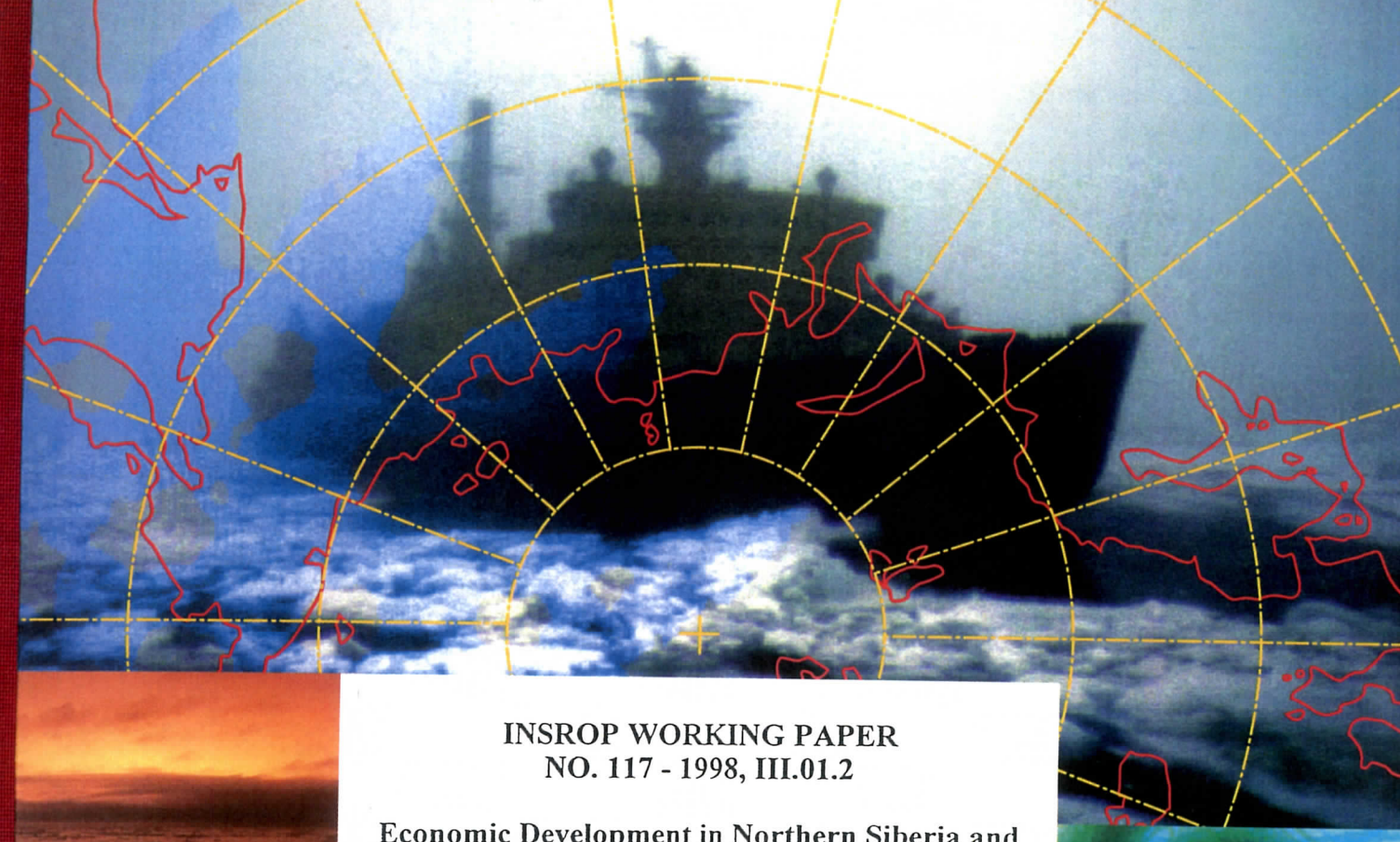
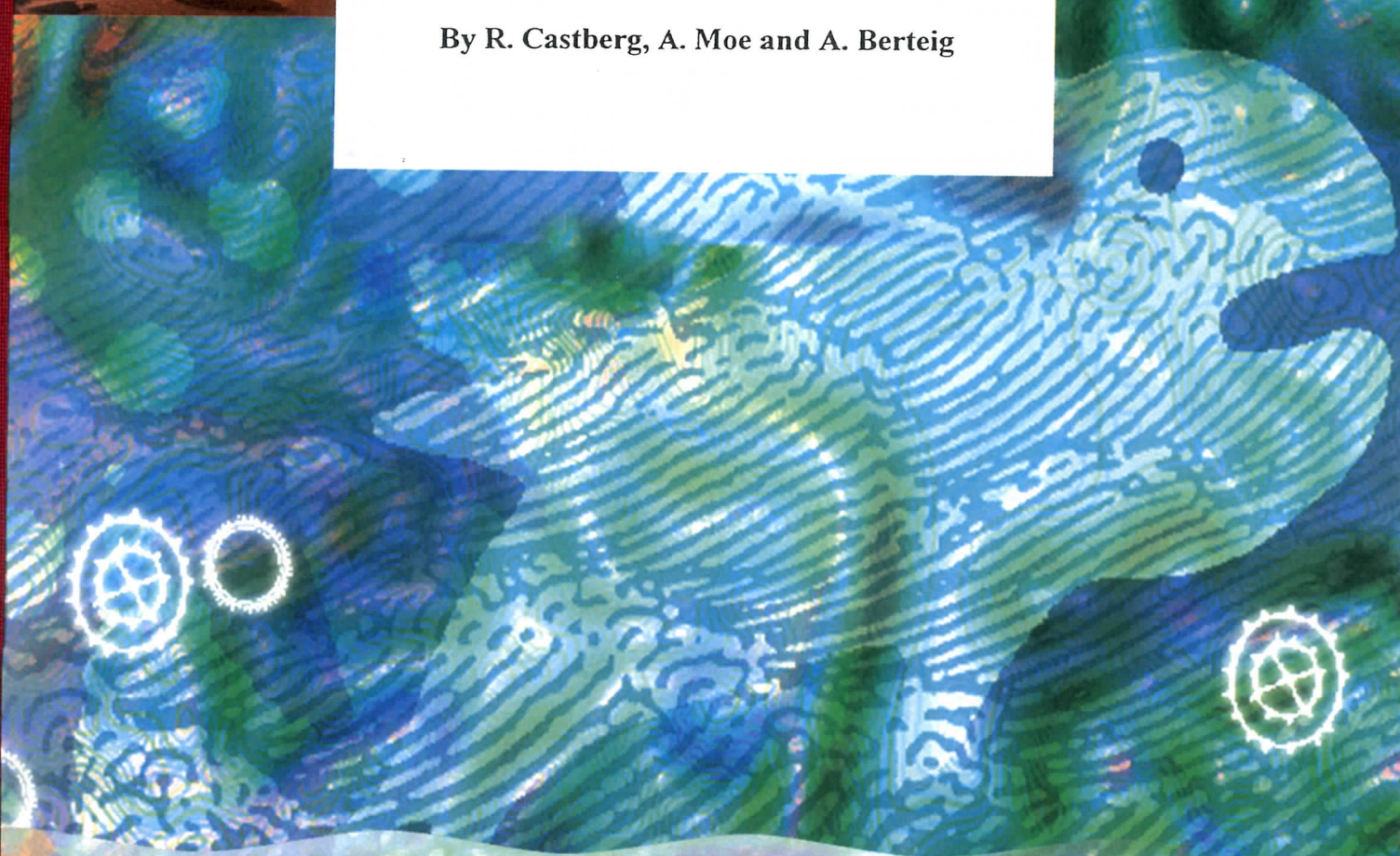


