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**HIGH LEVEL ADVISORY SERVICES FOR THE BAIKALSK
PULP AND PAPER MILL**

SI/RUS/94/801/11-54

RUSSIAN FEDERATION

**Technical report: Socioeconomic impacts of industrial restructuring
The case of the BPPM***

Prepared for the Government of the Russian Federation
by the United Nations Industrial Development Organization,
acting as executing agency for the United Nations Development Programme

Based on the work of Peter van Tilburg.

Backstopping officer: R. M. Viegas Assumpcao
Chemical Industries Branch

United Nations Industrial Development Organization
Vienna

* This document has not been edited.

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I

INTRODUCTION

The initial assignment of the expert was directed at assessing the social and economic impact on the Baikalsk population of the possible restructuring of the Baikalsk Pulp and Paper Mill (BPPM).¹ A fact is that the working population of Baikalsk town largely depends on the activities of the mill. The town was in fact established at the same time the mill was (1965), on purpose to house its labour force.

However, it soon became clear to the expert that, for all who are concerned about the ecological condition of Lake Baikal, the BPPM has become (rightly or wrongly) symbolic for the pollution of the lake. Because of the magnitude of the lake (roughly the size of The Netherlands), because of the fact that it is still one of the purest natural water reserves in the world, and that there are many more industries directly or indirectly influencing its water quality, it could easily be argued that the importance of maintaining the special ecological condition of Lake Baikal should be of concern to the whole world.

The differences in point of view between, on the one hand those putting Lake Baikal first, and on the other hand those supporting the continuation of the Baikalsk Pulp and Paper Mill, has become extremely black-and-white. The unfortunate position of the mill, being situated at the shore of the lake has made it a scapegoat for all that is being done to the lake that is harmful. Even a term like *horizon pollution* is used. It appears that rational considerations based on scientific research has partially been replaced by ethical principles and emotional assaults.

It is clear that the outsider layman, who can easily spot the factory at the lake side, its chimneys exhausting smoke and vapour (especially due to the cold climate) and smell the chemical odour, will readily form the opinion that this plant can be nothing if not harmful to the environment. Nevertheless it is extremely important that this so-called *general opinion* is informed about the actual situation in terms of the exhaust parameters and levels in the air as well as in the water. The matter is much too important for all parties involved to have it overtaken by irrational criteria. Management and employees of the mill, local population, environmentalists, politicians etc., may all have their own reasons for being interested, however, the source of interest is the same: Lake Baikal.

The expert soon came to the conclusion that the problem of the mill and the socioeconomic consequences for the surrounding population should be considered in a

¹ See for Terms of Reference, Annex Nr. 1.

larger perspective. The problems that the BPPM is facing can not be seen without considering the situation of the other enterprises who release water into the lake, especially other pulp and paper mills. Restructuring the BPPM means at the same time finding ways to establish alternative employment in the area, not necessarily in Baikalsk itself. In general it appears that a proper balance will have to be found in the Baikal ecosystem between ecological stability and socioeconomic development.

Only rational debate, based on clear parameters and norms, can solve the present confusion of tongues. It appears to be unjust to consider one participant as the big bogey, and to think that its disappearance will dissolve all environmental problems of the lake. It would be bad policy to let the discussion go towards the situation in which one is either an unscrupulous industrialist whose concern for Lake Baikal is instrumental only to the continuation of the profit making enterprise, or a rigid environmentalist whose only concern is with maintaining nature, irrespective of the attendant social and economic cost. These caricatures do not make sense and will never lead to a solution that is satisfactory to all parties concerned.

In this context, the expert has tried to analyze the specific problems of the BPPM in the larger context of the problem of Lake Baikal.² The report is set up as follows. Chapter 2 deals with a brief overview of the economic and ecological context of reform measures in Russia. Included is a section on the social safety net, as requested in the expert's Terms of Reference (see Appendix Nr. 1). Such a safety net is important as in all the alternatives the cost of supporting the unemployed will have to be taken into account. Chapter 3 deals specifically with the Baikalsk Pulp and Paper Mill, its history as a relatively healthy enterprise, vis-à-vis the other pulp and paper mills in the area. Separate sections deal with the specific role of the mill in Baikalsk town, and its role on the district and regional level. Finally, chapter 4 gives the recommendations within the framework of balanced development.

² For this reason, the expert had discussions with people who represented a variety of organisations and who consequently carry different opinions. The expert has met not only technicians and scientists, but politicians, senior civil servants and labour unionists as well. For a complete list of meetings, see Appendix No. 2.

II

ECONOMIC-ECOLOGICAL FRAMEWORK: THE CONTEXT OF REFORM MEASURES IN RUSSIA

A. Macroeconomic reform

Decisions to be taken on individual enterprises in Russia will have to be considered in the context of its macroeconomic development. If we compare Russia's economic development during the last decade with e.g. China's, some significant differences become apparent³. Table 1 gives annual growth figures for both countries during this period.

Table 1 Annual growth of Russia and China (% per annum).

	Average 1986-89	1990	1991	1992
Russia	2.4	-2.0	-9.0	-19.0
China	8.7	4.1	7.7	12.8

The reasons being given for this extreme difference is that China started reform as a peasant agricultural society, with about 80 percent of the labour force outside the strong conservative state sector. Russia, however, started as an urban and over-industrialized society, in which the state sector virtually covered the whole population. China had to transfer its agricultural workers from low-productive agriculture to high-productive industry. This is more or less economic development in a traditional way, to be witnessed in many developing countries. Russia, though, had to restructure its industry, cut employment in inefficient and subsidized industry and create new jobs in efficient industry and services.

In general it could be concluded that the situation in Russia, unlike that in China, at the brink of *perestroika* had three main characteristics: the industrial structure consisted of too much heavy industry and too little light industry, consumer goods and services; almost all workers were working in heavily subsidized jobs; and almost the complete

³ This section is partly based on an article from J. Sachs and Wing Thye Woo: *Structural factors in the economic reforms of China, Eastern Europe and the former Soviet Union*, in: *Economic Policy; a European Forum*, Vol. 9, nr. 18, 1994.

Soviet population was covered by an extensive social welfare system. The people were used to job security, pension benefits, guaranteed income, health facilities and housing.

In China, the result of liberalization was that most workers were falling outside the socialist economy, were without social protection and became subject to labour market principles. Peasants coming from the dominant agricultural sector left their farms to join the new industrial sectors, i.e. not only the continuing state enterprises but also the newly allowed non-state sector, fully outside state control. In Russia, the industrial workers in the subsidized state enterprises were not willing to leave their posts, until these subsidies were cut sharply. This retarded mobility was heightened by the fact that many social benefits were linked to specific jobs. Russia was saddled up with a problematic heritage.

In China and Russia respective labour forces were affected in different ways. In China, all labourers could in principle profit from the move towards an industrial state, especially when the industry was export oriented. Chinese workers had little to lose. On the other hand, in Russia, the restructuring of certain sectors, in industry as well as in agriculture, meant loss of jobs for large groups of labourers, and even a threat to their long cherished social protection. Both China and Russia failed to establish a new adequate social safety net.

Contrary to China, where next to the small state sector a non-state industrial sector was allowed and growing fast, the Russian state-owned sector with its strongly established social security system did not make it easy for private enterprises to establish themselves. It is hard to induce a voluntary flow of labourers, capital and productive inputs from the state sector to the non-state sector as long as the subsidies to the state sector are so large that these offset the productivity difference between the state and the non-state sector. There can be no doubt that it is very difficult to establish new firms in such an atmosphere.

Moreover, in the process of rapid privatization, the property right reform in China is less advanced than in Russia. But a weakness in Russia is that the insiders of the firm, like managers and workers, are receiving the lion's share of ownership. The lack of a strong role for outside investors did not allow a system of corporate governance in which capital markets effectively could discipline state managers. In this context it could be concluded that great care should be taken in restructuring enterprises. Especially the enterprises that are doing well and have reasonable market prospects should be handled with great care.

However, the largest reform challenges in Russia are likely to be political: how to establish a stable, legitimate political system in a country that is undergoing such rapid changes?⁴ Though such an evolution may favour new decentralized power systems, this is

⁴ See also: W.H. Berentsen, *Regional problems and regional planning in Central and Eastern Europe*, in 'Tijdschrift voor Econ. en Soc. Geografie', Vol. 83, nr. 5, 1992.

unlikely to happen in the near future. Unhappy experiences in the past and present of failures in planning have undermined the traditional support. Moreover, confidence in politicians with regard to protecting the population against the negative externals associated with market forces has also been shaken. Finally, weak socialist regional planning bodies have been dismantled without being replaced by new ones.

"In an ideal world, government policy development should be integrated with the changing needs of the productive sector, but in the real world policy makers are subject to cross-cutting pressures from a multitude of different constituencies. Many of these interest groups are far from sympathetic to the needs of an efficient and competitive industrial sector, particularly where loss of jobs is involved. This highlights the paramount importance of policy makers, consultants and top management not only being able to spell out the strategies and techniques being used in industrial restructuring exercises in terms that can be widely understood, but also being willing to sell them in public to managers, trade unions and workers"

The same report, from which this quotation is taken, gives a methodology of industrial restructuring. Lessons learned from restructuring enterprises in different countries in Eastern and Central European countries are that restructuring should always be done as an integrated exercise: creating a new institutional infrastructure, including its legal support system. But one of the critical steps, and possibly one of the most disputable aspect of industrial restructuring, is the selection process by which enterprises are identified for assistance. Selection often becomes highly politicized. Some enterprises have adjusted themselves surprisingly well to the new situation, suddenly being confronted with world market competition. Indicated are the following selection criteria: marketability, competitiveness and creditworthiness.

The Baikalsk Pulp and Paper Mill is such an example, notwithstanding the fact that before the mill was assured of demand from the army industry. Without government support it has conquered a growing market for its high quality product (viscose pulp). Management has been inventive enough to survive the killing competition and was able to continue to employ a large part of the Baikalsk labour force. And management is strongly interested in improving the technology even more in order to reduce the ecological damage to a minimum. In other words, by following the selection criteria as proposed in the above mentioned report (i.e.: marketability, competitiveness and creditworthiness) it could be concluded that the BPPM meets these criteria and should therefore be considered for government support.

⁵ UNIDO's Europe Programme Country Strategy and Programme Development Division, *Economies in transition: restructuring of large-scale industries*, CPD 7, 1994, p. 74.

B. Implications for the environment

The centrally planned economy in the former Soviet Union followed a policy of a resource-intensive growth pattern. This resulted in rapid deforestation, a slow deterioration of the soil, intensive application of fertilizers and pesticides, inefficient energy use and a high energy intensity, a high air pollution intensity of the manufacturing sector, serious water pollution, and uncontrolled dumping of hazardous waste, including nuclear waste. This has left the present Russian Federation with rather pressing environmentally destructive consequences.

Nevertheless, during the last decade the Soviet system provided Russia with an environmental management system that is considerably more advanced than that of most Eastern and Central European countries. In this respect the *polluter-pays-principle* has been legislated. Already in 1991 more than Rbl. 2 billion (about \$ 7 billion) of fines are said to be collected. In 1992 pollution fines were increased on average by 500 percent and were indexed according to the inflation rate.

A World Bank study indicates that in Russia those industries that contribute most to air pollution also tend to be the heaviest water polluters. The worst offenders are the metals, pulp and paper, chemicals and petroleum refining sectors.⁶ At the same time it is said that in recent years 80 percent of pollution control investments were directed towards water problems. Still, Siberian rivers are likely to be rather more polluted than those in other parts of Russia.

