing enterprises often have to deal directly with end users. Another example is the general shortage of capital and the wide-spread system of barter which has resulted in a non-monetary type of trade. The problems of transportation, already described, is a third hurdle for all businesses, small as well as large, the merging of industries with the social sector is a another type of obstacle, and so on.

However, if decision makers do believe that small and middle sized enterprises have the qualities we have indicated (see also Radaev, 1997) adequate policies for stimulating them should be created. Building new administrative "monsters" in which every conceivable social interest is represented would rather increase the political risks for enterprises and thus undermine the possibilities of establishing trust and legitimacy in the forest sector.

Trust and Legitimacy as an Institutional Foundation

Why is trust and legitimacy so essential for the forest sector? The answer is simple. Trust makes transactions cheap and legitimacy increases the likelihood of fulfillment of duties and compliance with rules and regulations. Business contacts characterized by trust means, for example, that the seller knows that he will get paid once he has delivered his timber and, simultaneously, the buyer knows that he will actually receive the agreed amount and quality of wood. Thus, as a result of previous relations a "social capital" might be built up and this makes transactions easy and comparatively cheap.

Trust comes from a record of past relations informing actors how people "normally behave." If these records are negative, business will suffer, which is precisely what has happened in the Tomsk forest sector. In our interviews representatives of forest enterprises complain about violation of agreements and especially about payment failures. However, in contrast to larger enterprises, some representatives of the small independent enterprises who were interviewed emphasize that they do not trade with firms showing bad records of payment. The existence of this possibility (of non-interaction) has the general effect of fostering trust among parties. This can be compared to the larger and more "integrated" enterprises which simply cannot terminate their relations, even if their counterparts show bad records of payment. For instance, such firms may be heavily involved in and tied to social commitments, or they may play a crucial role for the very existence of whole communities. It is this situation that has nourished barter based transactions.

Approximately 88% of the forest production in Tomsk is realized through barter with consequences for the debts of obligatory payments, such as taxes, and a criminalization of the sector (Tomsk Oblast, 1997a). In one of the larger forest processing enterprises in Tomsk only 10% of the turnover was realized in money. The barter system comprises a complicated weave of relations based on a "system of debts." For example, debts for energy might be paid for by furniture, which, in turn, is received as payment for board. Furniture might also be used as wage payments to employees who have not received their wages for a long time. Wage arrears could also be set off against rents for apartments in enterprise owned houses, etc. In order to make this system work "bills" or "promissory notes" (*vekseli*) have been introduced and these can be bought and sold.

Such bills are bought to a value lower than their nominal. Thus, we have a whole system of quasi money. As was said earlier, even tax debts are used in such trade and similar to the use of barter and bills such debts can be "exchanged" for shares in the debtor enterprise. Thus, the barter system creates an undercurrent of deprivatization. How strong this undercurrent really is, is hard to assess.

Managers stress that the barter system is very time consuming. Thus, here we have a typical case of inflated transaction costs. The whole institutional configuration of the forest sector (with its family-like links, formal and informal, between authorities and enterprises) contributes to the preservation of the inefficient barter system. The barter system benefits from the general lack of transparency and predictability in the sector. Legitimacy is affected in the sense that all actors *know* – their "social expectations" are such – that negotiations, deliberations and "special deals" are always possible alternatives to pure commercial solutions. A rhetoric question might end this discussion: Under circumstances, such as those just described, why should people pay taxes and obey other types of authoritative rules?

Summary

- The institutional shortcomings of the forest sector have a nested character, in which different features are reinforcing each other. This can be understood as an institutional deadlock that must be opened up.
- The forest sector is characterized by a notable "personnel union," something that raises questions about the possibilities for a successful restructuring of the sector. Actors who are supposed to lead the restructuring may, in fact, constitute hurdles for its realization.
- The existing ambiguities in the legislation, in combination with the high levels of taxes, weird pricing and an absence of adequate transportation policies severely affect the enterprises' ability to benefit from and to become successful actors in the still rudimentary markets.
- Due to a general lack of transparency in the forest sector political risks are significant. This creates a hesitant behavior among foreign as well as domestic investors.
- The forest sector is organized in a way that promotes a type of enterprise behavior that aims at expanding their control over actors adjacent to their own position in the forest-to-market chain. This has to do with uncertain property rights and a general inability to capture the benefits of division of labor and specialization.