INSROP WORKING PAPER
NO. 117 - 1998, III.01.2

Economic Development in Northern Siberia and the Russian Far East: Implications for the Northern Sea Route

By R. Castberg, A. Moe and A. Berteig



INSROP International Northern Sea Route Programme

Central Marine Research & Design Institute, Russia

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International Northern Sea Route Programme (INSROP)

Central Marine Research & Design Institute, Russia

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Sub-programme III: Trade and Commercial Shipping Aspects

Project III.01.2: Economic development in Siberia and the Far East

Supervisor: Arild Moe, The Fridtjof Nansen Institute, Norway

Title: **Economic Development in Northern Siberia and the Russian Far East: Implications for the Northern Sea Route**

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What is an INSROP Working Paper and how to handle it:

FOREWORD - INSROP WORKING PAPER

INSROP is a five-year multidisciplinary and multilateral research programme, the main phase of which commenced in June 1993. The three principal cooperating partners are **Central Marine Research & Design Institute (CNIIMF)**, St. Petersburg, Russia; **Ship and Ocean Foundation (SOF)**, Tokyo, Japan; and **Fridtjof Nansen Institute (FNI)**, Lysaker, Norway. The INSROP Secretariat is shared between CNIIMF and FNI and is located at FNI.

INSROP is split into four main projects: 1) Natural Conditions and Ice Navigation; 2) Environmental Factors; 3) Trade and Commercial Shipping Aspects of the NSR; and 4) Political, Legal and Strategic Factors. The aim of INSROP is to build up a knowledge base adequate to provide a foundation for long-term planning and decision-making by state agencies as well as private companies etc., for purposes of promoting rational decisionmaking concerning the use of the Northern Sea Route for transit and regional development.

INSROP is a direct result of the normalization of the international situation and the Murmansk initiatives of the former Soviet Union in 1987, when the readiness of the USSR to open the NSR for international shipping was officially declared. The Murmansk Initiatives enabled the continuation, expansion and intensification of traditional collaboration between the states in the Arctic, including safety and efficiency of shipping. Russia, being the successor state to the USSR, supports the Murmansk Initiatives. The initiatives stimulated contact and cooperation between CNIIMF and FNI in 1988 and resulted in a pilot study of the NSR in 1991. In 1992 SOF entered INSROP as a third partner on an equal basis with CNIIMF and FNI.

The complete series of publications may be obtained from the Fridtjof Nansen Institute.

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1. Introduction and analytical perspective

The aim of this report is to give a general overview of the economic structure and activities in Siberia and the Russian Far East which may have relevance for the Northern Sea Route and to point out developments which may influence traffic on the NSR in the coming years. It is natural to focus primarily on the economic development in the High North and the territories that are connected to and dependent on the Northern Sea Route directly or through the the northern rivers. This report is complementing studies already done under INSROP focusing on developments in the most promising areas and sectors. It will summarise conclusions from these works but also provide information on the regions not covered by other INSROP papers.

Practically all industrial activity and urban settlements in the Russian North along the Northern Sea Route were established during the Soviet period and were thus based on the needs and priorities of the centrally planned economy and the Soviet political system. With the emergence of a Russia which to a large extent is based on market principles and integration into the world economy, the viability of northern enterprises, resource extraction as well as communities is questioned. Domestic demand for raw materials, which constitutes the bulk of industrial production in the North, has fallen sharply. And, under the new conditions the real production costs have become apparent. At the same time the federal government is working under stricter budget constraints limiting the possibility of subvention. Altogether the changes have hit the northern areas in a dramatic way. However, in certain businesses and areas, like the oil and gas industry in Western Siberia, the picture is much brighter.

Central factors supporting economic development are available infrastructure and transport systems. Dependence on the Northern Sea Route and connected water ways - with a limited period of navigation - undoubtedly represents a serious economic disadvantage for large parts of Northern Siberia and the Far East. Other factors are demand and price structures in internal and external markets, conditions for foreign economic co-operation, perceived national and regional interests in the High North, demographic development etc.

The significance of transport costs in the Russian economy has changed dramatically compared with the Soviet system, in which transportation costs were a secondary concern. Now transportation costs are hitting hard on traditional material production, trade and material supplies. In many sectors there was a distinct geographic division of labour between parts of the country thousands of kilometres apart. The strategic needs of the Soviet Union were then the main concern, economic efficiency was not.

The limited scope of the present study does not permit a thorough discussion and analysis of such factors. Here we only point out two important underlying questions for the empirical analysis in this study: Which economic activities in the North seem to be self-sustaining under the new political and economic conditions? What level of activities are central and regional authorities likely to subsidise on a long term basis? What are the implications for the transport system?

The following regions from the Urals in the west to Chukotka in the east[1] have coastlines along the Northern Sea Route, or are to a large extent dependent on waterways leading to the Arctic coast: Yamal-Nenets autonomous okrug in Tyumen oblast, Taymyr and Evenk autonomous okrugs in Krasnoyarsk kray, Sakha Republic (Yakutiya), Magadan oblast and Chukotka autonomous okrug. These administrative units constitute 39 per cent of the territory of the Russian Federation, while their share of the population is only 1.3 per cent. The administrative units mentioned above belong to the three economic zones Western Siberia (Tyumen), Eastern Siberia (Krasnoyarsk) and the Far East (the rest). In this report we study the Far East more closely than the two other zones, which have been treated in some detail in other INSROP reports.