According to the aforementioned World Bank study, water pollution does not rank as one of the greatest environmental problems, neither under current conditions nor with expected changes in future. The main problems are rather air pollution, rapid deforestation and radioactivity. Lake Baikal is still a magnificent area in terms of natural beauty and purity of water. It is well understood that any polluter or potential polluter is very critically considered.

But as Lake Baikal has more than 300 tributaries it is very important to examine the total level of pollution flowing into the lake from all these water sources. There is only one out-flowing river (Angara river), and due to the immense depth of the lake (roughly 2000 metres), the water movement in the lake is extremely slow. Moreover, the exhaust coming from industries situated in Irkutsk also settles down on the lake when the wind is from the west.

⁶ World Bank, *Russian Economic Reform; Crossing the Threshold of Structural Change*, Washington, 1992, chapter 10.

Due to the fact that the lake is huge and its water still clean, Lake Baikal should be considered of importance not only to Russia but to the world as a whole. From this point of view the lake should be considered as a *global heritage*, and its maintenance should become an international concern.

C. *The importance of a social safety net*

The primary form of social security under the former system of state socialism or bureaucratic collectivism was the employment guarantee, irrespective of the demand for that labour and of its productivity. A market economy cannot provide such guarantee, but rather demands productive work, and at the same time renders a social safety net to support those who are not able to find employment. Therefore, the transition to a market economy necessitates the development of a labour market and the construction of a social safety net.

For the time being, the high level of social welfare spending in Russia is a major factor in the large budget deficit, contributing to an overall macroeconomic instability. The paradox in a social safety net is that in the long run it can only be financially viable if enough jobs are created. In other words, the highest priority for Russia should be the development of an unemployment benefit system together with an active labour market policy.

Based on a selection of important literature on the subject of social safety nets, the following experiences from different countries can be distilled. For example, for the OECD countries an active labour policy is said to have been established by means of matching demand and supply of labour through a more efficient search process (job broking), by training programmes, and by direct job creation in the public sector or giving subsidies in the private sector.⁷ Another publication mentions some programmes used in Slovakia as of 1990: of supporting small and medium-sized businesses, employment for school-leavers and disabled persons, of re-qualification, shortening the working time, and of socially useful jobs and public works.⁸ However, most of the literature also warns against the danger of merely copying the systems and approaches used in western European countries and use them in Russia.

⁷ L. Calmfors, *Active labour market policy and unemployment; a framework for the analysis of crucial design features*, OECD Economic Studies, Nr. 2, 1994.

⁸ P. Ochotnický and J. Kohutová, *Regional unemployment and employment policy in Slovakia*, Paper for the Workshop on 'employment and unemployment in Russia from a microeconomic perspective', IIASA, Laxenburg, June, 1994.

The danger of political instability as a result of unemployment necessitates certain concrete actions from the government. Such actions are, among others, the following: the setting up of labour exchange bureaus, supervising the unemployed with looking for jobs, training and retraining the unemployed, financially supporting starting entrepreneurs, improving the labour mobility by increasing the housing market and diminishing the red tape, and identifying public works programmes to involve the unemployed to improve the infrastructure.⁹ The establishment of a social safety net is inspired by the sense for social justice.

Funds could be found through extra lending from the Central Bank. Such actions could be forced by threatening the government to organize social unrest.¹⁰ Another possibility indicated to finance this safety net is reducing the privileges of certain advantaged groups.¹¹ Lack of sufficient active employment policy may lead to a situation wherein many labourers will end up in the so-called *grey circuit*, often criminal activities, or at best will find work in the *informal sector*, resulting in a reduction of the total premium paid to the government.¹²

There is also literature indicating several important aspects to be considered when setting up a social safety net. The target group should be clearly identified, the available limited resources should be utilized efficiently, the starting point should be the existing administrative reality, and the design of the social net should go hand in hand with fostering the development of the private sector. One important aspect is to keep the safety net affordable by rationalising the present benefit structure through capitalising on pension funds, applying the rules regarding the level of the pension to all pensioners, increasing the retirement age, etc.¹³ On the other hand, it is possible to use entrance restriction to control the cost of the social safety net.¹⁴

⁹ Netherlands Social Economic Council (SER), *Socio-economic relations with Central- and Eastern-Europe*, 1993; A. McAuley, *Economic transition in Eastern Europe; employment, income and social security net*, in: Oxford Review of Economic Policy, Vol. 7, nr. 4, 1992; UN, *UN report on the world social situation*, 1994.

¹⁰ P. Kirkow, *Regional politics and market reforms in Russia*, in: Europe-Asia Studies, Vol. 46, nr. 7, 1994.

¹¹ V. Pynzenyk, *Ukraine, a reform agenda*, in: Economic Policy, Dec. 1994.

¹² J. Winiecki, *East Europe, a regional survey*, in: Europe-Asia Studies, Vol. 46, nr. 5, 1994; B. Deacon, *Social policy in Central and Eastern Europe*, in: Journal of European Social Policy, Vol. 3, nr. 3, 1993; D. Powel, *Social problems in Russia*, in: Current History, Oct. 1993.

¹³ S. Private and R. Hagemann, *Social protection during Russia's economic transformation*, in: Finance & Development, Dec., 1994; R. Holzmann, *Social policy in transition from plan to market*, in: Journal of Public Policy, Vol. 12, 1992; IMF, *World economic outlook*, 1994.

¹⁴ M. Ksiezopolski, *Social policy in Poland*, in: Journal of European Social Policy, Vol. 3, 1993.

Another important aspect of employment policy is the establishment of institutions, called: *social partners*. These are the interest groups consisting of government, employers (employers' organizations) and employees (labour unions), allowing tripartite meetings. Such an institutionalized set-up guarantees that, on the one hand, all interests and needs are being taken into account and, on the other hand, the limitation of certain resources is being accepted by all parties. Moreover, it makes a stimulating, positive social policy possible, such as rewarding productive employment.¹⁵

Finally, along with an active employment policy, a social policy should also focus on promoting the private sector. The setting up of *incubator centres*, of *technology innovation centres*, of *industrial liaison units* etc., are possibilities to stimulate the small and medium-scale sector. Some important general operational problems of small-scale enterprises are: shortage of working capital, shortage of raw materials, marketing bottlenecks, lack of management know-how, bottlenecks in infrastructure support, absence of vertical growth possibilities, technological stagnation, underutilization of capacity resulting in noncompetitiveness, excessive bureaucratic controls, absence of human resource development facilities, and lack of communication between growth facilitators and entrepreneurs.¹⁶ This implies a proper bureaucratic, institutional and physical infrastructure, adequate credit schemes, good functioning communication network, etc.¹⁷

¹⁵ B. Deacon, *Social policy in the new Eastern Europe*, in: *Journal of Social Policy*, Vol. 21, 1992; U. Götting, *Destruction, adjustment and innovation: social policy transformation in Eastern and Central Europe*, in: *Journal of European Social Policy*, Vol. 4, nr. 3, 1994; ILO, *World Labour Report*, 1992 - 1994.

¹⁶ P.V. George, *Fundamental gaps in the new policy initiatives for the small scale sector*, in: *The Indian Economic Journal*, Vol. 39, nr. 3, 1992.

¹⁷ OECD, *DAC Report*, 1993; UN, *Human Development Report*, 1993.

III

THE BAIKALSK PULP AND PAPER MILL

A. *The history of the mill; a success story?*

The Baikalsk Pulp and Paper Mill was built between 1962-1966 in an area that was a completely untouched forest at the time. Together with the establishment of the mill, Baikalsk town was set up to house the employees of the mill. The main purpose of the mill's erection was organising dissolved refined "super-super" cord pulp production for further processing. The cord and viscose were produced for military purposes. The importance of the mill for the military industry was reflected in the speed and efficiency with which the mill and Baikalsk town were established.

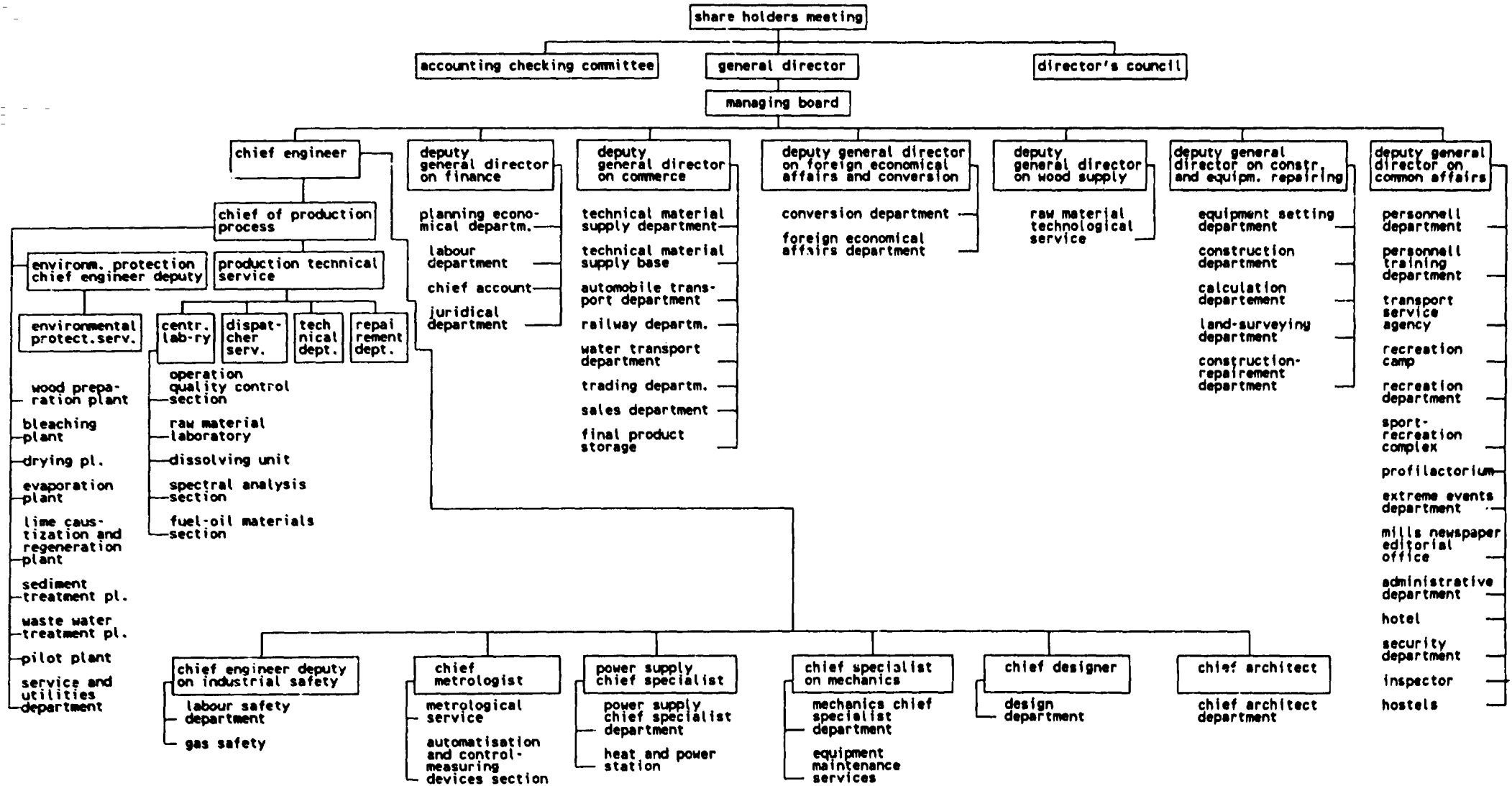
At the time the mill was established the production tasks were set as follows:

- cord sulphate cold refined pulp	200,000 tons/year
- wrapping paper	12,100 tons/year
- fodder yeast	15,000 tons/year
- raw turpentine	2,090 tons/year
- tall oil	9,680 tons/year

Pulp production is made on two equal lines for cord pulp and viscose pulp, with an equal capacity of 100,000 tons/year each. However, in order to reduce the pressure on the ecological system through discharging waste water, the yeast production was discontinued in 1985. Moreover, due to the changing demand for raw material for the military industry, in December 1992 the BPPM was, by Russian Federation Government resolution, to be converted to ecologically harmless production by preventing anthropogenic motions in Lake Baikal.