6. Conclusion and Recommendations

We started this report by making two statements. The first was that the restructuring of the Russian economy could hardly be successful without fully integrating the forest sector in the process. The analysis of the situation in the Russian economy as reflected in the forest sector supports this hypothesis. The second statement was that the abundant Russian forests cannot be regarded as a "resource" in an economic sense without the establishment of a suitable institutional framework. Our analysis of the forest sector in Tomsk has clearly illustrated this statement. Despite the existence of abundant forests the actors in the sector have great difficulties in realizing its potential resource value.

In order to make it possible to assess how close to market conditions the forest sector has moved eight broad criteria were launched. To what extent does the forest sector in Tomsk meet these criteria?

- ***Constitutional rules are acknowledged and transparent.***

A number of constitutional problems concern the forest sector. As we have discussed in Chapter 5 some rules of the Russian constitution are contradictory. Consequently, the constitution itself is a source of uncertainty and confusion. Furthermore, some of the subsequent rules add more confusion to the picture. The constitution might be acknowledged but different actors emphasize different qualities of it. For example, those who plead for a privatization of the forests as well as those who oppose such a policy can find support for their views in the constitution.

- ***The structure of property rights is settled and well defined, i.e., private actors can acquire property or at least get the right to utilize property for their own benefit.***

The property rights issue is not settled in Tomsk as it is not settled in most other parts of Russia. Two separate state "bodies," the Russian Federation and the regions, are the legal owners of the forests. These bodies often pursue different goals. In Tomsk no private actors can acquire forest lands. At the same time, however, this possibility seems to exist in other parts of the federation. Even if land acquisition is not allowed, private actors do have the right to utilize forest lands. However there are many barriers to overcome. Certain users enjoy special privileges, information is scarce and often of bad quality. Consequently, no foreign investors have acquired any long-term leasing contracts in Tomsk.

It may also be questioned whether all recently privatized *lespromkhozy*, for example, really fulfill the criteria of being "private." Nevertheless it can be concluded that private actors today do have the right to utilize property for their own benefit even if these

rights are circumvented through excessive regulations, of which inappropriate harvesting rules is one example and taxation rules another.

- ***Rules and regulations from official authorities are regarded as legitimate, and apply equally to similar actors.***

This problem has been discussed in some detail in the present report and our conclusion is that the current institutional configuration, understood as rules-in-use, does not secure an equal treatment of all actors. Negotiations and special agreements with the authorities are a legacy from the past and are still making a clear impact on business behavior. Moreover, our findings do not support the conclusion that official rules are regarded as legitimate. Taxation is the most apparent example of an area of regulation for which there is poor legitimacy and a low degree of compliance.

- ***The market decides prices of property and goods.***

Market mechanisms are weak and the price of forest products neither reflects costs of production nor actual demand. Taking the wide-spread barter system and the existence of its quasi-money into account it is easily realized that the pricing of many forest products is far from decided in genuinely competitive markets. However, we should acknowledge the fact that many enterprises both inside and outside the Union of Forest Industrialists are currently selling their products in foreign markets at market set prices. Thus, we can conclude that the price mechanism works in certain market segments, while it is still weak in other segments, especially in a large part of the domestic market where behavior is constrained by political administrative interferences.

- ***Decision-making regarding collective choice and operational rules is decentralized.***

Today, a significant part of the decision making affecting the forest sector is actually done in enterprises and at the *oblast* level. Thus, one could claim that decision making has been decentralized. The creation of the regional forest program and the rule-making regarding leasing and stumpage fees are two examples of such decentralized decision making. A similar logic applies to environmental regulations; regional authorities can make rules if decisions of federal law allow them to do so or if such rules are absent.

However, in many respects the forest sector is still heavily centralized and there is virtually no popular participation in decision making affecting the development of the sector. As we have seen, the Federal Forest Service, which has a uniform administrative system all over Russia, even in detail regulates forest operations. The failure of the cedar ban is another example of the problems with this type of centralization.

It can also be concluded that the old patterns of centralization have reappeared. The structure and function of various “unions” and other Moscow based organizations dealing with timber exports, etc., supports this conclusion. However, like many other regions of the Russian Federation (Tolz & Busygina, 1997) Tomsk *Oblast* is advancing the frontier in its interactions with the center, thereby forcing decision making to become more decentralized. Great victories have not yet been won, but there is a clear

tendency towards the introduction of more decentralized political administrative procedures.