In this study the focus is on *primary economic activities*[2] along the sea route, mainly industrial production connected with extraction of natural resources, i.e. the backbone enterprises of settlements and regions. Other economic and human activities are - to a large extent - directly or indirectly dependent on a limited number of such core activities, be it construction, transportation and communication, food processing, trade, services or local administration. This is a traditional - and much criticised - approach in economic studies and tends to overestimate the importance of heavy industry and natural resources extraction. However, under the harsh and remote conditions of the Russian High North this approach is still appropriate. It is not least fitting after the fall of the centralised plan economy, in which such direct dependencies were less discernible, because of the radical redistributional character of the Soviet political economy.

The criteria for establishing and maintaining economic activities in the Soviet High North were - in the last instance - based on the national interests, as perceived by the political leadership in Moscow. With the disappearance of the Soviet Union and the CPSU, the

1 Formally the sea route stretches from Novaya Zemlya to the Bering Strait, but its functional ends are Murmansk/Arkhangelsk on the one side and Vladivostok and other harbours in the Russian Far East on the other.

2 In this context "primary" is not limited to agriculture, forestry or fisheries, but concerns the core economic activity in regions and local communities.

constellation of national interests have changed profoundly. But a new, stable interest structure is still not in place.

Sources and methods

When describing Siberia and the Far East in aggregate economic terms, available statistical data do not allow for detailed quantitative analysis of the federation subjects. The general analysis will therefore focus primarily on economic zones, which are very large categories including much more than what is the primary focus here. However, since one purpose of this report is also to provide a picture of overall economic development in Siberia in the Far East, this is justifiable. The change and chaos in the Russian society has led to decreased discipline in statistical reporting, understatement of production and turnover numbers for tax reasons, and a significant unregistered black economy. In Soviet statistics there was a tendency to overstate production levels. As a general rule one may say that the more concrete the data, the more reliable it will be, but also that the problem is smaller when looking at tendencies, like we do here, than at absolute numbers.

The description of the developments in particular areas and regions deals more with specific cases, i.e. a less systematic and more qualitative approach. Most of the secondary literature on economic development in these areas deals with the resource base. In our approach we have wanted to identify more concrete commercial development plans, in addition to referring to the 'resource-oriented' literature. Since we are not in a position ourselves to evaluate commercial possibilities in these vast areas to any significant extent, our analysis rests on the assumption that plans and ideas for such development will leak out into the public domain. This is certainly not to say that any information about such plans should be taken seriously. We would expect there to be many unfounded and overly optimistic projects on the drawing board. In other words, 'positive' finds cannot be used to confirm a hypothesis saying that commercial developments can be expected, without a more thorough discussion of each project. However, if there is no information about commercial plans in a given area, we will interpret this as a quite strong indication that there are no such plans at the moment. The sources checked for information include searches on the key geographic areas on the Internet, as well as Financial Times' Profile Database, which covers a large number of general and business oriented newspapers and periodicals.

2. Natural Conditions, Population and Economic Structure

The Russian Federation is leaning to a significant extent on the north. Depending on definition, between 60 per cent and 70 per cent of Russia's territory is in the north, while less than 10 per cent of the population live in these areas. In the Russian economy the north carries much weight when it comes to raw materials production, such as fish, timber, oil and gas, diamonds and gold, and several other mineral resources. The north also contains vast expanses of more or less untouched nature, the economic value of which may grow in the future.

2.1 Geographic and Natural Characteristics

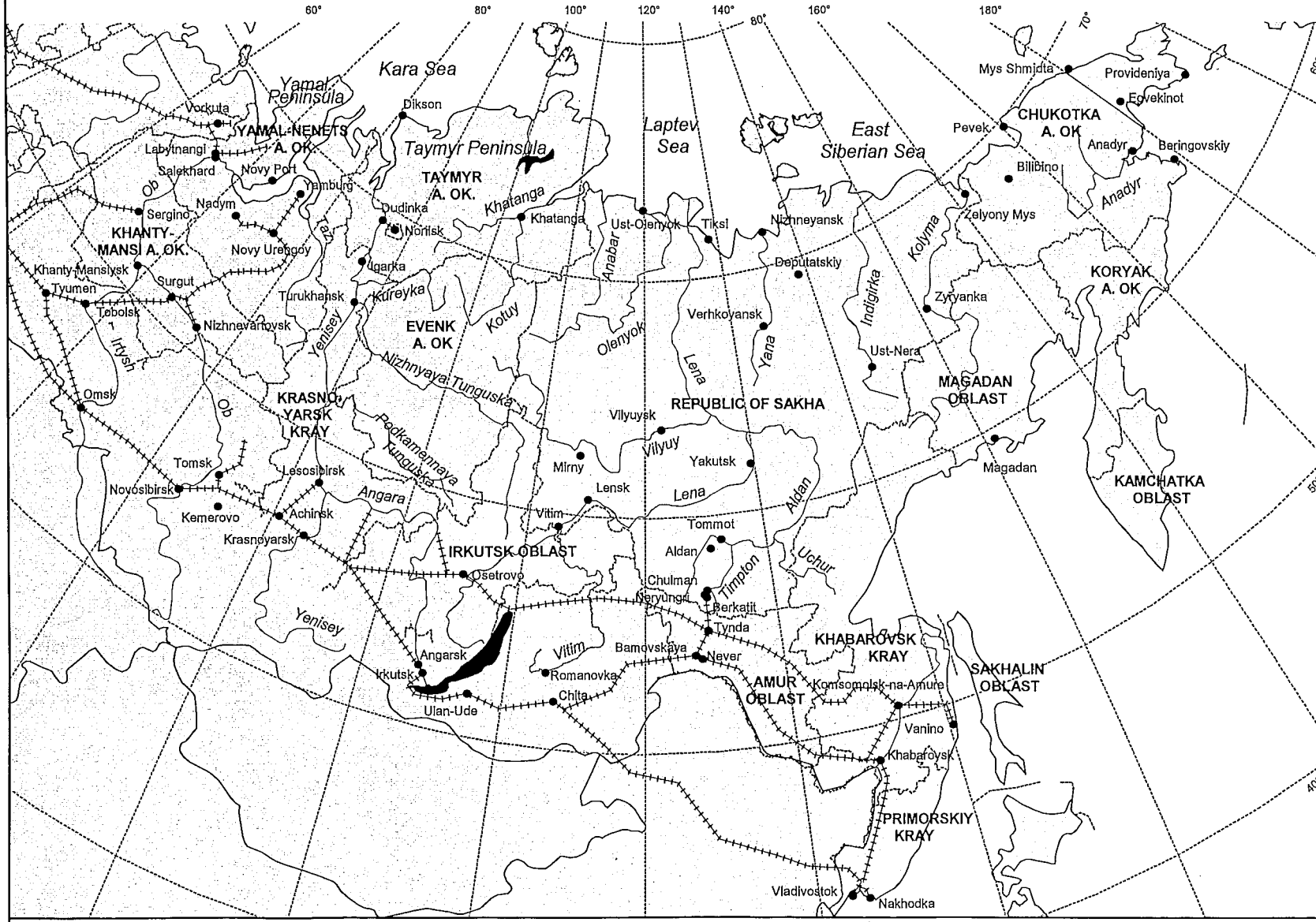
The Northern Sea Route (NSR) and its natural Russian waterway connections run mainly through the *High North and areas, which have* [administrative] *status equal to the High North.* The High North is defined as "territory situated mainly to the North of the Polar Circle (66° 33'). It includes zones of arctic desert, tundra, forest tundra and part of the taiga"[3]. The High North is characterised by harsh climatic conditions and sparse population.

