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

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Contents

Foreword

With this report on the forest sector institutions in Irkutsk Oblast the seventh study in a series of case studies that IIASA has initiated in different regions of the Russian Federation is completed. All of the studies have been published as IIASA Interim Reports (IR). The first study was conducted in Tomsk Oblast and was reported in Carlsson and Olsson (1998a), Carlsson and Olsson (1998b) and Carlsson, Lundgren and Olsson (1999). The second case study on the institutional framework of the forest sector in Arkhangelsk Oblast was reported in Carlsson *et al.* (1999). The third study on Khabarovsk Krai was published in Efremov *et al.* (1999). Reports of studies of the forest sector institutions in the Karelian Republic (Piipponen, 1999) as well as in the regions of Moscow (Kleinhof, Carlsson and Olsson, 1999), and Murmansk (Ivanova and Nygaard, 1999) have recently been published. The final study, on Krasnoyarsk Krai (Sokolova, 2000), is currently being prepared for publication.

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The Novosibirsk team was helped by Vladimir Gukov and Alexander Chernikov and their assistants in Irkutsk. We would also like to thank the City administration of Bratsk for their generous help and we are grateful for the services provided by the regional department of statistics in Irkutsk.

During our work we have had consultations with specialists of the Irkutsk forest complex. We would also like to thank the many researchers at the Institute of Economics and Industrial Production of the Siberian Branch of the Russian Academy of Science, Novosibirsk, for their help and discussion of the results.

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Yuri Blam, Lars Carlsson and Mats-Olov Olsson

1. Introduction

The working hypotheses for this study[1] 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 because they are standing 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 forest use in Russia today is largely deficient or malfunctioning. Thus, as a matter of fact, the Russian forest sector today 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 state 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 the USA, Canada, and the tropical areas will decline. Russian forests are underexploited and have the potential to fill the expected supply gap (World Bank, 1997:44; Nilsson and Shvidenko, 1997).

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[1] As this study is one among a number of case studies conducted by IIASA, the introductory chapter is virtually the same in this report as in several others. The following case study reports have been published: Carlsson and Olsson (1998a), Carlsson and Olsson (1998b), Carlsson, Lundgren and Olsson (1999), Carlsson *et al.*, (1999), Efremov *et al.* (1999), Kleinhof, Carlsson and Olsson (1999), Piipponen (1999), Ivanova and Nygaard (1999), and Sokolova (2000). Other publications from the project include: Lehmbruch (1998), Malmlöv (1998), Mashkina (1998), Jacobsen (1999), Pappila (1999), Carlsson (2000), Carlsson, Lundgren and Olsson (2000), Nysten-Haarala (2000), Mabel (2000), and Wignall *et al.* (2000).

Whether they will actually be able to do so, however, primarily depends upon whether adequate *institutional arrangements* will be developed in order to smoothen the entrance of the Russian forest sector into this new market (North, 1997). 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," i.e., those formal or informal rules that are *de facto* used by a set of actors. Pejovich (1998:23) defines institutions "*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 a well functioning institutional framework, is a basic prerequisite for the future development of Russian forestry. Logically, a poorly governed Russian forest sector will be a severe obstacle for the transition to a market economy.

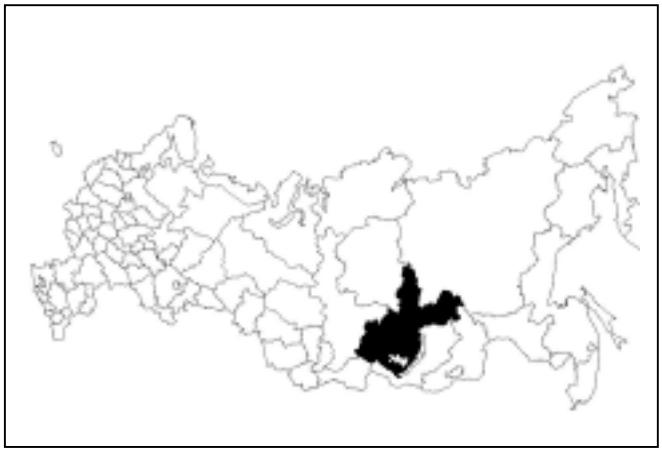
The aim of this project is to describe and analyze the current institutional framework of the Russian forest sector. This is done through a series of case studies in several Russian regions. In this report we present the results of a study in Irkutsk Oblast in East Siberia (see map on page 3).

Historically, Irkutsk[2] 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. Irkutsk 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.

Structure of the Report

The report consists of eight chapters structured in the following way. The next section of this introductory chapter outlines the logic and methodology of the study. In the second chapter, the structure of the forest sector is analyzed. Here, the main objective is to give a description of the numbers and activities of the forest enterprises, thus assessing the current "status" of the sector.

[2] Throughout the report we will use "Irkutsk" as shorthand for the region of Irkutsk, "Irkutsk Oblast". This complies with the name convention used in our earlier reports. The capital of Irkutsk Oblast is always referred to as the "City of Irkutsk" or "Irkutsk City".



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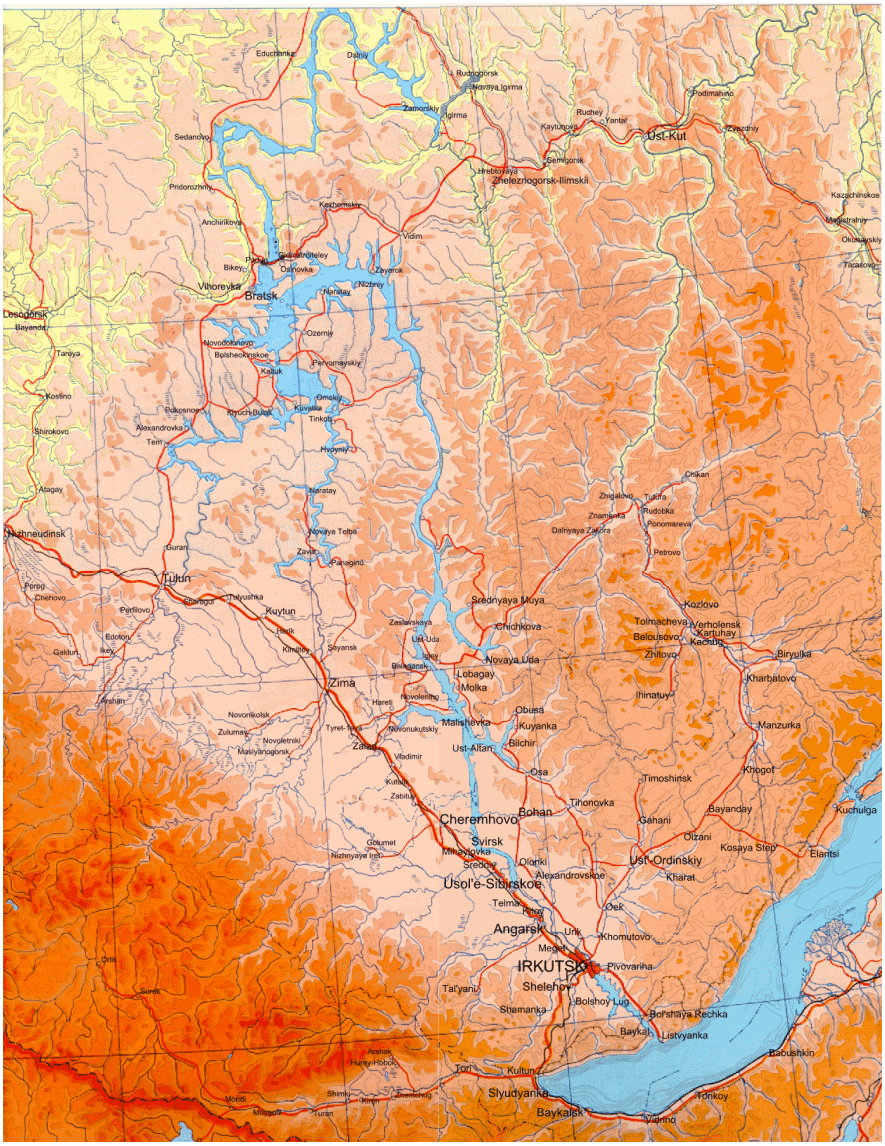

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Irkutsk Oblast:(a) Location in Russia; b) Overview of transportation Infrastructure; and c) Area of interest.

In the third chapter we provide a general overview of the region's industrial production. In chapter four the focus is on the situation in the regional forest sector in the late 1990s. Chapter five summarizes the socioeconomic characteristics of Irkutsk Oblast. In chapter six, we take a closer look at the management structure of the regional forest sector. Chapter seven basically contains the results of the survey made among the forest firms of the Oblast. This chapter depicts how the enterprises assess and regard their own situation, their ability to operate, perceived obstacles, etc. Finally, chapter eight of the report contains our conclusions and recommendations.

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).[3] For example, at the time of finalizing this report (January 2000) the nation building problem demonstrates its significance in Chechnya, which has been the scene of daily fighting for the past few months; the president has just resigned and his recently appointed prime minister is functioning as interim president awaiting a new election in a couple of months; and the economic situation, although showing signs of improvement, is still not stable, mainly due to the many political uncertainties and the ongoing Chechen war. The three tasks are, indeed, intertwined with regional problems. However, the present report primarily deals with the regional forest sector, 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 ready-made solutions to the great number of problems that currently beset 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 Irkutsk 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 Irkutsk, 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* (or should) behave according to some *formal* regulation, such as the Russian forest code.

When designing our case studies we have taken the *Institutional Analysis and Development Framework* (IAD) as a point of departure. The IAD framework is a

[3] The concept of "nation" seems to have an ethnic connotation in Russian. Here, we use the term in the sense reflected in the following citation from the *International Encyclopedia of the Social Sciences* (edited by David L. Sills and published in 1972 by The Macmillan Company and The Free Press, New York, the following citation is from Vol. 11, p. 7): "In prevailing usage in English and other languages, a 'nation' is either synonymous with a state or its inhabitants, or else it denotes a human group bound together by common solidarity — a group whose members place loyalty to the group as a whole over any conflicting loyalties. This latter definition was first proposed by John Stuart Mill, …"

thoroughly tested tool for institutional analysis (Sabatier, 1991; Oakerson, 1992; Thomson, 1992; Bogason, 1994; Ostrom *et al.*, 1994; E. Ostrom, 1995; Imperial, 1999). 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. Figure 1:1), in this case the Irkutsk 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 the 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 the region, affect the forest sector — our action arena — in particular ways. Similarly, a number of attributes of the Irkutsk "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.

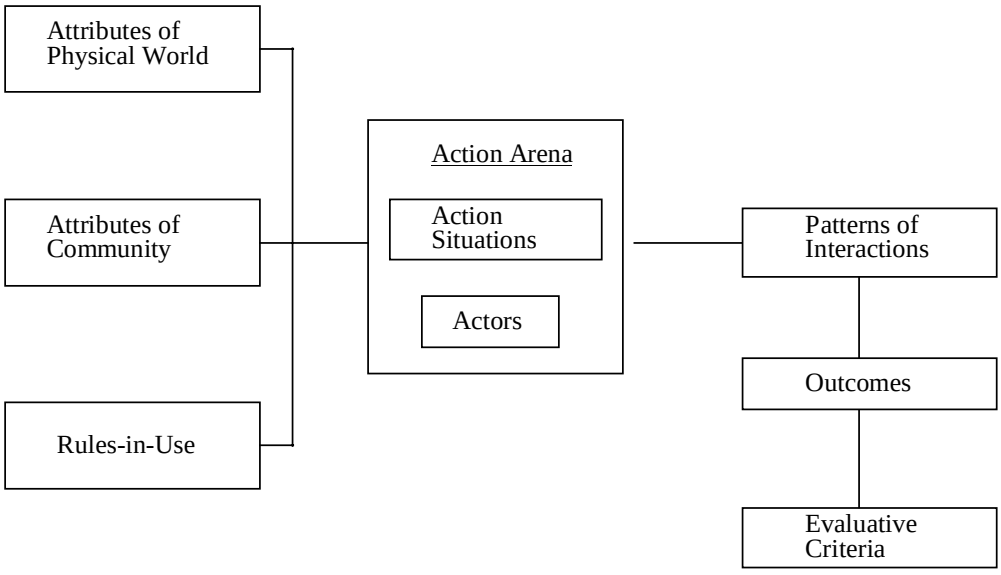


Figure 1:1. A framework for institutional analysis. (Source: Ostrom *et al.*, 1994:37.)

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 Irkutsk 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 is applied in this study is 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 the price 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 Irkutsk is more a matter of discretion. Thus, in this report the listed criteria are looked upon as devices that indicate how close to ideal the forest sector has developed.

Data Collection

The guiding principle for the collection of data has been the idea of "tracing 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 the data that has been collected can be divided into four types:

I) The first kind of information concerns the socioeconomic situation of Irkutsk Oblast, its economic geography as well as the formal political, administrative structure that

relates to the forest sector. Here the IIASA database[4] as well as a number of secondary sources has 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 Irkutsk forest sector. Here information has been gathered during field visits and with the help of local collaborators who have collected information according to specific instructions developed in the project.

IV) Finally, interviews have been conducted with management representatives of 30 enterprises in the Irkutsk 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 and old enterprises, 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 described above, we assume the result of our analysis to be relevant for the forest sector as a whole.

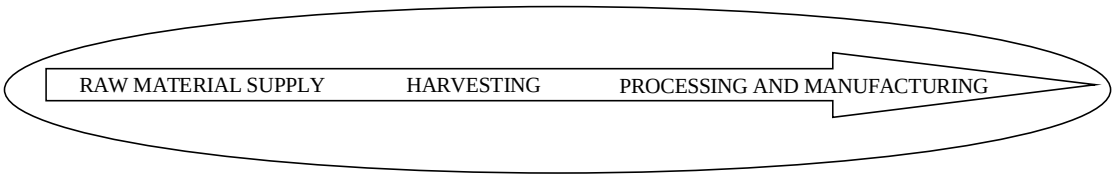


Figure 1:2. The action arena of the Irkutsk forest sector, the focus of the study.

We now turn to report the results of our study of the Irkutsk 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 Irkutsk Oblast and, in particular, its forest resources.

[4] See a description of IIASA's Siberian forestry databases published on the internet at URL: http://www.iiasa.ac.at/Research/FOR/dbdoc/

2. Forest Resources in Irkutsk Oblast

Forest Stock Characteristics

Irkutsk is among the richest regions in Russia in terms of forest resources. The forest density[5] in the region is 1.7 times higher than the Russian average (78% compared to 45%) and almost 3 times higher than the world average *(*27%). Compared to the world and the Russian total, Irkutsk Oblast has larger average wood reserves per hectare of forested lands (Tables 2:1 and 2:2). The world average is 104 m^3/ha, Russia has 106 m^3/ha, while Irkutsk Oblast holds 153 m^3/ha (cf. Nilsson and Shvidenko, 1997).

Table 2:1. Timber resources. Irkutsk Oblast compared with the totals for the the World and Russia.

Geographic Regions	Timber Reserves				Total annual timber increment, million m^3
	Total		of which coniferous		
	billion m^3	%	billion m^3	%	
World	361500	100	121300	100	3250.10
Russia	81307	22.5	57677*	47.5	822.15*****
Irkutsk Oblast	9320	2.6	7836*	6.5	89.58*****

*Only for forests under the Federal Forest Service.

Source: *Lesa i lesnoe khoziaistvo Irkutskoi oblasti* (1997).

Irkutsk Oblast possesses 12.5 percent of Russia's total stock of mature forests. When it comes to coniferous forests the share is even higher — 13.6 percent. If only the mature forest suitable for commercial use is taken into account the *leskhozy*[6] of the Oblast possess roughly 2.9 billion m^3, including close to 2.5 billion m^3 of coniferous timber (the corresponding figures for Russia are 25.7 and close to 20 billion m^3, respectively). In terms of timber reserves Irkutsk Oblast comes second after Krasnoyarsk Krai among all regions of the Russian Federation.

Distribution of Forests and Forest Density

As can be seen in Table 2:2, no major changes in forest density have taken place since the early 1960s.

[5] Forest density is defined as the ratio of lands covered with forest to the total area of the administrative unit considered. In the case of Irkutsk this means the total area including Lake Baikal, the artificial lakes of the hydropower stations of the Angara Cascade, and other reservoirs. Forest density is expressed in percent.

[6] A *leskhoz* is a primary forest management unit belonging to the Federal Forest Service (FFS) of the Russian Federation, which is, in effect, the state owner of most Russian forest lands. The FFS has an office in all Russian regions coordinating the work of the *leskhozy* in the region. More about this structure can be found in Chapter 6.

Table 2:2. Changes in forest covered area and forest density 1961–1995.

	1961	1978	1983	1988	1993	1995
Forest covered area, million ha	57.95	59.86	61.90	58.33	60.64	60.72
Density, %	74.8	77.3	79.9	75.3	78.3	78.4

Source: *Lesa i lesnoe khosiaistvo Irkutskoi oblasti* (1997).

The forest stock in various administrative regions (*raiony* and *okrugi*) of Irkutsk Oblast is provided in Table 2.3. Data on forest density is also included.

However, we obtain somewhat different density indicators if we consider the ratio between forest covered land and the dry land area. Using this method, the dry land forest density in Olkhon Raion is 77.6 percent; in Slyudianka 83.2; Irkutsk 78.1; Bratsk 85.6; Balagan 79.2; Nizhneilimsk and Ust-Ilimsk 88.8; Ust-Uda 93.5; and Kuitun 72.6 percent. The total forest density indicator for the Oblast is 80.6 percent.

The reserves of mature forests amount to 5.32 billion m^3, of which 4.73 billion m^3 are valuable coniferous species. However, mature coniferous forest resources are quite unevenly distributed over the various administrative regions. For example, the concentration of reserves of mature coniferous forests per hectare of the territory in Alarki and Nukut Regions is only 3 m^3; in Angarsk 4; Cheremkhovo 8; Zalarinski 13; Bokhanski 16; Irkutsk 19; Slyudianka and Zima 21; Olkhon 23; and Usolski Region 25 m^3/ha. The mature coniferous forests in the territory of the above 11 regions constitute only 2.7 percent of the Oblast resources of such forests. These areas can be compared with northern regions which have a high concentration of mature coniferous forests; in Kirenski Region 122 m^3/ha; Ust-Ilimsk 112; Chuna 108; and Ust-Kut and Zhigalovski 91 m^3/ha.

The area of forest lands in relation to the size of the population (the "per capita forest area") varies significantly between different administrative regions: from 0.3 ha (in the Angarsk Region with the city of Angarsk) to 1,244 ha (in the Katanga Region). Accordingly, the per capita provision of timber varies between 3 m^3 (in the Angarsk Region with the city of Angarsk) to 94,876 m^3 (in the Katanga Region). However, it should be noted that in many cases the boundaries of the forest management units (*leskhozy*) do not match those of the administrative regions (*raiony* and *okrugi*). This creates certain difficulties in organizing proper forest use.

Table 2:3. The distribution of the forest stock between constituent administrative regions in Irkutsk Oblast in 1995.

Administrative units (regions)	Region territory 1,000 km^2	Forest stock area, thousand ha		Reserves, million m^3			Forest density
		Total	Covered with forest	total	of which mature and over-mature	of which conif-erous	
Angara	0.9	69.1	63.5	4.5	0.9	0.4	68.7
Balagan	6.4	486.3	468.2	86.8	40.1	26.9	73.8
Bodaibo	92.0	9197.6	5903.2	484.1	352.8	337.8	64.2
Bratsk	33.2	2729.9	2499.0	379.8	238.6	187.6	75.3
Zhigalovsk	22.8	2215.1	2152.4	474.8	221.9	208.2	94.2
Zalarinski	7.6	609.3	487.6	75.4	13.0	10.1	64.2
Zima	7.0	567.3	478.9	6 5.1	17.2	14.5	68.0
Irkutsk	11.3	733.1	697.4	111.1	28.2	21.4	61.5
Kaz.-Lena	33.3	3264.3	2781.5	430.0	224.0	206.1	83.6
Katanga	139.0	13897.2	11523.9	1176.9	834.9	794.6	82.9
Kachuga	31.4	2925.9	274.6	459.3	194.4	178.8	88.3
Kirenski	43.8	4270.6	377.1	768.7	563.6	535.1	86.2
Kuitun	11.2	878.2	785.6	115.9	66.2	54.0	70.4
Mamsko-Chuiski	43.4	4308.3	378.6	554.0	298.7	280.7	87.1
Nizhneilim	18.9	170.6	1620.9	313.0	193.4	155.3	85.9
Nizneudinski	49.9	4759.2	3665.0	575.5	193.3	174.1	73.5
Olkhon	15.9	637.4	594.7	86.43	38.7	36.5	37.4
Slyudianka	6.3	428.1	360.0	59.6	17.6	13.1	57.1
Taishet	27.7	2610.1	2399.8	504.0	283.8	209.8	86.7
Tulun	13.5	1133.6	927.2	123.5	48.3	41.7	68.6
Usolje	6.3	493.3	416.8	64.7	18.5	15.6	66.4
Ust-Ilimsk	36.6	3449.7	3116.2	660.0	468.7	408.6	85.2
Ust-Kuts	34.6	3426.1	3275.3	632.1	341.9	315.0	94.6
Ust-Uda	20.4	1955.8	1846.4	350.8	181.7	151.5	90.4
Cheremkhovo	9.9	797.2	674.6	108.4	13.1	8.4	68.1
Chuna	25.8	2481.3	2313.5	458.3	334.2	279.4	89.8
Shelekhov	2.0	182.8	172.6	20.5	8406.5	7.0	86.8
Total for regions of the Oblast	**751.0**	**70237.3**	**59554.1**	**9143.2**	**5236.1**	**4672.4**	**79.3**
Total for cities of oblast and federal subordination	1.7	43.8	40.7	7.3	2.5	1.8	24.4
Oblast total	**752.7**	**70281.0**	**59594.7**	**9150.5**	**5238.6**	**4674.2**	**79.2**
Alarski	2.7	77.0	75.7	11.3	1.5	0.7	28.5
Bayandaevski	3.8	220.0	215.1	28.3	16.2	14.1	57.3
Bokhanski	3.7	193.0	180.4	24.1	74.7	6.0	48.7
Nukutski	2.5	64.9	63.4	6.9	1.2	0.8	25.7
Osinski	4.4	320.2	302.9	57.4	37.7	23.5	68.8
Ehirit-Bulagatski	5.2	311.7	295.9	41.5	21.7	15.3	57.4
Total for Okrug	**22.1**	**1186.8**	**1133.6**	**169.5**	**85.8**	**60.43**	**51.2**
Total for Oblast and Okrug	**774.8**	**71467.8**	**60728.3**	**9320.0**	**5324.5**	**4734.6**	**78.4**

Source: *Lesa i lesnoe khoziaistvo Irkutskoi oblasti* (1997).

Forest Groups and Protection Categories

In accordance with the national economic and environmental importance of the forest stock, its location and the functions performed, it has been divided into three use categories, three "groups": Group I, Group II, and Group III. Group I contain forests that mainly serve as protection and perform social functions (this group contains several protection categories). Group II forests are those that have protective value and limited commercial use, while Group III forests are mainly used for industrial and commercial purposes.

The distribution of the forests between these groups in Irkutsk Oblast are as follows (according to data of 1 January 1993): Group I– 15.9 million ha (22.3%), Group II – 4.1 million ha (5.8%), and Group III – 51.4 million ha (71.9%) of the total forested area. In Russia as a whole, Group I occupies 21.7 percent of the forested area; Group II – 7.8 percent; and Group III – 70.5 percent (Tables 2:4 and 2:5).[7]

Since the resolution of the Central Committee of the Soviet Communist Party of April 23, 1943, which resulted in the first division of forests into three groups according to their economic importance, this differentiation has undergone substantial changes (Table 2:3). The share of Group I forests owned by *leskhozy*, national parks and nature preserves (*zapovedniki*), had increased to 21.8 percent; Group II forests – to 3.7 percent; while Group III forests have decreased to 74.5 percent. Due to population growth, expansion of existing and the construction of new cities and industrial centers, it is expected that the share of forests belonging to Group I and II will continue to increase and that Group III will constantly be diminishing.

Table 2:4. Changes in the forest stock owned by leskhozy, national parks, and nature preserves, by forest groups (excluding forests given for long-term lease).

Year	Group I		Group II		Group III		Total
	1,000 ha	%	1,000 ha	%	1,000 ha	%	1,000 ha
1949	561.7	0.8	497.4	0.7	67524.8	98.5	68583.9
1952	559.0	0.8	483.8	0.7	68156.3	98.5	69199.1
1956	597.8	0.8	658.8	0.9	69761.4	98.3	71017.4
1961	4964.1	7.2	666.2	1.0	63699.8	91.8	69330.1
1966	5453.5	7.9	679.2	1.0	62455.2	91.1	68587.9
1973	7085.7	10.2	782.3	1.1	61635.6	88.7	69503.6
1978	7223.7	10.4	764.4	1.1	61268.9	88.5	69257.0
1983	8844.3	12.8	782.0	1.1	59527.1	86.1	69158.4
1988	10544.0	15.2	768.8	1.1	57901.5	83.7	69214.3
1993	14939.5	21.8	2553.8	3.7	51148.1	74.5	68641.4

Source: *Lesa i lesnoe khoziaistvo Irkutskoi oblasti* (1997).

[7] Careful reading reveals that the figures in the tables are somewhat lower than those mentioned in the text. This is explained by the fact that not all forests are managed by *leskhozy*.

Table 2:5. Forests owned by leskhozy under the Irkutsk forest management, Baikal national park and nature preserves.