The Siberian Institute for Pulp and Paper Engineering (Sibgirobium) has developed several scenarios for restructuring the mill, of which six options are the most realistic. Of these options one extreme is the complete closure of the mill, the other options are variations on the situation that the mill will continue its present pulp production but with additional ecologically friendly production lines. One option combines both extremes in the sense that alternative production lines slowly take over the pulp production over a certain number of years. A brief on each of the options is given in Appendix Nr. 3.

JOINT STOCK COMPANY "BAIKALSK PULP AND PAPER MILL" ORGANIGRAMMA



Any newly proposed option for a production process is to guarantee ecological safety in accordance with the norms set in "*Norms of permissible effects on the ecological system of Lake Baikal, for the period 1987-1995*" in 1987 affirmed by the president of the Science Academy, the minister of health, the minister of fishing industries, the chairman of the state hydro-methodological committee and the minister of land-improvement and water industries of the USSR. In addition, the mill has had to fulfil a number of nature protection measures.

Independent of the choice for a particular option, the BPPM was obliged to reclaim the exhaust of ash dumps by reconstructing the gas dust emissions treatment plant, to reduce sludge piles, to construct a sewage treatment system for Baikalsk waste waters, etc.

The BPPM was established as a state enterprise but was recently privatized. This means that 51 percent of the total of 254,000 shares are now owned by the workers of the mill. These shares have been equally distributed; the management owns four to five percent. The balance 49 percent is still in the hands of the federal government. Though 20 percent consists of nonvoting shares enough are left to form a bloc if necessary; parliament will still have to approve whether the mill is closed or not. The workers-shareholders are not yet sufficiently organized to form a bloc. Together with privatization a new organizational structure was set up. The preceding page shows the organigram of the BPPM.

One aspect still very much underdeveloped in the area is the organization among the labourers. Formally a labour union exists at the BPPM, but as there is only one, and it includes management, it has little bargaining power. All industrial branches fall under the overall Federation of Independent Trade Unions of Russia. This federation consists of 36 different branch labour unions, each having its central committee in Moscow.

The labourers of the BPPM are organized under the Forest Branch Workers, with a central, regional and local committee. At local level chairman and deputy are even full-time assignments. At present about 98 percent of the employees is a member; contribution is one percent of the salary. The advantage of being a member appears to be questionable. So-called *collective agreements* between management and employees are to be taken within the union. Neither do the unions appear to possess a strong position vis-à-vis the government.

The management of the mill have had to face the fact that suddenly the market for "super-super" cord pulp had disappeared as a result of the collapse of the military market caused by the end of the cold war. They were able to switch to another market: the fibre market. Consequently, the viscose pulp production became the main product of the mill. In the mean time, the mill, in 1990, set up a pilot project for the manufacture of two-sided soft mattresses and spring mattresses using residues and ingredients which the factory obtains in exchange for pulp. This venture still functions on a low scale.

In 1993 the mill produced about 75 thousand tons of viscose pulp and about 48 thousand tons of cord pulp, totalling 123,000 tons of marketable pulp. This means that only 73 percent of the mill's capacity is utilized. In the same year the marketable pulp production comprised more than 80 percent of the total production of cooked pulp. The balance 20 percent comprises of wrapping paper, tall oil and turpentine. Table 2 shows these figures for the BPPM for the years 1990 to 1995. These figures are compared with those from two other pulp and paper mills in the vicinity. The table shows that the efficiency of the BPPM over the last three years was much higher than that of the other mills. While, for example in 1994 the efficiency of the BPPM was 65 percent, the other mills operated only at levels of 32 and 48 percent of their total capacity. Moreover, at the end of 1993-beginning of 1994 ten pulp and paper mills in the Russian Federation had to close down as the price for pulp reached an exceptionally low level.

When monthly production figures are set out one can see that the production of marketable pulp (cord and viscose pulp) is reasonably stable (see Table 3). At the same time the corresponding graph indicates that the production in the second half of 1994 was higher than in the same period for 1993. Notwithstanding the extremely difficult period during the first years after *perestroika*, the mill has survived remarkably well. The first three months of 1995 are also promising.

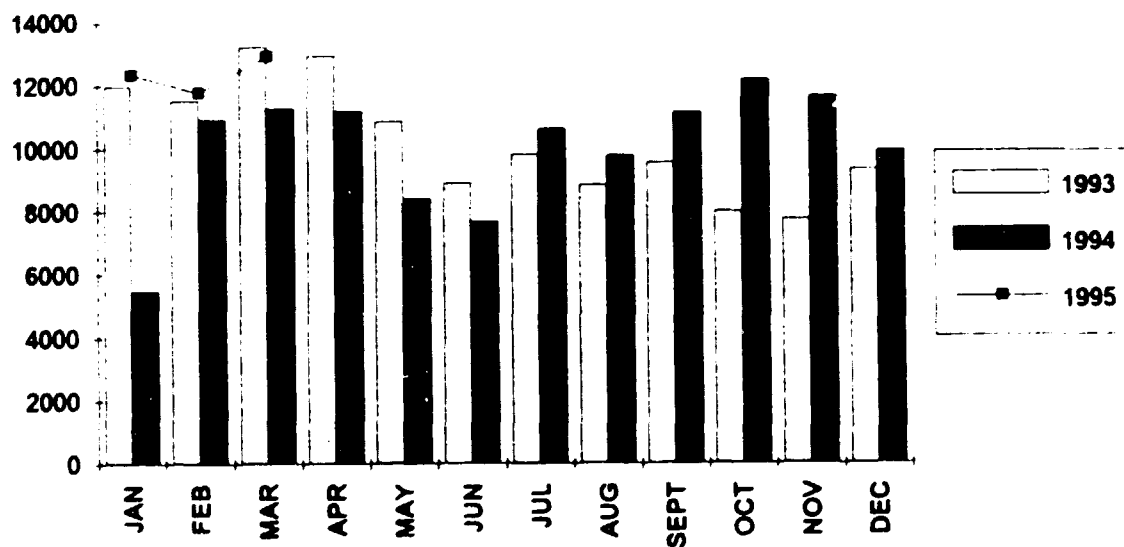
Table 2 Marketable pulp production in comparison with total capacity of three mills in Lake Baikal's vicinity (in 1000 tons and %)

Mill	Unit	designed capacity	1990	1991	1992	1993	1994	1995 (projected)
Bratsk	th.T %	712	442 62%	307 43%	305 43%	296 42%	228 32%	
Ustilimsk	th.T %	550	528 96%	509 93%	431 78%	291 53%	265 48%	
Baikalsk								
- total cooked pulp*	th.T %	228	191 84%	175 77%	185 81%	153 67%	147 65%	200 88%
- marketable pulp of which:	th.T %	167	147 88%	138 83%	148 85%	123 73%	120 72%	163 98%
viscose pulp	th.T		110	71	80	75	61	82

* including pulp for wrapping paper, tall oil and turpentine.

Table 3 Production of marketable pulp by Baikalsk Pulp and Paper Mill (in tons)

	1993	1994	1995
January	11,970	5,450	12,357
February	11,500	10,913	11,788
March	13,227	11,249	12,936
April	12,965	11,169	
May	10,865	8,399	
June	8,902	7,670	
July	9,814	10,620	
August	8,841	9,787	
September	9,577	11,152	
October	8,013	12,204	
November	7,759	11,669	
December	9,371	9,971	
TOTAL	122,804	120,253	37,081



Graphic presentation of monthly production of marketable pulp by BPPM

Moreover, when the export figures are considered it can be concluded that the market position of the BPPM is even more interesting. The percentage of marketable pulp exported increased from a little more of 10 percent in 1991 to almost 56 percent in 1994 (see Table 4). The mill is exporting mainly to Japan, South Korea and some Arab countries. Recently the export to India, China and Italy has assumed large proportions.

The BPPM has specialized in the production of high quality viscose pulp, a half-finished product used in fibre production, for example in special tires (for airplanes) etc. and in thread making for materials. This is reflected in the quality of the paper pulp. As by-product the BPPM produces about 12 tons of wrapping paper. Quality parameters for pulp are *brightness* (in percentage) and *tearing length* (in km). With regard to *cord pulp* for the Bratsk and Ustilimsk mills, the brightness is about 88 percent and tearing length 8 km; for the BPPM these figures are 85 percent and 7.2 km, though it is said that quality can be improved to 87 percent and 7.6 km respectively.

date	Rbl./\$
1 June 90	0.67
31 Dec. 90	1.67
1 Jan. 93	414.50
1 June 93	1072.-
31 Dec. 93	1241.-
1 Jan. 95	3620.-
3 Apr. 95	4908.-
7 Apr. 95	4972.-

However, the BPPM's market position is good as it produces a high quality of *viscose pulp*, a product which the other mills do not produce. One very restraining factor is the increasing devaluation of the rouble. The exchange rate table above shows the falling currency over the last four years: from roughly one rouble to the dollar in 1990 to almost 5000 roubles to the dollar at present! This makes the urge to sell pulp on the world market for hard currency even more acute. Since 1993-94, when the price for pulp was at its lowest, it has gone up again to such a level that a profit can again be made.

Table 4 Exported pulp, Baikalsk Pulp and Paper Mill

	unit	1990	1991	1992	1993	1994
pulp for export	T	1,583	14,298	30,743	26,384	67,099
% of total prod.	%	1.1	10.4	20.7	21.5	55.8

In 1993-1994 the production cost went up to \$ 270 per ton which was the same as the market price at that time. In Scandinavia and Canada the cost of pulp production was even \$ 350 per ton. In Scandinavian countries and Canada several mills had to close down. The BPPM was able to hang on and slowly take over part of the world market, because it was able in some cases to take over contracts from closed-down mills. At present the world market price for viscose pulp is \$ 850-900 per ton and production costs

are between \$ 400 and \$ 500 per ton. The BPPM can get the highest price as the quality is good, and the mill claims to always deliver on time. The price of viscose pulp for the BPPM was 1995 \$ 1050 per ton in April 1995. The most significant feature is that, though the pulp price has been fluctuating in the last decade between \$ 270 to \$ 850 per ton (always over periods of eight years), the present increase was realized in only one year.

The increase in production costs was a result of increase in costs of production factors and raw material. Labour costs went up from an average level of \$ 50 a month in 1990 to \$ 150-200 a month per labourer at the present time; the highest level being \$ 1000 a month. The cost of power production increased, and notably the price of wood went up from \$3/m³ in 1990 to \$35/m³ in 1995. Another constraining factor is the payment procedure: long periods before money is transferred, extremely high inflation rate, difficulty getting loans, distrust of 'letters of credit' for advance payments. etc.