The same is true for the "territories with status equal to the High North" situated South of the Polar Circle. A few administrative units (subjects) of the Russian Federation are situated almost exclusively within the High North zone: Murmansk oblast, Nenets autonomous okrug (a. ok.), Yamal-Nenets a. ok., Taymyr a. ok., Sakha Republic, Chukotka a. ok., Kamchatka oblast, Magadan oblast. The following subjects of the Federation now fall under the "equal status" category: Komi Republic, Arkhangelsk oblast, Sakhalin oblast, Khanty-Mansiysk a. ok., Evenk a. ok. The same is the case for a substantial number of districts and towns in Karelia Republic, Perm oblast, Altay Republic, Tomsk oblast, Tyumen oblast, Buryatia Republic, Krasnoyarsk kray, Irkutsk oblast, Chita oblast, Primorskiy kray, Khabarovsk kray, Amur oblast.[4]

3 *Geograficheskiy entsiklopedicheskiy slovar'*, Sovetskaya Entsiklopedia, Moscow, 1989.

4 *Rayony Kraynego Severa i mestnosti, priravnennye k rayonam Kraynego Severa v 1992 godu.* Statisticheskiy sbornik, Goskomstat Rossii, Moscow, 1993, 201.

Siberia and the Russian Far East



Legend

- Cities and settlements
- Regional borders
- Main railroads
- Rivers
- Lakes

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2.2 Population and Settlement

The profound political and economic restructuring which has taken place in Soviet and Russian society coincides with a sharp fall in fertility and growing mortality rates.[5] The population of the Russian Federation is now declining. From 1.1.1992 to 1.1.1997 it was down about 1.19 mill. people, or 0.8 percent[6]. This downward trend commenced in spite of a significant net influx of immigrants over the same period of time, altogether 2.26 mill people. Demographers expect this negative trend to continue well into the next century, and Russia's population might well fall to 135 million and less by year 2010.[7]

It is evident that also patterns of migration and settlement in Russia are changing. On the local and regional levels the demographic effects of *perestroyka* and reform are often far more dramatic than for Russia as a whole. This is especially true for the geographically and infra-structurally "marginal" parts of the Federation, the Far East and the High North. In the Soviet era many such areas experienced the steepest population growth in relative terms. Now, these areas are experiencing some of the most dramatic demographic shifts in post-Soviet Russia. But the picture varies from region to region and from settlement to settlement.

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5 The reduced life expectancy of Russian men is one of the most dramatic changes. According to official statistics it went down from 64,8 years in 1988 to 57,3 years in 1994. The corresponding figures for women are 74,4 and 71,1. (*Narkhoz RSFSR* ,1991:107, and *Rossiya v tsifrakh*, 1995:41). According to the most recent statistical yearbook life expectancy increased again in 1996 to 60 and 72 years respectively. *Rossiyskiy statisticheskiy ezhegodnik 1997*, Moscow: Goskomstat, 1997, p. 86.

6 Population data in this paper are from Soviet and Russian statistical yearbooks, *Narodnoye Khozyaysto SSSR* and *Rossiyskiy statisticheskiy ezhegodnik*, as well as the special population statistics *Chislennost naseleniya Rossiyskoy Federatsii 1997*, Moscow: Goskomstat, 1997, where not otherwise indicated.

7 Murray Feshbach, personal communication, Oslo, January, 1996.

Table 1: Population in Siberia and the Far East 1970-1997 (thousands)

	1970	1979	1989	1991	1992	1993	1994	1995	1996	1997
Western Siberia	12 109	12958	15003	15158	15167	15163	15138	15139	15128	15098
Eastern Siberia	7463	8157	9155	9243	9260	9242	9200	9166	9144	9144
Far East	5780	6819	7941	8057	8032	7900	7788	7625	7505	7421
Russia	130079	137551	147400	148543	148704	148673	148366	148306	147976	147502

Source: *Rossiyskiy statisticheskiy ezhegodnik*, 1994 and 1997.

Over a 20 year period (1973-1992) the population of the three vast economic regions east of the Urals, grew 25 per cent, from 26 to 32.5 million. At the same time the population growth of the whole of Russia (RSFSR) was less than half of this, 12 per cent. The number of inhabitants in the Far East increased by as much as 30 per cent, while Western and Eastern Siberia had growth rates of 24 per cent and 21 per cent respectively.

Over the last years the relative population decline in the Far East exceeds the reduction for the Federation as a whole. The number of inhabitants in the Russian Far East was down 611.000 - or 7.6 per cent - from 1992 to 1997. The decline in Eastern and Western Siberia was significantly less: Western Siberia showed a smaller relative decline than the Federation (0,45 per cent compared to 0,8 per cent), while Eastern Siberia's population declined 1.58 per cent. The more dramatic changes are to be found in specific provinces and settlements, especially in the North. Of all the federation subjects Chukotka autonomous okrug is worst affected. The population declined by 40 per cent from 154,000 to 92,000 in the years 1992-97.

The reduction in population in these areas is not necessarily caused solely by a drastic increase in out-migration. The Russian north has in modern times been characterised by a significant turnover in population., i.e. people have been moving in to work and earn good wages for some years and then move out again to regions with a more hospitable climate. What has been happening in the 1990s is that these regions are not attracting new immigrants at the same time as out-migration is as high or higher than before. The net result is of course a dramatic reduction in population. These developments are also reflected in fertility and mortality data. Whereas the Far East used to be characterised by a high proportion of births over deaths, 15.5 : 8.2 as late as 1990, this relationship had been inverted by 1996, to 9.7 : 12.1.[8] In addition to a general decline in fertility this reflects decreased in-migration of young fertile couples.