Forest groups and protection categories	Area, 1,000 ha		Reserves, million m^3		
	Total	of which covered with forest	Total	Mature	of which commer-cially usable
Total forests of Group I, II and III	68884.5	58373.0	8965.85	5212.73	2925.22
Group I total of which:	15065.2	12250.8	2051.06	865.80	132.19
a) performing mainly water protection functions:	5157.9	4522.7	778.11	506.41	105.94
– restricted areas along the banks of rivers, lakes, etc.	1772.1	1579.0	270.96	165.84	105.94
– restricted areas protecting spawning grounds of valuable fish	3385.8	2943.7	507.15	340.57	-
b) performing mainly protective functions:	4481.2	3065.9	360.60	101.38	6.66
– anti-erosion	4335.3	2933.8	337.86	91.74	-
– protective areas along rail-ways, federal and Oblast roads	143.5	130.0	22.46	9.64	6.6
– other forests in low-forested and steppe regions being important for environment protection	2.4	2.1	0.28	-	-
c) performing mainly sanitary, hygienic and health protection functions:	515.7	466.7	78.98	25.14	19.59
– green zones around cities, villages, industrial enterprises	443.6	401.5	65.28	21.35	19.59
Of them forest parks:	21.0	18.8	3.08	1.09	-
– forests of the 1st and 2nd belts of sanitary protection of water supply sources	42.8	39.9	7.60	1.80	-
– 1st and 2nd zones of sanitary protection of spas	4.3	4.0	0.80	0.40	-
– urban forests	30.0	21.3	5.30	1.59	-
d) forests of specially protected territories	3359.5	3148.7	693.06	208.38	-
– cedar nut production zones	3359.5	3148.7	693.06	208.38	-
e) nature preserve stock	1550.9	1046.8	140.31	24.49	-
– preserves	1245.6	764.4	85.97	8.39	-
– national parks	305.3	282.4	54.34	16.10	-
Group II forests	2560.4	2278.5	308.08	130.17	123.21
Group III forest	51218.9	43843.7	6605.71	4216.76	2669.82
of which in reserves	21496.1	17378.1	1726.96	1219.78	-

Source: Gosudarstvennyi uchet lesov v 1993 godu. In: *Lesa i lesnoe khoziaistvo Irkutskoi oblasti* (1997).

Group I Forests

Group I forests in Irkutsk that belong to the *leskhozy*, national parks and nature preserves (*zapovedniki*) are distributed between various protection categories in the following way: anti-erosion forests – 4.3 million ha (29%); restricted forest areas protecting fish spawning grounds – 3.4 million ha (22%); cedar nut producing zones – 3.4 million ha (22%); restricted areas along the banks of rivers, lakes, etc. – 1.8 million ha (12%); preserves (*zapovedniki*) – 1.2 million ha (8%); green zones around cities, villages and industrial enterprises – 0.4 million ha (3%); national parks – 0.3 million ha (2%); and protective areas along railways, Federal and Oblast roads – 0.1 million ha (1%). The remaining four protection categories cover 0.07 million ha (or 0.5%) of all forests belonging to Group I.

Group II Forests

Forests in areas with a high population density and developed transportation network belong to Group II. They perform environmental functions, serve as protection and are of limited commercial use. Generally, all forests in areas with insignificant forest resources also belong to this group. In order to preserve their protective functions limited forest usage is allowed. Group II forests owned by *leskhozy* are also subject to intensive forestry activity. Of 2.3 million ha of forest covered lands, 118,000 ha (slightly more than 5%) are artificially planted forests. In total, the artificially planted forests for all forest groups only amounts to less than 1 percent. Owing to the well developed transportation network and a larger number of fire fighting units per areal unit, Group II forests are much better protected from fires than those belonging to Group I or III. Here, burnt areas merely amount to 53,700 ha, or 2.2 percent of the forested lands. The corresponding indicator for all forest groups is 4 percent. Despite a more intensive use of the forests belonging to this group, unforested areas cover only 4.6 percent of the land, the national average being 5.6 percent.

In Group II, owned by *leskhozy* belonging to the Irkutsk Forest Management with a total area of 2.6 million ha (excluding lands given on long-term lease), forest covered lands amount to 2.3 million ha (89%). These lands are stocked by pine (41%), larch (9%), cedar (6%), fir (4%), abies (3%), birch (29%) and ash-tree (8%).

The share of deciduous trees in Group II forests is substantially higher than on the rest of the Oblast territory (37 compared with 18%). The total area under mature coniferous forests is 414,300 ha or 18 percent of forest covered lands of Group II forests (the Oblast indicator is 38%). This means that these forests have been intensively used for a long period resulting in a deterioration of the species structure and commodity pattern, and this is what motivates their inclusion in the Group II category.

Usable mature forests of Group II occupy 595,500 ha with a reserve of 123.2 million m^3, or 206 m^3/ha; the Oblast indicator is 235 m^3/ha. This is another indicator of the fact that the most productive forests in this group have already been removed. The species structure of usable mature forests in Group II forests is represented by coniferous varieties – 88.7 million m^3 (72%), including pine (33%), larch (21.9%), and fir (9%); deciduous varieties – 33.5 million m^3 (28%), including birch (18%) and ash-tree (10%). When comparing similar indicators for the entire forest stock in the Oblast, it should be noted that the quality of the Group II forests is lower.

Group III Forests

Forests in highly forested areas having mainly industrial and commercial importance and meant for continuous satisfaction of national economic needs of timber, without any detriment to the environmental function of forests, belong to Group III. This group is divided into "developed" (26.5 million ha) and "reserved" (17.4 million ha). The reserved forests are not used due to their remoteness, poor transportation routes, and a number of other reasons. However, when roads have been constructed and logging developed, these forests will also become exploited. For example, in 1961, reserved forests covered 39 million ha, or 61 percent of all Group III forests in the region. In 1973, this share decreased to 29.8 million ha, or 48 percent; in 1993, to 21.5 million, or 42 percent.

Group III forests cover 51.4 million ha, or 72 percent of the forested lands, 51.2 million ha are owned by the *leskhozy* belonging to the Irkutsk Forest Management and 182,500 ha are owned by other forest stock holders. As forests are being transferred to Group I and Group II, the share of Group III is constantly being diminished.

Data in Table 2.6 show an essential difference in the species composition between reserved and developed forests. Firstly, since ten percent is made up of shrubs and bushes (mainly cedar shrub), these forests should not be regarded as forest at all. Secondly, it should also be noted that the reserve is mainly composed of deciduous forests located in the northern and northeastern regions of the Oblast.

Table 2:6. Species composition of Group III corests (excluding forests given for long-term lease) in 1993.

Prevailing species and groups of species	**Total forests**		**Of which**			
			Reserved		**Developed**	
	1,000 ha	**%**	**1,000 ha**	**%**	**1,000 ha**	**%**
Pine	11739.5	27	2873.9	16	8865.6	33
Larch	14630.1	33	8437.2	48	6192.9	23
Fir	2537.9	6	779.3	5	1758.6	7
Abies	1170.3	3	134.1	1	1036.2	4
Cedar	3758.9	8	1191.7	7	2567.2	10
Total coniferous	33836.7	77	13416.2	77	20420.5	77
Birch	5546.7	13	1480.2	9	4066.5	16
Ash-tree	2060.1	5	712.8	4	1347.3	5
Other deciduous	15.7	-	9.7	-	6.0	-
Total deciduous	7622.5	18	2202.7	13	5419.8	21
Shrubs	2369.4	5	1753.2	10	616.2	2
Total	43828.6	100	17372.1	100	26456.5	100

Source: Gosudarstvennyi uchet lesov v 1993 godu. In: *Lesa i lesnoe khoziaistvo Irkutskoi oblasti* (1997).

Of most interest for the logging business is the amount of mature forests suitable for logging. A closer look at Table 2.6 reveals that the quality of the forests in the reserves is significantly lower than that of the developed forests. The average volume of trees suitable for logging in developed forests is 236 m^3/ha, in reserved forests it is only 143 m^3/ha (Table 2:7). While mature timber in developed forests is represented by pine (45%) and by larch (28%), the share of larch in reserved forests is 73 percent of the stock, for pine – a mere 16 percent. In developed forests, Siberian larch is dominant and characterized by a high productivity (average stocking – 221 m^3/ha). In the northern reserved forests the average stocking is 151 m^3/ha. Among the reserved forests, those located in the Kirenski Raion are most suitable for economic development.

Table 2:7. Characteristics of mature forests suitable for harvesting in Group III (1993).

Prevailing species and group of species	Total		Developed		Reserved	
	Area 1,000 ha	Reserve million m^3	Area 1,000 ha	Reserve million m^3	Area 1,000 ha	Reserve million m^3
Pine	5867.1	1379.57	4328.0	1194.73	1539.1	184.84
Larch	8876.1	1574.84	3326.7	735.17	5549.4	839.67
Fir	1565.6	266.21	1008.7	196.09	556.9	70.12
Abies	714.2	170.26	609.6	149.94	104.6	20.32
Total coniferous	17023.0	3390.88	9273.0	2275.93	7750.0	1114.95
Birch	1540.7	244.55	1277.4	215.22	263.3	29.33
Ash-tree, other	792.0	190.27	738.6	178.67	53.4	11.60
Total deciduous	2332.7	434.82	2016.0	393.89	316.7	40.93
Total	**19355.7**	**3825.70**	**11289.0**	**2669.82**	**8066.7**	**1155.88**

Source: Gosudarstvennyi uchet lesov v 1993 godu. In: *Lesa i lesnoe khoziaistvo Irkutskoi oblasti* (1997).

Species Composition

In Irkutsk Oblast forest covered lands are composed of 77 percent coniferous species, 17 percent deciduous and 6 percent bushes and shrubs (Table 2:8). If we consider only the main forest forming species, coniferous species comprise 82 percent of the total area, and deciduous species 18 percent. The geography of species composition in the Oblast is highly non-uniform, which has influenced the location of the forest industry to a large extent.

Pine, which is in constant demand not only by the forest industry but also for public consumption as well as from the world market, occupies 15.1 million ha or 26 percent of forest covered land. This is only slightly less than the area dominated by larch; in reserves it has first place among the other species. In total, the pine forests of Irkutsk Oblast constitute 13.1 percent of the total pine stock of Russia (*Lesa i lesnoe khoziaistvo Irkutskoi oblasti*, 1997).

The stock of usable mature forests amounts to 2.9 billion m^3. Valuable coniferous species amount to 85 percent of the total; this indicates a high potential consumer value.

Table 2:8. Distribution of forest lands by dominating species (excluding lands given for long-term lease) as of 1 January 1993.

Tree and shrubbery species	Area		Stock					
	1,000 ha	%	Total		mature and over-mature		of those, usable	
			million m^3	%	million m^3	%	million m^3	%
Cedar	6926.9	12.0	1641.57	18.5	384.54	7.4	-	-
Pine	15063.2	26.2	2793.68	31.5	1742.98	33.5	1314.26	44.9
Larch	17425.0	30.3	2610.96	29.4	1946.14	37.4	796.60	27.2
Fir	3245.0	5.6	459.14	5.2	343.14	6.6	210.70	7.2
Abies	1583.3	2.7	330.06	3.7	223.06	4.3	162.62	5.6
Total coniferous	44243.4	76.8	7835.41	88.3	4639.86	89.2	2484.18	84.9
Birch	7220.0	12.5	632.56	7.1	313.18	6.0	243.34	8.3
Ash-tree	2459.1	4.3	304.17	3.4	231.66	4.5	197.48	6.8
Alder	6.7	-	0.82	-	-	-	-	-
Poplar	2.9	-	0.49	-	0.47	-	0.20	-
Willow	11.4	0.1	0.58	-	0.20	-7	0.02	-
Total deciduous	9700.1	16.9	938.62	10.5	545.51	10.5	441.04	15.1
Total tree species	**53943.5**	**93.7**	**8774.03**	**98.8**	**5185.37**	**99.7**	**2925.22**	**100**
Ernicks	1138.4	2.0	9.59	0.1	1.48	-	-	-
Willow shrubs	444.3	0.7	6.11	0.1	6.06	0.1	-	-
Cedar shrubs	2055.8	3.6	88.78	1.0	10.94	0.2	-	-
Other shrubs	5.9	-	0.11	7	0.01	-	-	-
Total shrubs	**3644.4**	**6.3**	**104.59**	**1.2**	**18.49**	**0.3**	**-**	**-**
Total covered with forest	**57587.9**	**100**	**8878.62**	**100**	**5203.86**	**100**	**2925.22**	**100**

Source: Gosudarstvennyi uchet lesov v 1993 godu. In: *Lesa i lesnoe khoziaistvo Irkutskoi oblasti* (1997).

In analyzing Tables 2:9 and 2:10, we should note that the forest stock distribution by main forest forming species remained fairly stable during the last 30 years. This sometimes indicates a relatively favorable outcome of natural restoration on lands not covered by forest. It also reflects a trend of reverse replacement of deciduous forests by coniferous trees with an age of over 100 years. Despite the fact that the share of coniferous forests in the period in question decreased area-wise by 2 percent, in total stock – by 3 percent, the total area of coniferous forests remained practically unchanged, and the stock even increased by 6 percent.

Table 2:9. Changes in forest species, excluding shrubs (million m^3).

Dominating species	**Years of record**						
		1961	**1973**	**1978**	**1983**	**1988**	**1993**
Pine		3019.3	2754.1	2658.6	2794.0	2938.0	2793.7
	%	38	33	32	32	34	32
Larch		2773.8	2770.2	2763.2	2791.4	2513.8	2611.0
	%	35	33	34	32	29	30
Cedar		987.7	1222.2	1217.3	1419.4	1508.9	1641.6
		12	15	15	16	18	18
Fir		507.3	474.1	502.0	515.0	486.0	459.1
	%	6	6	6	6	6	5
Abies		105.6	309.6	296.1	302.9	303.6	330.0
	%	1	4	3	4	4	4
Total coniferous		7393.7	7530.2	7437.2	7822.7	7750.3	7835.4
	%	92	91	90	90	90	89
Birch		490.5	555.7	590.2	583.2	557.6	632.6
	%	6	7	7	7	7	7
Ash-tree		135.4	206.0	218.7	233.5	258.5	304.1
	%	2	2	3	3	3	4
Other deciduous		0.7	0.9	1.1	1.2	1.8	1.9
	%	-	-	-	-	-	-
Total deciduous		626.6	762.6	810.0	817.9	817.9	938.6
	%	8	9	10	10	10	11
Total		**8020.3**	**8292.8**	**8247.2**	**8640.6**	**8568.2**	**874.0**
	%	**100**	**100**	**100**	**100**	**100**	**100**

Source: Gosudarstvennyi uchet lesov v 1993 godu. In: *Lesa i lesnoe khoziaistvo Irkutskoi oblasti* (1997).

Table 2:10. Changes in forest species, excluding shrubs (1,000 ha).

Dominating species		Years of record					
		1961	**1973**	**1978**	**1983**	**1988**	**1993**
Pine		16169.9	15216.3	14836.8	15161.5	15134.6	15063.2
	%	31	28	28	28	29	28
Larch		19082.0	18531.0	18925.8	18995.6	17067.9	17425.0
	%	36	35	35	35	33	32
Cedar		5530.9	6571.0	6637.1	7014.7	6898.6	6926.9
	%	10	12	12	13	14	13
Fir		3167.5	3184.8	3509.7	3487.7	3331.1	3245.0
	%	6	6	6	6	6	6
Abies		515.2	1701.0	1655.8	1570.0	1599.4	1583.3
	%	1	3	3	3	3	3
Total coniferous		44265.5	45204.1	45565.2	46229.5	44031.8	44243.4
	%	84	84	84	85	85	82
Birch		7635.3	6677.8	6925.0	6516.3	5976.2	7220.0
	%	14	13	13	12	12	13
Ash-tree		979.4	1604.9	1583.4	1766.1	1811.2	2459.1
	%	2	3	3	3	3	5
Other deciduous		2.2	18.0	22.0	20.6	19.9	21.0
	%	-	-	-	-	-	-
Total deciduous		626.6	762.6	810.0	817.9	817.9	938.6
	%	16	16	16	15	15	18
Total		**52882.4**	**53504.8**	**54095.6**	**54532.5**	**51839.1**	**53943.5**
	%	**100**	**100**	**100**	**100**	**100**	**100**

Source: Gosudarstvennyi uchet lesov v 1993 godu. In: *Lesa i lesnoe khoziaistvo Irkutskoi oblasti* (1997).

The areas as well as the stock of pine and larch forests have slightly decreased. This is mainly explained by a more intensive cutting compared to other species, but also by changes in the definition of dominating species. The rapid increase in pine forest areas during the last 32 years (a threefold increase), other (excluding birch and ash-tree) deciduous species (nine-fold) and cedar (by 30%), can be explained only by the application of more advanced recording techniques.[8] The 250 percent increase in ash-tree stocks during the last 32 years can be explained by the fact that this species is well

[8] It is due to this that, when comparing the areas under the above species in 1993 and 1973, we observe only minor deviations: larch – by 7 percent, cedar – by 5 percent, other deciduous species – 17 percent.

renewed via vegetation, it grows very quickly and thus often wins the competition with other species.

Forest Age Pattern

The forest distribution by age groups depends on the age of trees when they are cut. This, in turn, is stipulated by forest groups and protection categories for each zone, species, etc. Table 2:11 shows age groups for the most common forests of the taiga zone in Irkutsk Oblast.

Table 2:11. Age groups for tree species, adapted to forests of the Taiga zone.

Tree species and class	Minimum cutting age, years	Age groups, years				
		Young	Medium	Almost mature	Mature	Over-mature
Pine and larch, III class and higher	101	< 40	41–80	81–100	101–140	141 and older
Pine and larch IV class and lower	121	< 40	41–100	101–120	121–160	161 and older
Fir and abies	101	< 40	41–80	81–100	101–140	141 and older
Birch	61	< 20	21–50	51–60	61–80	81 and older
Ash-tree and other deciduous species	51	< 20	21–40	41–50	51–70	71 and older

Source: *Lesa i lesnoe khoziaistvo Irkutskoi oblasti* (1997).

In Group I forests, depending upon the protection category, the cutting age has been increased: for coniferous trees by 20–40 years, deciduous 10–20 years compared to forests in use. The cutting age for pine and larch in the forest-steppe zone has been decreased by 20 years. For cedar (cutting prohibited) the breakdown into age groups is as follows: young – less than 80 years; medium – 81–200 years; almost mature – 201–240 years; mature – 241–320 years; and over-mature – 321+ years.

Forests of Agricultural Organizations

Not only *leskhozy* possess forest lands. As of 1 January 1993, *kolkhozy*, *sovkhozy* and other agricultural entities controlled a forest stock totalling an area of 2,113,600 ha represented by Group I forests – 615,900 ha (29%) and Group II – 1,497,700 ha (71%) (*Lesa i lesnoe khoziaistvo Irkutskoi oblasti,* 1997).

Mature forests cover 367,600 ha with the stock of 73.69 million m^3 of timber; coniferous forests cover 266,700 ha (stock of 58.23 million m^3). This means that available resources are sufficient to satisfy a significant portion of timber needs of the agricultural sector.

Earlier *kolkhozy*, etc., had to organize the use of their forest stock via *leskhozy* or via contracts with government forest management bodies. With the purpose of managing the forests stock of *kolkhozy* and *sovkhozy*, the Oblast amalgamation *Oblmezhkolkhozles* (now the Irkutskmezhkhozles Production Amalgamation) was established in 1971. The establishment of such *leskhozy* in Irkutsk that began in 1968 significantly improved the utilization of the forest stock and reliability of their fire protection.

In the period 1987–1990, there were 21 *leskhozy* in Irkutsk Oblast uniting the forests of 78 *kolkhozy* and 123 *sovkhozy* occupying a total area close to 1.8 million ha. The *leskhozy* incorporated 45 forestries (*lesnichestva*) with an average area of about 40,000 ha and 292 forest compartments (*uchastki*) each with an area of approximately 6,000 ha. The *kolkhozy* and *sovkhozy* annually conducted forest restoration on an area of about 4,500 ha. This type of *leskhozy* annually logged about 750–800,000 m^3 of timber as general cut, and around 150,000 m^3 as sanitary cuts (*Lesa i lesnoe khoziaistvo Irkutskoi oblasti,* 1997*).*

According to data provided by Irkutskmezhkhozles, this type of *leskhozy* currently exists in 17 districts (*raiony* and *okrugi*) of the Oblast with a total area of 1.3 million ha and incorporates the forests of 163 agricultural entities (Table 2:12). However, 517,600 ha belonging to various agricultural entities, or 28% of their total area, are still not under the *leskhoz* umbrella.

Table 2:12. Leskhozy Established on the Basis of Kolkhozy and Sovkhozy, 1998.

Name of leskhoz	Year established	Year of last change	Total area 1,000 ha	No. of lesni-chestva	No. of member entities	Calculated cut in 1997 1,000 m^3
Bokhanski	1968	1988	122.9	2	23	52.3
Bratsk	1975	1985	103.9	4	9	159.0
Zhigalovski	1979	1981	50.4	-	8	15.2
Zalarinski	1970	1983	97.9	3	15	23.9
Zima	1972	1983	91.9	4	5	106.9
Irkutsk	1973	1985	101.4	4	10	40.9
Kuitun	1973	1984	101.7	3	14	74.6
Nizhneilimski	1986	1989	52.5	-	3	37.1
Nizhneudinski	1968	1982	137.1	5	13	116.5
Olkhon	1977	1981	45.2	-	4	7.9
Tulunski	1976	1984	116.4	4	13	90.0
Usolje	1975	1984	29.0	1	9	18.0
Ust-Ilimsk	1987	1989	44.5	-	3	47.9
Ust-Uda	1975	1987	88.5	3	6	89.3
Cheremkhovski	1975	1986	45.3	1	14	30.3
Eh-Bulagatski	1974	1986	69.7	1	13	20.8
Shelekhov	1993	1985	6.3	-	1	-
Total			**1304.6**	**35**	**163**	**930.6**

Source: *Lesa i lesnoe khoziaistvo Irkutskoi oblasti* (1997).

Thus, in summary, Irkutsk Oblast holds one of the largest reserves of forest resources in Russia. Although, there has been intensive exploitation of timber over the years there are still significant amounts of land available for commercial use. No major changes in forest density have taken place since the early 1960s.

3. Industrial Production in Irkutsk Oblast

The Industrial Potential of Irkutsk Oblast [9]

A specific feature of the economic-geographical position of Irkutsk Oblast in the southern part of East Siberia (almost in the center of Asia) is its remoteness, both in terms of distance from the main economic centers of European Russia (the distance from Irkutsk to Moscow is over 5,000 km) and the distance from major sea ports (the Baltic Sea is about 5,500 km away, the Pacific Ocean over 4,000 km). The location in the midst of Siberia is partly compensated for by the availability of good transit transportation routes (e.g., the Transsiberian and Baikal-Amur Railway, the Moscow Highway, and air routes). This gives the region a comparatively favorable position relative to the neighboring regions, which have to depend on the supplies of many products from Irkutsk, mainly due to their lower industrial potential.

The economic profile of Irkutsk Oblast is dominated by industry, which produces 80 percent of its aggregate gross output. The Oblast is one of the 15 industrially most developed regions in Russia. The most important branches are: fuel-and-power (highly efficient hydro-power engineering), metallurgy (non-ferrous, represented by aluminum production, and ferrous metallurgy — producing iron ore concentrate and fire-proof materials), petro-chemistry, inorganic synthesis chemistry, forest industry, mining (gold). Construction materials, foodstuffs and light industries are of primary regional importance.

Irkutsk Oblast has 35 percent of Russia's total aluminum production capacity, 20 percent of the country's pulp production capacity, 15 percent of its caustic soda, 12–13 percent of its veneer and logging, 12 percent of its artificial resins and plastics, over 6 percent of its capacity for mining gold, iron ore and coal, electric power production, and it produces a significant share of its gasoline, diesel fuel, certain types of petrochemical, chemical, and machine building products. In recent years, there has been a growing importance of aluminum, pulp, oil primary refining products, etc., in the total industrial output of the Oblast. The access to effective fuel-and-power bases as well as low electric power tariffs, make it possible to ensure a stable and efficient performance of the energy-intensive industries that constitute the skeleton of the regional economy.

In 1997, Irkutsk Oblast produced 49 billion kW/h of electric power, processed 10.3 million tons of oil, mined 12.4 million tons of coal, logged 6 million m^3 of commercial timber, produced 988 thousand m^3 of lumber, 527 thousand tons of pulp, 3.7 million

[9] Data for this chapter was provided by:Yu. Berezutskiy, Deputy Head of Administration, Chairman of the Committee on Economic Issues; B. Podnebesniy, Head, Department of Information and Analysis of Production Sphere; and Yu. Makhalov, Deputy Chairman, Committee on Economic Issues.

tons of iron ore concentrate, etc. Its volume of industrial output occupies 13th place in Russia. The region's share in the total Russian production volume amounts to 2.2 percent (see Appendix).

The basis of exports from Irkutsk Oblast are aluminum, oil refining products, pulp, forestry products, which together cover 77 percent of the total export volume. The largest share of imports (6%) consists of raw materials for the aluminum industry.

The Oblast is rich in natural resources, first of all, in coal. New areas have been discovered that are quite promising for oil and gas production. On almost all of the Mid-Siberian Highland territory layers of rock salt can be found at depths of 400–1,000 m. In the northern part of the area there are potash salts. The main deposits of gold and mica are located in the northeastern part of the Oblast. Prospected reserves amount to 290 million tons of oil, 5.07 billion tons of coal, 20.36 billion tons of iron ore, and 620 billion m^3 of natural gas. The total timber reserves amount to 9.14 billion m^3.

A particular role in the economy of Siberia as a whole, and Irkutsk Oblast in particular, can be attributed to Lake Baikal. It has enormous reserves of fresh water (232 km^3) and the role of the lake in the socioeconomic development of the Oblast as an enormous accumulator of fresh water and hydro power resources (the potential is estimated to be 201 billion kWt/h), promoting the development of the regional economy and tourist industry, is believed to increase.

General Characteristics of Enterprises and Organizations

Since the collapse of the Soviet Union there has been an extensive privatization of enterprises in Irkutsk Oblast. In total 2,273 state or municipally owned firms were privatized between 1992 and 1997. Around 80 percent of these were transformed during the first years of transition, i.e., before 1997 (see Table 10-1 in the Appendix). According to data from the Unified State Register of Enterprises and Organizations of all types of ownership (USREO), by 1 January 1998, there were 39,113 enterprises and other organizations (including schools, hospitals, etc.) registered in Irkutsk Oblast. The annual growth rate of the number of enterprises was 104.3 percent. By 1 January 1998, the largest number of enterprises (27,600 or 71% of the total) were privately owned (Table 3:1).