Why did the demand for pulp change so rapidly in the last five years? The world production level in 1993 was such that the production cost was higher than the price. The market was saturated. Pulp production took place mainly in countries like the US, Canada and the Scandinavian countries where pulp was made from soft wood, as in Russia. There were other pulp-producing countries like Brazil, Indonesia and South Africa who produced pulp made from hard wood. Tropical wood, however, is not suitable for high quality pulp; nordic wood will always have to be added.

In the Russian Federation there are now 103 pulp and paper mills producing more than twelve million tons of pulp per year. The total figure for 1994 is compounded of the following components:¹⁸

* wood pulp for paper and paperboard	11,619,000 tons
- mechanical pulp	2,174,000 tons
- thermomechanical pulp	1,090,000 tons
- semichemical pulp	658,000 tons
- chemical pulp	7,697,000 tons
* dissolving pulp	561,000 tons
Total pulp	12,180,000 tons

BPPM currently represents only a small part of this. Among the mills there are only 15 large enterprises; the BPPM is considered a medium-sized mill. However, the BPPM is one of the very few producing high quality viscose pulp; in the Irkutsk region it is the

¹⁸ These figures are taken from: an FAO Survey 1993-1998 on Pulp and Paper Capacities.. and relate to the former USSR for the year 1994.

only one. Though the Bratsk mill could produce this type of pulp, its quality is significantly lower.

Why is the pulp and paper market suddenly doing so well? There are several reasons. In the first place, the paper consumption was formerly based on the European and American market. This consumption has now increased strongly, especially in Japan and the Newly Industrialising Countries in Asia like Indonesia, Taiwan, South Korea, and recently also India and China. Meanwhile these countries have obtained some 70 percent of the world's production. Another reason is that the number of producers has been reduced due to the powerful Green Movement in Scandinavian countries (especially Sweden) and Canada, putting high pressure on governments to reduce deforestation. During 1993-1994 ten mills were closed in these countries. The larger market for fewer producers kept the paper and pulp market booming. The forecast is that this trend will continue in the coming eight years.

An additional reason for the high production of pulp in Asian countries is the fact that viscose pulp is used for the textile industry, and with a declining cottons production - and reducing world market prices - last year in countries like China, Pakistan, Indonesia, and India, the demand for alternative semiproducts increased. And moreover, the French *haute couture* increasingly appears to utilize textiles made of viscose tissue.

Management, in collaboration with Sibgiprobum, has examined the possibilities for restructuring the present production lines in such a way that the ecological pressure on Lake Baikal will be reduced as much as possible, and at the same time safeguard the profitability and competitiveness of the mill. Besides a better end-of-pipe cleaning system, a cleaner production process (for example the old digester is leaking) is indispensable. It must be stated, though, that the distance from the shore to the spot in the lake where pollutants, coming from the mill, can still be measured, and which was anticipated to be 25 kilometres, is in fact only three kilometres.

This means a high capital investment for environmental protection. This will require technological modernization of three main components of the plant's production process: a move from wet to dry debarking, deep cooking of the pulp with utilization of sulphide liquor, and Elemental Chlorine Free (ECF) bleaching with the possibility of further Totally Chlorine Free (TCF) bleaching. The results of these measures are expected to be spectacular. Total investments for two phases will add up to about US\$165 million.¹⁹ A total reduction of the serious pollutants would mean an investment which is even higher.

One aspect still to be considered is the raw material problem. The forest around Lake Baikal is fully protected and the BPPM does not extract wood from the surrounding area.

¹⁹ See UNIDO's *Final Project Report*, for details on discharges after reconstruction as well as on estimated capital investments.

It receives its soft wood from different areas, up to 1000 km away: from five areas in the east, two in the west and one to the north of Baikalsk; a total of 1.5 million m³ per year. This consists of pine and larch; the red pine around Lake Baikal is not the appropriate type of wood for pulp making. Compared to other paper mills the BPPM does not consume a huge amount of wood. Nevertheless, from a national point of view, it would be worthwhile to see whether the pressure on the forest reserve is not becoming too high. The efficiency of the mill is about 40-45 percent of the wood made into pulp.

B. *The role of the Baikalsk Pulp and Paper Mill in Baikalsk township*

i. Baikalsk township

Baikalsk is situated at the southern tip of Lake Baikal and administratively belongs to the Sludjanka District. Baikalsk has about 17,000 inhabitants (0,6 % of the population in Irkutsk region), of whom about 9,000 belong to the labour force. The average annual population increase is not higher than 1,3 percent. Since the town was established, only about 30 years ago, the population structure has shown few elderly people; the majority of the population consists of those belonging to the economically productive category and of children. Another feature is that in all age groups women are in the majority.

The number of registered unemployed at the Baikalsk *employment centre* is currently 420, all of whom receive unemployment benefit. This benefit is supplied for a period of only one year and is calculated as follows: for the first three months 75 percent of the last salary, for the next four months 60 percent, and finally for the last five months 45 percent.

The part of the labour force that is usefully employed is distributed as follows:

- industry	5,300
- trading and public catering	800
- culture, education and science	760
- construction	600
- transport and communication	400
- health care	350
- services	70
- others: administration, private enterprises, cooperatives etc.	300

The BPPM is by far the most important source of income for the population of Baikalsk, as well as for the township itself. Apart from the BPPM, other suppliers of employment in Baikalsk are a bakery, a milk factory, a laundry and a cleaning firm.

Trade in Baikalsk is conducted by 18 shops, of which nine are food shops. The average area of foodstuff products is 70 m², and of manufactured goods 80 m² per 1000 inhabitants (standard figures are 90 and 140 m² respectively). In the centre of town a small market of private entrepreneurs is emerging. In town are also five public catering enterprises with a total capacity of 850 seats. At full shift the town would need a maximum of 1,220 seats, meaning a shortage of 370 seats. Baikalsk also has a hotel, owned by the mill.

There is a *hospital* in Baikalsk with 250 beds. The medical staff consist of 42 doctor and 134 nurses. On average 500 polyclinic treatments are given. When these medical provisions are calculated per 1000 inhabitants it appears that the number of beds is higher than the standard norm (14,7 and 13,5 beds/1000 inhabitants respectively), but the number of medical doctors (24 in stead of 40 per 1000) and nurses (79 in stead of 129/1000 inh.) is lower.

In Baikalsk there is also the internationally reputable **Institute of Ecological Toxicology**, doing scientific work on the water and soil quality of Lake Baikal. The institute was also established in the early sixties. It has never been owned by the BPPM, but is financed by the Ministry of Pulp and Paper. After *perestroika* the institute received less money, and it can still survive by grants from the Rockefeller Foundation, NATO funds, etc. If the mill were to close down the institute would still continue, though the lack of electricity and heat would be a great problem.

The special character of the lake necessitated the development of particular methodologies for biological control. There are still 100 staff members at the institute (the number used to be 150) doing research in the following areas:

- water toxicology,
- waste water bio testing,
- ecological chemistry,
- on-land ecosystems.

Currently the state of the forest in East Siberia also forms part of the institute's activities, as well as medical-biological research (like the one during a period of ten years on the chlorine content in mother's milk). The institute has an international reputation, as many contacts exist not only with similar institutes in the Russian Federation but with those in foreign countries as well.

Training institutions, which are relevant to the industry, are very limited. In Baikalsk there is only one technical school. This training institute was set up at the time of the establishment of the mill and now celebrates its 31st anniversary. It was established specially for training technical employees for the BPPM. The mill needed about 25 fresh graduates annually, of whom about 15 only for the obligatory supervision of kolchoses, attending party committee meetings, joining in *socialist competitions*, writing reports,

singing and dancing at gatherings etc., as was required by the former Soviet government. These functions no longer exist. It is, therefore, very difficult to find a job after finishing the study. The result is a decrease in students and consequently a reduction of financial support from the state. Another obstacle for the school is the military service which takes students away as soon as they are 18, regardless of their study level. The system works in such a way that students can go as far as the fourth grade in school and can then achieve the 6th grade through work.

Education is still free of charge. Students from outside even have free boarding and lodging. The present cost of educating one student is Rbl. 1.171.000 per year; for the total of about 400 students this means a budget of Rbl. 468 million, which the school does not get. In order to survive, the school has started a workshop where, on request, certain items can be manufactured and at the same time students can get practical experience. Other vocational training institutes or institutes of higher learning are in Irkutsk. The curriculum of the school can easily be adjusted when new industries in the area make this necessary. If requests do come from the employment office then it also has to pay for it.

Moreover, the town has five schools providing general education to about 3,000 pupils. There are about 2,500 primary school children in town. Finally, there are several kindergartens, mostly financed by the BPPM as well.

The mill supplies *direct employment* to about 4,400 persons, but indirect employment is given to almost the complete Baikalsk labour force. Of the 4,400 persons receiving their income from the mill, 3,700 are directly employed, and 700 via 12 contractors. Of the regular labourers of the mill 3,120 are industrial labourers, and 580 work in administration. About fifty percent of the Baikalsk labour force is working in the mill.

Of the industrial labourers at the mill about 1,000 belong to the group of skilled labourers. About 60 percent of this force is specially qualified in activities closely related to the production process of the mill. They are e.g. operating the chemical processes, the digester, the bleaching process, the evaporation and drying processes, the caustic soda treatment, the chlorine process etc., but they are also laboratory analysts and researchers. As know-how and skill are based on the specific pulp production, it would be very difficult for these employees to find alternative employment. In case the mill closed down, this group, including about 100 engineers would have to be retrained.

Another category of labourers has a working skill which is of a more of general nature, like turners at the lathe, welders, machine operators, drivers etc. These groups, consisting of about 400 persons, may find jobs in other sectors of the economy without being retrained.

The *housing situation* in Baikalsk is still problematic. Though since 1970 the living space per person has increased from 9,1 m² to 14,9 m², and about 120 flats were built annually,

there is still a shortage of accommodation. The maintenance of the flats (i.e. heating, water and sewage treatment, housing repairs etc.) is only covered by the rent for 20 percent, the rest is covered by the BPPM and town budget. According to the housing communal-services department of Baikalsk township, one third of the town is in need of urgent repairs. The total cost for maintenance and repair adds up to more than \$2 million. Privatization may ease the financial load of the mill and the municipality, but this may necessitate a salary increase.

Baikalsk township is located at the *Trans-Siberian Railway*. Seventy percent of the freight turnover of the town comes from the railway transport. The cargo station is located at Solzan, about 5 km east of Baikalsk. The average annual freight is 2.3 million tons, of which the most important incoming components are wood (56%), coal (26%) and construction materials (10%). The BPPM takes the lion's share of the outgoing cargo, i.e. 65 percent.

The railway is also important for passenger transportation. Due to price increase of bus tickets during the past two years suburban railway transport has increased. The total number of train passengers annually is more than 180,000 of which about 110,000 are suburban passengers.

The *road network* in town is not up to standard; it is 1.7 km/km² and it should be 2.5 km/km². As it costs more than \$300,000 per km to tar a road, the investment cost to bring the network at standard level is high: about \$4.2 million.

Another important impact on the Baikalsk township is the fact that the mill provides *electricity* and, through its recovery boilers, steam for *heating*. Moreover, the sewerage water coming from town is being treated at the mill together with its own waste water.