- ***Private investors can realize the returns on their investments.***

As was emphasized in the previous chapter the forest sector in Tomsk is to some extent "translucent" but far from "transparent" and this fact constitutes a considerable political risk for actors in the sector. Private investors may be able to realize the returns of their investments, but since political risks are relatively high, they have very limited possibilities to insure themselves for business failures. The conclusion is that the political authorities have not yet succeeded to "minimize or eliminate political risks as a means of achieving economic growth." In principle, private investors should be able to realize the returns on their investments but the generally low profitability in the Tomsk forest sector indicates that the likelihood that they will actually enter the market and do so is low.

- ***Rules are enacted aimed at preventing the devastation of natural resources.***

We have seen how the institutional features of the legacy of overuse still govern many activities in the forest sector of Tomsk and how the behavior of actors in the sector affects sustainability. Rules are, however, enacted to prevent devastation of the forests in the region. This is primarily done through the new forest code and its subsequent environmental legislation. Environmental groups and others argue that the new forest code is weakening the protection of the environment. For example, the clause forbidding timber operations in threatened and endangered habitats has been taken away in the new forest code of 1997. It is also obvious that the new forest code contradicts other environmental laws, such as the law on wildlife protection.[39] The basic problem, however, is not the actual wording of the rules and regulations but rather the lack of means for their implementation. This moves us to the last criterion.

- ***Legitimate authorities take measures against violations of rules.***

This criterion is somewhat ambiguous. Throughout the report we have referred to institutional arrangements composed of the rules that are used by the actors implying that one should concentrate on how people actually behave rather than on how they are supposed to behave. Rules-in-use are those rules that *are in fact sanctioned*; otherwise they would just be words on paper. Consequently, even "bad" rules and informal rules may be sanctioned. The rules of barter are one example of a system of rules that by no means is formally codified but which nevertheless is sanctioned.

[39] Environmental groups are very active in discussing Russian forestry and related topics. For example, independent "environmentalists" have formed a "Forest Club" consisting of a broad spectrum of groups but also bureaucracies, such as Greenpeace Russia, The Socio-Ecological Union, the Kola Center of Biodiversity, the International University of Ecology and Politology, and others. The Forest Club is currently running a campaign in the northern part of European Russia focussing on certification, the establishment of conservation areas, fund raising for local ENVOs, support of new technology, information to the Regional Forest Management, distribution of information from Sweden and Finland about forest maintenance practices and the moratorium on harvesting in certain forests that foreign timber buyers now support in Russian Karelia (interview with representatives of the Forest Club in Arkhangelsk, October 1997). For opinions about contradicting laws etc., see e.g. Olsson, 1997.

As for the sanctioning of rules of law applying to the Tomsk forest sector it is a well-known fact that violations of rules are common and tolerated. In the regional forest program it is stated that ecological aspects of the activity of the forest industrial complex cause "serious concerns," and that "serious violations of forest management rules are tolerated" in the exploitation of harvesting sites (Tomsk Oblast, 1997a:20). Two causes for this accepting attitude may be envisaged. The first is the general economic situation, which makes almost any commercial undertaking better than the alternative of no activity. The second is the poor funding of the Federal Forest Service which affects its capabilities of monitoring and sanctioning. The new financial solution giving *leskhozy* more of the revenue from forest operations will presumably improve the situation.

Finally, some words about the sanctioning of "bad" or counterproductive rules. The rules of harvesting that in practice prevent the introduction of a new and environmentally friendly technology is one example of sanctioning of the "wrong" rules. The weird taxation system might serve as another example of this kind of mistaken rule sanctioning. Thus, the problem does not only concern the sanctioning capability but also the rules themselves. The general conclusion is that in many important respects the authorities have to consider a whole range of problems whenever they want to take measures against the violation of rules.

Recommendations

On the basis of the wide spectrum of problems that has been described in this report and the conclusions we have drawn from our analysis, what could be done in Tomsk in order to make institutional arrangements more conducive for a market oriented forest sector?