Table 3:1. Distribution of enterprises in Irkutsk Oblast by types of ownership.

	Units	**Percent**
Oblast Total	**39113**	**100**
Federal	2000	5
Oblast	359	1
Municipal	3543	9
Property of public organizations	1317	3
Private	27618	71
Mixed	3792	10
Property of foreign legal persons	97	0.2
Mixed with Russian and foreign capital	387	1

Source: USREO (1998).

During the last two years, the distribution of individual enterprises between the various branches of the economy has not undergone any essential changes. The largest number of enterprises is still concentrated in retail and public catering (26%), industry (17%), agriculture (12%), and construction (11%) (USREO, 1998). The distribution of enterprises by organizational and legal form is found in Table 3:2.

Table 3:2. Distribution of enterprises by organizational form.

	Units	**Percent**
Oblast Total	**39113**	**100**
State-run	1494	4
Municipal	3477	9
Public and religious	849	2
Individually owned and private	5134	13
Open JSCs	1111	3
Closed JSCs and limited liability companies	17814	45
Farmer ventures	3026	8
Other	6208	16

Source: USREO, (1998).

It can be noted that private firms dominate. It can also be seen that a significant number of firms are in mixed ownership and that there are only a few genuine foreign firms.

State and Municipal Enterprises

As can be seen in Table 3:2 many firms are still owned by the state and other public entities. These kinds of enterprise are "inherited" from the planned economy. The share of such enterprises in the economy is steadily declining as they are reorganized into other legal forms. Enterprises owned by the state or municipalities do not own their property, they only manage it ("complete economic administration"). This gives these enterprises quite broad rights to manage and use the state and municipal property entrusted to them, rights that are sufficient for them to act as legal independent agents. However, such enterprises do not possess absolute liberty to dispose of the property. They can use and sell (or alienate in any other way, through lease, mortgage, etc.) real estate, but only with the permission of the body authorized to manage the respective state or municipal property. State or municipal enterprises are established through the decision of the respective bodies authorized to manage the property of the state and municipalities of the Russian Federation, the Subjects of the Federation, and other administrative and territorial formations. Formally, the founding body jointly with the staff hires the head of such an enterprise. The staff also participates in defining the terms of the contract signed with the enterprise manager. Along with rights related to hiring the manager, the staff (i.e., the labor collective), together with the founder, jointly approves changes and additions to the enterprise charter.

Joint stock company (JSC)

In Irkutsk most private firms are joint stock companies. Joint stock companies (JSCs) are enterprises (partnership) with their authorized capital divided into a certain number of shares of equal nominal value (stocks). The risk for the shareholder is limited to the amount of their contribution to the authorized capital. A JSC is responsible for all its obligations and all its property. The stockholders do not have personal responsibility for the JSC's liabilities. Russian legislation differentiates between the closed type (CJSC) and open type (OJSC) of JSC. Closed JSCs differ from the open type in that they cannot resort to open subscription of their stock or otherwise offer it to an unlimited circle of persons. A CJSC charter can stipulate limitations on the sale of stock both within the company itself and to third parties. In addition, limiting amounts are set for CJSC on the authorized capital and the number of shareholders. The existing legislation on JSCs is a somewhat mixed picture consisting of standard acts of various levels that quite often do not correlate with each other.

Limited liability partnership (LLP)

A limited liability partnership (LLP) represents an alliance where only members are responsible for the company's liabilities within the limits of their respective unpaid portion of authorized capital, which was invested at the time of establishment. (After full payment they are not responsible for the LLP's liabilities, similar to the owners of a JSC.) In contrast to JSCs, where all shares have equal nominal value, they may have different values in an LLP. In the case when the partnership charter does not have a provision on share equality, each member has one share and its nominal value corresponds to the value of his contribution to the authorized capital. The main difference compared to a JSC is that the shares in an LLP are not securities, they do not constitute any "physical" stock. Since membership in LLPs is not expressed as securities, sales of shares to third parties need a more complex procedure than sales of stock. The profits in LLPs are distributed among its members in proportion to their share of the authorized capital. However, the charter can envisage a different manner of profit distribution (e.g., accounting for the personal input of individual owners).

Individual (family) private enterprise (IPE)

An individual private enterprise is a firm, which is owned by a citizen or jointly by the members of a family if not otherwise specified in the agreement between them. The IPE property is formed from the personal (family) property, revenues and other legal sources. An individual (or a family) can establish an IPE by purchasing a state or municipal enterprise. The IPE owner is responsible for its liabilities within the limits defined by the IPE charter. An IPE should have a name indicating its legal form and contain the last name of the owner. In the current turbulent situation in Russia many small, private enterprises have been established, but might equally quickly disappear again. Therefore, one should bear in mind that statistics concerning these types of firms are somewhat unreliable.

Small Business

According to recent statistics, the number of enterprises in Irkutsk Oblast that are owned by single persons amount to more than 5,000, indicating that the region has a significant number of small firms. The distribution of small ventures over industries and types of ownership is shown in Table 3:3.

Table 3:3. Distribution of small ventures in Irkutsk Oblast.

	Number of small businesses*		**Distribution of small businesses by types of ownership (in % of sector total)**	
	units	**in % of total**	**private ownership**	**mixed ownership**
Total businesses	**12497**	**100**	**85.6**	**14.4**
Industry	2337	18.7	71.5	28.5
Construction	1924	15.4	87.8	12.2
Transportation and communications	487	3.9	91.4	8.6
Retail and public catering	5312	42.5	93.4	6.6
Procurement, logistics and sales	84	0.6	70.2	29.8
General commercial activity	797	6.4	78.6	21.4
Health care, physical culture, sports	236	1.9	83.5	16.5
Science and related services	190	1.5	76.3	23.7
Other sectors	1130	9.1	80.5	19.5

* Small businesses are commercial organizations (legal entities) where the number of employees does not exceed: in industry, construction, transport – 100; agriculture and scientific research – 60; retail and services – 30; and wholesale and other kinds of entrepreneurship – 50.

Source: Goskomstat Rossii (1997).

By 1 October 1997, there were four small enterprises per 1,000 inhabitants of permanent population in the Irkutsk region. In the City of Irkutsk there were 11 small enterprises per 1,000 inhabitants. More than 137,000 people worked in small ventures, almost 120,000 full-time. Compared to 1996, the number of full-time employees had increased by 6.5 percent, part-timers decreased by almost 50 percent, and the number of contractors fell by 21 percent. Among small production ventures, the highest share is concentrated in the forest and timber processing industries (31%), in machine building and metal processing (19%), and the food industry (14%).[10]

[10] See Appendix 10, Table 10-3.

Production and Deliveries of Industrial Output

As in the rest of Russia, the industrial production in Irkutsk Oblast has also been heavily reduced as a result of the dramatic changes in the economy and society. In fact, the industrial production in 1997 was only 48 percent of the output in 1992. For the forest sector the corresponding figure is 44 percent (cf. Table 3:4).

Table 3:4 Development of physical output by industry. Percent (1990 = 100%).

	1992	**1993**	**1994**	**1995**	**1996**	**1997**
Industry Total	85	74	63	64	55	48
including: mining	81	73	58	58	54	46
processing industry	86	74	64	66	55	48
Industries						
Electric Power Engineering	93	91	82	83	78	69
Fuel Industry	86	72	68	66	56	44
Ferrous metallurgy	75	72	63	60	58	52
Non-ferrous metallurgy	95	92	89	88	90	90.3
Machine-building and metal processing	87	76	61	44	31	23
Chemical and Petrochemical	61	39	38	41	32	20
Forestry, timber processing and pulp and paper industry	88	71	56	71	56	44
Construction materials industry	73	59	40	27	15	12
Light industry	95	88	42	28	16	12
Foodstuffs industry	66	60	50	49	40	40.5

Source: *Irkutskaia oblast': 1992–1997 godi. Statisticheskii spravochnik* (1998).

In 1997, production volumes were dramatically reduced in the following branches: chemical and petrochemical (by 39%), light industry (by 27%), machine building and metal processing (by 25%), fuel, forest, timber processing and pulp and paper (by 22%), construction materials (by 18%), and flour-grinding and fodder (by 14%). The most dramatic production decline (53%) was observed in the glass and porcelain industries. At the same time, there was a production increase in non-ferrous metallurgy, foodstuffs and micro-biological industries. As can be seen in Table 3:5, the forest industrial sector only makes up 11.7 percent of the industrial output. This might seem striking given the fact that Irkutsk has very abundant forest resources.

*Table 3:5. Irkutsk Oblast: industrial production by industrial branch in 1997 (at current prices, percent).**

Industry total	**100**
Mining	12.6
Processing	87.4
By selected branches:	
Electric power engineering	19.7
Fuel industry	14.3
Non-ferrous metallurgy	21.3
Forest, timber processing and pulp and paper industry	11.7

* Figures are only given for large and medium sized enterprises.
Source: Goskomstat Rossii (1997).

By consulting Table 6-4 in the Appendix, it becomes obvious that very few industrial branches have succeeded in maintaining their production during the transition. Among 21 listed industrial branches only two (synthetic detergents and raw aluminum) had a (slightly) larger production in 1997 compared to 1992.

Russian statistics on industrial production reports figures of "production" as compared to "shipped" products. "Shipped" refers to the amount of products that has, in fact, left the factory, whether or not the goods have actually been sold, involved in barter trade, or exported. In 1997, the index of physical volume of output shipped compared to 1996 amounted to 87% for large and medium sized enterprises. The ratio between the output produced and shipped (without warehouse storage) in 1997 is illustrated in Table 3:6. As can be see, the forest sector has a somewhat lower "shipping grade" than the other listed branches.

In general, almost half of the shipped output (48%) goes to customers within Irkutsk Oblast. Besides, part of the output is sold to consumers who pay directly to the enterprise. In 1997, such sales totaled 1,785 billion rubles.

Table 3:6. The ratio between the output produced and shipped.

	Produced	**Shipped**	**Shipped in % of produced**
Large and medium sized enterprises	**27163**	**26777**	**98.6**
including:			
Electric power engineering	5360	5360	100.0
Fuel	3879	3829	98.7
Non-ferrous metallurgy	5783	5714	98.8
Forest, timber processing and pulp and paper industry	3190	3056	95.8

Source: Goskomstat Rossii (1997).

Decline in the Forest Sector

As indicated above, the forest sector in Irkutsk has also been severely hit by the transition. This is true for all branches of the sector. For example, production of commercial wood in 1995 was only 30 percent of that in 1985. The situation is similar for lumber, veneer, board, etc. For pulp, paper and cardboard the drop from 1991 has been smaller, especially for pulp. Table 3:7 illustrates this decline for a number of forest products. As can be noticed the relative drop in production has been significant, between 40 and 95 percent. Although there was a temporary recovery in the production of particle board and pulp in 1994–95, the decrease has continued. (See also Tables 2-1–2-9, Table 5-8, and Table 6-4 in the Appendix).

Table 3:7. Change in production between 1992–1997 in the Irkutsk forest sector, percent.

Branch	**Production volume 1997 in % of 1992**
Commercial timber	35
Lumber	43
Glued veneer	61
Fiber board	46
Particle board	5
Pulp	36
Paper	57

Source: *Irkutskaia oblast': 1992–1997 gody. Statisticheskii spravochnik* (1998).

Capital Investments

Thus, the departure from the old state controlled system towards a market economy has obviously affected the forest sector production in a very negative way. This is also reflected in the level of investment.

In 1997, firms of all types of ownership spent 5,269.1 billion rubles for investments in tangible capital. The volume of investment was 76 percent of the 1996 level (in 1996 it was 82% compared to 1995). The main funding source for capital construction was non-budget funds, 79 percent of the total. The sources of investment funding is shown in Table 3:8.

Table 3:8. Investments by sources of funding in 1997.

	Billion rubles	Percent of total
Investment in tangible capital	**5269.1**	**100**
From non-budgetary sources	4152.2	79
Own funds of enterprises and organizations	3849.2	73
Individual builders	49.4	0.9
From budgetary funds	1116.9	21
Federal budget	433.2	8
Oblast budget	683.7	13

Source: *Irkutskaia oblast': 1992–1997 godi. Statisticheskii spravochnik* (1998).

The share of investments financed from budgetary sources in the Oblast was 21 percent of total investments. The share of foreign investments attracted to the Irkutsk economy still remains insignificant. In 1997, joint ventures only invested 47.9 billion rubles, which correspond to a mere 0.9 percent of total regional investments.

Seventy-five percent of all investments (3,964.3 billion rubles) were used for construction, expansion, renovation, and re-equipment of production facilities. In comparison with 1996, investments in industrial construction declined by 18 percent.

Table 3:9 illustrates that the investment rate is relatively low in the pulp and paper sector while timber processing industries have a higher rate. It should be borne in mind that these figures are relative and that the investment level in general is very low.

Table 3:9. Capital investments in main industries in Irkutsk Oblast (percent of total).

	1996	1997
Industry Total	53.3	42.4
Electric power engineering	8.5	10.9
oil refining	7.2	1.4
gas	1.9	2.3
Coal	3.5	3.1
Non-ferrous metallurgy	4.3	2.3
Chemical and petrochemical	11.2	4.3
Defense	1.8	1.6
Timber processing	5.7	8.1
pulp and paper	2.5	2.1
Construction	4.6	10.0
Transport	27.8	24.7
Agriculture	3.6	5.1
Retail and public catering	3.2	7.9
Other	7.5	9.9

Source: *Irkutskaia oblast': 1992–1997 gody. Statisticheskii spravochnik* (1998).

In industry, the highest share of investment can be found in electric power engineering, timber processing, chemical and petrochemical, and coal industries, together amounting to 26 percent of the total.

As can bee seen in Table 3:8, investments in construction amount to 10 percent of the total investments. By 1 January 1998, there were 2,113 such organizations and enterprises in the Oblast, of which 1,933 had less than 100 employees. (Construction activities in the Oblast are also conducted by JV "Calibra" in Bratsk.) As a result of privatization, 96 percent of these actors belong to the "non-public" sector, 79 percent are private ventures, 17 percent have mixed ownership, and 1 percent is owned by municipalities. In 1997, construction companies of all types of ownership completed contractual jobs worth 3,802.4 billion rubles, of which 1,967.7 billion were completed by privatized enterprises (Goskomstat Rossii, 1997). Due to the decline in investment activity, unstable funding and non-payments, construction companies work inefficiently. In 1997, the reduction of contractual jobs was 24 percent compared to 1996. By the end of 1997, customers had not paid for about one-third of the work completed. In 1997, 13 percent of all contractual jobs were completed by public sector companies (in 1996 this share was 10%). Companies with mixed ownership handled 46 percent of the total volume (in 1996 – 37%), private companies – 41 percent (in 1996 – 53%). This means that private companies reduced their activities in the construction sector. As in previous years, construction companies are also still engaged in non-construction activities. The share of this work was 8 percent of the total services provided (Goskomstat Rossii, 1997).

Infrastructure

Industry, and especially forest sector enterprises, are dependent upon good transportation structures, but the transportation network density in Irkutsk Oblast is low. Transportation links for all-year-round use are especially scarce, a fact that is shown in Table 3:10. There are 3.2 km of railways and 16.5 km of hard surface automobile roads per 1,000 km^2.

Table 3:10. Length of transportation routes in Irkutsk Oblast, 1995 (km).

Types of transportation links		**Including**		
	Total	**forest industry use (by road type)**	**Timber hauling**	**General use**
1. Roads, total length	74284	1769	7476	9165
a) Railway	2498	—	—	—
b) Automobile,	56019	1769	7476	8027
Hard surface	12772	110	95	125
Dirt	43247	1659	7381	7902
All-year round use	21859	1339	3309	3256
c) Winter roads	15767	—	—	1138
2. Navigable waterways	10042	—	—	—

Source: Goskomstat Rossii (1997).

Between 1988 and 1993, the length of hard surface and dirt roads for all-year-round use increased from 18,122 km to 24,589 km, or by 36 percent. In spite of the development of transportation routes in the forests, the shortage and low quality of roads seriously hinder a profitable use of forest resources in many regions. The share of dirt and hard surface roads of the entire road system is still insufficient.

The current situation can, to a large extent, be explained by the old habit of constructing "cheap" non-permanent roads in the forest. Such "dirt roads" or "carriage roads", at best provide access only during the dry season and only for a very limited time. In fact, these roads create a false image about the possibility of developing forest use. Besides, such roads are only good for 4–5 years, then they deteriorate and require new construction efforts.

Currently, in Irkutsk Oblast, harvested timber is transported by three means: railway, automobile, and water. The major part of total shipments is done by railroad (47%). An increase of railroad transport is envisaged as a consequence of the future elimination of rafting and the stricter requirements for raft and boat transportation. In 2000, railroad transports are believed to account for 56 percent of total timber transports. Automobile shipments currently cover around 34 percent of the total volume transported.

A weak road network is typical for most of the Oblast regions. Therefore, at the beginning of the 19th century, the rivers of the area were used for floating the logs. However, large scale use of the rivers for this purpose only started in the 1930s, in the period when large harvesting enterprises — *lespromkhozy* and *lestranskhozy* (forest enterprises with the task to take care of timber transports) — were established. These enterprises mostly used the main rivers for timber transportation. Thus, rafting began on the Kitoi river in 1936, on Belaya in 1938, Oka in 1937, Ija in 1938, Chuna in 1951, and on Biryusa in 1950. All in all during the whole period, 47 rivers were used, including nine mainline floating reservoirs. The liquidation of timber rafting started in the 1950s, when a Resolution of the Irkutsk Administration prohibited rafting on small rivers, such as Ushakovka, Taltsinka, and Bolshaya Rechka. In the mid 1960s, rafting began to be terminated in the Lake Baikal basin. The most active measures aimed at terminating rafting were taken in the 1970s and -80s.[11] In recent years, measures have been taken to terminate timber rafting on the rest of the rivers in the region and to switch to transporting timber by roads and railways (see map of Irkutsk Oblast on page 3).

Cargo Shipments

In 1997, the amount of cargo shipments by all types of transportation totalled 50.5 million tons, a decrease of 18 percent compared to 1996. This change of course reflects

[11] For example, in 1971, rafting was terminated on Verbliud (tributary of Tumanshet), Onot (Malaja Belaya), Shelbeika (Zima) Uda (Biryusa) and Kodui (Uda); in 1972: Kochetar (Biryusa); in 1973: Toporok (Biryusa); 1975: Slyudianka (Tumanshet) and Andocha (Uda); 1976: Urik (B. Belaya) and Ora (Kitoi); 1977: Tymbyr (Biryusa); 1978: Zhidoi (Toisuk), Khorka (Tagna) and Tangiu (Uda); 1979: Kharagun (Tagna), Tagna (Oka) and Katarma (Uda); 1981: Igna (Zima); 1982: Zima (Oka); 1985: Oka (Angara); 1987: Ikei and Kirei (Ija tributaries) and Ija itself (Oka); 1988: Toisuk (Kitoi); 1989: B. Belaya (Angara); 1990: M. Iret (M. Belaya), M. Belaya (Belaya), Belaya (Angara), and Kitoi (Anagara).

a downward trend that is connected to the general decline in industrial production that was discussed in previous sections (Table 3:11).

For example, railway transports have been reduced by 10–15 percent annually during the last four years. Accompanying these changes, however, is a steady increase in the costs for all kinds of transport. For example, in 1997, prices for railway shipments grew by 11 percent and reached 669 rubles per 10 t/km. In the next chapter we shall see how all these changes have affected the forest sector.

Table 3:11. Cargo shipments in Irkutsk Oblast by all modes of transport.

	1997	**Percent**
Cargo shipped by transportation companies, thousand tons	**50515.7**	**100.0**
railway	41370.0	81.9
automobile*	6221.3	12.3
air	15.0	0.0
internal water	2909.4	5.8
Cargo turnover of transportation companies, million t/km	**46062.4**	**100.0**
railway	44260.0	96.1
automobile*	193.1	0.4
air	106.6	0.2
internal water	1502.7	3.3

* Including an estimate of volumes transported by individual entrepreneurs (private persons), engaged in commercial automobile cargo shipments, and small automobile transportation ventures.

Source: Goskomstat Rossii (1997).

4. The Situation in the Forest Sector at the Beginning of 1998[12]

As has already been emphasized, Irkutsk Oblast has significant forest resources: 9.1 billion m^3 or 711 percent of the Russian total. However, as Table 4:1 demonstrates, only 40–50 percent of allowed volumes are actually used. This strengthens the picture of a problem-ridden sector, but it also indicates that a significant potential exists for forest production (cf. Burdin *et al.*, 1998).

[12] In the preparation of this chapter a report by Yu.B. Kashtanov, Deputy Chairman of the Information and Analysis Commission, Irkutsk Oblast Administration, was used. This report is based on information from the Department of Forest Policy (1992–1997 reports), the Department of Foreign Economic Relations, data from State Statistics Committee, the Customs and the East Siberian Railroad.

Table 4:1. Use of forest stock, 1,000 m^3 in Irkutsk Oblast.

	1993	**1994**	**1995**	**1996**	**1997**
Allocated	28173	17415	20011	28355	28718
Actually used	17516	12962	15192	12266	11426

Source: *Lesa i lesnoe khoziaistvo Irkutskoi oblasti* (1997).

The main drawback in using forest stock is the lack of coherent harvesting plans and measures to replenish the forest stock. The task of leasing out plots of forest land is practically completed. Today, a redistribution of leased plots among forest users is taking place. Many of those who have leased forest land plots, proved to be unable to organize full-scale logging or to pay their fees in full.

The activities of the forest sector enterprises in Irkutsk Oblast are characterized by a decline in the production of most products as compared to 1996. The 1997 output of commercial timber was 6.5 million m^3 (78.7% of the 1996 level); 1.3 million m^3 of sawn timber (92.3%); 67.300 m^3 of veneer (73.1%); 15.8 million conditional m^2 of fiber board (70.9%); 15.2 thousand conditional m^3 of particle board (23.2%); 2.6 million ties (83.3%); 527,000 tons of pulp (71.7%); and 110,500 tons of cardboard (122.1%). The total physical volume of forestry output in 1997 amounts to 76.5 percent of the 1996 level (Goskomstat Rossii, 1997).

One reason for this decline is the rapid decrease in world market prices for the main types of forest products that were exported on a large scale. For example, in 1996, the average contract prices of exported pulp fell by 44 percent, for round wood the decrease was 5.5 percent, for lumber 2.9, and for cardboard 30 percent. The demand from the domestic and the CIS markets also kept falling. Obsolete wood processing and sawing technologies used by the majority of the Irkutsk enterprises do not allow competitive production for foreign markets. The decreased demand for lumber on the domestic market has been caused by a significant reduction of construction works. Besides, due to a very limited product mix, sawmills and processing enterprises are unable to react flexibly to changes in the market situation.

Production output for harvesting, timber processing, pulp and paper and the chemical industry is shown in Table 4:2.

Table 4:2. Harvesting, timber processing, pulp and paper and forest chemical industry production in Irkutsk Oblast in 1997.

	Produced in 1997	% of 1996	December 1997 in % of December 1996
Logging industry		**81**	**75**
Timber removal, 1,000 cub. m	8598.4	79	73
Technological chips, 1,000 cub. m	493.1	104	120
Timber processing industry*		**79**	**78**
Lumber, 1,000 cub. m	1607.2	86	96
Wooden ties for railroads, 1,000 pieces	2911.4	86	80
Glued veneer, cub. m	67313	73	81
Particle board, cub. m	15233	23	-
Door blocks, 1,000 sq. m	61.6	62	67
Window blocks, 1,000 sq. m	51.1	62	51
Fiber board, 1,000 sq. m	15797.0	71	59
Pulp and paper industry		**76**	**99.4**
Commodity pulp, 1,000 tons	527	72	93
Paper, tons	6295	109	176
Cardboard, tons	110525	122	210
Forest-chemical industry		**68**	**46**
Colophony (rosin), tons	7882	65	39
Turpentine, tons	592	44	30
Charcoal, tons	3703	137	172

* In the furniture industry the production of arm-chairs amounted to 135%, sofas 132%, wooden beds 100%, wardrobes and cupboards 82%, tables 86%, and chairs 18% of the last year volume.

Source: Goskomstat Rossii (1997).

Export of Forest Products

In recent years there has been a rapid decrease in the prices for pulp and some other forestry products. Nevertheless, with the objective to get “real money”, enterprises seem to increase the export share in their total volume of production (Table 4:3).

Table 4:3. Irkutsk Oblast, share of exports in total production for some forest sector products 1992–1997. Percent.

	1992	1993	1994	1995	1996	1997
Commercial timber	6	4.4	6.7	5	8.4	5.3
Lumber (sawn wood)	22.6	14.6	37.5	42	52	45
Ties	…	…	1.7	3.8	4.3	2.3
Particle board	28.5	33	18.7	14	11.6	19
Pulp	42.8	54.8	76	81	82	83

Source: Goskomstat Rossii (1997).

During price falls on the world market for pulp (approximately once in every 5 years) pulp producing countries react in a number of ways. For example, plants may be closed down or technologies upgraded in order that the enterprise becomes competitive when the market starts to expand again. In Irkutsk there has been no such practice. Another factor providing for the stabilization of foreign enterprises is their concentration on the production of paper products, the world market prices of which are not subject to such large fluctuations. However, as the forest complex of Irkutsk Oblast used to be oriented towards the USSR and COMECON, rather than towards the world market, no such strategies have been developed. Even if world market prices for lumber and sawn wood do not decrease, it is still unprofitable for the Irkutsk enterprises to export these products. One reason is the high transportation costs, another is the fact that real production costs could not be reflected in the consumer prices, because if they were the products would be far too expensive to be competitive.

Impact of Railroad Tariffs on the Competitiveness of the Irkutsk Forest Complex

The current Russian transportation system is not tailored for a vital market economy. Compared to other industrialized countries the Russian system is very labor intensive, the transport apparatus is old and maintenance is poor. Accordingly, costs are regarded too high to be competitive for forest companies. Already in 1993, the cost (the railroad tariff) for transporting one cubic meter of commercial timber exceeded the sales price in varying degrees depending upon destinations: from Irkutsk to Moscow the tariff was 2.15 times higher than the sales price, to Kiev it was 3.2 times higher, and to Nakhodka 2.7 times higher. In 1994–1995, transportation costs for commercial timber to the CIS countries and the western regions of Russia exceeded the sales price by 50–160 percent. In 1996, transportation costs for roundwood and lumber fell by 10–30 percent. However, still in 1997, transportation costs to the CIS countries and the western regions of Russia exceeded the sales price: to Moscow it was 1.7 times higher, to Nakhodka 1.6 times, and to Vladivostok 1.8 times higher (Goskomstat Rossii, 1997).