On the other hand, there is the question of whether the mill has a negative influence on the health situation of the local population. The Toxicological Institute has done research during a couple of years on the health consequences and they have come to the conclusion that there are no significant changes in certain health indicators on the population. In accordance with the standard procedure an area of about two kilometres has been laid idle between the mill and the residential area.

ii. The Zero-option; serious consequences for Baikalsk

As has been indicated above there are several options for restructuring the mill, varying from different technical alterations in the production process to complete closure of the mill. Some of the options are the following:

- to relocate the BPPM away from the Lake Baikal to an other site;
- to discharge the treated effluent to a place far away from the lake;

- to bury the treated effluent underground;
- to modify the mill's technology in accordance with the requirements;
- to diversify the mill's activities among other ecologically harmless activities;
- to completely reprofile the mill and to move into other production processes;
- to close down the mill.

As this last alternative was mentioned several times during the consultant's visit to the area, the financial, social and economic consequences will be calculated roughly. Specifically for Baikalsk township these consequences will be extremely serious. They can be divided into direct consequences (employment and unemployment benefits, public services, income from taxes), and indirect ones (influence on other economic activities, housing, psychosocial problems).

The Sibgiprobum institute has done some calculations on this 'zero-option' in 1992. Though the inflation has been enormous, the price increase will more or less compensate. Prices are given in US dollars. Main expenses as a consequence of closing down the mill and terminating the pulp production are estimated as follows:

1. Dismantling of the mill and cleaning the area:

	<i>million US dollar</i>

- cleaning, disposing and processing pulp, liquids, chemicals etc.	2.7
- dismantling equipment	64.5
- disassembling basements	12.5
- restoration of the released buildings and new constructions	14.3
- recultivation of the ash-slime dumps	85.6
- preservation of the idle equipment like power boilers and turbines	0.5
- other: storage and disposal of waste, building material after dismantling etc.	49.6

Total	229.7

2. Heat and power plant:

- Investment for replacement of retained public services, like sewage treatment (see under 3), electricity, hot water and heat; Needed equipment: power boilers, turbine, maintenance shop, compression station, oxygen station, water supply & sewage department, warehouse for fuel and lubricants etc, transformers 62.0

- Maintenance of auxiliary plants for heat and power facilities for life-support 34.8/year
- Payments for the normal and extra normal ejections and effluent from the heat and power plant 12.0/year

3. Heat and power supply:

- Besides the continuation of supplying heat by means of the present method with coal boilers etc., a feasibility study has been executed on converting the Baikalsk township to electric heating by the year 2000. This would mean the instalment of 25 boilers with 10 KW power, using the present means of heating where possible, auxiliary equipment and substation building. In addition to the existing power supply line (PSL 220), the boilers need an additional power line (PSL-500), and two transformers (16 MW). 2.5
- Construction of electric boiler station, including mounting, of equipment etc. 8.7

4. Sewage treatment system:

The present sewage treatment plant at the mill has been designed to process about 250,000 m³ of effluent every day. At present 10,000 m³ from the town is mixed with 200,000 m³ from the mill. Town and industrial effluent are treated together. The system can, however, still operate at a level of 30,000 m³ per day. But when pulp production has been terminated, the sewage water from town and some from the mill will have a volume of only 11.200 m³. This means that a new sewage treatment system will have to be installed, whereby only part of the former mill's facilities could be used. This will take at least two years during which period the sewage and affluent from the town and the remaining enterprises will be discharged into Lake Baikal untreated.

5. Financial losses due to termination of pulp manufacturing (based on production in 1994):

	Irkutsk region		Baikalsk	
	(ths. tons)	(ths. tons)	(perc.)	(mln. \$)
marketable pulp	870	120	13.8	108

Based on the 1994 production, the total financial loss due to termination of production adds up to US\$108 million. For the Baikalsk township this would create a large difference in income from industrial taxes. Table 5 gives the income part of the budget of Baikalsk township for 1995, showing a large share (about 90%) deriving from taxes from enterprises. It should be realized that the township only receives income tax directly, all other taxes are collected at federal level, and these then trickle down via the region and district to the townships, or are collected at regional level following the same route. When all direct and indirect income of the township is aggregated it appears that almost eighty percent comes from the mill. The total loss of local and district taxes is calculated at US\$ 5 million. Therefore, according to the mayor of Baikalsk, there "is no Baikalsk without the mill".

Moreover, of other existing production lines, the spring mattresses plant may still be in operation after a shut down of the mill. The capacity is very small, but the plant is supplied with raw materials, like steel, threads etc., in exchange for dissolving pulp deliveries. It is very likely that the manufacture of these mattresses will have to be terminated as well due to lack of raw material.

In addition, the cargo turnover which is largely depending on the BPPM's raw material input and output of semiproducts will consequently also be reduced to almost nothing.

Table 5 **Income budget Baikalsk Township for 1995**
(in thousand US dollars)

Profit tax	915.00
Enterprise property tax	1,870.00
Personal property tax	0.82
Enterprises income tax	19.00
Personal income tax	1,220.00
Water supply fee	278.20
State duty	26.70
Tax for educational needs	88.80
Tax for maintenance of residential fund	212.00
Miscellaneous non-tax income	2.50
Transport tax	19.00
Licence to trade	0.55
Earth tax	82.80
Total	4,735.37

6. Loss of capital value:

Capital value of the industrial facilities which will have to be dismantled are estimated (at 1992 prices) at US\$ 134 million and the main environmental protection facilities at US\$ 56 million.

7. Housing maintenance:

As was indicated earlier, at least one third of the housing stock in Baikalsk needs urgent maintenance. These costs will have to be covered by the town budget. Long-term maintenance of existing and newly built houses and flats should also be the responsibility of the township provided that they are rented. The foreseen increase in private immovable property may alleviate this burden for the community, provided the owners have a decent salary. This applies to those labourers who are on the payroll of the mill and to the contract labourers.

8. Social opportunity cost:

Currently, the mill has 3,164 own employees of which there are 2,715 labourers and 449 are superiors. Moreover, the mill employs about 700 contract workers. Some employees are now constructing their own private houses, with the help of easy loans from by the mill. Besides supplying its employees with salaries, allowing them to have flats, dachas etc., the mill also supplies other fringe benefits. There is a sports centre, including a swimming pool and sauna, a hotel, kindergartens, and the electricity, heat and hot water is supplied by the mill.

It is estimated that, for the short term, at most 800 persons could be maintained at the dismantled mill for the public services and possible direct alternative economic activities. This means that 2,400 persons will immediately become unemployed. This group will consist of 1,680 industrial labourers, 240 administrative personnel and 480 contract labourers. The total allowance will likely amount to Rbl. 60 bn. per year at present value (about US\$ 13 mln.). It has been estimated that at most one third of these would ever find a new job again.

Besides the financial problem for these unemployed, other indirect activities related to the mill may find it difficult to maintain themselves, e.g. cargo enterprises, delivery services, social services, and those institutions depending on the purchasing power of the local community. In addition, more than 10,000 residents of Baikalsk township will become socially insecure as no adequate alternative industrial activities are available as yet. Some of the alternative enterprises mentioned may become a solution, but this will take time and high investments. Moreover, the option of tourist development in the area is not

likely to solve this problem as only few tourists with special interests will be attracted to the area.

9. Relocation of BPPM:

In case the mill is going to be moved to some other place, it will be doubtful whether the present high quality viscose pulp can still be manufactured, as the pure Baikal water is a necessary ingredient of this product. This would make a marketing study and feasibility study necessary in order to identify possible niches in the market. Some sectors have been mentioned, like wood processing, sewing, water bottling, brick making and tourism. But a period of at least ten years would be needed to re-establish such a factory: building market relations, establishing the physical infrastructure to build sufficient housing facilities, retraining staff members etc. For Baikalsk township this would, in any case, be irrelevant.

Several interested parties have already come forward regarding the distilling of Baikal water for the food industry. A German supermarket and a trading house in South Korea have sent in official requests. The water has been tested in Germany and has received a certificate from a research institute. Also some Arab countries have expressed their interest. Recently a meeting with a British investment company took place. Selling water appears to be more profitable than pulp production.

In this context the mill itself has already worked out at least two feasible options, both based on a slow restructuring of the mill. The first option concerns the setting up of the water bottling production line over a period of three to four years, during which the mill should continue its original operation. Moreover, other ecologically harmless industries are to be established, e.g wood processing. These plants should then employ the same number of employees as the paper and pulp plant. The second option has a much longer-term perspective and focuses on the improvement of the mill. It should produce not more than 300,000 tons of oxide bleached TCF pulp, which is nowadays the only type accepted in Europe. Moreover, an efficient cooking plant, without the dissipation of sulphide and mercury, will have to be installed. This 100 percent reduction of pollutants is technically feasible but would cost at least \$350 million. This investment is risky as long as there is no guarantee that the mill can continue for a certain period of time. This political instability is not a sound basis for investments. A pay-back period of five years is too short.

In all cases the power plant, which is said to cause *horizontal pollution*, will still have to be maintained. Each of the industrial alternatives will need energy and heat. Moreover, Baikalsk township - though consuming only about five percent of the heat production and fifteen percent of the total energy production - will continue to need hot water and electricity.

But in all cases three criteria will have to be met:

- there must be a market,
- the production must be environmentally friendly,
- there must be one or more investors.

Regarding this last point it should be mentioned that the present tax level of eighty percent is lethal. To stimulate foreign investors the government has initiated certain investment rules. A minimum of \$10 million should be invested in any type of industry, guaranteeing a tax holiday of two years. Thereafter the tax will be fifty percent. The same rules apply to newly established local food industries. For all other sectors a tax level of eighty percent will be maintained.

10. Conclusion:

Based on the above calculations it is easy to see that closure of the mill will have extreme financial, economic and social-psychological consequences. The total of all the cost for dismantling the mill etc. is at least \$600 million. Over and above this comes the annual cost for Baikalsk township of about \$65 million. Before any decision is taken it would be necessary to weigh the consequences of mass unemployment (social opportunity cost) against ecological cost. The latter should include the cost of new technology for cleaner production. Ecologically friendly production could also include de-inked pulp, made from waste paper.

C.

The Baikalsk Pulp and Paper Mill at large: at Sludjanka District, Irkutsk Regional and national level

The BPPM is situated in the *Baikalsk Township*, but administratively falls under *Sludjanka District*. The larger governmental unit is the *Irkutsk Region*. Besides Irkutsk Region there is one more region that directly borders the lake: the Buriat Republic on the east side of the lake. Moreover, Chita region on the northeast side of the lake forms part of the watershed. Not more than 200,000 people are living around the lake. But considering the fact that the total coastline is about 2000 km, it is understandable that the impact of human settlements and industry is to be taken seriously.

i. District level

Sludjanka District is located at the southwestern tip of Lake Baikal and covers about 400 km². There are 46,300 inhabitants in the district of which 26,800 (67%) belong to the

labour force. Compared with the districts bordering the southern part of Lake Baikal, the northern districts are significantly less developed. According to the Sludjanka District Office there are 82 industries in the district, in the following sectors:

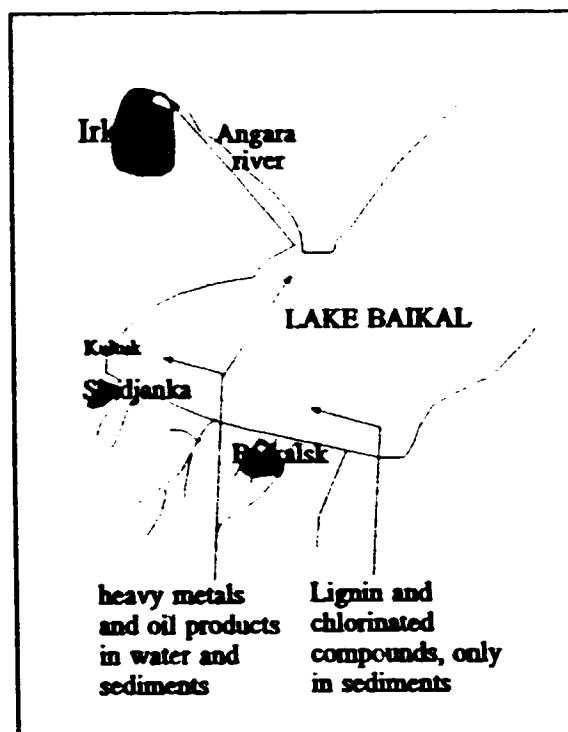
- Industry 37
- Construction 40
- Food processing 5

Concentrations of pollutants in Lake Baikal are at the mouth of the Angara river and mainly in the area along the coast near Sludjanka, where heavy metals and oil products are found in the water as well as in sediments. On the coastal side of Baikalsk lignin and chlorinated compounds are found, but only in sediments.