8 *Rossiyskiy statisticheskiy ezhegodnik 1997*, Moscow: Goskomstat, 1997, p. 602.

2.3 The Economy: Industrial Production[9]

Siberia and the Far East have a dominating position in extraction of natural resources. The share exceeds 3/4 of total Russian production (in value terms), while the corresponding share of industrial processing and manufacturing amounts to less than 1/4. In two industrial branches Siberia/Far East stands for more than half of the Federation's production, namely in *nonferro* and *fuel.*). The fuel industry of Siberia and the Far East generated about 10 per cent of Russia's total industrial production in 1992, while their nonferro industries constituted 5 per cent, machine building - 2.5 per cent, food and power industries - 2 per cent.

The Siberia/Far East share of Russian industrial production is higher than the share of the population. While 21 per cent of the population live in the Asian parts of Russia, these areas stand for as much as 28 per cent of the country's total industrial output. Among the three economic zones of Russian Asia, oil and gas rich Western Siberia has the highest industrial production *per capita* with 10 per cent of the Russian population generating 14 per cent of industrial output, i.e. a per capita industrial production of 1.6 of the Russian average.

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9 According to Soviet and Russian terminology forestry, commercial fishing, extraction of mineral resources etc. are parts of 'industrial production'.

2.3.1 Industrial Structure

Table 2: Industrial Branch Structure in Western Siberia, Eastern Siberia, and the Russian Far East 1996 in Percent of Each Region's Economy.

	Western Siberia	Eastern Siberia	Far East	Russia
Power	12.1	16.0	23.2	15.1
Fuel industry	52.6	17.6	11.6	17.4
Ferro	6.4	1.5	0.5	8.3
Nonferro	0.9	28.0	18.2	5.3
Chemical and petrochemical	4.9	4.5	0.9	7.1
Machine building	8.8	7.6	10.1	19.0
Forest, paper, pulp	1.4	9.0	4.6	4.0
Food industry	6.3	7.3	22.9	12.4
Other	6.6	8.5	8	11.4
Total	100.0	100.0	100.0	100.0

Source: *Rossiyskiy statisticheskiy ezhegodnik*, 1994 and 1997

Extraction of natural resources dominates the industries of Siberia and the Far East. Manufacturing of finished goods, especially consumer goods, is weakly developed. The exception used to be the defence industry, which is relatively well represented in the southern, more densely populated parts of the three economic regions. But since 1992 many old defence plants have fallen on hard times.

Each of the economic regions has one or two dominating branches, which primarily are based on natural resources extraction. In Western Siberia the *fuel* sector (oil, gas and coal) stood for as much as 52.6 per cent of industrial output value in 1996. The same year the *nonferro* branch (nickel, copper, aluminium and other metals) had a 28 per cent share of turnover in Eastern Siberia, while the most prominent sectors in the Far East were the *nonferro* (18.2 per cent) and *food* (22.9 per cent) industries. The first is dominated by diamond and gold extraction (Sakha, Magadan, Chukotka), but includes a wide range of other nonferro metals

and minerals. The fishing fleets and fish processing enterprises on the Pacific Coast generate the bulk of the turnover of the food industry in the Far East[10].

As table 2 shows, in Western and Eastern Siberia *power generation* has about the same share of industrial output as in the federal total (15.1 per cent), while this sector has a 23.2 per cent share in the Far East. In Siberia the share of *light* industry is about half of the federal level. In the Far East industrial structure light industry was only half of that again. In *machine building* all three score less than half the overall federal share, which was 19.0 per cent in 1996. Also *chemical* industry has a smaller share in Siberia and the Far East than in Russia as a whole.

The *forest* industry (including paper and pulp) is especially well represented in Eastern Siberia, with a share of 9.0 per cent of industrial production. That is about twice the level of the country as a whole. For many years the Irkutsk oblast has been Russia's number one timber producer, with Krasnoyarsk kray coming second or third. The combined timber production of Western Siberia and the Far East did in fact fall behind the large volumes of Eastern Siberia, which reached 64 million m^3 towards the end of the 1980's and equalled 22.5 per cent of the total Russian output.[11]

2.3.2 Economic Structural Change

A central feature of the Soviet economy was the dominating role played by heavy industry: natural resources extraction and processing, power generation, manufacturing of means of production, weapons etc. Production of consumer goods was disproportionately less developed. One might have expected that the market reforms would lead to adjustments of this imbalance. But the opposite has, to a large extent, happened. The economic depression since 1990 has affected manufacturers of finished goods harder than it has heavy industry. This does not only concern branches like the machine building and building materials industries, but the producers of consumer goods as well. (Light industry in particular.) Russian finished goods turned out to be inferior in open competition with imported products. At the same time there was a sharp fall in domestic demand for raw materials and semi-finished goods, but these producers managed, to a certain extent, to compensate the loss by increasing exports. They do not encounter the same quality problems in international markets as producers of finished goods do.

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[10] In Soviet and Russian statistics fishing is considered an industrial activity, belonging to the food industry. Similarly, logging is grouped together with *wood processing* and *pulp and paper* production in the forest or forest-chemical sector.

[11] *Narkhoz RSFSR v 1989 g.*

Although foreign trade turnover has decreased in absolute numbers since 1990, its relative share of the national income (produced and consumed) has increased. Exports to and imports from 'the far abroad' compensated for many of the severed trade relations between former Soviet republics.

The opening up of the Russian economy to international markets has put an effective end to the traditional Soviet price structure, which placed exceptionally low value on raw materials, while labour and science intensive production was given relatively high value. The poor competitiveness of Russian finished goods and the international demand for raw materials and semi-finished products have accelerated this development. Domestic prices for some central raw materials have now reached the world market level and, in some cases are even higher. For example, in June and September 1995, aluminium and zinc were sold at higher prices domestically than in the export markets.[12]

These trends have in fact augmented the traditional imbalance of the Russian industrial structure. The relative weight of the raw material producing branches seems to have increased, not least in value terms. But although the bulk of industrial activity in Siberia and the Far East belongs to these more competitive branches, this by no means guarantees the safe performance of individual enterprises, especially when many of them must be considered "marginal".

Marginality may stem from a wide range of factors. As for Siberia and the Far East *marginality* is primarily caused by the enormous distances, lack of infrastructure and extreme climatic conditions. This leads to logistic and transportation problems, inadequate access to qualified labour, technology, information and financing, higher input costs and operational costs. This in turn means high risks and low profits. In a difficult economic situation this results in scaling down of activities, and in many cases bankruptcies and closures.