An obvious conclusion is that exports of such products are profitable only for enterprises that acquired their products in criminal ways. It should be noted that this situation is typical for the whole country and a common explanation for the

uncompetitiveness of Russian firms. Nevertheless, blaming the large distances to final forest product users cannot be the main argument.

Table 4:4. Share of the Irkutsk forest complex in total Russian production. Percent.

	1993			1995			1997		
	Change in production volume (% of previous year)			Change in production volume (% of previous year)			Change in production volume (% of previous year)		
	Russia	Irkutsk Oblast	%	Russia	Irkutsk Oblast	%	Russia	Irkutsk Oblast	%
Timber removal	–	–	–	–	–	10.2	84.6	81.8	10.9
Commercial timber	71	57	11.1	100.9	115.7	13.4	–	–	–
Lumber	73.3	70.1	9.7	87	95.7	10.2	88.2	83.7	8.8
Ties	87.6	96.7	32.1	87.4	85.7	28.8	76.2	86.4	33.8
Particle board	87.6	58.6	4.7	83.7	154.3	7	99.4	24.3	1.2
Pulp	78.8	80.2	44	133.2	150.7	53.2	97.4	72.2	43.5

Source: Goskomstat Rossii (1996); Goskomstat Rossii (1997).

Forest products from Irkutsk Oblast are mainly delivered to other Russian regions. In 1997, 44.9 percent of all lumber produced, 65.8 percent of veneer, and 83.3 percent of all pulp was exported. Compared to 1996, shipments of all types of forest products to the CIS countries decreased considerably, while shipments to foreign countries increased, primarily shipments of lumber and cardboard. This indicates that the key to the problem of the forest sector is to be found in the internal organization of the sector, the lack of domestic demand and internally caused problems, such as the mentioned costs of transport, taxes, etc.

However, it should be noted that the East Siberian Railroad and Customs Office data on the shipment of forest cargoes differ by 100 percent (Table 4:5). This is evidence of the fact that a considerable portion of the shipments were registered for export with the purpose of getting export transportation discounts, while the products were never intended to leave the country.

Table 4:5. Production and removal of forestry products and pulp in 1997.

	1,000 tons	**1,000 m^3 (documented)**
Production:		
Lumber	1092.3	1607.2
Round wood	4941.9	5935.1
Pulp	527	
Total	6561.2	
Forest cargoes shipped	4864.2	
of which export	2518.7	
Customs (export)		
Lumber	539.1	794.6
Round wood	314.7	393.8
Pulp	444.2	
Total	1298.0	

Source: Goskomstat Rossii (1997).

As is revealed by data from the Ust-Ilimsk Region, part of the output, particularly the output of roundwood, is shipped by companies that are not registered in Irkutsk Oblast and, thus, do not pay taxes to the region. [13]

[13] The following table illustrates how single producers may engage several exporters, contract-holders or resellers. While, for example, it should be noted that a company such as the Baikalskii PPS has only one reseller, others, such as Bratskkompleks holding, may engage many other companies for their sales and exports.

Exporters	Senders (contract holders): 1996.
• OJSC "BPPC" -	OJSC "BPPC"
• OJSC "BPPC" -	JSC "Vostsibugol"
• Bratskkompleks Holding -	"Bratskoje Lesopromyshlennoje Upravlenije"
• Bratskkompleks Holding -	Bratskkompleks Holding
• Bratskkompleks Holding -	OJSC "Russian Forest Industrialists" Corp.
• Bratskkompleks Holding -	CJSC "Technoferm Engineering"
• JSC "UILPK" -	International Consortium "MEKOR"
• JSC "UILPK" -	JSC "UILPK"
• JSC "UILPK" -	UILPK Holding
• JSC "UILPK" -	JV "Continentalinvest"
• JSC "UILPK" -	JSC "Ilimwood"
• JSC "UILPK" -	JSC "ROSEXPORTLES"
• JSC "UILPK" -	JSC SPETSTRADE
• JSC "UILPK" -	JSC "RUSIMPEX"
• JSC "UILPK" -	CJSC "ILIM PULP ENTERPRISE"
• JSC "UILPK" -	CJSC "BUMINVEST"

The above table was borrowed from a report by Yu.B. Kashtanov, "Analysis of Irkutsk Forest Complex at the Beginning of 1998", 2 July 1998.

Investments in the Forest Sector

According to latest available reports there are 2,088 businesses registered with the Oblast Statistics Commission that have operations with forestry products as their main activity. The financial and economic situation of forest industry enterprises is quite complicated. Total accounts receivable on 1 December 1997 amounted to 1,431 billion rubles, accounts payable – 4,651 billion rubles, including 284 billion rubles to the federal budget, 386 billion rubles to the consolidated Oblast budget, and 889 billion rubles to non-budgetary funds. One hundred and twenty-three businesses or 99.2 percent of the total number of large and medium sized forest industry enterprises had accounts payable that exceeded accounts receivable amounting to 3,220 billion rubles.

Practically all businesses lack — or have no — working capital and most of the payments between sellers and buyers are made via barter. In many regions of Irkutsk Oblast payments to the local budget are made in the form of offsets (goods, services, etc.). At the same time, there are no effective mechanisms to influence an actor who does not fulfill his obligation to keep his business running and ensuring employment. This is of particular importance for the city-forming enterprises with mono-production (Commander and Mumssen, 1998).

For example, due to the lack of working capital and reluctance of the owner (Closed JSC “ROSPROM” belonging to the MENATEP Group) to be involved with the management of production and financial activity, JSC “Ust-Ilimsk LPK” was completely out of operation for 3 months in 1997. Production began only on 15 November 1997, and on 22 December that same year it was put to a stop again as the managing company “CONTINENTALINVEST” did not fulfill its obligations to pay wages and ensure the supply of coal and chemicals for the production of pulp.

In the first nine months of 1997, the total amount of investments of the forest industry enterprises was 70.2 billion rubles: with 30.2 billion (43 percent) invested in construction and installation and 33,6 billion (48 percent) in equipment. In the first nine months of the year, 30.6 percent (21.5 billion rubles) of total investments in the production sphere were made by joint ventures: 33.4 percent (7.2 billion) in construction and installation; and 66.6 percent (14.3 billion) in equipment. Compared to the same period in 1996, investments decreased by 22 percent (in 1997 prices). The source for all investments was the enterprises’ own funds — depreciation and profit allocations. This will be further illustrated in Chapter 7.

5. Socioeconomic Characteristics of Irkutsk Oblast

In the 1950–70s many large heavy industries were established in Irkutsk Oblast. They were based on natural resources designed to produce semi-finished products that would be processed into final products outside the Oblast territory. Although Irkutsk Oblast occupies the first place in Russia in the production of several important raw materials, like aluminum, plastics, and pulp, there are almost no facilities for final production. However, the Oblast is one the most economically developed among the eastern regions of the country.

At the same time, prior to the reforms of the 1990s, practically all living standard indicators in Irkutsk Oblast were lower than the Soviet Union average. The Oblast was notoriously called the "hungry area". By that time a major part of the financial resources accumulated in the Oblast was channeled to Moscow. Several of its districts had acute environmental problems and still more than 70 percent of the population lived in areas where atmospheric pollution exceeded officially accepted limits.

Under the administrative-command economy, when the industrial ranking of regions was based on non-economic principles, no particular socioeconomic advantages were granted regions producing highly effective resources, such as oil, gas, gold, etc. Such advantages were associated more with Moscow, Union republic capitals, and cities with a high concentration of defense industry enterprises.

During the transition period the production decline in Irkutsk Oblast has remained smaller and people's income higher than the country average. The share of financial resources used in the Oblast has grown and the region acquired a "donor status" and, consequently, significantly increased its socioeconomic rating. Therefore, it is not by chance that one always finds Irkutsk Oblast among the relatively safe regions of the country in various rankings. The Oblast has reached better results than the RF average due to the industry's orientation towards raw materials and semi-finished products, which has intensified in the years of reforms (Table 5:1).

Table 5:1. The industrial structure of Irkutsk Oblast in 1991 and 1996 (production value. Percent).

Industries	**1991**	**1996**
Fuel and Power Complex	22.0	46.4
Metallurgy (ferrous and non-ferrous)	11.8	17.7
Forest Industry	25.3	13.5
Chemical Industry	6.3	3.1
Machine Building	11.1	7.6
Foodstuffs	12.4	6.8
Other	11.2	4.6
Industry, total	100.0	100.0

Source: Goskomstat Rossii (1996).

A similar situation is found in other regions of the Russian Federation with an economic structure similar to that of Irkutsk Oblast, e.g., in Krasnoyarsk Krai, the Kemerovo and Tyumen regions. With the dramatic decline in domestic demand, raw materials and a few other products have turned out to be the only goods that are competitive on external markets. Therefore, the share of exports in the total volume of industrial output has grown from 6–8 percent prior to the reforms to as much as 50 percent today. Besides, the high capital intensity in the mining and processing enterprises allowed them to accumulate money in their depreciation funds and to use this money to increase wages rather than for reinvestments for which they are actually intended.

At the same time, almost all living standard indicators have fallen during the reform years. Thus, the last 5 years have seen a 25–56 percent decrease in consumption of quality foodstuffs for most of the population — meat and milk products, eggs, sugar — while consumption of bread rose by 18 percent, potatoes by 80 percent. The level of diseases increased by 26 percent, etc. In 1996, 25 percent, and, according to preliminary estimates in 1997, 23 percent of the Oblast population had a per capita income lower than the minimum subsistence level (Goskomstat Irkutsk, 1997). The share of foodstuffs exceeded 50 percent of total consumer expenditures, this is the level of the 1950s! Life expectancy fell to 60.5 years, 54 years for males (lower figures can only be observed in the Republics of Altai and Tyuva). Housing construction has declined by around 65 percent during the reform years. The current investment activity will not be sufficient to maintain existing production capacities. The same as before the transition, the investment pattern in the Oblast is biased in favor of investments in industry. These investments amounted to 66 percent of total investments in the Oblast as opposed to an average of 60 percent for Russia.

Employment

In December 1997, the economically active population constituted 1,092,300, or 39 percent of the total population of the region. In comparison with the same period of the preceding year, it had decreased by 8 percent, and in comparison with the preceding month by 0.2 percent. Of the economically active population, 1,019,100 (93.3%) worked in industry, and 73,200 (6.7%) were not employed, but were actively looking for a job (classified as unemployed according to the International Labor Organization — ILO).

In November 1997, a total of 830,000 people worked in the large and medium sized enterprises of the region. As can be seen in Table 5:2, the forest industrial sector is not a major employer. The public sector is still the dominating employer in the region.

Table 5:2. Number of employees in various branches of the economy in Irkutsk Oblast, 1997.

TOTAL	**830002**	**100.0**
Industry	239182	28.8
electric power	25237	3.0
fuel	26305	3.2
nonferrous metallurgy	21022	2.5
forest, wood working, paper and pulp	61769	7.4
Agriculture	75848	9.1
Forestry	8859	1.1
Transport	78619	9.5
railway	46394	5.6
automobile	13160	1.6
internal water	6064	0.7
Communication	15370	1.9
Construction	61942	7.5
Trade and public catering, supplies, sales, storage	36959	4.5
Retail trade	24655	3.0
Municipal services	48132	5.8
Health care, physical training and sport, social welfare	70374	8.5
Public education	118478	14.3
Science and scientific services	5934	0.7
Crediting, finances, insurance, pension service	10473	1.3
in particular, banks	8453	1.0
management	35937	4.3

Source: Goskomstat Irkutsk (1997).

As of 1 January 1998, 39,220 people were registered at the State Employment Service, 34,468 persons were registered as unemployed. In comparison with the same period of 1997, the number of registered unemployed persons decreased by 14,443, or by 30 percent, and compared to the preceding month decreased by 1,422 (4%). One reason for the decrease in the number of unemployed persons registered at the Employment Service is a set of amendments and supplements to the law “On the employment of the population in the Russian Federation.”

In comparison with the same period for the preceding year, the number of job vacancies by the end of December 1997 had increased by 637 or 21 percent. By the end of December there were 11 persons for every announced vacancy. The level of registered unemployment for the economically active population constituted 3.2 percent.

Working opportunities in Irkutsk Oblast has dramatically changed over the last few years. In 1990–1995, the number of employed fell by 210.400 or 15.5 percent. At the same time, officially registered unemployment totaled about 50,000. Calculations using

the ILO methodology give an estimate of 80,000 unemployed. The decrease in employment mostly affected industrial production, which traditionally is the main source of employment (up to 75% of total employment) in Irkutsk Oblast. Thus, employment in industry decreased by 18.5 percent following a 40 percent decline in production, employment in construction decreased by almost 50 percent, while the volumes of capital construction fell by about 65 percent (Goskomstat Irkutsk, 1997).

The employment picture changed much less in services. Practically all branches of the public sector have excess labor due to its low cost, high labor intensity, deteriorating labor discipline (as a consequence of the breakdown of the administrative management methods of the Soviet era), and the low quality of output. As was mentioned above, along with official unemployment there is also latent unemployment. It should be noted, however, that along with latent unemployment there is also "latent employment," meaning that officially registered unemployed actually work for various (mainly private) businesses. Very often they do not hold a contract, as this is not lucrative for the employer. Such employees must cope with the situation as well as they can since they are dependent on their income.

Along with the larger cities in the region, where unemployment is less than 1 percent, there are territories with an official unemployment rate of 5–8, up to 15 percent (Katanga Region). On the whole, northern regions are problematic from the employment point of view. However, unemployment data for a specific date only give a static picture and cannot adequately reflect the serious situation in some parts of the Oblast. For example, mass emigration from several northern regions (Mamsko-Chuiskiy, Katanga, Ust-Ilim, Kazachinsk-Lenskiy and others) lowers the local registered unemployment. Moving to districts located in the western parts of the region is a common reaction to the inferior living standard and the poor health situation.

Recently the quality of life in Irkutsk Oblast has shown a tendency to improve. The slower rates of production decline might provide the necessary prerequisites for a stabilization of the living standard for a majority of the population. Commodity shortages have been overcome, inflation rates have decreased, and the share of the population with a per capita income lower than the minimum subsistence level has become smaller (Goskomstat Irkutsk, 1997). The development of market relations, expansion of the services provided by trade and intermediary companies and the emergence of other forms of private businesses have solved the problem of supplying the region's commodity market both with food products and other types of consumer goods.

After the first signs of stabilization appeared the financial and economic situation in the Oblast has deteriorated again since 1996. Revenues of leading enterprises rapidly decreased (by almost two-thirds in 1996 for all businesses), the problem of balancing the budget emerged again, and the "donor functions" of the Oblast became an issue. Among the reasons for this one can note a deterioration of world market prices for the region's exports (aluminum, pulp, PVC resins) with growing prices for imported raw materials (e.g., aluminum, oil), the high transportation and energy tariffs, and the "hard currency corridor" (which required the Central Bank to keep the exchange rate at a certain level). No doubt, the lower tax revenues are caused by the payments crisis and the intensive use of barter, offsets, promissory notes, etc. Thus, the consolidated budget of the Oblast is balanced with "dead money".

At the same time, several major enterprises acquired new owners of: foreign companies (aluminum plants), and Moscow banks (Angara Petrochemical Company, Ust-Ilimsk LPK). Their interests often differ from those of the Oblast population. This affects, in particular, the solution of acute environmental problems caused by the aluminum and petrochemical industries and forest industry enterprises.

What benefits do the population receive from the region's export oriented enterprises? A rapidly diminishing profit tax share in the Oblast budget (due to a decrease and an apparent concealment of profits). According to the Russian legislation such enterprises are value added tax (VAT) exempt. Customs duties are channeled in full to the federal budget (it is almost one-fifth of the Oblast budget), excise taxes on fuel produced by the Angara Petrochemical Company are also channeled there. Of course, some of their taxes remains in the Oblast (local taxes, income tax). The Oblast also has quite highly paid jobs. But that is all!

Export oriented enterprises have access to and are free to use highly effective natural resources, probably the cheapest electric power in the world, a cheap labor force (by world standards), and they do not pay for their pollution of the environment — they do not compensate the damages inflicted on the population's health and on nature, they sell their products at world market prices and finish off by declaring that they make no profits!

For quite a long time rent payments to the Oblast budget for the use of natural resources have remained some 5–6 percent of sales values. The main portion of rent-related revenues (including indirect taxes and export) is concentrated to the federal budget.

It is not the transfer of ownership of enterprises located on the Oblast territory to external owners — to foreign companies and large Moscow banks — that is of major concern. In the end, it is those partners who might be able to reconstruct the industrial giants in Irkutsk. One should rather be concerned by the reduction of the taxable base of the new owners of major export oriented enterprises and, consequently, taxes paid to the Oblast budget, i.e., the infringement of the interests of the region's population. In both 1996 and in 1997, expenditures of the consolidated Irkutsk budget exceeded incomes (tax and non-tax receipts) by 18 and 14 percent, respectively.

The Demographic Situation

The demographic situation in the region mainly repeats Russian trends. In 1970–1988, birth rates in Irkutsk Oblast remained at the level of 18–21 per 1,000, death rates between 8 and 10 per 1,000. This ensured a steady natural population increment of 10–12 per 1,000. After that there was a catastrophic decline in birth rates (down to 11 per 1,000 in 1994–1995) and an increase in the death rate which went up to 14–15 per 1,000. There was actually a natural population decline of up to 4 percent per year.

The demographic crisis of the 1990s is not caused by any single factor, but is rather a result of a complex combination of various factors and causes. Of these, two groups of factors can be noted: a) demographic waves that change the size relation between different age groups — this is the consequence of the low birth rates during World War II (1942–45) manifested in minimal birth rates in the late 1960s; b) a reaction of the

population to the rapidly declining living standards in the course of economic transformations.

By the beginning of 1998, the Irkutsk population was estimated to be close to 2.8 million people, 2.2 million of them (79.7%) were urban residents, while close to 565,000 (20.3%) lived in the countryside.

Compared to the preceding year the total population decreased by 12,100 people or 0.4 percent in 1997 (9,000 or 0.3% in 1996). The number of urban residents decreased by 6,700 or 0.3 percent, the number of rural residents by 5,400 or 1.0 percent (cf. Diagram 5:1).

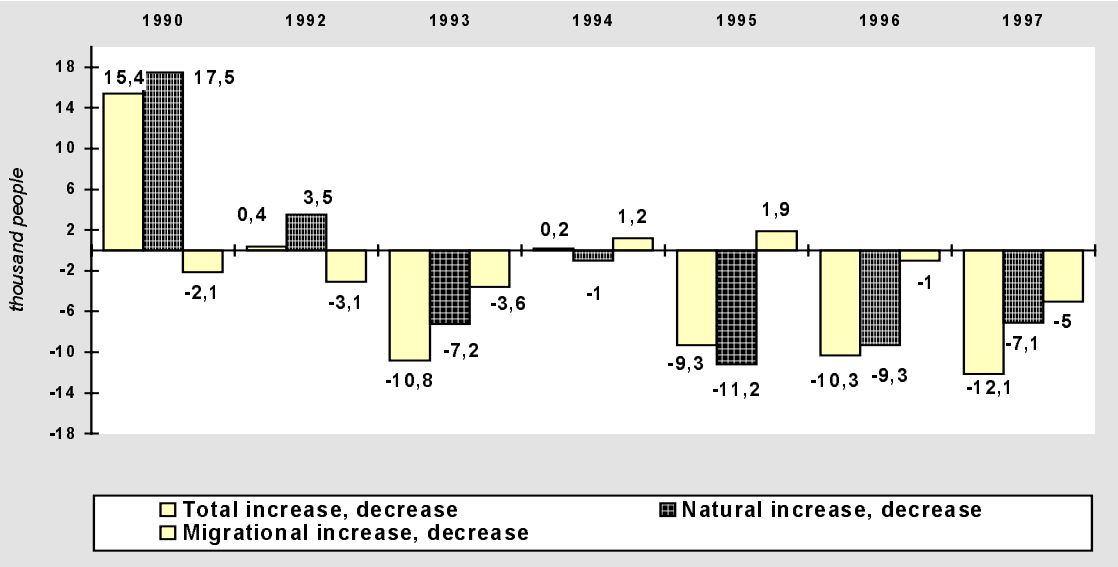


Diagram 5:1. Population dynamics in Irkutsk Oblast. (Source: Goskomstat Irkutsk, 1997.)

The natural population decrease (newly born minus deceased) observed since 1993 is one of the reasons for the decrease in the size of the population. In 1997, 27,800 people were born, the number of deceased was 34,900. Infant mortality remains high: 512 infants died before reaching the age of 1 year, or 18.4 per 1,000 born (18.8 in 1996). In spite of a decrease in the number of deaths and in the natural loss (by 24%), the number of deceased in 1997 was greater than the number of births by a factor of 1.3. The birth rate per 1,000 people was 10.0 in 1997, and the death rate was 12.6 (10.0 and 13.3, respectively, in 1996).

In 1997, there were 231 hospitals with 37,000 beds, and 368 polyclinics. Besides, there were 838 obstetrical dispensaries in the region (mostly in the countryside). “The Regional Foundation for the Obligatory Medical Insurance of Citizens of the Irkutsk Region (OMI)” and its 19 branches are now in service. In this system of obligatory medical insurance 276 medical prophylactic institutions are involved. Close to 2.3 million people (81% of the total population) are insured. However, low funds of the

local budgets and the difficult economic situation of many enterprises hinder the stable funding of the OMI territorial foundations.

Poor economic circumstances are also believed to affect marriage rates. However, in 1997, the number of registered marriages clearly grew while divorces became more rare. Due to family break-ups, however, 6,700 children and teenagers were left without one parent.

Another reaction to unsatisfactory working opportunities, etc., is to move. Thus, the imigration to Irkutsk that was observed in 1994–1995 has been replaced by an outflow of people. In 1997, as a result of migration, the region lost 5,000 people (in 1996 the corresponding figure was 900 people). Migrants from the former Soviet republics continued to come, although their inflow decreased by 38.5 percent (3,400 people in 1996 and 2,100 people in 1997).

Monetary Incomes and Expenses of the Population

According to a rough estimate, the nominal monetary income of the population in Irkutsk Oblast for 1997 was 32,501.3 billion rubles. This was an increase of 19.6 percent compared to the same period for the preceding year. For December 1997 the income amounted to 3,278.6 billion rubles — an increase by 20.1 percent compared to the same period one year earlier.

The increase in monetary incomes for December is due to a partial settlement of the wage arrears for workers in the budget sphere. It is also due to the fact that payments of debts on children's allowances, additional end-of-year payments, and timely payments of pensions were made.

The main social and economic indices of the regional living standard are presented in Table 5:5.

Table 5:5. The main standard of living indices for Irkutsk Oblast 1995–1997.

	1995	**1996**	**1997**
Average monthly monetary income per capita, 1,000 rubles	864	976	1177*
Real average monthly monetary income per capita, Percent of the preceding month	110	123	124*
Average calculated salaries of workers in all branches of economy, 1,000 rubles	941	1140	1279
Subsistence level (per capita), 1,000 rubles	361	407	393

* Preliminary data.

Source: Goskomstat Irkutsk (1997).

In December 1997, per capita income of residents in Irkutsk Oblast bought 4.2 baskets of basic goods consisting of 25 food products. The corresponding figure for November 1997 was 3.4 baskets. The real disposable income, that is, all incomes minus obligatory payments, deflated with the consumer price index, increased in 1997 by 4.8 percent compared with 1996. In December 1997, compared to December 1996, they increased

by 10.6 percent, in November 1997 by 19.3 percent compared with the same month one year earlier.

The increase in the real disposable incomes was greatly affected by slackening the inflation slow-down.

The distribution of the annual monetary income per capita (preliminary data) among the population of Irkutsk Oblast is shown in Table 5:6.

Table 5:6. The distribution of per capita annual monetary incomes among the population of Irkutsk Oblast in 1997.

	1997	
	Thousand inhabitants	**% of total**
Population total	**2790.7**	**100**
with an average monthly monetary income per capita (1,000 rubles) of		
less than 200.0	69.8	2.5
200.1–400.0	407.4	14.6
400.1–600.0	527.4	18.9
600.1–800.0	457.6	16.4
800.1–1,000.0	351.6	12.6
1,000.1–1,200.0	259.5	9.3
1,200.1–1,400.0	187.0	6.7
1,400.1–1,600.0	134.0	4.8
1,600.1–1,800.0	97.7	3.5
1,800.1–2,000.0	72.6	2.6
more than 2000.0	226.1	8.1

Source: Goskomstat Irkutsk (1997).

In 1997, 27.7 percent of total monetary incomes was earned by the 10 percent wealthiest persons, while 2.3 percent was earned by the poorest 10 percent of the population. The average monetary income per capita of the first group was almost 12 times larger than the per capita income of the second group.

The average monetary income per capita of the 20 percent group with the largest incomes was 2.1 million rubles per month, whereas for the less well-to-do group it was 301,000 rubles. In 1996, the corresponding numbers were 1.8 million and 251,000 rubles, respectively. In 1997, the average monthly subsistence level calculated by the Irkutsk Regional Labor Committee was 431,500 rubles per capita, and for December it was 398,500 rubles.

In 1997, the share of the population with incomes lower than the subsistence level constituted 20.1 percent, a decrease of 5.6 percent since 1996.[14]

Average wages in the various branches of the economy are listed in Table 5:7. By consulting this table, it can be concluded that the forest sector is one of the lowest paid sectors of the economy.

Table 5:7. Average wages in Irkutsk Oblast, November 1997.