It should be noted that several international organizations, such as the World Bank, OECD, IIASA, IUFRO, and others, working with the Russian forest sector and the situation in Russia in general, have already made numerous valuable suggestions on how to make the Russian forest sector sustainable. In addition, regional stakeholders in Tomsk have started activities and produced more specific suggestions aimed at restructuring the regional forest sector in order to make it more efficient. Many of the efforts made by regional authorities and others are regarded as positive and important. For example, the development of a higher forestry education is one important step that has recently been taken. The recent reorganization of the Union of Forest Industrialists, formally separating it more clearly from the state, is an example of another serious effort to meet the existing problems. The analyses made in the Tomsk *Oblast* forest program can also be regarded as a good foundation for further developments.

One problem with many of the proposed measures for improving the situation is that they *presuppose the existence of an already well functioning institutional framework*. This is the crucial problem. In order to create such a well functioning institutional framework we suggest the following:

- The overall task of political authorities in Tomsk should be to minimize or eliminate political risks as a means of achieving economic growth. This duty has an array of consequences.
- Regional authorities and others should promote institutional stability and, thus, transparency of rules which will subsequently increase predictability.

- Rules should be simplified and contradictions between various rules should, if possible, be eliminated.
- When rules are in a flux domains of uncertainty might be occupied by deliberate decision making. Regional authorities should try to advance their sphere of influence relative to the center (Moscow). All possibilities should be explored in order to find regional and local options for a sustainable forest management.
- Together with other actors regional authorities should develop programs in order to stop the deterioration of education and to increase the competence in the forest sector.
- Activities of independent actors should be encouraged and supported, thereby counteracting a further bureaucratization of the forest sector. The guiding principle should be a conscious promotion of a structure of actors who benefit from the existence of an open and transparent system of rules rather than from obscure informalities or even corruption. For example, programs deliberately aimed at stimulating the establishment and development of small and medium sized enterprises should be constructed, provision of economic guarantees should be considered as well as economic support of entrepreneurship.
- All private actors in the forest sector as well as the regional authorities must find ways of releasing industries from their social commitments. For example, the privatization of apartments should be increased and supported. The present situation is definitely a serious obstacle for attracting foreign investments.
- Finally, all concerned parties should try to find economic support for deliberate programs aimed at renovating apartment houses and public buildings. As a side effect this will increase the regional demand of forest products. In cooperation with Federal authorities representatives from the *oblast* should try to make the preservation of the unique areas of Siberian log houses in Tomsk a concern for the international community. Contacts with international organizations, such as Unesco, should be initiated.

The details on how these suggestions should be realized are up to the population of Tomsk and other stakeholders to decide. Hopefully, the elaboration of a forest policy for Tomsk will be accomplished through a series of “policy exercises” for which this report and other analyses of the forest sector may serve as a background.

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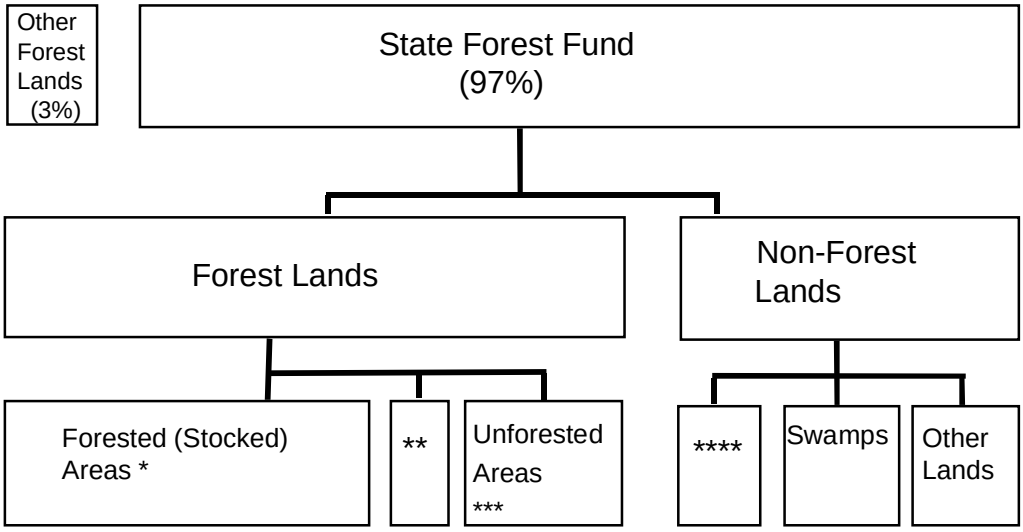
Appendices

Appendix 2:1



* Includes closed plantations

** Free-growing plantations & nurseries

*** Sparse forests, burned and dead stands, cutover areas, grassy glades

**** Croplands, grasslands, water, orchards & vineyards, roads, estates, sands, barrens, glaciers

Figure: Classification of forest land in Russia (Source: Schmidt, T. *et al.* (1998), p. 8.