At present, no institutional infrastructure has been set up to support and stimulate new enterprises, such as incubator centres, business innovation centres etc. The district has no higher training institutes, except for three art schools. There is one technical school (in Baikalsk) and 17 secondary schools. Also the banking facilities are rather limited: one commercial bank and one savings bank. Furthermore, there is the pension fund and the medical insurance fund.

Formally the district office in Sludjanka is responsible for all matters in the district, including those in Baikalsk. However, permission is not always needed, for instance on medical, construction and transport issues. Also an experiment is going on at present to transfer certain tasks from the district to the town, e.g. on education and police matters. This means that the budgets concerned are transferred and the town can outline its own policy, provided that for additional activities it finds the finances. Slowly a general approach is emerging, stimulating institutions, e.g. educational and medical institutions, to become as financially self-supporting as possible.

The importance of the mill for the district is reflected in the share of Baikalsk town in the district budget. Most of the enterprise taxes are collected by the district and the town receives in accordance with what it has earned. The first nine months of 1994 the share of the mill in the district budget was 24 percent. For the last quarter this was 49 percent, and for the first quarter of 1995 the percentage was 54.



Map of southern part of Lake Baikal with major pollutants.

With regard to supervision of the environment in the whole of the district a District Environmental Protection Committee has been set up. So far ECU 7 million has been spent on preparing a seminar in April, and on research on the lake. According to the district office ECU 10 million could solve the complete sewage and boiler system question in the district. However, communication between district and federal level administration is poor. The district office complains of rules coming from Moscow without the necessary financial support. When asked whether the mayor could come and defend the BPPM's case before federal parliament this was turned down.

Regarding the unemployment policy, this is also regulated at federal level and the consequent budget of the employment centres is fixed at regional level and distributed at district level. The *employment centres* are set up at district level and town level in Sludjanka and Baikalsk. These centres have the following tasks:

- provide training to young people;
- retraining of the unemployed when required;
- find jobs for invalids, single mothers and the long-term unemployed;
- subsidize enterprises that create jobs;

In 1994 the district unemployment office registered 2,264 applicants for unemployment benefit. Of these 559 are said to have found a job again, and 37 were sent to a retraining programme. The balance of 1,668 were listed as unemployed, resulting in an official unemployment rate of 6.2 percent, which is relatively low. Allowances were granted to almost 90 percent.

Another social security office in the district is the *District Department of Pensions and Allowances*. Except for Baikalsk township it is responsible for the whole district. The budget for 1995 is Rbl. 765 million (US\$ 190,000). The office has a staff of 15 and has the following tasks:

- calculate pensions and allowances for pensioners, invalids, single mothers, orphans and veterans;
- support those who have no possibility to apply for other social support systems, like labour invalids, persons with long-term illnesses etc.;
- support mothers and children who live under extremely difficult conditions;

So far, the number of persons who are receiving a pension from the Baikalsk township (incl. the nearby villages of Solzan and Utulik) is 3,845. For the last four years the numbers are presented in Table 6.

These figures clearly indicate that there is very little financial flexibility in the social security system and unemployment services. Should the BPPM close down, the economic and social situation in the whole district would be seriously affected. The income would be reduced by almost half. The unemployment rate would increase from about six percent

of the labour force to more than 19 percent, tripling the expenditure for unemployment benefits.

Table 6 Number of persons receiving a pension from Baikalsk township

	Retired from BPPM		
	no longer working	still working	due to disability
1992	295	5	38
1993	314	9	20
1994	424	19	42
1995 (3 months)	97	5	9

ii. Regional level

The Irkutsk Region is an area with several industrial concentrations. Especially in and around Irkutsk town many factories are situated. The Region has a size of 775,000 km², which is 4.6 percent of the total Russian Federation. It stretches over a distance of 1500 km from west to east and 1400 km from north to south. The total exhaust of polluting material into the atmosphere in the region is substantial, though it has been slightly diminishing in the last few years (see Table 7). The total exhaust of the BPPM is 12,067 tons (1993) which makes only 1.1 percent of the total for the region.

Table 7 Exhaust of pollutants in the atmosphere in mln tons/year

1986	1990	1991	1992	1993
1.50	1.27	1.30	1.25	1.08

At the level of Irkutsk region there are several institutions that are in one way or another involved in the discussion regarding the restructuring of industry around Lake Baikal, in particular the restructuring of the BPPM. The important issue here is that decisions are prepared at regional level, but the major consequences are felt at district township levels.

The **Siberian Chamber of Commerce**, Irkutsk Region, is said to be not much different from its counterparts in western Europe. It is an independent social structure of which the members determine the policy. Last year it joined the International Chamber of Commerce. Its main activities are promotion of Russian enterprises abroad, giving information on import and export of goods, on customs regulations, on prices, on origin etc., and guiding foreign companies who are interested in investing in the region. More than 3000 large, medium and small enterprises are situated in the region.

It has also established an arbitration court where economic arguments are settled concerning contracts and patents. Furthermore, there is an independent body: the state standard committee on foodstuffs. A new activity is the development of a management school for privatized enterprises. Another function of the Chamber is to advise on environmental criteria. For this reason ten research centres were established in Irkutsk region. Each industrial investment plan has to be analyzed as to its ecological consequences.

One of the research institutes is the **Siberian Institute for Pulp and Paper Engineering** (Sibgiprobum). Its tasks are to develop and calculate projects for reconstructing, and reorganising forestry, and the pulp & paper industry. The approach is multiprofile oriented, i.e. on the market, the influence on the forest, the waste water treatment, energy etc. For each project the complete social, economic and physical infrastructure is analyzed.

These studies do not only relate to existing enterprises, but to new ones also, and not only to paper and pulp, but also to other related sectors. The institute has relations with the Limnological Institute, the Organic Chemistry Institute, the Geo-chemistry Institute, the Polytechnic Institute, and the Bratsk Institute. Moreover, it has contacts with companies in Switzerland and Finland. Sibgiprobum has done studies on the BPPM: on the different options, on alternative production processes etc. As companies for whom the institute is doing research are financially supporting it, the closure of the BPPM will also have direct consequences for the institute. At present, the institute is doing research for 23 enterprises and has 250 staff members.

A very relevant institution with regard to the ecological position of the mill is the **Irkutsk Regional Committee for Environmental Protection and Natural Resources**. The standpoint of this institution is that when the BPPM is able to technically solve all environmental problems there will be no rational arguments to close down the mill. The committee is a technical institution and not a political one. It gives advice on pollution levels to the legislative power that prepares regulations.

The Committee's tasks are to control air, water and land pollution and resources, monitor the possible improvements, set standards, develop economical mechanisms for the use of resources, organize education for government and NGOs and coordinate special committees. For Lake Baikal a special committee has been installed to set standards for about thirty pollutants.

Irkutsk also has one institute of higher learning: Irkutsk State Economic Academy. Especially the Production Management Department is strongly involved in linking economic development and ecological protection. A manager is defined as someone making an effort at an objective in order to get a result. The attention is on *ecological management*, i.e. management with a view to obtaining a balanced situation between nature and industry.

The department's tasks are the following: giving education and doing research on *usage affordable usage of natural resources* in terms of management and economy, and on investments from a technological point of view. Natural resource use includes the valuation and standardization of certain pollutants. The focus is on three types of enterprises: federal and regional (both state owned), and private enterprises. With ecological management attention is given to profitability depending on the effectiveness of the use of raw material and of waste, vis-à-vis the cost of dumping the waste. This means keeping an account of the waste, and at regional level costing the ecological pressure on the region.

iii. Federal level

Apart from the directly perceptible and visible consequences of closure of the BPPM for the local people, there are consequences for the economy of the Russian Federation as a whole. Figures on national level are only available for 1991. The dissolving pulp deficit in the Russian Federation was 240,000 tons, which had to be purchased from abroad. In that year the BPPM already produced 138,000 tons of marketable pulp. Due to a lack of hard currency only 32,000 tons were purchased, being only 13,3 percent.

Although the present production of the BPPM has slightly decreased, the projected output is much higher (see Table 2) and export has progressively increased (see Table 4). Still forty-four percent of the marketable pulp of the BPPM is sold at the local market. This means that the share of the BPPM on the local market of dissolved pulp decreased from nineteen percent in 1991 to ten percent in 1994, which is almost half. Moreover, it can be assumed that the national demand for pulp has increased. The role of BPPM in supplying the national market with high quality pulp has become less important in favour of its role on the world market. Though the dissolved pulp has been analyzed, the figures will be different for the high quality viscose pulp which is BPPM's speciality.

One indication of the high quality is, as was indicated in chapter III-A, the fact that BPPM can ask a higher price for its viscose pulp than the other mills. The dissolved pulp is a raw material for the production of viscose fibre, cord fabric and filament, and chemical detergents. For 1991 the total marketable product loss in the Russian Federation, due to a closure of the BPPM, for the chemical fibre manufacturers was calculated to exceed US\$ 400 million. For that same year it was calculated that the effect of the closure of the mill for the employment situation in the textile and garment, auto and tire

industries would mean a loss of jobs for almost 100,000 employees. The consequent loss of consumables adds up to more than US\$ 11 bn. per year! With the smaller share of the mill in the local market this figure will also be less.

The economic importance of the BPPM for the district as well as the national economy is not offset by ecological squandering. On the contrary, the expert on water pollution has indicated that the BPPM has a very good water treatment system and, according to world standards, is one of the cleanest of its kind. If the ecological importance of Lake Baikal calls for stricter norms, the BPPM is inclined to satisfy these norms, if possible. The ecological importance of the lake is already stated by a group, called the George Davis Group, which has done research for several years on the lake and the soil around it.

In April 1995, a regional conference was held in Irkutsk on the ecological situation and environment protection problems in the region. The concept of sustainable development was worked out. The Institute of Economy of the Russian Academy of Science prepared the proceedings of this conference.²⁰ Final resolutions are said to have been taken to the national conference, which was held in Moscow in June 1995.