	Average wage (excluding social privileges) November 1997			Social payments per capita
	1,000 rubles	**% of Nov. 1996**	**% of Oct. 1997**	**1,000 rubles**
TOTAL	**1279.3**	**111.0**	**95.8**	**30.6**
Industry	1616.9	110.3	97.3	40.7
Electric power	2405.6	106.2	98.4	51.6
Fuel	1785.9	109.8	101.3	39.9
Non-ferrous metallurgy	3469.4	117.7	93.9	55.7
Forest.wood working, paper and pulp	1085.2	94.3	99.7	44.9
Agriculture	535.8	103.0	102.9	8.0
Forestry	750.4	126.6	89.4	12.1
Transport	1648.4	117.8	79.4	42.5
Railway	1696.4	121.0	87.0	48.9
Automobile	1335.5	109.4	97.4	28.1
Internal water	1538.9	152.0	35.4	13.3
Aviation	1931.3	106.3	78.6	68.0
Construction	1440.0	123.1	99.7	24.7
Crediting, finances	2339.2	70.0	96.0	53.6
Including banks	2471.8	64.6	94.8	42.2
Administrative bodies	1541.5	121.4	96.8	46.2

Source: Goskomstat Irkutsk (1997).

[14] In 1997, there were changes in the structure of monetary expenses of families. The expenses increased considerably as the family income increased. For the first 9 months of 1997 food expenses constituted 47.2 percent of the total monetary expenses. The average family with high income spent a smaller part of the family budget on buying food (34.9%) than the average family with low income (59.7%). The expenses for bread products constituted 13.1 percent of the total food expenses in families with high incomes. For meat products it was 24.7 percent, for milk products 10.3 percent, fruits 5.5 percent. The same expenses in the group with low incomes are as follows: bread products 30.3 percent, meat products 16.8 percent, milk products 6.4 percent, and fruits 4.5 percent. Per capita food expenses of families with high incomes were higher than the expenses of less well-to-do families by a factor of 5.6.

Irkutsk has the second largest nominal wages, and occupies fourth place in the purchasing power among the regions of Siberia (Table 5:8).

In accordance with preliminary estimates there were 650,000 pensioners in the region at the beginning of 1998. This was 2 percent more than the preceding year. For the last three years the number of pensioners has increased by 6.6 percent (or by 40,000 people).

There are 228 pensioners per 1,000 persons in the Irkutsk population (1997). The average mothly pension including compensatory payments was estimated to be 377,400 rubles. This constituted 127 percent of the subsistence level.

Table 5:8. Average wages in some Siberian regions, November 1997.

	Nominal, 1,000 rubles	**% of October 1997**		**Purchasing Power***
		nominal	**real**	
Krasnoyarsk	1,501.2	97.6	97.3	5.1
Irkutsk	1,279.3	95.8	95.4	4.6
Tomsk	1,231.4	100.6	100.3	5.2
Kemerovo	1,213.0	98.7	98.4	5.2
Chita	952.0	97.5	97.4	3.5
Buriat Republic	954.0	99.4	98.8	4.0
Novosibirsk	945.4	98.6	98.4	4.0

* The number of baskets of 25 basic food goods that can be purchased for an average salary.

Source: Goskomstat Rossii (1997).

Education and Culture

At the beginning of the 1997/98 school year, 565,800 people were participating in adult education, and 468,300 people attended high schools (Diagram 5:2). In the current school year the number of pupils decreased by 2,000 people (0.4%), and the number of schools decreased by 4 (0.3%). 21,200 people completed high school education in 1997 (19,800 in 1996).

There are approximately 15 pupils per teacher in urban areas and 10 pupils per teacher in rural areas; the average number of pupils in a class is 26 and 15 in urban and rural areas respectively.

At the beginning of the 1997/98 school year, there were 69 specialized technical schools with 28,400 pupils. Approximately 2,700 (23%) of the 11,700 people that graduated in 1997 could not find jobs. Specialists are trained at 10 higher educational establishments and 56 special high schools in the Oblast. A new college of business and law for 495 students was opened in 1997 at the Irkutsk State Economic Academy.

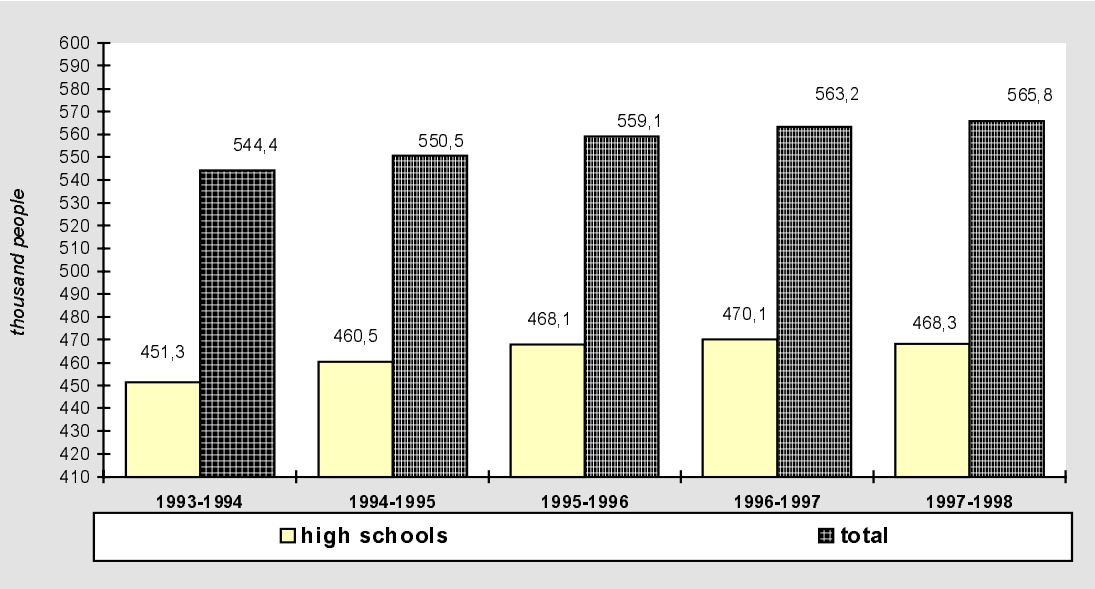


Diagram 5:2. Number of students in Irkutsk Oblast 1991–1998. (Source: *Irkutskaia oblast': 1992–1997 godi. Statisticheskii spravochnik,* 1998.)

Currently 58,600 students are educated at higher educational establishments, 36,800 participate in daytime education. Twenty-five percent of all students in the education system pay, at least partially, for their education. Half of all students must pay for their education in full.

In 1997/98, 8,900 students were admitted to the daytime department of higher schools in the region (19,000 applications were submitted). The total number of graduates was 7,500 people. As can be seen in Diagram 5:3 there has not been a major drop in higher education during the transition period.

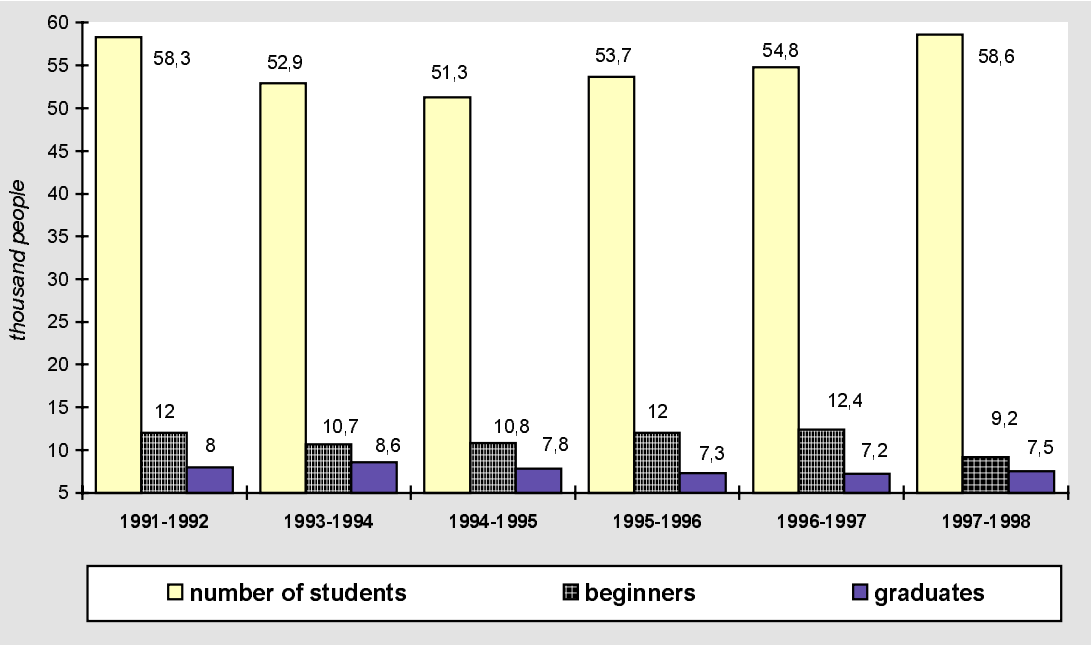


Diagram 5:3. Number of students in higher educational establishments in Irkutsk Oblast 1991–1998 (Source: *Irkutskaia oblast': 1992–1997 godi. Statisticheskii spravochnik,* 1998.)

Criminal Situation[15]

It is a well-known fact that the criminal situation in the region was aggravated in 1997 and, according to the Department of Internal Affairs, the number of crimes increased by 1.7 percent compared to 1996. A considerable growth in crime (12–36%) was observed in the Angarsk, Ust-Ilimsk, Sayansk, Slyudyan, Bratsk, and Bayandayevo regions. Irkutsk is the region with the greatest number of grave and serious crimes, which constitute 61 percent of all crimes.

There are also many "mercenary" and violent crimes: 55 percent of all crimes are thefts, robberies, and assaults. Half of all thefts were from privat apartments. Less than 40 percent of these were exposed.

In 1997, 1,048 murders were registered, which is 7 percent more than in the preceding year. 75 percent of the perpetrators were exposed.

In addition, the number of registered fraud cases increased by a factor of 1.5. The number of road accidents increased by 7 percent. A rapid (twofold) growth of drug crimes is causing much anxiety. Crimes involving illegal operations with weapons (a growth of 21%) is also an indication of the severe situation.

Every fifth crime is committed under the influence of alcohol. The number of crimes committed by previously convicted people is stable, while the occasional crimes

[15] Based on Goskomstat Irkutsk (1997).

increased by 27 percent. The number of group crimes increased by 10 percent. Every second crime registered in 1997 was exposed. The reduction in the standard of living is, among other factors, a "stimulator" of crime. Every second crime is committed by someone who does not have a permanent income.

Ecology and Welfare

Environmental circumstances also affect people's welfare. Thus, the emission of harmful substances into the atmosphere is gradually decreasing. In the first six months of 1997, 284,000 tons of harmful substances were discharged into the atmosphere in the region. This is 53,000 tons (16%) less than in the same period for 1996. Polluting emissions were made at 551 enterprises in the region and at 137 of these, emissions increased compared to the previous year.

The atmosphere is mainly polluted by the electric power industry (44% of all discharges), the fuel industry and the nonferrous metallurgy (13%) and by the forest, woodworking, and pulp and paper industries (7%) (Goskomstat Irkutsk, 1997). The largest emissions into the atmosphere take place in the following cities: Angarsk (34%), Bratsk (12%), Usol'ye-Sibirskoye, Shelekhov (7%), and Ust-Ilimsk, Zima (4%).

On average, there is an exposure of 102 kg of pollutants per inhabitant in the region; 358 kg in Shelekhov, 357 in Angarsk, 296 in Zima, 193 in Usol'ye-Sibirskoye, 132 in Bratsk, 108 in Ust-Ilimsk, and 47 kg in Irkutsk.

In 1997, the forest area affected by fires decreased by 80 percent compared to the preceding year and constituted 74,412 hectares. The damage caused by forest fires was estimated to be 67.7 billion rubles. This was a reduction of almost 86 percent compared to 1996.

In 1997, 987,000 m^3 of forest worth 18 billion rubles, 4,657 m^3 of lumber worth 225 billion rubles, buildings, constructions, and other property worth 6 billion rubles perished in fires or were damaged.

The costs of reforestation amounted to 17 billion rubles, the cost of cleaning to 16 billion rubles, and the cost of fire extinction to 17 billion rubles.

A major part of the forest fires in the region (1,896 cases or 78% of the total number of fires) was caused by the local population.

Two hundred and seventy criminal offenses were brought to court by the regional judicial authorities; 25 billion rubles were paid as fines for the damage caused by forest fires; 13 billion rubles for 206 cases were exacted by administrative means.

Before turning to Chapter 6 and the forest sector management structure we can note, in summary, that the comparative advantages of Irkutsk Oblast — its relatively favorable geographical position for transit cargo transport and its rich natural resources — has only been poorly used so far.

There is an imbalance between the comparatively high economic development in the Oblast and the low quality of life compared to other regions of Russia.

There are significant differences in the settlement and socio-demographic structure, resulting from poor economic activities inside the Oblast.

The level of crime is significantly high.

6. The Forest Sector Management Structure

The federal management and control over the use, reproduction and protection of forests on the territory of Irkutsk Oblast is exercised by 58 *leskhozy* belonging to the Irkutsk Forest Management, consisting of 269 *lesnichestva* (Figure 6:1).

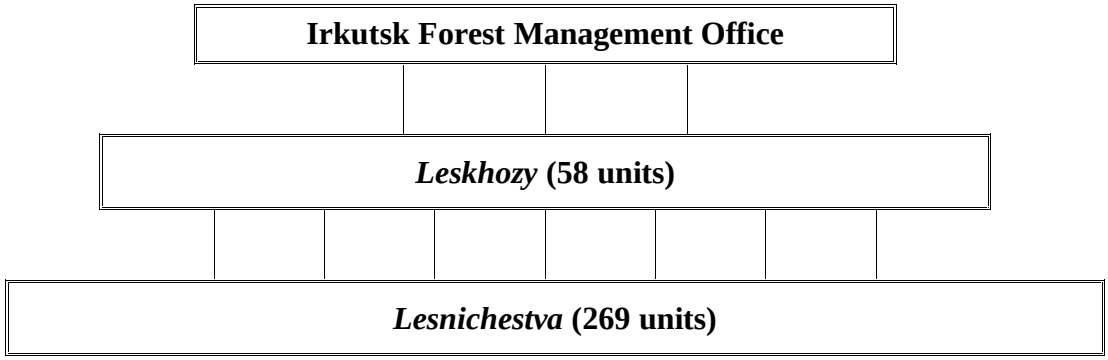


Figure 6:1. Forest organizations in Irkutsk Oblast (as of 1997).

In addition to what is shown in Figure 6:1 there are also two natural preserves, the Baikal National Park, *kolkhozy* and *sovkhozy*, military *leskhozy* and *lesnichestva*.

In the postwar period (1960–1965 and 1985–1993) two attempts were made to merge forestry activities with the forest industry; the functions of the *leskhozy* were to be performed by the departments of integrated *lespromkhozy*. These forest use reforms were conducted with the positive intention to concentrate all forest activities in the same hands and to ensure an integrated use of forest resources. The *leskhozy* were included in the structure of integrated *lespromkhozy* as special departments.

However, these reforms caused many negative consequences for forest use and after a while the *leskhozy* were restored.

Structure of Forest Users in Irkutsk Oblast

In 1998, the main portion of logging in Irkutsk Oblast was carried out by large and medium-sized enterprises (forest users with a different status). According to the 1997 annual data of the Irkutsk Forest Management, they included the following enterprises:

Types of harvesting companies		Number of enterprises
Goskomlesprom		97
Ministry of the Interior		12
Joint stock companies		37
Including	OJSC:	6
	CJSC	5
	JSC	26
Joint ventures		2
Other forest users		72
Total		**220**

The largest timber processing enterprises are the Bratsk Forest Industry Complex ("OJSC Forest Industry Holding Company"), the Ust-Ilimsk Forest Industry Complex ("Ust-Ilimsk Forest Industry Concern" owned by Continentalinvest) and the Open JSC "Baikalsk Pulp-and-Paper Combine". Most other forest users are members of the "Union of Forest Industrialists of Irkutsk Oblast," a "public" organization that performs coordination functions.

A more or less formal and realistic interaction scheme of forest users in Irkutsk Oblast existed until 1992 (the main actors are shown in Figure 6:2). Besides enterprises, associations and amalgamations, numerous logging and processing units from different ministries operated in Irkutsk Oblast. There were units belonging to the construction industry, the Ministry of Defense, joint ventures with foreign companies, as well as those of former Union republics.

Taking into account the fact that in recent years many companies have disappeared (at least, they terminated the activity for which they are officially accountable), and in their place many others have emerged, a more accurate representation of the forest indusry structure than the one found in Figure 6:1 is very difficult to present.

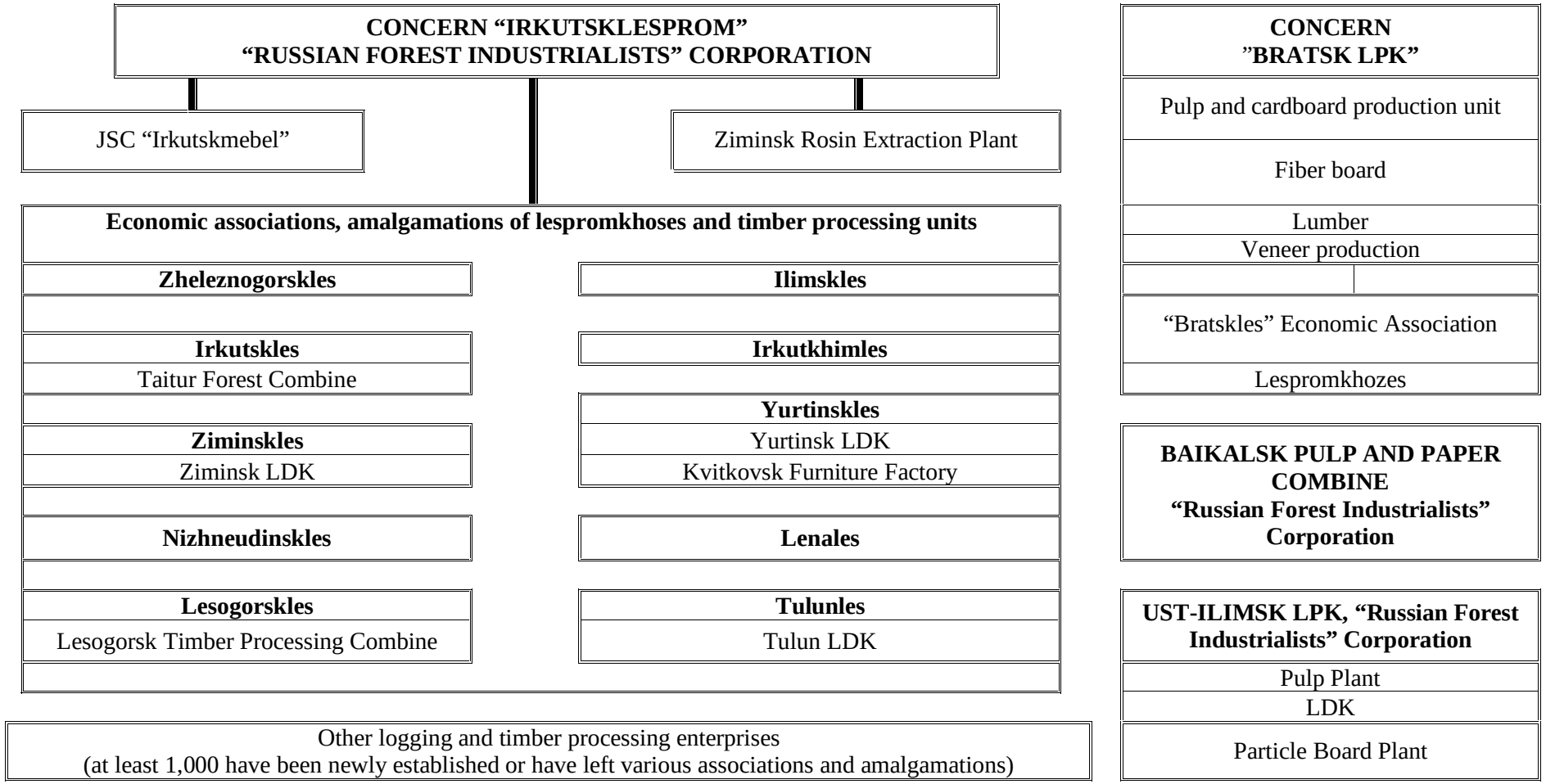


Figure 6:2. Forest enterprise structure in Irkutsk Oblast.

The Distribution of Forests among Different Forest Holders

Forest Stock Owners

According to the records of 1 January 1993, the total forest stock area in Irkutsk Oblast, including the Ust-Orda Buryat Autonomous District, amounted to almost 71.5 million ha or 92.2 percent of the total Oblast territory (Table 6:1). Forest industry enterprises, under the umbrella of the Irkutsk Forest Management, own 67.6 million ha of the forested area (94.6%), Pribaikalsky National Park has 305,300 ha (0.4%); *kolkhozy*, *sovkhozy*, other rural entities own 2.1 million ha (3.0%), preserves – 1.2 million ha (1.7%), and military *leskhozy* and *lesnichestva* – 0.4 million ha (0,6%). The legal status of the above forest stockholders is defined by the Forest Code of Irkutsk Oblast (No. 27, signed by the Governor on 9 February 1995) as owners of the forest stock.

Table 6:1. Forest owners in Irkutsk Oblast.

Forest owners	**Forest stock area thousand hectares**			**Reserves, million m^3**		
	Total	**Forests**	**Covered with forest**	**Total**	**including mature and over-mature forests**	
					Total	**coniferous**
1. Rosleskhoz	67598.9	62343.6	57608.6	8879.88	5204.34	4640.22
2. Ministry of Nature	1245.6	795.4	764.4	85.97	8.39	8.11
3. *Kolkhozy*, *sovkhozy*, other agricultural entities	2113.6	2063.1	1911.3	275.89	73.69	58.23
4. City administrations	20.6	20.2	19.9	2.38	1.53	1.03
5. Other forest stock holders	466.5	369.6	344.1	50.37	36.61	30.61
Total	71445.2	65591.9	60648.3	9294.49	5324.56	4738.20

Source: *Lesa i lesnoe khoziaistvo Irkutskoi oblasti* (1997).

Historical Review of Forest Ownership in Russia and in Irkutsk Oblast

The nationalization of forests in October 1917 eliminated private ownership. A letter of the Council of People's Commissioners of 5 April 1918 defined federal ownership of the forests stressing that "forests are not the property of villages, regions or gubernias" — they are federal stock that is not subject to any division. This letter predetermined the principle of centralized forest management. But in 1924–25, the process started in Irkutsk Oblast of selecting forests of local significance to be transferred to rural Soviets.

During the Soviet period, forests were federal property with the exception of forest land given to *kolkhozy* for permanent use. It should be noted that the term "forest stock

owner" was not in use until the adoption of the "Basic Forest Legislation of the Russian Federation" in 1993 (Sheingauz, Nilsson and Shvidenko, 1995).

Federal forests in the post-revolution period were sorted under various bodies of forest management, logging industry, agriculture, transportation ministries, public utilities, internal affairs and other organizations. The proportions of the forest stock divided between different organizations varied widely: from almost complete transfer to the forest management organizations (1947), to the transfer of 94 percent of the forests to various organizations (1929).

In the post-war period, there were two attempts (in 1960–1965 and 1985–1993) to combine forestry and forest industry when the *leskhozy* were merged to become departments in the *lespromkhozy*. This resulted in the violation of the sizes and terms of cutting area, while logging volumes exceeded existing norms. When *leskhozy* were being re-established, it appeared that many units lost their material and technical base.

Changes in the owners of forest stock on a smaller scale were much more frequent. Based on the *Goslesfond* (the Federal Forest Fund), the hunting retreat "Baikal" of the RF *Glavokhota* was established in 1967. This later became part of the Baikal National Park. In 1982–86, two forest preserves of the Ministry of Nature were established. Quite frequently the lands of *leskhozy* were given (as an expansion of agricultural lands) to *kolkhozy*, *sovkhozy*, *gospromkhozy*, etc. In contrast, in other cases the forests of agricultural entities were given to forestry organizations. The scale of the above changes is given in Table 6:2.

Table 6:2. Changes in the distribution of forests between forest owners (1,000 ha).

	1961	**1978**	**1983**	**1988**	**1995**
Forestry and forest industry	69330.1	69288.9	68603.9	67999.0	67691.6
Agricultural enterprises and formations	2138.8	2131.5	1870.0	2164.3	1822.2
Reserves and hunting retreats	7	153.7	738.7	1244.6	1245.6
Other	96.3	255.5	1103.5	202.4	708.3
Total	71565.2	71829.6	72316.1	71610.3	71467.7

Source: *Lesa i lesnoe khoziaistvo Irkutskoi oblasti* (1997).

During the last 12 years the total forest stock area in Irkutsk Oblast has decreased by 848,000 ha (or by 1.2%) as a result of using forest lands for industrial and civil construction, agriculture, and gardening. Due to poor knowledge about the forest stock in the past it is impossible to monitor the dynamics of forest land reduction over a longer period. Suffice to note, that only by 1956 the forest inventory in the Oblast was completed by a simplified aero-visual method conducted without aero-photography using only topographical maps. This provided only very approximate data on the forest stock. Changes in the forest area between 1961 and 1983 can be explained by the verification of the data via surface activity and aero-photography.

In general, the organization of the forest management system is similar to that of other Russian regions.[16]

Public Finances

As the region is rich in forests naturally the regional budget is dependent upon the function of the sector. However, the public finances of Irkutsk are in trouble (see Table 6:3).

According to the Financial Department of Irkutsk Oblast Adminstration, the total amount of incomes in the period from January to November 1997 constituted 5,174.2 billion rubles, and the total amount of expenditures was 5,684.9 billion rubles, the deficit was 510.7 billion rubles (9% of total expenditures).

Table 6:3. Structure of incomes and expenditures in the Irkutsk regional budget.