It is important to distinguish between production problems and structural change which are effects of the profound systemic transformation of Russian politics and economy - and the changes caused by temporary problems of learning and adaptation. However, the way a society tackles such transitional problems may undoubtedly have long-term effects on political and economic performance and structure in different spheres.

The general impression is that the economic changes taking place in Russia have made the northern areas more vulnerable. And at the same time as the new economic system has

12 *Sotsial'no-ekonomicheskoye polozheniye Rossii.* Yanvar'-sentyabr' 1995 g., no. 9, Goskomstat Rossii, Moscow, 1995.

exposed the weak economic basis for many settlements and activities in the north, the state finances have deteriorated to an extent which does not permit subsidies at the level needed to sustain population and activities. As reported by Granberg[13] there are several state programs intended to alleviate the situation. But they are not carried out due to lack of finance. Another indication of this is the reduced state financing of supplies to the northern areas - *Severny Zavoz*. Reportedly, it was reduced from the equivalent of approximately 960 mill USD in 1995 to 440 mill. in 1998.[14] Consequently, an evaluation of future developments in these areas must primarily rest on an assessment of the commercial potential.

2.4 Regional Overview of Industrial Production

2.4.1 Western Siberia

Western Siberia is one of the 3 vast Russian economic regions east of the Urals. It consists of 9 federation subjects: 5 oblasts (Tyumen, Novosibirsk, Kemerovo, Omsk, Tomsk) 1 kray (Altay kray) and 1 republic (Altay republic). There are two autonomous areas or districts - *okrug* - which are formally part[15] of Tyumen oblast, Yamal-Nenets and Khanty-Mansiysk. The economic region covers 2.4 million km^2, 14.2 per cent of the territory of the Russian Federation. In the beginning of 1997 it had 15.1 million inhabitants, 10.3 per cent of the total population in the Russian Federation.

The relevant part of Western Siberia in connection with the NSR is Tyumen oblast. It covers almost 60 per cent of Western Siberia's territory, but it has only 20.7 per cent of the population (3.1 million). Most of the Tyumen oblast territory lies within the two northern autonomous okrugs, Yamal-Nenets and Khanty-Mansiysk. However, as much as 43 per cent of the population is concentrated in its southernmost corner, which is not part of the two autonomous okrugs and which constitutes merely 12 per cent of the territory.

Still, compared with other parts of the Siberian Arctic the northern parts of Tyumen oblast are relatively densely populated: 0.6 and 2.5 persons pr. km^2 in Yamal-Nenets and Khanty-Mansiysk autonomous, vs. Komi: 2.95, Sakha: 0.34, and Chukotka: 0.15

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13 A. Granberg: INSROP Working Paper 74-1997.III.02.3: *Selected Studies in Regional Economic Development along the Northern Sea Route.*

14 Calculated from Andrey Krivorotov: 'Krayniy Sever v torosakh rynka' *Neft i Kapital,* 2, 1998

15 In real terms these two districts have over the last years gained almost full independence from Tyumen, leaving the oblast administration with control only over the southern part of the oblast.

The southern parts of Tyumen oblast are linked to the sea by the Ob and Irtysh rivers, and heavy machinery produced in e.g. Tyumen city has been shipped down the rivers by barge for export beyond the region. Typically, however Ob serves internal purposes, i.e. cargo is transferred from the railway to the river for shipment to the northern part of the oblast. The southern parts themselves are well served by the railway and roads.

The economy of the oblast is dominated by the oil and gas industries, with Khanty-Mansiysk standing for 55 per cent of Russia's oil production and Yamal-Nenets supplying 92 per cent of Russia's natural gas.

The main portion of oil reserves in the oblast are within reach of the integrated oil pipeline network. However, as discussed in INSROP working paper 56,[16] there are significant volumes that are beyond the reach of existing pipelines and which probably would be more profitable to exploit in connection with transportation along the sea route. A full scale integrated development of resources in this part of Tyumen together with the northern parts of Krasnoyarsk kray could yield more than 100 million tons of oil annually. Such a development would depend on a large number of conditions. But even a smaller scale development consisting of several unconnected projects could produce extensive traffic on the NSR. The same goes for condensate. [17] In sum the northern part of Tyumen - Yamal-Nenets autonomous okrug - forms one of the most promising regions for traffic along the Northern Sea Route.

2.4.2 Eastern Siberia

Eastern Siberia covers 4.1 mill km2. with a population of only 9,1 million (1997). It is composed of 10 federation subjects: The republic of Buryatiya, the Tyva republic, the republic of Khakaziya. Krasnoyarsk kray, Irkutsk oblast, Chita oblast, Taymyr and Evenk autonomous okrugs (within Krasnoyarsk kray), Ust-Ordynsk Buryatian autonomous okrug (within Irkutsk oblast) and Agin-Buryatian autonomous okrug (within Chita oblast). The population is concentrated in the southern part, along the Transsiberian railroad and the north south connection from Tayshet to Abakan. In the northern parts of the region, constituted by Evenk

16 INSROP Working Paper 56-1996 III.07.3: *West Siberian Oil and the Northern Sea Route: Current situation and Future Potential.* By V. Kryukov, A. Moe & V. Shmat.

17 See INSROP Working Paper 102 -1998 III.07.7: *Analysis and Evaluation of Economic Conditions of Energy Prospects Implementation of the Yamalo-Nenets autonomous okrug.* By V. Kryukov, A. Tokarev and V. Shmat.

and Taymyr autonomous okrugs, the population is only 65,500[18] (1997), i.e. less than five persons per 100 km2.

The economy of the region is based on raw materials: coal, hydroenergy, forest, and metals. There is a large aluminium and paper and pulp industry. Krasnoyarsk kray and Irkutsk oblast are clearly the dominating provinces in Eastern Siberia. In industrial turnover the other administrative entities are dwarfed by the two. In turnover terms Krasnoyarsk has passed Irkutsk. The industry of central Krasnoyarsk and Norilsk utilises Yenisey as a very important means of transportation, and forms the most important source of traffic on the NSR. This will be augmented by exploitation of natural resources in the north of the kray, as discussed below.

2.4.3 The Russian Far East

The 6.2 million km^2 territory of the Russian Far East constitutes more than a third of the total Russian territory. Its population is only 5 per cent of Russia's total, however. Until the early 1990s the Far East had the fastest growing population of any of the economic regions in the Russian Federation. 65 per cent of this was natural growth while the rest was a result of migration from outside the region.[19] Since then this tendency has been reversed, and the region's population dropped from 8.1 million in 1991 to 7.4 in 1997. The region consists of 10 federation subjects: the Republic of Sakha (Yakutiya), Primorskiy kray, Khabarovsk kray, Amur, Kamchatka, Magadan and Sakhalin oblasts, Chukotka autonomous okrug, the Jewish autonomous oblast and Koryak autonomous okrug (within Kamchatka oblast).