One of the options brought forward time and again as an alternative for the type of production of the BPPM, is tourist development. Though the recreation potential of the region is considered good, the development of mass tourism in the area is not very realistic. There are mountains of up to 2000 metres with lots of snow in the winter, several mountain rivers for canoeing, a lake for skating in the winter and swimming in the summer, the number of tourists who would be interested in such surroundings is likely to stay far below the level making it an economic substitute for large industry. It is claimed that there are at present 4000 beds available in Sludjanka district alone, of which 500 all year round. It is questionable, however, whether the type of accommodation would satisfy the average tourist. In any case, the accommodative infrastructure, including travel potential, sports facilities, boarding possibilities etc., would have to be greatly improved.

²⁰ Russian Academy of Science, *Ecological situation and environmental protection problems in Irkutsk Region*, 1995. For a summary of the most important chapters (I, III and V) of this report, see Annex 4.

IV

CONCLUSIONS AND RECOMMENDATIONS; TOWARDS AN ECO-ECONOMICALLY BALANCED DEVELOPMENT IN THE BAIKAL AREA

One conclusion regarding the performance of the BPPM is that it has a high productivity and a very good local as well as export market. The production process is, compared with other factories in the same sector relatively clean. However, it may be that international norms should not be used for Lake Baikal as the lake needs specific norms. Technology which could reduce air and water pollution to all but nothing is available, though it requires high investment costs. This is important for the special pollutants such as chlorine etc. But the management of the BPPM is willing to improve technology according to standards.

In case the BPPM is closed the social opportunity costs are extremely high, as there are no present alternative industrial developments in Baikalsk. Social unrest and economic instability will be the result. The chance that from an ecological point of view the result could become worse is certainly not unrealistic. At present, the mill is treating waste water, supplying electricity and heat, and can be controlled for its air and water pollution. When every individual will try to survive by setting up a workshop, small enterprise or service station, the control on dumping of waste material is going to be much more difficult.

Moreover, the cost of dismantling of the mill and all the transition costs will be very high and would have to be carried by the government. The loss of income from local customers is also significant. All these parameters will have to be considered carefully and set against each other.

Only rational debate, based on clear parameters and norms, can solve the present confusion of tongues. It is extremely unfair to consider one participant as the big bogey, and to think that its disappearance will solve all environmental problems of the lake. It is absurd to let the discussion go to where one is either the unscrupulous industrialist whose concern for Lake Baikal is only instrumental insofar as the continuation of his enterprise is concerned, or the rigid environmentalist who is only concerned about the life cycle in nature, easily forgetting the social and economic costs involved. These caricatures make no sense and will never lead to a solution that is satisfactory to all parties concerned.

Several conclusions may be drawn from the foregoing:

1. At this stage it would be very unwise to close down a factory which still generates a reasonable profit and employs more than four thousand people. In respect of the transition problems, priority of factories to be closed down or totally restructured should be given to those factories that are extremely unproductive due to inefficient technology or management. The only solution would be to make a step-by-step development plan for the factory, for a period of e.g. a minimum of ten years, for -if necessary- partially replacing the mill by alternative industries. But this should be done in an overall sustainable development plan for the whole area.

2. In this phased plan the mill should invest as much as possible in technology which guarantees a clean production process. As no investors will be interested to put money into a mill that has only a few years left to go, the period of at least ten years is necessary. A TCF production and smokeless chimneys will have to be realized. The production of *biogas* from residues of pulp production should also be researched. In this context it is recommended that pollution tax collected from polluters should be ploughed back into financing environmentally friendly technology.

3. The ecological problems of Lake Baikal can never be solved by the BPPM; neither by its technological restructuring, nor by its closure. The BPPM is responsible for only a fraction of the air and water pollution. As has been indicated above, not only would it be unfair to take one industrial enterprise as a scapegoat for all pollutants in the lake, it would be unwise as well. The problems of the lake and the surrounding area are too complex and too important to think of solving them by such a relatively simple intervention. Moreover, the region cannot go and try to solve its problems at the expense of a small segment of the working population who cannot be blamed for the situation. If pollution is to be taken seriously then the entire Lake Baikal area should be considered.

4. As government has built the mill it is responsible for a proper settlement of the present consequences. The problem has to be looked at from all sides: from the environmental point of view, from the point of view of industry and the economy at large, and that of the employees, who will carry the social consequences. Because of the magnitude of the lake, its relevance goes far beyond the Baikalsk town, the Sludjanka District, or the Irkutsk Region and other regions around the lake. Moreover, there are many more industries directly or indirectly influencing the water quality of the lake. It could easily be argued that the importance of maintaining the special ecological condition of Lake Baikal should concern the whole world. The lake is the same size as The Netherlands and is still one of the purest natural water reserves in the world.

Therefore, the final conclusion is that the performance of the BPPM and all the other industrial and agricultural activities will have to be considered in an overall development plan for the three regions bordering the lake. This means that the Irkutsk Region, the Chita Region and the Buriat Republic will all have to be involved. It is suggested to make

a strong case to upgrade Lake Baikal and its surrounding area to an area of global relevance and to give it the status of *global heritage*. This would make it an area of ecological importance to the whole world.

In point of fact, this recommendation is to identify four pilot districts around the lake; suggested are: Sludjanka District at the southern end, Olkhon District on the western shore, both within Irkutsk Region, North Baikalsk District at the northern tip and Kabansk District on the eastern shore, at the mouth of the Selenga river. In these four districts a *sustainable development concept* should be worked out. This means that, based on the actual situation in the areas and the situation that is aimed for, sustainability should not only refer to resource management, but also to a *balanced development* weighing and considering ecological, economic and social parameters. For each of the districts priorities will have to be set, depending on the specific conditions in terms of type of industry, potential for alternative industries, market position etc.

Based on the findings and experiences of these pilot projects a *sustainable development model* for the other areas around the lake or elsewhere could be worked out. Such a programme would need a period of at least five years to be worked out and would require several different specialists in the fields of engineering and socioeconomics.

Since such a sustainable development plan for Lake Baikal would need a lot of financial support, it is recommended that such a project proposal be presented to several potential international organizations for backstopping or financial support. Aside from UNIDO itself, support from FAO, World Bank, and ILO could be requested. This proposal could also be considered in the framework of the development programme for the CIS countries of the European Union (TACIS programme), that is proposing to set up development programmes in the region.

APPENDICES

APPENDIX NO. 1

**JOB DESCRIPTION
SI/RUS/94/804/11-54**

Post Title: consultant on social science in the social and economic impacts of industrial restructuring

Duties:

Due to the economic restructuring process underway in the Russian Federation, the Baikalsk Pulp and Paper mill may be forced to reduce its workforce, change the skill mix of labour used in the plant or cease operations. Any one of the above will have a severe impact on the workers and the local community which is totally dependent on the mill for employment and social and environmental services;

The expert is requested to:

1st mission (field and home-based):

1. summarize the latest literature on mitigating the social and economic impact of plant transformations/closures to identify measures that have successfully assisted communities (labourers, their families, the civic infrastructure) in making the transition. The literature review should consider measures actually undertaken by industrialized countries, measures now being applied by countries in transition, and measures recommended by multilateral and bilateral assistance agencies; [field].
2. document the employment and community relations currently existing in the town of Baikalsk. This assessment should be based on interviews with both mill and community leaders as well as regional authorities. Evaluate the social impact of the existing study on modifying/reprofiling the mill already prepared by mill personnel; [field]
3. prepare alternative scenarios, based on the technical alternative being proposed by the consultant 11-52 (consultant on pulp and paper), for modifying/reprofiling the mill, for employment-community relations based on workforce reduction, change in skill mix and eventual closure of the mill. For each scenario identify measures that need to be undertaken to find alternative employment and mitigate community impact, the probability of their success and their fiscal costs. Describe possible assistance measures for national government and bilateral and multilateral agencies. The latter could be significant given the ecological importance of lake Baikal. This report will be part of the consolidated report to be prepared by the consultant 11-52. [home-based]

2nd mission (meeting in Vienna and expert group meeting in Baikalsk):

- participate in a one week meeting in Vienna to finalize the report on alternatives and programmes for conversion of the mill. This report will be presented by UNIDO during the expert group meeting in Baikalsk;
- participate as resource person in the expert group meeting in Baikalsk;
- prepare a report with suggestions and recommendations in his/her area of expertise.

APPENDIX NO.: 2

Working schedule

**Consultant on Socioeconomic impacts of restructuring of
Baikalsk Pulp and Paper Mill (BPPM),
Russia, 10 - 29 April 1995**

Peter van Tilburg

Monday, 10 April 1995; travelling from Amsterdam to Vienna, and briefing at UNIDO head-office: introduction on the project;

- Mrs. L. Taylor; Senior Project Personnel Officer
- Mrs. Grace Luarca; Administrative Assistant
- Mrs. Rosely M. Viegas Assumpção; Industrial Development Officer Pulp and Paper
- Mr. Leonid Oushakov; Consultant BMA&T; contact person for BPPM in Vienna

Tuesday, 11 April 1995; meeting in Moscow;

- Mr. Anatoliy Vladimirovich Steinberg; Deputy Director for Reorientation and Foreign Economic Relations of the Baikalsk Pulp and Paper Mill

Wednesday, 12 April 1995; travelling from Moscow via Irkutsk to Baikalsk

Thursday, 13 April 1995; briefing at the Baikalsk Pulp and Paper Mill: introduction to the mill;

- Mr. Alexander Teleshev; Interpreter, who accompanied me to all the meetings that took place during my stay in the area
- Mr. Rem L. Latipov; Chief of Conversion Division
- Mr. Valery Vasiljevich Glazarin; Director of the BPPM
- Mr. Sergei Vasiljevich Semiletko; Chief Engineer

Friday, 14-Sunday, 16 April 1995: reading and preparation for meetings in coming week

Monday, 17 April 1995; meetings at the BPPM;

- Mr. Anatoliy Vladimirovich Steinberg; Deputy Director for Reorientation and Foreign Economic Relations
- Visiting the different production lines of the BPPM
- Dr. Albert M. Beim; Director Institute for Ecological Toxicology, Baikalsk
- Mr. Andrei Beim; Researcher at the same Institute

Tuesday, 18 April 1995; meetings at Baikalsk and Sludjanka;

Town Hall of Baikalsk:

- Mrs. Lubov Korneichuke; Mayor of Baikalsk Town
- Mrs. Ludmila Slepikova; Chief Employment Centre
- Mrs. Olga Tkachuke; Chief Social Security Services

Baikalsk Technical School:

- Mr. Nicolai Tumin; Director of the school
- Mrs. Kaidolova Vera Ivanovna; Deputy Director industrial education
- Mrs. Evsukova Lubov Alexeevna; Deputy Director general education

Sludjanka District Office:

- Mr. Vasiliy Ivanovich Saikov; Chief District Administration/District Mayor
- Mr. Alexander Vasilyevich Kamyskov; Deputy District Mayor

- Mrs. Revengina Ludmila Valentinovna; Chief Social Security Department
- Mrs. Malutina Albina Veniaminovna; Chief Employment Centre

Wednesday, 19 April 1995; meetings at the BPPM;

On the economical development of the mill over the last five years and on the pulp market:

- Mr. A.V. Steinberg; Deputy Director for Reorientation and Foreign Economic Relations

On the Forest Branch Labour Union at the Mill:

- Mr. Ivan I. Panchenko; Former Chairman Labour Union, Forest Branch; Dep. Director Dept. of Common Affairs of the BPPM

Visiting the Institute for Ecological Toxicology, Baikalsk:

- Dr. A. M. Beim; Director and Mr. Andrei Beim; Researcher of the Institute
- Dr. Yelena I. Grosheva. Manager of Ecological Chemistry Laboratory at the Institute