Appendix 3:1

Table: Selected socioeconomic variables for Tomsk compared the average for the Russian federation and Siberia, 1993 and 1996.

	Russia	Tomsk	West Siberia	East Siberia	Far East
Income below subsistence, % of househ.	28	12	22	39	30
Share of non-state enterprises, % of all	91	80	85	82	79
Share of privatized apartments, % of all	32	25	38	32	28
State employees, % of all	28	35	33	27	31
Library attendants per 100 inhabitants	41	33	39	45	41
University students per 1,000 inhabitants	17	36	17	16	14
Female students per 1,000 inhabitants	9	16	9	8	8
Female students, % of all students	52	45	52	51	54
Number of students per lecturer	11	9	11	11	11
Researchers per 10,000 inhabitants	113	134	78	39	43
PhDs (Dr nauk) per 100,000 inhabitants	11	16	8	4	4
PhDs (Kand nauk) per 100,000 inhabitants	80	153	54	30	34
Inhabitants (100,000) per university	271	143	261	288	236
Savings mill. R. per 1,000 inhabitants	27	17	22	21	33
Alcohol consumption, liter per inhabitant	6.0	2.5	5.2	5.3	5.7
Private cars per 1,000 inhabitants	75	94	79	82	88
Housing space per inhabitant, m^2	12	12	11	11	10
Urban households with running water %	83	88	82	76	81
Rural households with running water %	30	32	34	13	25
Physicians per 10,000 inhabitants	45	56	45	43	50
Alcoholism patients per 100,000 inh.	1657	1560	1831	1486	1787
Drug addiction patients per 100,000 inh.	31	26	31	37	74
Cancer patients per 100,000 inhabitants	1209	1190	1069	815	775
Sick-days per 100 employees	903	932	931	897	1043
Practicers of sports per 1,000 inhabitants	77	73	81	97	76
No. of sport establishments per 10,000 inh.	14	12	14	17	12

Source: IIASA Russian Forest Study Database, Rows 1-4 from Bradshaw & Palacin, 1996.