The main industrial activities are the fisheries, mineral and timber industries. Traditionally 40-45 per cent of the national catch of fish has been taken in the Far East. The region stands for about 1/3 of the federal forest reserves, but merely 9 per cent of the timber cut.[20]. In extraction and reserves of several minerals the Far East region is also in a special position: 98 per cent of the diamond extraction, 80 per cent - tin, 90 per cent - boron, 60 per cent - gold. In addition there are large unexploited deposits of a number of natural resources, *i.a.* large coal reserves.

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18 The population of Norilsk and surrrounding areas, 251, 500 (1998) is not included. That city is directly subordinate to Krasnyarsk kray, even though it is situated inside the Taymyr autonomous area.

19 *Biznes-karta Rossii, Dal'nij Vostok, Sots-ek. potentsial*, Moscow, 1993, p. 7

20 *Biznes-karta Rossii, Dal'nij Vostok, Sots-ek. potentsial*, Moscow, 1993.

3. Transport

This chapter aims at giving an overview of the existing transport system in the northern parts of Siberia and the Russian Far East. Since the focus of the report is potential activity in relation to the Northern Sea Route, the Pacific coast and island traffic, which constitutes one of the major parts of the transport system of the Russian Far East, is touched upon only briefly.

The transport systems that link the regions together from west to east are the Northern Sea Route in the north, and, most important, the Trans-Siberian railway in the south. Apart from that, each of the provinces has more or less its own separate infrastructure: Tyumen has Ob and Irtysh; Krasnoyarsk has Yenisey; Sakha has the Lena and other rivers; and Magadan and Chukotka has a system of harbours and roads. There is a very low degree of regional integration.

In the northern areas settlements and activity are generally concentrated around exploitation of natural resources or around ports. Except for the more densely populated belt in the south along the Trans-Siberian Railway, settlements are mostly isolated, scattered, and far apart. The lion's share of the territory of Siberia and the Russian Far East has no permanent connection to federal rail or road networks. The bulk of railways and roads are concentrated in a relatively thin zone along Russia's southern border.

A typical transport pattern is "export" of mineral resources from Siberia and the Far East to European Russia, and "import" of fuel, machinery, and consumer goods in the opposite direction. Freight from European Russia generally comes in by one of the following routes: By rail to Murmansk, then transferred to ship and transported along the Northern Sea Route to a Siberian or Far Eastern port, reloaded to a river vessel and brought to its final destination, or still further by truck. The alternative is by the Trans-Siberian Railway to Tyumen and on to a tributary to Ob, to Krasnoyarsk (on Yenisey) or further along the Baykal-Amur Railway to Osetrovo (on Lena) for transshipment to river vessels.[21]

Transport in the High North is expensive. Because of the enormous distances and low population, investments in infrastructure become very high in relation to the relatively limited volumes transported. Secondly, due to lack of infrastructure, several transshipments are required. Average number of transshipments in Siberia is eight (national average - three

21 INSROP WP 58-1996 IV.2.3 *Regional Cooperation in Northeast Asia: new opportunities for the Russian Arctic?* By H. Simonsen, p. 31.

transshipments).[22] Extreme climatic conditions with flood, drought, ice etc. often cause breaks in the transport regime, calling for more expensive solutions like air transportation. Freight volumes in Russia have decreased steeply over the past years as a result of the economic transformation and the general reduction in industrial production. This tendency is severely felt in Siberia and the Far East.

As Table 3 shows, the density of railways and roads in the northern provinces is low, among the lowest in Russia. Although the figures are from 1980-1991 they should still give a fairly correct picture of the situation today since in general construction of infrastructure has been limited since 1991. A certain increase in road density from 1991 to 1996 is observed on the regional level, though. Road density (km per 1000 km²) in Western Siberia: 16 (1991) - 20 (1996), in Eastern Siberia: 9,0 (1991) - 10,5 (1996) ,and in the Russian Far East: 4,1 (1991) - 5,1 (1996).[23]

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22 North Robert: *The Far Eastern Transport System.* in: Rodgers (ed): *The Soviet Far East.Geographical Perspectives on Development.* London and New York: Routledge, 1990, p. 192.

23 *Rossiysky Statistichesky Ezhegodnik 1997*, Moscow: Goskomstat Rossii, 1997.

Table 3: Transport routes (km) in the northern parts of Siberia and Russian Far East.

Tyumen oblast	**1980**	**1985**	**1991**
public railways*	1,870	2,374	2,369
interior water ways	15,239	12,912	12,816
public surfaced roads	1,468	2,580	4,074
railways pr. 1000 m²	1.3	1.7	1.7
roads pr. 1000 m²	1.0	1.8	2.8
Krasnoyarsk kray[24]			
public railways	2,657	2,702	2,714
interior water ways	12,601	11,241	8,331
public surfaced roads	12,054	11,430	9,219
railways pr. 1000 m²	1.1	1.1	1.1
roads pr. 1000 m²	5.0	4.8	3.9
Republic of Sakha			
public railways	-	124	165
interior water ways	16,341	14,267	13,501
public surfaced roads	2,752	3,181	3,833
railways pr. 1000 m²	-	0.04	0.05
roads pr. 1000 m²	0.9	1.0	1.2
Magadan oblast[25]			
public railways	-	-	-
interior water ways	1,238	1,238	990
public surfaced roads	923	952	922
railways pr. 1000 m²	-	-	-
roads pr. 1000 m²	0.8	0.8	0.8
Russian Federation			
public railways pr. 1000 m²	4.8	5.0	5.1
non-public	3.9	4.2	4.3
int.water ways pr. 1000 m²	7.0	6.2	6.0
publ. srf. roads pr. 1000 m²	18.9	21.3	23.7
non-public	5.8	9.1	15.9

* Some railway lines are not owned by the Ministry of transportation and its subsidiaries and belong to industrial enterprises, even though they are serviced by regular trains.

Sources: *Biznes-karta Rossii 93 Sotsialno-ekonomicheskiy potentsial* No. 1, 2, 3, and 5, Moscow 1993;: *Narodnoe Khozyaystvo Rossiyskoy Federatsii. 1992*, Moscow : Goskomstat Rossii, 1992.