Thursday, 20 April 1995; meetings at regional capital, Irkutsk;

East-Siberian Chamber of Commerce and Industry:

- Mr. Konstantin S. Shavrin; President
- Mr. Alexander M. Lai; Section Head Foreign Services

Siberian Institute for Pulp & Paper Engineering/Institute for Enterprise Projections (SIBGIPRO-BUM):

- Mr. Gennady I. Gromashev; Director
- Mr. Alexey Ivanovitch Goncharov; Deputy Director Technical

Irkutsk Region Council:

- Mr. Igor Shirobokov; Representative of the President of the Russian Federation in the Irkutsk Region

- Mrs. Lyudmila V. Varfolomeeva; Chief of the Ecology, Natural Committee, Legislative Meeting of Irkutsk Region

Friday, 21 April 1995; meetings at regional capital, Irkutsk:

Accompanied by:

- Mrs. Raisa M. Zaikova; Deputy Chief Engineer on Environmental Protection, BPPM

Irkutsk Regional Committee for Environmental Protection and Natural Resources:

- Dr. Yury Udodow; Chairman of the Committee

National Economic Academy:

- Dr. Vladimir Jelking; Dean Management Faculty
- Mr. Vladimir Tikkonovitch Grigorov; Professor Production Management Section
- Mrs. Bella Borisovna Jakobson; Professor Production Management Section
- Dr. Gennady V. Khomkalov; Professor and first pro-rector (education)

- Dr. Genrietta Rusetskaya; Professor Natural Resources Usage Economy/Head of the Section

Saturday, 22 and Sunday, 23 April 1995: reading and report writing

Monday, 24 April 1995: final discussions at the mill on expert's initial findings and collecting last information:

- Mr. A.V. Steinberg; Dep. Director of the BPPM
- Mr. V. V. Glazarin; Director of the BPPM

Tuesday, 25 April 1995: travelling from Baikalsk, via Irkutsk to St. Petersburg

Wednesday, 26 April 1995: St. Petersburg:

- Discussion with Mr. O. Olle, TACIS office
- Visiting Foundation for SME Development (TACIS): Mr. J.A. Duffy (coordinator advisor DA) and Mr. Andrei Brusov (General Manager)

Thursday, 27 April 1995: travelling from St. Petersburg to Vienna

Friday, 28 April 1995: debriefing at UNIDO head office:

- Mr. B. Sugavanam; Senior Industrial Development Officer, Chemical Industries Branch
- Mrs. T. Svoboda; Administrative Assistant
- Mr. Bert Van Burik; Appraisal Officer
- Mr. Igor N. Volodin; Industrial Development Officer, Energy and Environment Branch
- Mrs. Akiko Suzuki; Investment Promotion Programme for Arab Countries, Europe and the Mediterranean
- Mr. Paul Wiedemann; Acting Head, Europe Programme
- Mr. Lech Kurowsky; Senior Industrial Development Officer, Feasibility Studies Branch

Saturday, 29 April 1995: travelling from Vienna to Amsterdam

APPENDIX NO.: 3

Six options of Baikalsk Pulp & Paper Mill conversion.

Option No.1

Production of consumer goods (pulp, cardboard, paper, fibre, starch, paints, spirit, caustic soda) from purchased materials & raw materials.

The enterprise will include the following production lines:

- paper for hygiene/sanitation & everyday articles;
- stationery goods;
- refined wooden mass;
- corrugated cardboard and corrugated tare;
- paper/cardboard boxes with multicolour printing;
- wall paper, consumer containers for eggs and such.

Advantages:

- economic efficiency and profitability;
- partial return of treated waters into the production process;
- total harmful gases emission reduction

Drawbacks:

- high cost and long term conversion period;
- huge demand for qualified construction staff and hard currency;
- huge number of operational staff - 3583 persons, (it exceeds the staff number of the existing mill by 340 persons);
- production process is based almost entirely on raw material;
- impossibility of total return of waste waters into production process.

Option No.2

The second option is analogous to the first one: the difference is in the preliminary conversion of unbleached pulp production (bleaching plant shutting down in 1993) and further gradual shutting down of unbleached pulp production line.

Option No.3

It envisages unbleached sulphate pulp production with recycling water consumption and full termination of industrial waste water discharge into Lake Baikal.

The enterprise will include the following production lines:

- unbleached sulphate pulp;
- wrapping paper;
- raw tall oil;
- raw turpentine;
- wall paper;
- stationery goods;
- spare parts.

Advantages:

- the lowest cost;
- short-term conversion period;
- the lowest number of operational staff (3184 persons)
- total recycling water consumption system.

Drawbacks:

- quality of product falling due to the changeover to unbleached pulp production;
- consumer goods production from purchased raw materials.

Option No.4

The fourth option is designed to create an ecological and economic opportunity by organizing paper production using part of the existing equipment of paper machinery and drying plant. Instead of refined mass production from spruce it is envisaged that wood mass gets produced from lower value aspen wood by a chemicothermic method.

Advantages:

- organizing paper production with Russian made equipment;
- using part of existing equipment of paper plant and drying plant;
- providing part of paper output with in-plant produced input;
- decreasing deliveries of scarce raw material in comparison with option No 1.

Drawbacks:

- huge number of operational staff - 3497 persons;
- high construction cost;
- long-term conversion period;
- impossibility of total return of treated waste waters into production process.

Option No.5

The fifth option differs from the fourth in that it envisages production of hygiene/sanitation paper on Russian made paper machines Г-83, two layer paper production at the existing paper machine Г-18 after its reconstruction.

Option No.6

The sixth option envisages conversion of the mill for soda pulp production and processing it for linear and corrugated cardboard and corrugated tare fabrication.

Advantages:

- low construction cost;
- short term conversion period;
- the lowest number of operational staff - 3101 persons;
- recycling water consumption;
- short payback period of investments.

APPENDIX NO. 4

**Russian Academy of Science:
*Ecological situation and environmental protection problems in
Irkutsk Region;
Conception of a transition to the model of sustainable develop-
ment.***

1995

(extracts from chapters I, III and V)

I. Preamble.

By sharing the main ideas and principles of the documents adopted at the UN conference on environment and development in Rio de Janeiro the Russian Federation considered it to be necessary and possible to realize transition to a sustainable development model at long-term perspective. This would provide balanced solutions of socioeconomic development and save favourable environmental conditions potential of natural resources

1.1 Transition to sustainable development.

Prolonged development of the country in terms of structural contradictions led to a deep crisis in Russia. Moreover, following the crisis process of production recession, a decreasing consumption level, infrastructure degradation and areas of ecological calamity, impel cardinal new solutions to be found for creating a basis of socioeconomic development, based on the sustainability principles.

The concept of sustainable development arose as a result of mankind's awareness of the potential of natural resources, evidently becoming too scanty to support economic growth and allow an increasing consumption level for a constantly growing population. This turns out to be in utter concurrence with Russian tradition, spirit and mentality. The works of Vernadskiy about the inescapable formation of a "mindsphere" on earth, and the thoughts of Tsyolkovskiy about the earth as mankind's cradle, anticipated the necessity of global development, allowing for satisfaction of society's needs, without detriment to the interest of future generations. Coordination of sustainable development ideas with traditions and spirit of the Russian people creates favourable conditions for realization in Russia.

1.2 Main principles of transition to sustainable development.

Sustainable development should meet definite social, economic and ecological demands. The most general of these, laid down in Rio documents (Rio Declaration and Agenda for XXI century) are the following: struggle against poverty; changing consumption structure; population growth control; care for human health situation; assistance for sustainable development of regions;

international cooperation regarding environmental protection; taking into consideration ecological demands while taking socioeconomic decisions.

Ecological aspect of sustainable development involves a wide range of measures, directed at environmental protection and rational usage of natural resources; atmosphere protection; rational usage of land resources; forest protection; struggle against desertification and drought; biological diversity protection; ecologically safe usage of biotechnology; increasing safety of toxic chemical substances usage; solving the problem of wastes.

Realization of the above-mentioned demands should provide a dynamic balance in development, allowing contradictions between the needs of society bearing on natural resources and the possibility of their satisfaction while saving the natural recourse potential to be eliminated. Criteria to optimize the proportions mentioned will depend on the chosen conceptual scheme of sustainable development.

In case the conceptual scheme is based on principles of economic activities, sustainable development will mean an increase in national property share and will consequently transform into an economical growth model. If the conceptual scheme is developed from the point of view of the biosphere and saving local ecosystems, then national property growth will involve limitations, anticipating optimum demands formation for future generations.

And last, if the conceptual scheme originates from problems of the "mindsphere" formation, then the focus will be on the quality of life of the working people and their spiritual values. This idea is the one chosen by Russia for constructing the sustainable development model.

The Russian Federation's conception on the model of sustainable development should proceed from realization of interconnected basic ideas:

- ecologization of economic activities in the process of increasing national wealth, providing support for necessary economic growth of the country and for solving the most acute social problems;
- saving and recovery of biosphere and its local ecosystems with limiting growth of elements of national property, and reinforcement of orientation on reasonable demands of future generations, taking into account the conditions of the natural recourse potential;
- mindsphere formation at the basis of the two previous conceptual schemes of development and providing national wealth growth mainly on account of increasing working people's qualifications and growth of spiritual values.

Such principles should be translated into realistic goal-oriented plans of action.

III. The main requirements for the Russian model of sustainable development.

General requirements for the model of sustainable development concur with socioeconomic and ecological priorities of national development in medium-term and long-term perspective. In spite of its ecological orientation sustainable development as a whole is more a social than an economic issue.

In accordance with the model of sustainable development such goals as achievement of sustainable economic growth, saving nature complexes, elimination of social injustice are mutually complementary for society, and they are priorities that can be changed in different periods. This is determined by the fact that sustainable development is a dynamic notion, and at every stage this notion can be modified considerably.

Fixing the general notion about sustainable development can be done only at conceptual level. The transition process itself, in some sense, will be permanent and should be realized by continuous transition from one version of the model to the other. The societal development according to every version will be the process of sustainable development, meeting the demands of the current period and generate possibilities for development in the future.

The main requirements for the model of sustainable development in Russia for the direct future are: reanimation of economic development, attaching new qualities to it, providing safeguards for natural resources potential, satisfaction of basic needs for employment, food, pure water and energy. To realize these demands, integration and harmonization of economic, social and ecological aspects of the decision process at all levels are necessary. For the nearest perspective the main goal of transition execution should be the completion of socioeconomic restructuring, and the most important means of achieving this should be structural perestroika.

Goal reference points should be expressed in indices, characterizing quality of life, level of economic development and ecological wellbeing. It is necessary to devise reliable and effective indices, which could make objective characterization of the mentioned processes dynamical. In spite of its complex (systematic) character, these indices should be simple enough and comparable with the indices used by the international community.

V. Stages of Russian transition to the model of sustainable development.

Within the bounds of present thinking on the conception of the model of sustainable development, the transition can be realized in three stages:

The first stage: 1996 - 2000:

During this period the first key tasks regarding transition to the model of sustainable development should be solved. These include overcoming the present crisis situation, creating legislative basis for ecological production and for other spheres of activities.

Second stage: 2000 - 2016:

A number of elements of sustainable development will be realized within the bounds of ecologization of socioeconomic process development in Russia. This will allow the realization of a normative level of environmental condition.

The third stage: 2016 - middle of XXI century:

During this period the problem of harmonization of the southern development economies and the biosphere on the planet Earth is to be solved.