Appendix 4:1

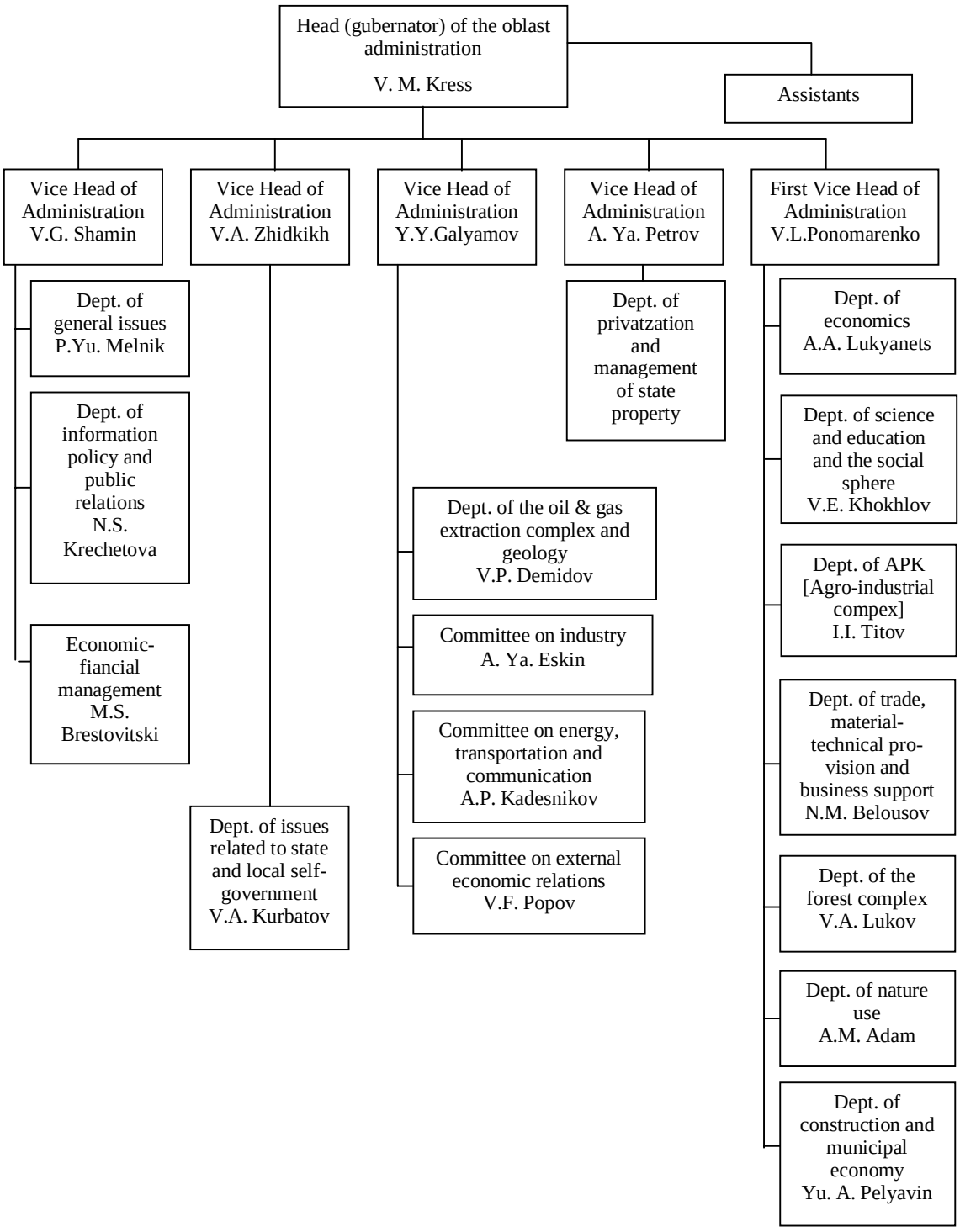


Figure: The Structure of the Administration of Tomsk Oblast. Source: Tomsk Oblast: Investment Passport (Assessment of the socio-economic development and investment climate), Tomsk regional administration, Tomsk, May 1996, p.11a.