	Billion rubles	**Percent of accomplishment in relation to the year's plan**
Total revenues	**5,174.2**	**70.5**
of which:		
Tax	4,671.3	74.7
Non-tax*	351.5	46.9
Other	151.4	45.7
Total expenditures	**5,684.9**	**64.4**
of which:		
Education	1,600.3	72.7
Municipal services	1,223.7	72.8
Health care	887.7	61.0
Social policy	390.4	31.4
State control	320.8	82.7
Agriculture and fishing	186.9	55.1
Transport, road services, communication and informatics	170.8	56.0
Culture and art	109.2	66.0
Industry, energetics, and construction	27.7	41.7

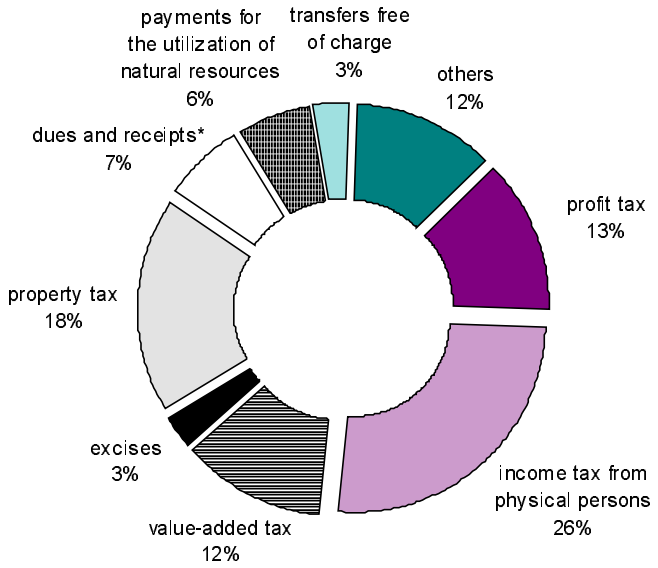
* Non-tax revenue: income from foreign economic activity; sales of Government-owned property; sales of federal reserves.

Source: Goskomstat Irkutsk (1997).

[16] See footnote 1 for a reference to other studies performed by IIASA.

In the incomes of the consolidated budget, tax payments amounted to 90.3 percent, non-tax payments to 6.8 percent, and the other entries to 2.9 percent (Diagram 6:1).

Income



* In addition to these sources of income there are charge-free transfers from the federal budget.

Expenditures

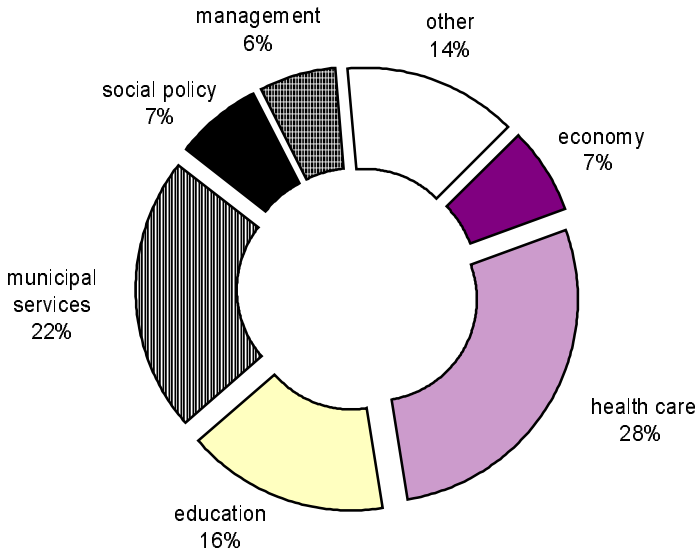


Diagram 6:1. Structure of the Irkutsk consolidated budget. Percent. (Source: *Irkutskaia oblast': 1992–1997 godi. Statisticheskii spravochnik, 1998*.)

Income tax from physical persons constituted the largest share of total budget revenues: 26 percent of the total sum of incomes (23% in 1996), property tax constituted 18 percent (19%), profit tax 13 percent (12%), and value-added tax 12 percent (10%). The share of these taxes in the total sum amounted to 69 percent (64% for January and November 1996).

In the consolidated budget of 1997, 385.4 billion rubles, or 7 percent of the total sum of expenditures, were paid for the maintenance and support of the economy, while 3,006.1 billion rubles (53%) was allocated to the social sphere. From Diagram 6:1 it can be concluded that the income from the utilization of natural resources is fairly insignificant. Other types of taxes provide the main part of the revenues. The relatively high levels of expenses for municipal services reflect a traditionally strong engagement in providing services. In fact, this part of the budget exceeds the costs for education.

Public finances are reflected in the economy of the enterprises (Diagrams 6:2 and 6:3). As of 1 December 1997, the total debts for bank credits and loans of industrial, transport, construction, and agricultural enterprises constituted 33,715 billion rubles, of which the overdue debts was 19,169 billion rubles, or 57 percent.

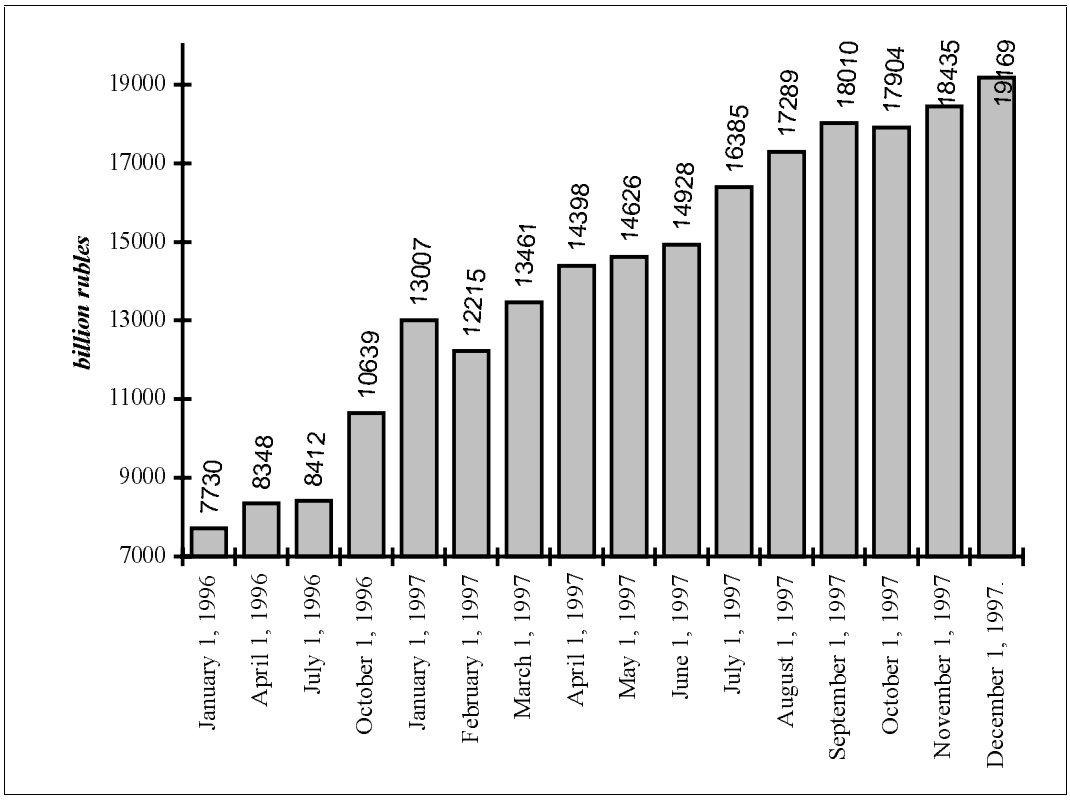


Diagram 6:2. Dynamics of total overdue debts in 1996–1997. (Source: Goskomstat Irkutsk, 1997.)

Since January 1996, the total overdue debts increased by a factor of 2.5. Credit debts that are more than 3 months overdue have a considerable share in the payment arrears.

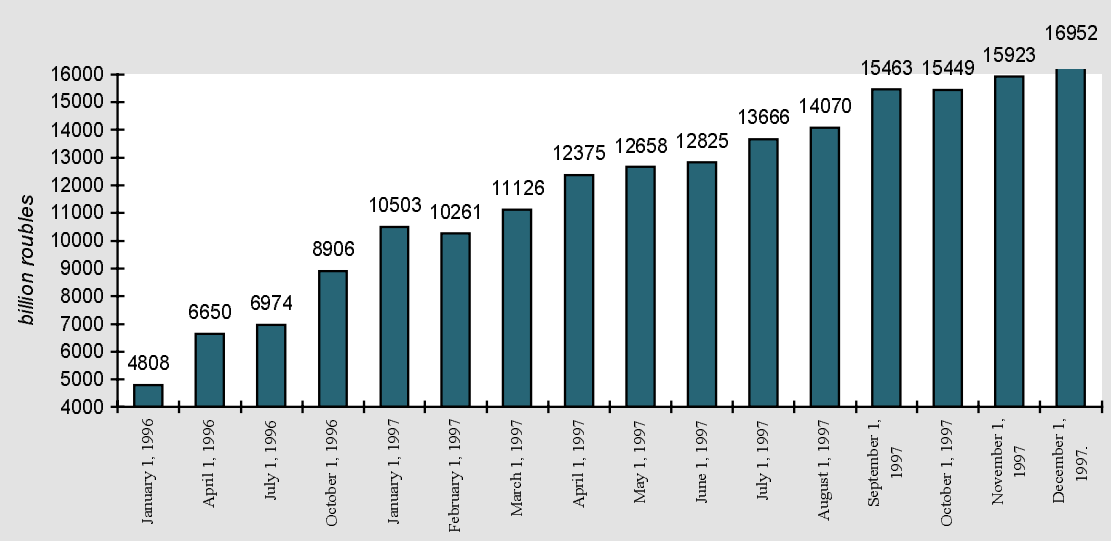


Diagram 6:3. Dynamics of payables (more than 3 months overdue). (Source: Goskomstat Irkutsk, 1997.)

Income from Privatization

In 1997, the process of privatization was mainly settled. During the first nine months of 1997, 53 enterprises were privatized, of these 52 were municipal property, one was federal property. Seven enterprises were privatized by becoming joint stock companies, prior to that they were all municipal property. Forty-three enterprises (81% of the total number privatized) changed the form of ownership by being sold. During this period of 1997 the relation between the sales value and the bidding price of these enterprises was on average 1.3.[17]

Since these changes meant that significant resources were transferred from the public sphere to private owners they also generated income. During 1997, the privatization of Irkutsk enterprises yielded 42.6 billion rubles, plus 25.8 billion rubles from the sales of stocks, Table 6:4.

[17] Bidding prices are set by a special municipal committee for privatization.

Table 6:4. Privatization revenue pattern and its distribution.

	Objects of ownership				1996
	1997				
	Total	**Municipal**	**Oblast**	**Federal**	**Total**
Funds received from privatization	42640	29527	2595	10518	16295
Distributed revenues, total	42571	29454	2599	10518	16264
including:					
– to local budgets	29064	27467	980	617	6645
– to Oblast budget	2337	97	636	1604	3307
– to federal budget	6287	167	119	6001	3209
Investment resulted from sales of stock	25824	16458	2	9364	8483

Source: Goskomstat Rossii (1997).

When joint stock companies are formed priority is given to so-called monetary privatization (through auctions).

By 1 January 1998, 306,335 housing units had become private property via privatization (38% of the total due for privatization). This total includes 32,979 units (34%) in rural areas. Only in 1997, 22,204 were agreements finalized on the transfer of housing units to private ownership. This was 5 percent less than in 1996. The total housing capacity privatized in 1997 (21,863 apartments and 294 communal flats) amounted close to 1.1 million m^2. Besides, 773 housing units were sold from the state and municipal stock, 662 (86%) of these to private persons. However, there is also a counter current. Thus, during 1997, 321 housing privatization agreements were terminated and 203 apartments (63%) became municipal property again. The highest rate of de-privatization took place in Kuitun Region, where 100 agreements were terminated (44% of the total finalized in the same period), in Ust-Ilimsk – 79 (7%), and in Irkutsk – 78 (1.4%) agreements.

7. Business Behavior in the Irkutsk Forest Sector

Like many other Russian forest regions Irkutsk has also been affected by the new circumstances caused by the dismantling of the Soviet state. In previous chapters we have discussed the severe decline in forest production, the problem that a general renewal of technology has failed to appear, the situation with non-competitive transportation costs, the intransparent tax system, and so forth. In this chapter we shall see how these problems are perceived from the point of view of the managers of the firms. In short, what problems, if any, do managers face in running their business, and to what extent can these problems be attributed to institutional features? Do they have any problems acquiring wood, finding customers, etc?

The material is based on interviews with 245 forest enterprises from different Russian regions. In order to enable a comparison with firms that are assumed to work under more "normal" circumstances a mirror study has been conducted among Swedish forest firms (25 enterprises).[18] In this chapter we will mainly concentrate on the 30 Irkutsk firms that took part in the survey.[19] These firms represent different segments of the forest sector, such as harvesting, processing, trade, etc. The sample contains both large and small companies — half have less than 250 employees while the largest has more than 11,000. Nine of the companies were recently established as a result of the transition, fifteen are older but privatized enterprises, while six are still publicly owned.

Productivity, Production and Employment

One way of surviving in the new economic system is to adapt to the principles of "the market." For example, one would expect that firms should invest in order to be more efficient, that they renew their machinery, and reduce their staff in order to become more productive. As Diagram 7:1 and 7:2 indicate this has only partly been the case. By consulting Diagram 7:1 it becomes clear that among interviewed forest firms we only find one that has simultaneously increased production and productivity measured as the output of goods per employee. In total, we only find three companies that show increased productivity. The majority of firms are located in the "problematic" lower left square of the diagram, characterized by both shrinking production and productivity.

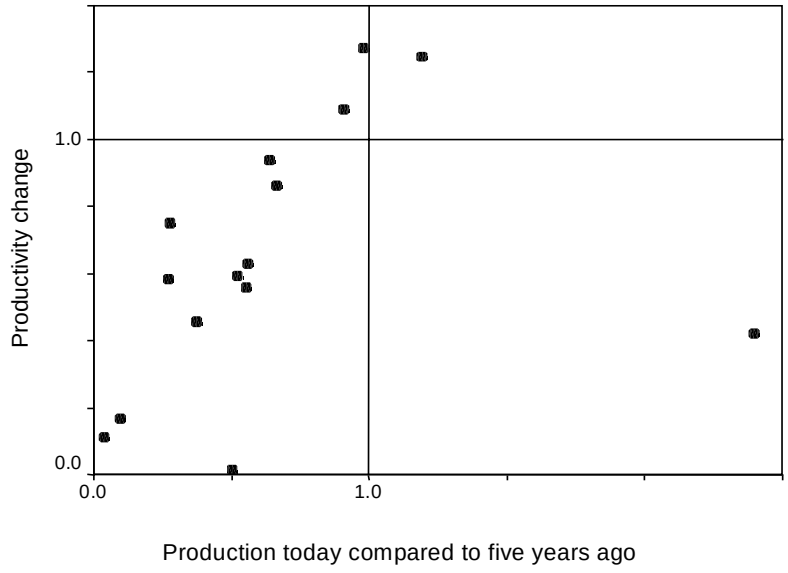


Diagram 7:1. Productivity and production change among Irkutsk forest enterprises.

[18] For information on how the interviews are performed see, Carlsson, *et al.* (1999:Appendicies 1:1 and 1:2). In total, the IIASA Institutional Framework Database contains data on 245 companies, of which 25 are Swedish, the latter for comparison purposes.

[19] It should be emphasized that all comparisons that are made only pertain to the investigated firms. The firms in the database have been selected for the purpose of providing a variation of firms rather than a statistical sample. Thus, conclusions cannot automatically be generalized to all Russian forest firms.

This picture becomes even clearer when compared to Diagram 7:2. Here we find one firm that has increased its employment, while productivity has dropped. Thus, the situation for the vast majority of the firms clearly reflects the problematic economic situation. Only three enterprises show what can be regarded as typical "capitalist" behavior, i.e., higher productivity with fewer employees.

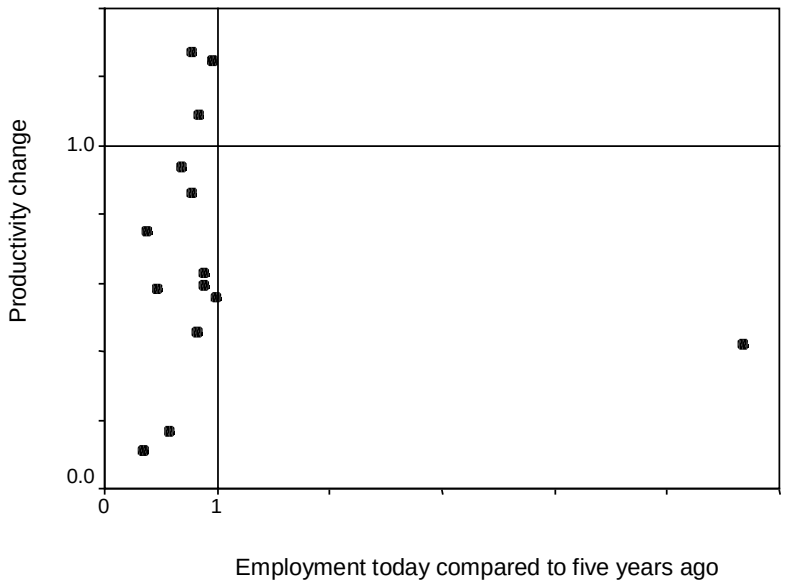


Diagram 7:2. Productivity and employment change among Irkutsk forest enterprises.

These three enterprises have qualities that should call for some attention, especially those that have a tendency to prescribe easy solutions to the "Russian problem". The relative "success" of the three enterprises show that old state companies can also lift themselves out of the conduct of the command economy. Although the three firms are all privately owned, one is newly established and the other two have been privatized. A common denominator is that they all invest, in buildings and equipment. At the same time, all three have substantial engagements in the social sector, basically health and child care, something that is often regarded as an obstacle for developing market behavior. Finally, its should be emphasized that all three of the "successful" firms are fairly big. Two export their products while the third operates on the domestic market.

Investment and Wood Supply

As was indicated in the previous section the relative success of a firm coincides with its propensity to invest. How common are investments among the forest firms interviewed in Irkutsk? From Diagram 7:3 one can conclude that the investment rate is somewhat higher in Irkutsk than among the other Russian firms in our sample. However, while more than 80 percent of the Swedish firms invest, the corresponding figure for Irkutsk is around 40 percent.

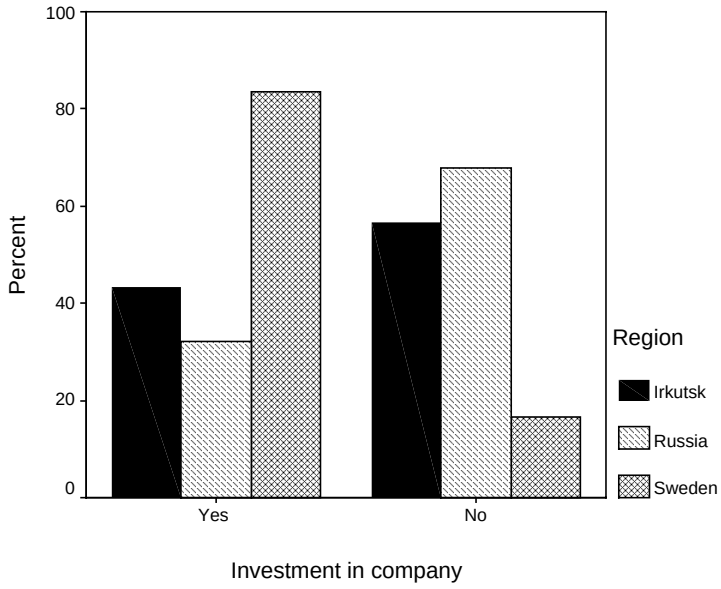


Diagram 7:3. Investment among forest enterprises.

The tendency to invest is logically coupled to a number of other variables, such as the availability of wood and the prospect for selling produced goods. Around 40 percent of the firms have difficulties in acquiring enough timber. This can be compared with the Swedish companies, where the corresponding figure is around 10 percent (Diagram 7:4).

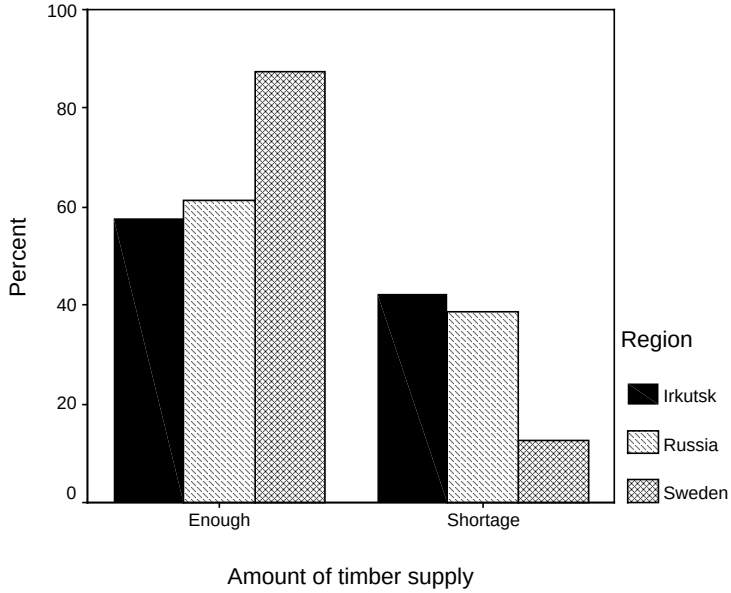


Diagram 7:4. Availability of timber among Russian and Swedish forest enterprises.

This result might be regarded as astonishing given the fact that Russian forest production has decreased significantly over the past ten years of transition. Evidently there are considerable potential resources to be utilized for processing, but institutional obstacles raise hurdles for their appropriation. Indeed, the figures that are revealed in Diagram 7:4 strongly support the conclusion of sub-optimal utilization of resources. If forest resources are abundant there "should" not be any shortage of timber. This, once again, supports the old lesson that resources in an economic sense are not the same as the mere existence of forests, minerals, fertile land, and so forth.

Two features are necessary for making a natural resource a valuable asset. The first is technology and the second is a functioning institutional structure embedding the resource (Kant and Nautiyal, 1992). Technology in the forest sector, as well as within other sectors, refers to the state and quality of physical capital, but it should also refer to the human capital that is involved in the activities related to the resource. The structure, usefulness and appropriateness of technology is closely related to the institutional arrangements. Without adequate institutional arrangements any technology is worthless (Kant and Nautiyal, 1992:7). As Diagrams 7:3 and 7:4 indicate neither of these prerequisites seems to be fulfilled in Irkutsk.

The Problems of Selling

Around 40 percent of the Irkutsk firms sell their goods on export mainly to Asia and (to some extent) Europe. However, half of the interviewed managers were not willing to reveal the recipient countries. Most firms are thus dependent on local customers and this has its own problems. As can be seen in Diagram 7:5, the vast majority of the firms perceive the violation of selling agreements as a substantial problem (the comparison with the Swedish sample should be striking). This reflects a general lack of trust in the Russian forest sector (cf. Fell, 1999).

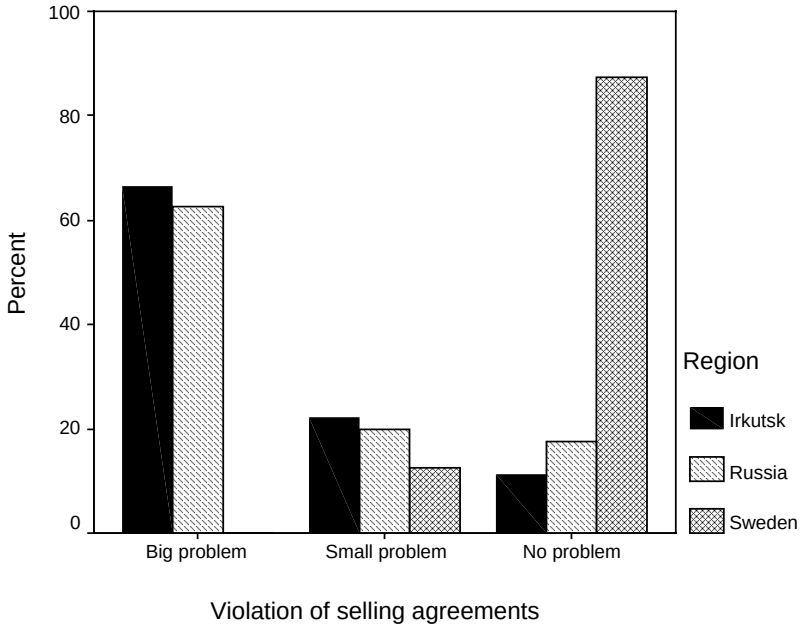


Diagram 7:5. Violation of selling agreements among Russian and Swedish forest enterprises.

Almost 60 percent of the Irkutsk respondents admit that their enterprises are involved in barter trade, a figure that is probably too low. In this respect Irkutsk seems no different from many other forest regions (cf. earlier reports from the project, see footnote 1; Aukutsionek, 1998; Commander and Mumssen (1998), Woodruff (1999), Guriev and Ickes, 1999).

One other aspect of trade is payment. The basic problem in all trade is the likelihood that the seller is paid in time, a problem that has already been discussed. The seller's logical response to insecurity is to demand payment in advance, before shipping any goods.

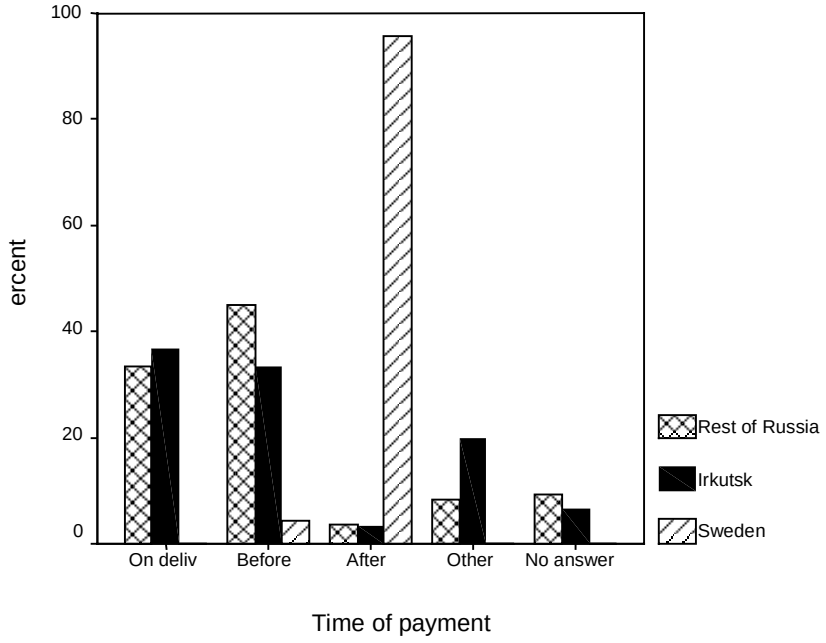


Diagram 7:6. Arrangement of payments among Russian and Swedish forest enterprises.