Appendix 4:2

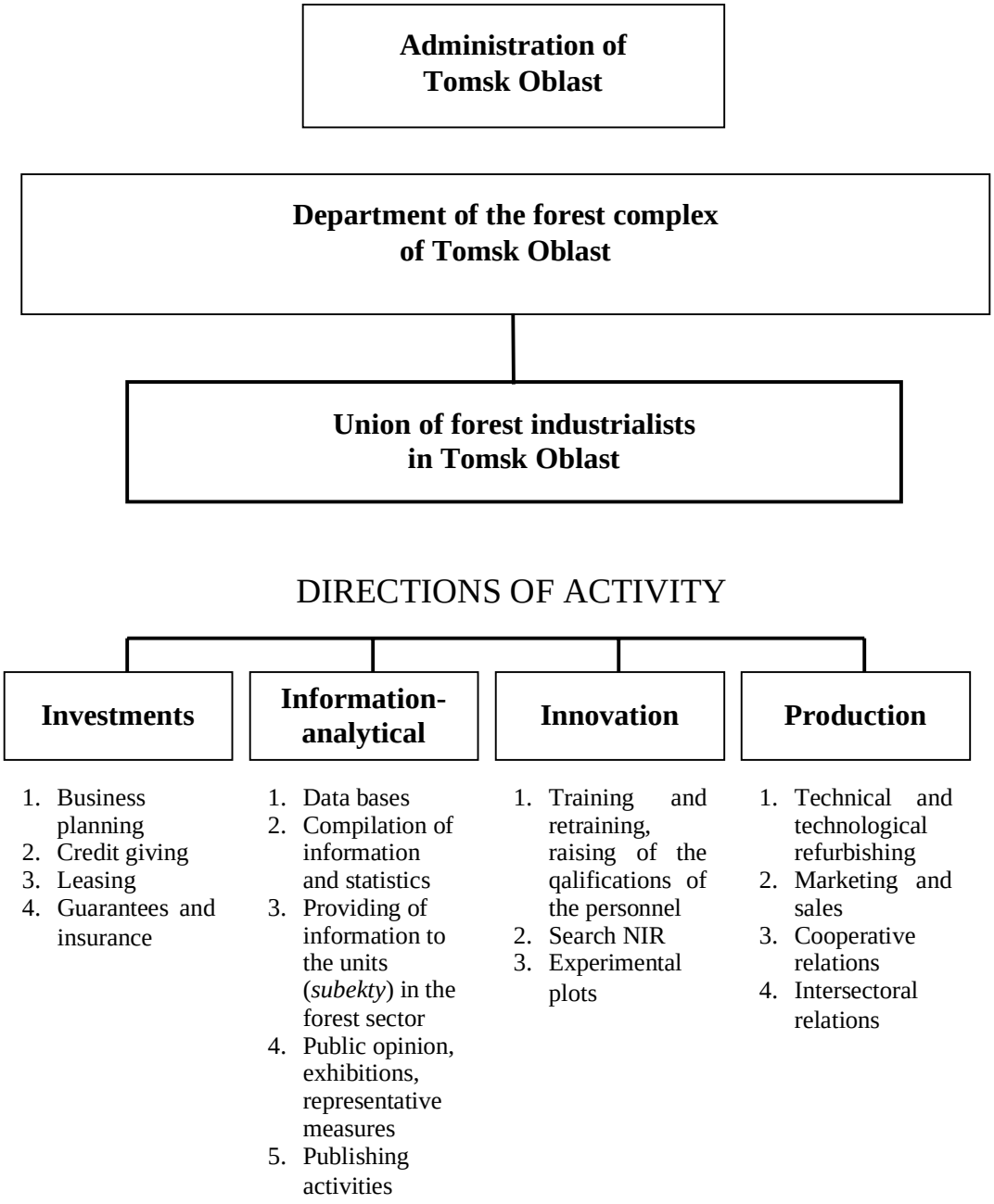


Figure: The direction of activities of the Tomsk Union of Forest Industrialists. (Source: Appendix to Lukov, V. (1997): "Information about the progress of the work with the program for reconstruction of the forest sector in Tomsk Oblast," Union of Forest Industrialists, Tomsk.)

Appendix 4:3

DIAGRAM OF THE RESTRUCTURING AND MANAGEMENT OF THE FOREST INDUSTRIAL COMPLEX IN TOMSK OBLAST

ADMINISTRATION OF TOMSK OBLAST

Department of the forest industrial complex of Tomsk Oblast

Tomsk forest management

UNION OF FOREST INDUSTRIALISTS IN TOMSK OBLAST

1. Asinovski LPK
- 1.1 Beregaevski LPKh
- 1.2 Orekhovski LPKh
- 1.3 Lesnoe prichulym'e
- 1.4 Chetski
- 1.5 Chernoyarski
- 1.6 ASKOM
- 1.7 The factory DVP
- 1.8 Asinovski LPKh
- 1.9 Kopylovski LPKh
- 1.10 Baturinski LPKh

2. Kargasokski LPK
- 2.1 Kargasok-Les
- 2.2 Dorozhnik
- 2.3 Narym-les
- 2.4 Ergai-les
- 2.5 Novosibirski LPK

3. Kolpashevski LPK
- 3.1 Novoselovski LK
- 3.2 Leskomtsentr
- 3.3 Ketski LPK
- 3.4 Tomlesprom

4. Tomski LPK
- 4.1 Aslanovski LPKh
- 4.2 Ulu-Yul-les
- 4.3 Saiginski LPKh
- 4.4 Tomski LPKh

5. Beloyarski LPK
- 5.1 Beloyarski LPK
- 5.2 Shimal

6. Kataiginski LPK
- 6.1 Kataiga-les
- 6.2 TKZ
- 6.3 Inguzetski LPKh

7. Molchanovski LPK
- 7.1 Mogochinski LPK
- 7.2 Narga-les
- 7.3 "Ob"

8. Ultom Ulu-Yul-les

9. Ketski LPP Orlovski LPKh

10. DSP Carbamide pitch factory Oblmezhkhozles Pesyanski LTKh

11. Match factory Orekhovo L. Prichulym'e Saiginskoe

12. Pencil factory L. Prichulym'e Beloyarski LPK

13. Furniture combine

14. Tomsk RMZ Asinovski TRZ

15. Torgovy komplex
- 15.1 Wholesale trade centre
- 15.2 Supermarket

Source: Lukov, V. "Spravka o khode raboty nad programmoi restrukturizatsii lesnogo kompleksa Tomskoi oblasti" (Survey on the progress in the work to implement the program of restructuring of the Tomsk forest complex), Tomsk: Dept. of the Forest Industrial Complex, Tomsk Regional Administration.