As can be seen in Diagram 7:6, almost no Russian forest firms in our sample accept payment after delivery, a custom that dominates, for example, in Sweden. It is easy to understand that if all parties demand payment in advance this will constitute a severe obstacle for trade. How, then, do managers of the Irkutsk forest enterprises look upon the palette of the problem that has been discussed in this report? What do they regard as their main problem(s)?

Restrictions for Operating in the Irkutsk Forest Sector

The most significant feature of the set of problems that affects the forest sector is the existence of many different issues that are obviously linked to each other. Thus, when managers are asked to indicate one problem that they regard as the most binding restriction for running their business we receive the following picture, Diagram 7:7.

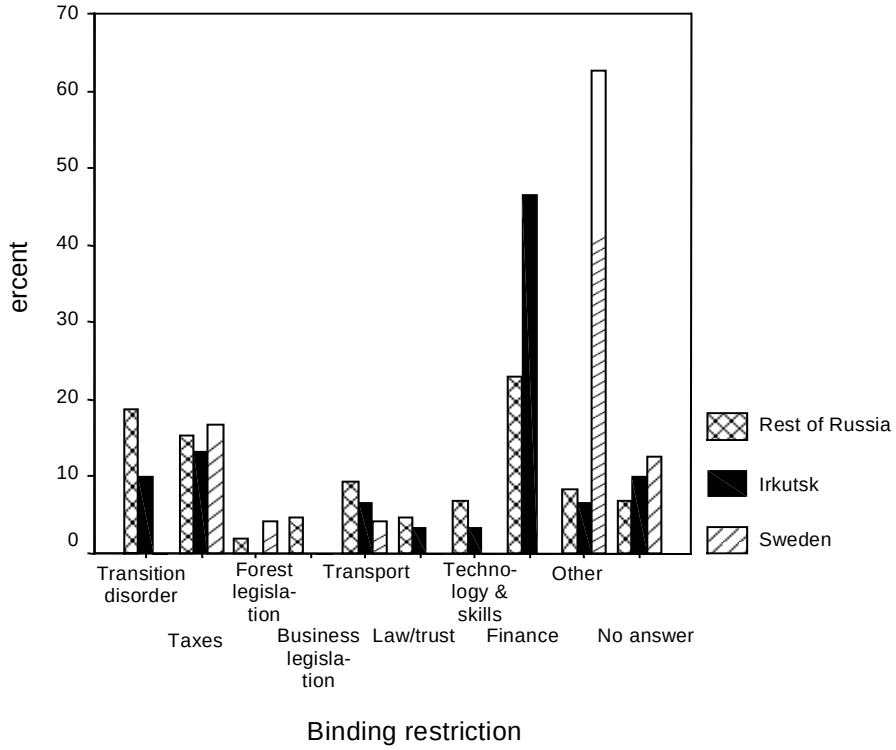


Diagram 7:7. The most binding restriction for running forest enterprises in Irkutsk as perceived by their managers.

More than 15 different problems are mentioned as the most important. Added together in categories, we find that the financial problem together with taxation dominate. It is also revealed in the diagram that even Swedish firms complain about taxes, but here the environmental legislation (the category "other") is regarded as the most binding restriction. Among other obstacles most frequently mentioned by the Irkutsk companies, although not regarded as the most binding, we find problems with machinery and the skill of their personnel. If the figures are broken down, it is further disclosed that "finding a market" is not regarded as a major problem for Russian enterprises. This, once again, demonstrates the institutional side of the coin. There are obviously opportunities to be developed, but due to a number of reasons firms are unable to exploit these opportunities.

The managers of the firms interviewed were also asked to suggest changes that they thought would significantly change the problematic situation in the regional forest sector, Diagram 7:8.

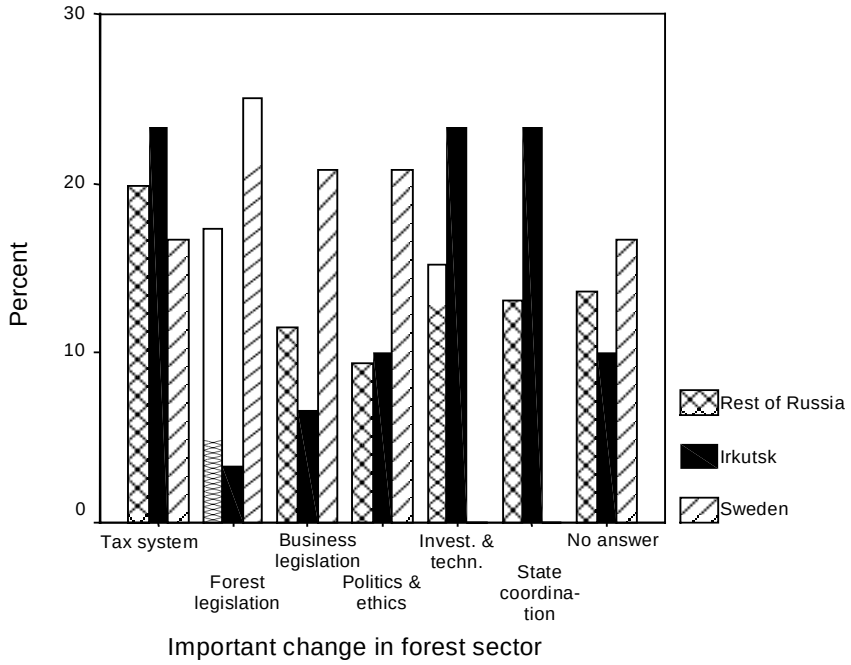


Diagram 7:8. Suggestions that are believed to change the problematic situation in the forest sector.

Not surprisingly we find that the current taxation policy is regarded as the most urgent area to change. But, as can bee seen, the respondents also think that technology improvement is important. However, and this might be surprising, a significant number of the firms also call for more state coordination, something that can be regarded as a step backwards to the old system of the planned economy.

Finally, it should be emphasized that the forest firms of Irkutsk do not greatly differ from other Russian forest enterprises.[20] The only significant differences are found in Diagrams 7:7 and 7:8 with respect to the call for state coordination, the appreciation of financial problems and the need for investment. Whether this should be interpreted as if the Irkutsk firms to a greater extent expect the state to solve their financial and technological problems is not easy to decide. It might as well be the case that the Irkutsk firms are more involved in the non-monetary economy, something that is indicated by the fact that around 75 percent of the forest firms are engaged in providing social services to the population (the corresponding figure for the rest of the Russian firms in our survey is around 45%). If so, the problem might be even more severe than what has already been indicated in this report.

[20] Cf. other case studies on the Russian forest sector made at IIASA (see footnote 1).

8. Conclusion

As in all of the other IIASA case studies dealing with the Russian institutional framework[21] the basic question to be answered is: To what extent the forest sector has moved towards a market economy? Since it is not self-evident what is meant by "moving towards a market economy" a number of rather general criteria must be used for such an assessment (cf. Carlsson and Olsson, 1998:Ch.1; Carlsson *et al.*, 1999:Ch.1). The criteria for which we have settled are the following:

- 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 the price 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.

From previous chapters, it can be concluded that none of these criteria is entirely met in the Irkutsk forest sector. The sector might have been affected by the sweeping changes of the dismantling of the Soviet state — radical privatization is one example — but there is still a significant distance to travel before the sector is adapted to the principles of a market economy (Dolgopyatova, 1996; Gaddy and Ickes, 1998; Ickes, Murrell and Ryterman, 1997).

The palette of the problem that afflicts the Irkutsk forest sector can also be found in other Russian forest regions. The forest sector is virtually organized in the same way and evidently causing the same kinds of problems as in other regions. Here, like elsewhere in Russia, it is characterized by *ad hoc* regulation, intransparency of rules, the existence of privileges to particular actors, lack of means to implement decided policies, etc.

It is also the case that the whole sector is ridden by severe economic problems; barter flourishes, while the officially registered cash flow is insignificant. The taxation burden is draconian and if firms really would pay all their taxes they would probably not be able to survive. The problem is that these taxes and fees also function as an asset for those who use them in non-monetary transactions. If taxes were reasonably few and the system transparent, bureaucrats and other actors would have nothing to "trade with" in order, for example, to finance the maintenance of public buildings, apartment houses, and so forth. Consequently, these people have only a weak incentive to alter the

[21] See footnote 1.

situation, they might even add more fees and taxes in order to have more with which to "trade".

The Irkutsk forest sector has great potential. Forest resources are immense and transportation possibilities are good. However, much of the production capacity is underutilized, export is underdeveloped and it is evident that inconsistencies exist in the registration of this export possibly hiding criminal activities and a systematic shunning of fees and taxes. In general, criminal activities in the Oblast seem to increase.

When the economy of forest firms is poor, or when income is deliberately hidden, the public economy is affected in a negative way, and when the public sector face more problems officials are willing to find "unorthodox" ways of solving their problems. Thus, key actors are trapped in a vicious circle that is hard to break. What can be done, then, to improve the situation? The easy answer is that the Russian government should make decisions aimed at straightening out ambiguities concerning property rights, including ownership of forest land, as well as deciding on a number of other undertakings aimed at improving the general economic and political situation (Bac, 1998).

However, forming an adequate institutional framework is not possible without a comprehensive integrated policy for the forest sector as a whole. In 1997, an attempt to formulate such a policy was made by leading Russian forest economists. However, this is only a first step towards solving the problem. A strategic program for the development of the forest sector should be elaborated at the national level in order to have the principles fixed in legislative acts. Moreover, it is necessary to change the existing practice for the elaboration of forest policies and development programs. Even the latest federal programs (from 1996) were elaborated separately without taking into account logical connections between forestry and the forest industry (and, to some extent, the environmental regulations).

In addition to these general comments and suggestions, we envisage a number of efforts in order to immediately initiate a long-term improvement of the Irkutsk forest sector. It is hardly surprising that these recommendations are similarly applicable to many other Russian forest regions.[22]

Recommendations

Regional authorities and others should withdraw from most of their engagements in individual firms. When such engagements are needed the reasons should be openly declared and justified.

The overall task of political authorities in Irkutsk Oblast should be to minimize or eliminate political risks in order to achieve economic growth. For example, all types of *ad hoc* regulations, such as retroactive rule making, should be immediately stopped.

[22] Some recommendations have been given earlier in this chapter and most of the recommendations that have been presented in earlier case studies also apply to the situation in Irkutsk Oblast (cf. Carlsson and Olsson, 1998; Carlsson, Lundgren and Olsson, 1999; Carlsson *et al*., 1999; Kleinhof, Carlsson and Olsson, 1999).

Politicians and related officials should promote institutional stability and, thus, transparency of rules, which will subsequently increase predictability.

In order to stimulate, or increase the likelihood of, the establishment of “real” branch organizations officials should withdraw from the type of corporativist organizations that have been created.

The authorities should pay great attention to the task of making regulations more simple and contradictions between various rules should, if possible, be eliminated.

Together with other actors regional authorities should develop programs in order to stop the deterioration of education and to increase management competence in the forest sector.

Activities of independent actors should be encouraged and supported, thereby counteracting a further bureaucratization of the forest sector. 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.

All concerned parties should try to find economic support for deliberate programs aimed at renovating apartment houses, repairing public buildings, roads, and other infrastructure facilities. As a side effect this might increase the regional demand of forest products.

More emphasis should be given to developing skills and technology for increasing the ability to perform intermediate cutting. In addition, the quality of locally produced wood products should be increased.

Political authorities as well as the authority of the police should be used to secure that firms have the possibility to reinvest the income of their trade thereby making their production more efficient. Firms have no incentive to generate money that will eventually end up in a draconian tax system or in the hands of organized crime.

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Appendices: Data on Various Aspects of the Transition in Irkutsk and the Other Regions in the IIASA Study

APPENDIX 1: MAJOR SOCIOECONOMIC INDICATORS (for the regions of Russia under survey)

Table 1-1: Population (end of year, thousand).

	1990	1991	1992	1993	1994	1995
Republic of Karelia	799	800	799	794	789	785
Irkutsk Oblast	2814	2823	2823	2812	2805	2795
Arkhangelsk Oblast	1577	1571	1562	1548	1535	1521
Moscow Oblast	6718	6707	6682	6644	6626	6597
Murmansk Oblast	1159	1148	1117	1092	1067	1048
Tomsk Oblast	1086	1086	1082	1074	1079	1078
Khabarovsk Krai	1631	1634	1621	1608	1588	1571
Krasnoyarskiy Krai	3159	3162	3159	3139	3117	3106

Source: Regiony Rossii: Inform.-stat. sb. V 2 t//Goskomstat Rossii – M. (1997).

Table 1-2: Capital investments (in current prices, billion rubles).

	1990	1991	1992	1993	1994	1995
Republic of Karelia	1.3	1.2	16.6	142.4	562.7	1260.8
Irkutsk Oblast	5.9	4.7	62.4	482.4	1875.5	5115.5
Arkhangelsk Oblast	3.1	2.2	28.9	218.7	1093.2	2160.4
Moscow Oblast	8.5	6.5	85	1277.8	4627.8	10913.4
Murmansk Oblast	2.7	1.9	29.4	237.4	891.4	2049.3
Tomsk Oblast	2.7	2.1	26.2	241.7	831.4	1993.4
Khabarovsk Krai	3.1	2.7	31	297.2	869	1974.1
Krasnoyarskiy Krai	6.9	5.5	80.3	665.0	2419.0	7074.5

Source: Regiony Rossii: Inform.-stat. sb. V 2 t.//Goskomstat Rossii – M. (1997).

Table 1-3: Exports (in current prices, billion rubles).

	1990	1991	1992	1993	1994	1995
Republic of Karelia	0.5	0.5	11.1	160.3	485.6	2613.2
Irkutsk Oblast	0.9	0.9	54.6	533.9	1279.1	13901.4
Arkhangelsk Oblast	0.8	0.6	21.9	134.2	640.8	3120.5
Moscow Oblast	0.58	0.78	10.9	125.4	577.2	3605
Murmansk Oblast	0.7	0.9	16	355.9	797.4	3317.4
Tomsk Oblast	0.2	0.2	51.5	79.1	430.2	2688
Khabarovsk Krai	0.4	0.3	17.8	418.4	949	2188
Krasnoyarskiy Krai	1.5	1.4	69.6	696.1	2372.3	9556.9

Source: Regiony Rossii: Inform.-stat. sb. V 2 t//Goskomstat Rossii – M. (1997).

Table 1-4: Volume of industrial output (in current prices, billion rubles).

	1990	1991	1992	1993	1994	1995
Republic of Karelia	2.9	5.8	96.3	603	2029	6163
Irkutsk Oblast	10.5	25.3	474	3415	10169	30116
Arkhangelsk Oblast	5.2	10.5	144	931	3186	11102
Moscow Oblast	27.9	61	560	4006	12112	29896
Murmansk Oblast	5.3	10	235	1464	4930	12276
Tomsk Oblast	2.9	8.4	91.7	657	2948	7798
Khabarovsk Krai	5.9	13	191	1357	3843	9180
Krasnoyarskiy Krai	13.8	30.0	644	4451	12347	33644

Source: Regiony Rossii: Inform.-stat. sb. V 2 t.//Goskomstat Rossii – M. (1997).

Table 1-5: Indices of physical volume of industrial output (percent of previous year).

	1990	1991	1992	1993	1994	1995
Republic of Karelia	102	95	83	87	79	103
Irkutsk Oblast	97	96	88	87	86	101
Arkhangelsk Oblast	99.5	95	89	94	79	92
Moscow Oblast	99.8	98	77	87	68	86
Murmansk Oblast	100.3	97	86	86	88	97
Tomsk Oblast	98	102	88	100.2	82	96
Khabarovsk Krai	98	99	86	82	59	81
Krasnoyarskiy Krai	99.1	97	85	86	83	101

Source: Regiony Rossii: Inform.-stat. sb. V 2 t.//Goskomstat Rossii – M. (1997).

APPENDIX 2: MANUFACTURE OF THE BASIC KINDS OF WOOD PRODUCTS (for the regions of Russia under survey)

Table 2-1: Timber removal (thousand dense cubic meters).

	1985	1990	1991	1992	1993	1994	1995
Russian Federation, mln. m^3	**337.3**	**303.8**	**268.9**	**238.1**	**174.6**	**118.9**	**116.2**
Republic of Karelia	12301	10768	9061	7800	6571	5312	5431
Arkhangelsk Oblast	24392	22620	18476	17642	13774	9768	9370
Moscow Oblast	1814	1706	1706	1588	1229	897.8	805.4
Tomsk Oblast	8090	7613	6760	5936	3744	2307	2043
Irkutsk Oblast	34403	34056	31096	27188	18250	13303	14052
Khabarovsk Krai	13507	11593	10099	8164	5987	3683	4564
Krasnoyarskiy Krai	23000	22311	20029	17472	13220	9275	9160

Source: Promyshlennost' Rossii. Stat. sb./Goskomstat Rossii – M. (1996).

Table 2-2: Production of commercial timber (thousand dense cubic meters).

	1985	1990	1991	1992	1993	1994	1995
Russian Federation, mln. m^3	**270.9**	**256**	**223.2**	**192.1**	**138.2**	**91.2**	**92.3**
Republic of Karelia	11305	9969	8344	6912	5770	4526	4763
Arkhangelsk Oblast	22770	21624	17348	15252	12312	8683	8305
Moscow Oblast	1404	1384	1398	1297	994.2	705.4	697.8
Tomsk Oblast	6324	5952	5168	4342	2725	1639	1488
Irkutsk Oblast	29409	30713	27724	23496	15578	10896	12032
Khabarovsk Krai	10841	9507	8054	6396	4556	2702	3453
Krasnoyarskiy Krai	17476	18087	16175	13377	10071	7064	7095

Source: Promyshlennost' Rossii. Stat. sb./Goskomstat Rossii – M. (1996).

Table 2-3: Lumber output (thousand cubic meters).

	1985	1990	1991	1992	1993	1994	1995
Russian Federation, mln. m^3	**79.5**	**75**	**65.8**	**53.4**	**40.9**	**30.7**	**26.5**
Republic of Karelia	2294	2004	1778	1388	1315	980.2	874.2
Arkhangelsk Oblast	5769	5011	4211	3488	3201	2332	1771
Moscow Oblast	783.8	634.2	447	459.3	477.4	379.9	326.8
Tomsk Oblast	1742	1633	1334	1107	829.5	524.9	527.6
Irkutsk Oblast	7670	7915	7198	5701	3515	2855	2368
Khabarovsk Krai	1692	1541	1368	918.8	566.8	346.1	313.9
Krasnoyarskiy Krai	5693	5891	5113	4482	3355	2489	2488

Source: Promyshlennost' Rossii. Stat. sb./Goskomstat Rossii – M., (1996).

Table 2-4: Glued veneer (thousand cubic meters).

	1985	1990	1991	1992	1993	1994	1995
Russian Federation	**1594**	**1597**	**1520**	**1268**	**1042**	**889.5**	**939.2**
Republic of Karelia	25.6	28.1	24.3	18.4	14.4	8.2	8.3
Arkhangelsk Oblast	50.3	50.4	53.9	44.2	40.4	24	25.4
Moscow Oblast	21.2	19.1	16.2	12.4	13.1	12.2	12.1
Tomsk Oblast	-	-	-	-	-	-	-
Irkutsk Oblast	190.3	201.5	153	110.1	86.5	90.3	101.1
Khabarovsk Krai	10	6.2	6.9	5.1	3	0.6	-
Krasnoyarskiy Krai							

Source: Promyshlennost' Rossii. Stat. sb./Goskomstat Rossii – M. (1996).

Table 2-5: Particle board (thousand conditional cubic meters).

	1985	1990	1991	1992	1993	1994	1995
Russian Federation	**4673**	**5568**	**5409**	**4522**	**3941**	**2626**	**2206**
Republic of Karelia	-	-	-	-	-	-	-
Arkhangelsk Oblast	156.9	188.8	171.8	140.8	133.3	40.6	21.2
Moscow Oblast	404.5	431.1	426.6	407.2	424.2	426.3	386.9
Tomsk Oblast	98.1	73.2	96.3	93.9	110.6	121.7	126.5
Irkutsk Oblast	104.8	301	426.2	310.1	181.9	77.8	154.3
Khabarovsk Krai	40.5	91.2	92	75.1	61.3	23.7	15
Krasnoyarskiy Krai	93.7	175.0	152.8	111.1	74.8	61.4	37.9

Source: Promyshlennost' Rossii. Stat. sb./Goskomstat Rossii – M. (1996).

Table 2-6: Production of fiber board (million conditional square meters).

	1985	1990	1991	1992	1993	1994	1995
Russian Federation	**453.2**	**483.2**	**474.1**	**426.5**	**362.1**	**239.8**	**233.9**
Republic of Karelia	16.9	16.2	15.2	12.2	10.6	5.2	2.8
Arkhangelsk Oblast	20.3	22.4	22	20.5	21.2	15.1	13.5
Moscow Oblast	-	-	-	-	-	-	-
Tomsk Oblast	17.1	18.3	13.7	14.7	11.9	5.1	2.7
Irkutsk Oblast	43.5	44.2	44.1	34	31.2	21.4	18.3
Khabarovsk Krai	18.3	22.2	19	18.7	10.4	5.3	4.9
Krasnoyarskiy Krai	24.9	26.4	26.5	26.0	27.3	28.0	37.4

Source: Promyshlennost' Rossii. Stat. sb./Goskomstat Rossii – M. (1996).

Table 2-7: Pulp production (thousand tons).

	1985	1990	1991	1992	1993	1994	1995
Russian Federation	**7954**	**7525**	**6400**	**5676**	**4403**	**3314**	**4197**
Republic of Karelia	785	765.7	688.7	534.2	350.2	261.8	324.3
Arkhangelsk Oblast	2106	2154	1881	1657	1529	1212	1344
Moscow Oblast	-	-	-	-	-	-	-
Tomsk Oblast	-	-	-	-	-	-	-
Irkutsk Oblast	1521	1467	1215	1168	945.9	798.3	1179
Khabarovsk Krai	250.3	264.2	240	206.8	105.6	29.2	27.4
Krasnoyarskiy Krai	212.3	190.9	191.9	159.8	107.7	79.9	121.8

Source: Promyshlennost' Rossii. Stat. sb./Goskomstat Rossii – M. (1996).

Table 2-8: Paper (thousand tons).

	1985	1990	1991	1992	1993	1994	1995
Russian Federation	**5030**	**5240**	**4765**	**3608**	**2885**	**2216**	**2773**
Republic of Karelia	1218	1220	1134	816.4	644.9	554.5	632.3
Arkhangelsk Oblast	373.9	396.5	364.4	299.1	304	177.1	211.1
Moscow Oblast	24.2	29.3	30.9	23.2	15.6	12.9	14.8
Tomsk Oblast	-	-	-	-	-	-	-
Irkutsk Oblast	12.4	11.1	9.6	10.1	6	6.6	7.9
Khabarovsk Krai	9.3	-	-	-	-	0.03	0.1
Krasnoyarskiy Krai	108.7	99.7	99.3	77.0	50.9	41.9	52.4

Source: Promyshlennost' Rossii. Stat. sb./Goskomstat Rossii – M. (1996).

Table 2-9: Cardboard (thousand tons).

	1985	1990	1991	1992	1993	1994	1995
Russian Federation	**2877**	**3085**	**2619**	**2157**	**1607**	**1196**	**1301**
Republic of Karelia	50	53.1	44.1	40.2	35.3	19.9	8.8
Arkhangelsk Oblast	602.1	628.1	559.4	460.1	417.3	367.6	399.7
Moscow Oblast	158.7	160.4	110.6	60.3	34.1	30.2	27.1
Tomsk Oblast	-	-	-	-	-	-	-
Irkutsk Oblast	219.8	188	174.9	156.2	128.1	110.6	141
Khabarovsk Krai	120.3	155.7	143.2	99.2	38.2	4.9	5
Krasnoyarskiy Krai	155.1	118.5	121.9	103.5	64.0	49.5	79.8

Source: Promyshlennost' Rossii. Stat. sb./Goskomstat Rossii – M. (1996).

APPENDIX 3: SOCIOECONOMIC INDICATORS (for Irkutsk region)

Table 3-1: Irkutsk Oblast in the RF economy in 1997 (major indicators).

	Russian Federation	Irkutsk Oblast	Percent of RF volume
Territory, *1,000 km2*	17075.4	774.8	4.5
Population, 1 January 1997, 1,000	148141.9	2767.8	1.9
Gross Domestic Product*, *trillion rubles*	2186	48	2.2
Industrial Output, *trillion rubles*	1576	30.9	2.0
Agricultural output, *trillion rubles*	335	6.4	1.9
Index of physical volume of industrial output, %	101.9	87.9	X
Output of individual types of industrial and agricultural products:			
Electric Power, *billion kWt/h.*	834	49.0	5.9
Primary Oil Processing, *mln. t*	178	10.3	5.8
Coal, *mln. t*	244	12.4	5.1
Aluminum, primary, *thousand t.*	1639.0	1052.6	64.1
Timber Removal, *mln.m3*	78.7	8.6	10.9
Lumber, *mln m3*	18.1	1.6	8.8
Cardboard, *thousand t.*	1102	110.5	10.0
Investment into main capital, *trillion rubles*	408.8	5.3	1.3
Including: production	263.5	4.0	1.5
non-production	145.3	1.3	0.9
Foreign Trade Turnover*, *USD billion*	138.1	2.8	2.0
Including: import	59.9	0.6	1.0
export	78.2	2.2	2.8
Retail turnover, *billion rubles*	853900	18067	2.1
Monthly average wages per employee, nominal, *thousand rub.*	965	1263	131
real, % of the preceding year	104.3	96	X
Population with income below poverty level, *mln.*	30.9	0.41	1.3
Total number of unemployed, *mln.*	6.4	0.073	1.1

* 1996 data.

Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

General Data.

(Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk, 1998.)

Territory and administrative-trritorial beakdown of the *Oblast (by 1 January 1997)*

Territory:		774.8	1,000 km^2
including:	forest stock lands	669.9	1,000 km^2
	water stock lands	22.5	1,000 km^2
	agricultural companies' lands	43.6	1,000 km^2
	incl. agricultural lands	21.6	1,000 km^2

Oblast borders : West – Krasnoyarsk Krai.

East – Buryat Republic and Chita Oblast.

North – Sakha Republic (Yakutia)

South – Buryat and Tyva Republics.

In Irkutsk Oblast there are 5 cities with a population of over 100,000, the population of Irkutsk is 591,000. Irkutsk Oblast occupies 6th position in RF in territory and 16th position in population. Population density is 3,6 persons per 1 km^2.

Table 3-2: Territorial division.

Cities of Oblast Subordination	14
City Regions (Bratsk)	2
City Districts (Irkutsk)	4
Regions	33
Cities of Regional Subordination	8
Urban Settlements	59
Rural Administrations	385
Rural Settlements	1474

Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

Table 3-3: Permanent population by age groups (1 January 1996).

Population		Percent of the Total	Number of females per 1000 males of the age group
	Thousand persons		
Total, age	2789.4	100	1082
0–6	254.3	9.1	961
7–13	363.6	13.0	974
14–19	279.3	10.0	983
20–24	213.0	7.6	979
25–29	187.0	6.7	923
30–34	213.7	7.7	945
35–39	245.1	8.8	986
40–44	232.7	8.3	1016
45–49	183.9	6.6	1070
50–54	95.3	3.4	1181
55–59	170.5	6.1	1241
60–64	109.3	3.9	1388
65–69	109.7	3.9	1648
70–older	132.0	4.7	2687

Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

APPENDIX 4: LABOR RESOURCES AND EMPLOYMENT (for Irkutsk region)

Table 4-1: Labor resources (thousand persons).

		1992	1993	1994	1995	1996
Labor Resources, total:		1659,6	1690,5	1640,6	1626,2	1639,5
Including:	employed	1308,4	1264,0	1192,2	1160,0	1121,7
	students	110,0	94,5	97,7	105,6	101,9
	persons of working age not involved in economic activity	241,2	332,0	350,7	360,6	415,9

Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

Table 4-2: Economically active population (thousand persons).

			1993	1994	1995	1996	1997
Economically active population, total			1345.6	1280.3	1243.9	1226.3	1092.3
		%	100	100	100	100	100
including	employed[1]	total	1264.0	1192.2	1160.0	1121.7	1019.1
		in % of total	93.9	93.1	93.3	91.5	93.3
	unemployed[2]	total	81.6	88.1	83.9	104.6	73.2
		in % of total	6.1	6.9	6.7	8.5	6.7
	those having official status in employment agencies,	total	15.9	33.0	40.8	48.9	39.2
		in % of total	1.2	2.6	3.3	4.0	3.6

[1] Annual average.
[2] By year end.

Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

Table 4-3: Employment by sector of the economy (thousand persons).

	1992	1993	1994	1995	1996
Total employed in the economy	1308.4	1264.0	1192.2	1160.0	1121.7
% of the total employment	100.0	100.0	100.0	100.0	100.0
Industry	400.9	390.6	358.1	330.7	327.5
% of the total	30.6	30.9	30.0	28.5	29.2
Agriculture and Forestry	114.7	109.1	111.7	104.9	98.9
% of the total	8.8	8.6	9.4	9.0	8.8
Construction	170.6	146.9	124.4	113.3	98.2
% of the total	13.0	11.6	10.4	9.8	8.7
Transportation and Communications	129.6	123.7	113.9	118.8	111.1
% of the total	9.9	9.8	9.6	10.3	9.9
Retail, public catering, procurement, marketing, etc.	104.5	111.0	114.8	114.1	102.8
% of the total	8.0	8.7	9.6	9.8	9.2
Public utilities, services	60.5	60.2	58.2	59.2	59.8
% of the total	4.6	4.8	4.9	5.1	5.3
Health care, physical culture, social services	79.0	78.4	78.1	79.6	80.3
% of the total	6.0	6.2	6.6	6.9	7.2
Education, arts and culture, science and related	171.3	171.4	157.8	160.4	157.7
% of the total	13.1	13.6	13.2	13.8	14.1
Banking, financial services, insurance	9.4	9.8	13.0	13.6	12.9
% of the total	0.7	0.8	1.1	1.2	1.1
Management	24.1	25.4	27.5	31.7	41.0
% of the total	1.9	2.0	2.3	2.7	3.7
Other	43.8	37.5	34.7	33.7	31.5
% of the total	3.4	3.0	2.9	2.9	2.8

Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

Table 4-4: Employment by branches of industry, November 1996 and 1997.

Large and medium sized enterprises	**Nov. 96**	**Nov. 97**	**Nov. 96**	**Nov. 97**	**Nov. 96**	**Nov. 97**
	persons	**persons**	**%**	**%**	**%**	**%**
Total employed in the economy	892475	830002	100	100	-	-
Industry	262837	239182	29.5	28.8	100	100
Electric Power Engineering	26289	25237	2.9	3.0	10.0	10.6
Fuel Industry	32475	26305	3.6	3.2	12.4	11.0
Ferrous metallurgy	9381	9287	1.1	1.1	3.6	3.9
Non-ferrous metallurgy	21451	21022	2.4	2.5	8.2	8.8
Machine-building and metal processing	15476	16869	1.7	2.0	5.9	7.1
Chemical and Petrochemical	42965	39528	4.8	4.8	16.3	16.5
Forestry, timber processing and pulp and paper industry	71824	61769	8.0	7.4	27.3	25.8
Construction materials industry	11543	10735	1.3	1.3	4.4	4.5
Light industry	5752	4832	0.6	0.6	2.2	2.0
Foodstuffs industry	17115	15575	1.9	1.9	6.5	6.5
Other branches of industry	-	-	1.0	0.9	3.3	3.4

Source: The table is based on the report "The Socioeconomic Situation in Irkutsk Area in 1997," prepared by Irkutsk regional committee of state statistics.

APPENDIX 5: FINANCE (for Irkutsk region)

Table 5-1: Money supply (percent).

	1991	1993	1995	1997
Cash	13	60.7	74.2	84.6
Money on bank accounts	87	39.3	25.8	15.4

Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

Table 5-2: Revenue of the consolidated budget in 1997 (percent).

Duties	7
Excise Tax	3
VAT	12
Payments for the use of natural resources	6
Profit Tax	13
Property Tax	18
Personal Income tax	26
Other	15
	100.00

Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

Table 5-3: Expenditure of the consolidated budget in 1997 (percent).

Management	6
Social Policy	7
Economy	7
Education	28
Housing and related services	22
Health Care	16
Other	14
	100.00

Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

Table 5-4: Budget (current prices, billion rubles).

	1992	1993	1994	1995	1996	1997
Revenue — total	62.9	642.1	2558.8	6435.1	7953.0	8622.3
Expenditure — total	60.2	620.2	2532.6	6459.8	8200.6	9656.7
Profit(+), deficit (-)						
Total	+2.7	+21.9	+26.2	-24.7	-247.6	-1034.4
In %	+4.5	+3.5	+1.0	-0.4	-3.0	-10.7

Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

Table 5-5: Price index, December to December of previous year, times.

	1993	1994	1995	1996	1997
Aggregated consumer price index for goods and services for population	11.30	2.70	2.40	1.25	1.09
Producer price index, industrial output	9.30	3.30	2.50	1.28	1.11
Average (calculate, used for calculating Table 5-6)	10.3	3.0	2.45	1.265	1.1

Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

Table 5-6 Budget (real prices, billion rubles).

	1992	1993	1994	1995	1996	1997
Revenue – total	62.90	62.34	82.81	85.00	83.05	81.85
Expenditure — total	60.20	60.21	81.96	85.33	85.63	91.67
Profit(+), deficit (-)						
Total	2.70	2.13	0.85	-0.33	-2.59	-9.82
In %	4.5%	3.5%	1.0%	-0.4%	-3.0%	-10.7%

Source: Tables 5-4 and 5-5.

Table 5-7: Investments (billion rubles).

	1993	1994	1995	1996	1997*
TOTAL	75.8	346.2	915.5	2294.9	984.0
Short-term					
total	65.8	310.8	731.4	1557.1	900.0
in % of the total	86.8	89.8	79.9	67.9	91.5
Long-term					
total	10.0	35.4	184.1	737.8	84.0
in % of the total	13.2	10.2	20.1	32.1	8.5

*As of 1 October 1997.

Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

Table 5-8: Total losses of major industries (billion rubles).

	1993	1994	1995	1996	1997
Industry total *including:*	4	60	383	2582	3820
Chemical and Petrochemical	-	5	165	694	489
Forestry, pulp and paper, timber processing.	3	34	78	1365	1351
Fuel	-	-	0,5	174	
Construction	1	13	19	446	123
Transportation	8	15	12	122	
Agriculture	2	28	60	452	

Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

APPENDIX 6: INDUSTRY (for Irkutsk region)

Table 6-1: Major indicators of industrial development.

	1992	1993	1994	1995	1996	1997
Number of enterprises	3978	4048	4062	4459	4687	…
Number of production personnel, thousand	392	356	323	318	311	…
of which workers	326	296	266	264	…	…
Output volume in existing prices, billion rubles	474	3413	10153	30116	33667	30887
Index of physical volume of output,* % to the preceding year	88	87	86	100.5	85	88
Revenue from production activity, billion rubles	110	736	1398	5800	937	2820
Profitability of production	32.5	29.4	17.4	25.6	3.2	7.1*

* As of 1 December 1997.
… — Data is missing.

Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

Table 6-2: Share of public sector in main economic activities (percent).

	1992	1993	1994	1995	1996	1997
Volume of industrial output	83	12	10	5	4	4
Capital Investments	80	40	36	31	29	27
Volume of contractual jobs	69	16	12	10	9.5	13
Cargo transportation by public transport	100	89	55	59	8	9.0
Retail turnover		35	16.3	20	14	10
Employment in the economy	78.4	46.3	42.8	49.1	46.6	

Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

Table 6-3: Physical volume of output by industry (percent, 1990 = 100).

	1992	1993	1994	1995	1996	1997
Industry Total	85	74	63	64	55	48
Including: mining	81	73	58	58	54	46
processing industry	86	74	64	66	55	48
Industries						
Electric Power Engineering	93	91	82	83	78	69
Fuel Industry	86	72	68	66	56	44
Ferrous metallurgy	75	72	63	60	58	52
Non-ferrous metallurgy	95	92	89	88	90	90.3
Machine-building and metal processing	87	76	61	44	31	23
Chemical and Petrochemical	61	39	38	41	32	20
Forestry, timber processing and pulp and paper industry	88	71	56	71	56	44
Construction materials industry	73	59	40	27	15	12
Light industry	95	88	42	28	16	12
Foodstuffs industry	66	60	50	49	40	40.5

Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

Table 6-4: Production of most important products in physical volumes.

	1992	1993	1994	1995	1996	1997
Electric power, billion kWt/h:	62.5	61.9	58.6	59.6	55.2	49.0
including, hydroelectric power	49.1	49.2	49.0	52.9	48.6	42.0
Primary oil refining, thous. tons	20335	17480	17006	16633	13427	10272
Coal, mill. tons	20.4	18.2	16.6	15.0	14.0	12.4
Iron ore, thous. tons	4724	4818	4467	4174	4124	3675
Primary aluminum, thous. tons	…	972	893	884	993	1053
Caustic soda (100%), thous. t	406.5	285.9	210.0	200.0	173.1	200.5
Mineral nitrogeneous fertilizers, thous.t	218.4	157.5	229.8	288.8	210.5	19.9
Synthetic detergents, thous. t	28.0	20.9	20.4	15.8	11	74
Plastics and synthetic resins, thous. t	342.7	249.3	222.3	236.4	147.3	168.0
Commercial timber, mill. m^3	**18.5**	**15.7**	**10.6**	**11.8**	**9.6**	**6.5**
Lumber, thous. m^3	**3730**	**3575**	**2785**	**2321**	**1899**	**1607**
Glued veneer, thous. m^3	**110.1**	**86.5**	**90.1**	**101.0**	**92.1**	**67.3**
Fiber board, thous. m^2	**34020**	**31224**	**21384**	**18298**	**22270**	**15797**
Particle board, thous. m^3.	**307.2**	**181.8**	**777.9**	**154.3**	**65.4**	**15.2**
Pulp, thous. t	**1467***	**946**	**798**	**1178**	**907**	**527**
Paper, thous. t	**11.1***	**6.0**	**6.6**	**7.9**	**5.8**	**6.3**
Cement, thous. t	899.2	470.9	529.1	562.3	336.7	296.2
Bread, thous. t	240.9	219.5	182.3	146.1	125.3	130.2
Ethyl alcohol, thous. decaliters	3687	4273	2305	2481	707	992
Vodka, strong spirits, thous. decaliters	3095	3822	2404	3575	1573	1992

* 1990 data.

Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

APPENDIX 7: INVESTMENTS (for Irkutsk region)

Table 7-1: Major indicators for capital construction (current prices, billion rubles).

	1992	1994	1996	1997
Capital Investments, total, billion rubles	62.4	1875.5	6665.7	5269.1
Including: production	41.4	1144.2	4491.7	3964.3
non-production	21.0	731.3	2174.0	1304.3
Putting into operation: Capital assets, billion rubles	33.6	1003.4	6276.8	…
Apartment buildings, thousand m^2	931.9	613.0	351.6	216.0
secondary schools, number of students	6554	3666	2802	4151
pre-schools, number of children	2804	1545	430	…
hospitals, beds	25	191	311	275
polyclinics, visits per shift	450	445	955	280
cultural facilities, capacity	3570	1200	300	…
Contractual jobs, billion rubles	36.8	1382.3	4561.9	3802.4

… — Data is missing.

Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

Table 7-2: Investments by funding source (percent of total).

	1992	1993	1994	1995	1996	1997
Federal Budget	14.3	23.4	15.7	7.1	11.6	8
Oblast budgets and local budgets	11.8	15.3	15.2	14.0	13.4	13
Centralized non-budgetary investment funds	2.0	0.5	1.6	11.5	-	-
Own funds of enterprises and organizations	71.1	57.6	66.0	62.7	68.4	73
Population savings	0.4	0.4	0.6	0.6	1.3	0.9
Foreign investment	-	-	-	0.3	1.1	0.9

Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

Table 7-3: Capital investments by major industries (percent of total).

	1996	**1997**
Industry, total *including:*	100	100
Electric Power Engineering	15.9	25.7
Oil Refining	13.5	3.3
Chemical and Petrochemical	21	10.1
Forest	10.7	19.1
Coal	6.6	7.3
Non-ferrous metallurgy	8.1	5.4
Gas	3.6	5.4
Pulp and paper	4.7	5.0
Defense	3.4	3.8

Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

APPENDIX 8: TRANSPORT (for Irkutsk region)

Table 8-1: Length of public transportation routes (kilometers).

	1992	1993	1994	1995	1996
Railway	2480	2480	2480	2480	2480
of which: electric powered	2067	2067	2164	2284	2284
Automobile, hard surface, including non-governmental ownership	18243	20173	20342	20511	20879
Tramway lines	107	107	107	107	107
Trolley-bus lines	60	66	66	69	69

Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

Table 8-2: Passengers by type of transportation (thousand persons).

	1992	1993	1994	1995	1996
Transport-total	541820	534666	518049	474394	441288
of which: railway	40603	37242	41064	39993	36900
automobile	339805	343541	300532	292350	276353
tramway	113283	109745	117734	98127	82286
trolley-bus	43876	42185	57391	42529	44668
water	1331	984	733	628	470
air	2922	969	595	767	611

Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

APPENDIX 9: FOREIGN TRADE (for Irkutsk region)

Table 9-1: Foreign trade of Irkutsk Oblast (million USD).

	1994	**1995**	**1996**	**1997**
Foreign trade turnover, grand total *including:*	2819.7	3818.1	3609.9	2813.4
export	1835.6	2883.6	2766.8	2191.5
import	984.1	934.5	843.1	621.9
foreign countries, total	2237.0	3337.2	3212.5	2495.5
% of the grand total	79.3	87.4	89.0	88.7
export/import ratio, %	186.5	3.1 times	3.3 times	3.5 times

Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

Table 9-2: Structure of exports to foreign countries (million USD, percent of total).

	1994		**1995**		**1996**		**1997**	
Export, total, *including:*	1726.4	100	2776.1	100	2682.3	100	2182.5	100
machines, equipment, vehicles*	7.6	0.4	7	0.3	6.6	0.2	55.1	2.5
oil refining products	244	14.1	296.4	10.8	406.5	15.2	48	2.2
unprocessed aluminum and aluminum products	825.4	47.8	1321.3	47.6	1304.4	48.6	1163	53.3
chemical industrial products, rubber	186.1	10.8	37	12.2	215.9	8	…	…
forestry products and pulp	351.3	20.4	663.6	24.1	430.5	16.1	356	16.3
foodstuffs and agricultural raw materials	11.6	0.7	15.7	0.8	10.8	0.4	9.0	0.4
Other (including "aircraft and parts")	100.8	5.8	134.4	4.8	308.5	11.5	551.4	25.3

* Without "aircraft and parts".

… — Data is missing.

Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

Table 9-3: Trade with individual foreign countries (million USD).

Countries	Export			Import		
	1994	**1995**	**1996**	**1994**	**1995**	**1996**
Singapore	297.7	305.7	344.3	1.4	-	0.0
United Kingdom	18.1	23.1	19.3	10.9	10.2	5.5
Japan	361.8	724.0	925.1	39.5	28.5	27.8
Italy	28.8	9.4	8.3	9.9	21.0	10.8
France	10.2	29.9	21.5	12.8	8.4	3.0
China	104.8	197.4	346.4	50.1	51.4	53.2
Netherlands	49.2	64	66.8	8.2	8.1	3.5
USA	474.7	640.3	467.6	7.6	53.1	66.6
Germany	11.1	30.3	23.7	58.9	65.7	39.9
Switzerland	0.4	37.4	43.0	10.9	5.2	3.9
Mongolia	38.0	30.7	27.8	4.0	2.9	4.5
Australia	0.7	1.0	0.9	44.9	66.0	37.1

Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

Table 9-4: Trade with CIS countries (million USD).

	Export			Import		
	1994	**1995**	**1996**	**1994**	**1995**	**1996**
TOTAL	109.2	107.5	84.5	473.5	373.4	312.9
Azerbaijan	1.0	0.4	1.9	4.1	2.2	3.5
Armenia	0.3	-	1.4	0.1	-	0.5
Belorussia	13.0	8	0.0	15.7	6.1	0.3
Georgia	0.1	0.1	0.6	1.6	0.3	0.2
Kazakhstan	26.8	34.5	30.4	184.2	174.9	229.1
Kirghizia	4.8	6.1	4.1	8.3	3.7	3.1
Moldova	3.6	3.1	2.1	9.7	6.2	4.2
Tajikistan	2.5	7.1	1.6	4.6	-	2.3
Turkmenia	1.2	4.1	1.6	1.0	3.3	5.2
Uzbekistan	18.8	13.7	24.7	31.3	13.6	9.5
Ukraine	37.1	30.2	16.0	212.7	131.3	55

Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

APPENDIX 10: MARKET ECONOMY (for Irkutsk region)

Table 10-1: Ownership of privatized enterprises.

	1994	1995	1996	1997*
Number of privatized enterprises — total,	328	219	69	53
including by type of ownership:				
Municipal	227	193	59	52
Oblast	48	2	…	
Federal	53	24	11	1

* For 9 months.
… — Data is missing.
In total, 2,273 enterprises have changed the type of ownership since the beginning of privatization (1992).
Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

Table 10-2: Revenues from privatization and their distribution (million rubles).

	1995	1996	1997*
Received from privatization	33954	22690	42640
Revenue from sales of corporate property** *including:*	33775	22661	42571
to local budgets to oblast budget	7254 5034	9039 3983	29064 2337
to federal budget	4992	10693	6287
Revenue from sales of stock	-	38913	25824

* For 9 months, 1997.
**After paying off employees.
Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

Table 10-3: Small businesses.

	1995	1996	1997*
Number of small businesses	13682	12494	12427
% of the total number of businesses	38.4	33.8	31.8
Average listed number, employees	123943	111293	118829
% of total employment	12.4	10.6	10.6
Output, (jobs, services), billion rubles	12841.1	14932.7	4085.9
% of total output	21.8	24.5	16.8
Profit, billion rubles	1300	360.3	114.0
Payments to budgets, billion rubles	118.6	875.7	372.9
% of total payments	6.3	9.5	11.2
Capital investment, million rubles	567.5	732.8	502.0

Profit, investment, and output indicators are given for 6 months.
Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

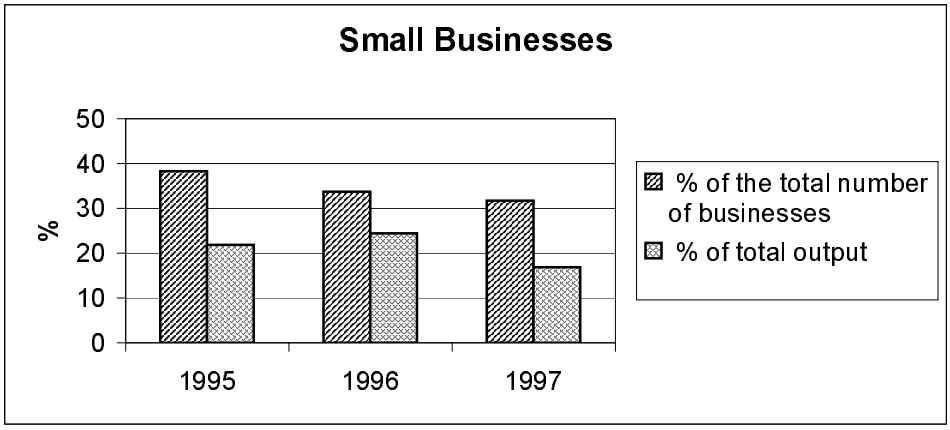

Diagram 10-1: Share of small businesses in total number of enterprises and total output 1995–1997.

APPENDIX 11: PRICE INDEX AND OTHER INDICATORS (for Irkutsk region)

Table 11-1: Price index by industry (December to December of previous year, times).

	1992	1993	1994	1995	1996	1997
Aggregated consumer price index for goods and services for the population	20.8	11.3	2.7	2.4	1.25	1.09
Producer price index, industrial output	41.7	9.3	3.3	2.5	1.28	1.11
Price index for construction and installation work*	15.8	13.0	3.8	3.2	1.63	1.66
Tariff index for cargo transportation	39.0	16.3	3.4	2.1	1.33	1.04

* January–December, the same period for the previous year.
Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

Table 11-2: Producer price index by industry (December to December of the previous year, times).

Industries	1992	1993	1994	1995	1996	1997
Industry Total	41.7	9.3	3.3	2.5	1.3	1.11
Electric Power Engineering	115.0	13.0	2.5	2.4	1.6	1.04
Fuel	100.8	8.1	2.4	3.1	1.5	1.17
Ferrous metallurgy	55.2	9.3	2.7	2.0	1.2	1.13
Non-ferrous metallurgy	30.6	6.0	4.3	2.0	0.97	1.01
Chemical	60.1	8.6	2.7	2.7	1.35	1.06
Machine-building	19.6	8.9	2.8	2.5	1.1	1.22
Forestry, pulp and paper, timber processing	16.6	9.5	4.2	2.2	0.98	1.1
Construction materials	34.7	9.5	3.7	2.7	1.4	1.19
Light	13.0	13.1	2.5	2.9	1.5	1.11
Foodstuffs	31.7	8.9	3.5	2.4	1.2	1.15

Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

Table 11-3: Tariff index for cargo transportation (December to December of the previous year, times).

	1992	1993	1994	1995	1996	1997
Transport Total	39.0	16.3	3.4	2.1	1.33	1.04
railway	40.6	18.6	3.4	2.1	1.31	1.04
automobile	18.9	5.5	3.1	3.3	1.25	1.07
air	64.8	3.3	3.6	1.8	1.87	1.07

APPENDIX 12: THE INCOMES OF THE POPULATION (for Irkutsk region)

Table 12-1: Major indicators of people's living standard (thousand rubles/month).

	1992	1993	1994	1995	1996	1997
Per capita income	4.6	50.2	224.1	584.2	826.6	972.1
Average wages	8.7	80.9	305.3	738.4	1140.5	1306.9
Average pension (accounting for compensation and other payments)	3.7	443	130.6	257.4	332.6	377.4
Per capita subsistence level	2.4	22.7	102.4	343.8	408.6	431.5
Income/subsistence level ratio	1.9	2.2	2.2	1.7	2.0	2.2

Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

Table 12-2: Sources of people's monetary income, percent.

	1992	1993	1994	1995	1996
Total monetary income	100	100	100	100	100
labor remuneration	72.4	69.3	57.1	48.7	47.4
social transfers	14.3	12.5	12.4	11.6	12.6
Income from property and entrepreneurship	13.3	18.2	30.5	39.7	40.0

Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).

Table 12-3: Average monthly wages by industries (thousand rubles).

	1992	1993	1994	1995	1996	1997
Economy total	8.7	81.0	305.3	738.4	1140.5	1306.9
Industry	10.8	93.7	339.8	924.5	1369.5	1626.8
Agriculture	5.3	50.3	162.3	367.2	554.0	564.0
Construction	10.1	94.3	354.2	843.5	1263.0	1494.9
Transportation	11.8	117.2	447.5	1021.3	1496.1	1734.2
Communications	7.3	78.9	359.1	772.9	1301.7	1550.8

Source: Irkutskaya oblast': 1992-1997 godi. Statisticheskii spravochnik./Irkutsk (1998).