Appendix 4:4

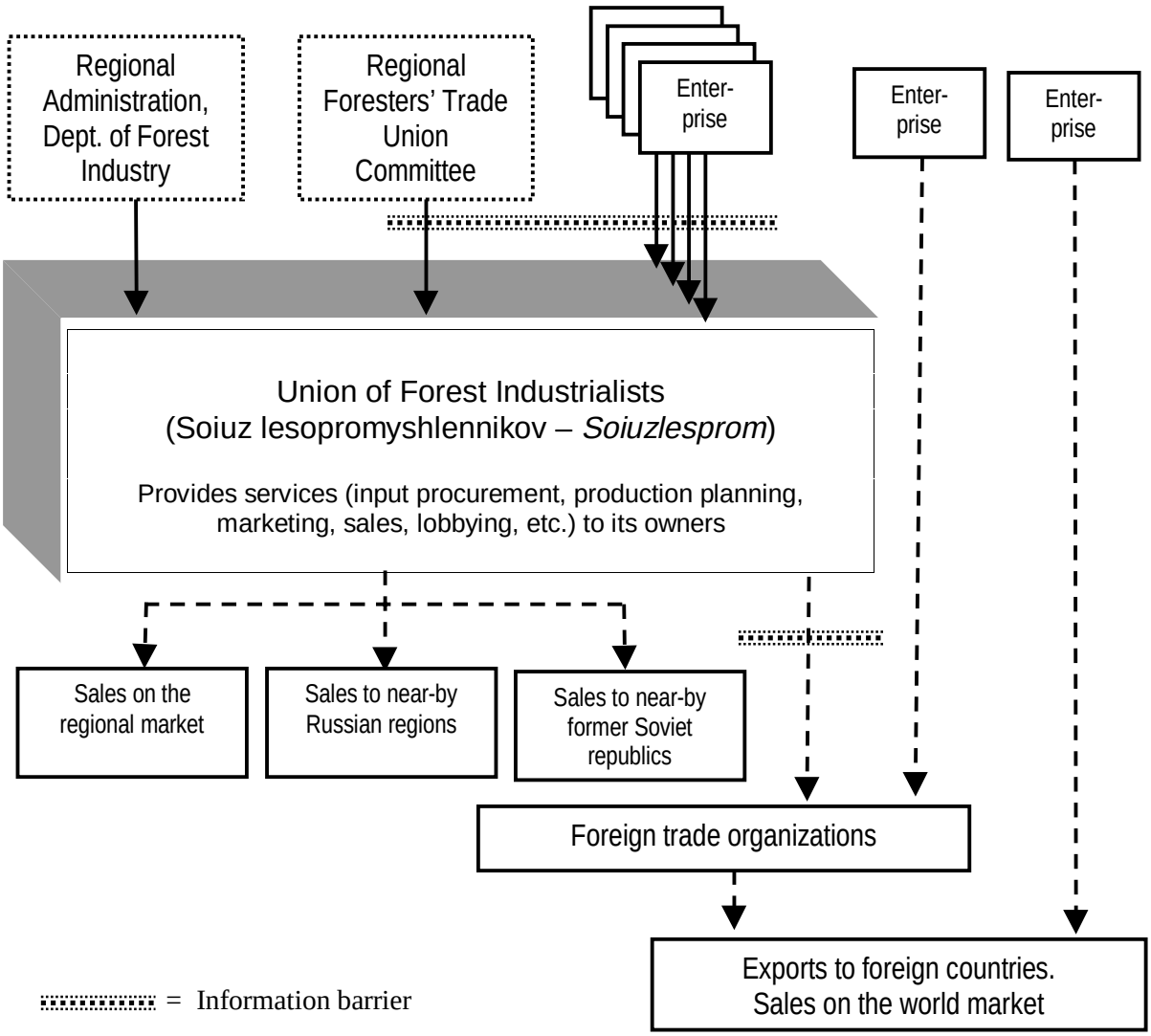


Figure: The Current Organizational Structure of the Tomsk Oblast Forest Sector