24 1991-figures take into account the separation of Khakazia from Krasnoyarsky Kray

25 Magadan oblast including Chukotka autonomous okrug.

3.1 Railways

The Trans-Siberian Railway runs to the south of the northern provinces, and almost every part of the regional transport systems feeds into or distributes from this main transport line.

Among the northern regions Western Siberia (Tyumen oblast) has the best provision of railways: one line goes from Central European Russia through the Komi Republic to the town Labytnangi close to the mouth of the river Ob. Another line comes in from Sverdlovsk oblast in the Urals and ends at Sergino on Ob's western shore. The third northern railway in the Tyumen oblast crosses Ob from the south (at Surgut) and goes all the way to the Yamburg gas field on the eastern side of Ob bay in the Yamal-Nenets autonomous okrug. The northern part of this line is owned by Gazprom. The same will probably apply to the line being built northwards from Labytnangi into the Yamal peninsula. The line is being built for the development of Bovanenko and other gas deposits on the peninsula, but construction has slowed down considerably because the phasing in of the Yamal peninsula fields has been postponed.

The vast northern expanses of Eastern Siberia, the Krasnoyarsk kray, are without connection to the federal network. The short railroad between Norilsk and Dudinka, which is serving the Norilsk Nickel Company, has no such connection. There are plans for building a line that would connect the Angara region with the northern part of the West Siberian network in Nizhnevartovsk, if such a line was connected to BAM a new alternative corridor East-West throughout Siberia would be established. However, there is no evidence that investment funds are being set a side for this project.

In Sakha (Yakutia), with a territory of more then 3 million km^2, there is only a short railroad running to the south of the Republic, connected to BAM and the Trans-Siberian railways. In the Far East provinces of Magadan, Kamchatka and Chukotka there is no railway whatsoever.

3.1.1 BAM and Vanino Harbour

The *Baykal-Amur Mainline (BAM)* is a second railway connecting central parts of the country with the Pacific coast, running east-west to the north of the old Trans-Siberian railway. It was the great Soviet propaganda project at the end of the 1970s and the beginning of the 1980s. Construction work was carried out simultaneously on several stretches and they were connected in 1985. But the project has in fact never been properly completed due to technical problems and lack of financing. Important factors behind the decision to undertake this ambitious project were undoubtedly the poor relations with China and military-strategic

considerations. Other reasons were plans for extensive development of the area's natural resources. These plans did not really come off during perestroyka times, and still less under the new market conditions.

The total length of the BAM is 3,145 kilometres, and it runs from the Lena River (in Irkutsk oblast) to Komsomolsk-na-Amure. The western half from Lena to Tynda (1,500 km), where BAM crosses the railway coming from the Sakha Republic, has two tracks, while the rest has only one. The line is not electrified, locomotives run on diesel.[26] BAM was designed for an annual cargo throughput of 35-40 million tons, but the maximum capacity under the railway's present unfinished state is not more than some 15 millions, and the actual transport volume equals 5-6 million tons. The low activity level results in low incomes to the railway and thus insufficient means for investments and maintenance.

The development of BAM was planned in conjunction with Vanino Harbour in Khabarovsk kray, which also should have a 35 million tons throughput capacity. But the existing railway connecting BAM with the Pacific coast (from Komsomolsk-na-Amure to Vanino) is in bad shape and has a capacity of only 12,5 million tons, while the present capacity at Vanino is about 11 million tons. Around 1990 the harbour was exploited at full capacity, but the cargo volume has dropped to about 6 million tons. This is primarily due to reduced deliveries to Sakhalin and other Russian destinations, while export volumes have actually been growing.[27]

3.1.2 Amur-Yakutsk Mainline (AYAM)

As indicated in the table above, by 1991 there were only 165 kilometres of railway on Sakha territory. The end point of this railway was up to 1990 the Neryungri industrial district, from which coal has been shipped by rail, *i.e.* for export over Vanino Harbour. The plan is to extend the railroad all the way to the republic's capital, Yakutsk, 500 kilometres north of Tommot. By 1993 the line had reached Aldan town, situated less than 100 km south of Tommot[28]. During 1993 construction work stopped 15 times due to lack of funding. In 1994 federal funding was missing completely, but nevertheless, work continued thanks to funding from the Sakha government.[29] In May 1994 construction of the AYAM was transferred from the Russian Ministry of Transport Construction to the Republic of Sakha. The new railway is considered to be of utmost importance to the republic, but due to low funding and

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26 *Geografichesky entsiklopedichesky slovar'*, Sovetskaya Entsiklopedia, Moscow 1989, p. 52.

27 Interview at DNIIMF, Vladivostok, October 1994.

28 Minakir 1993, p. 68

29 Interviews with republican government officials in Yaktutsk, October 1994.

construction brigades moving to more reliable projects, progress is very slow.[30] Loose estimates indicate that the line cannot be completed *before* 2005.

Seen from Yakutsk a direct railway connection is crucial under market economic conditions. Large parts of the Republic are dependent on river transportation, which puts quite tight limits on the freedom of action in most respects. However, the extension of the railway to the capital, does not remove the problem for the bulk of communities spread over the vast territory of the Republic. The railway will follow the existing road, which reportedly is open all year round. The road is thus already easing the problem of seasonality in transport and supplies. In a long perspective there are plans to build a railway all the way to Magadan.

3.2 Roads

A federal transcontinental Russian road system which functions all year round, does actually not exist. According to a 1991 USSR road atlas[31] there are white spots between Lake Baykal and the Pacific coast. This means that truck transportation is no real alternative to long distance rail or water shipments.

On average the road density in The Russian Far East and Siberia is very low. As shown in table 3, the road density in Krasnoyarsk kray of 3.9 km per. 1000 km² and Tyumen of 2.8 are not very impressive compared to 23.7 for Russia as a whole. For the Republic of Sakha and Magadan oblast[32] the figures are as low as 1.2 and 0.8.

The quality of these roads is often low, too, and because of the permafrost, many of them cannot be used during the thaw in spring and wet autumn periods. In the cold season the roads improve significantly, and winter roads on rivers, lakes and marshes are widely used.

In spite of the low road density and quality, 8 per cent of Russia's trucks work in the High North, and in 1992 they stood for 12 per cent of the total transport turnover (i.e. measured in ton/kilometre). 26 per cent of the High North truck turnover belongs to Tyumen oblast, constituting 7.1 billion tn/km, with the Sakha Republic - 3.8 billion, Irkutsk oblast - 2.7 and Krasnoyarsk - 1.7 billion tn/km.[33] Transportation by truck is often the last lap in the area's transportation chain.

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30 Athol Yates: Update Page for Siberian BAM Railway Guidebook, Update No. 1: 27 April 1997(http://www.russia-rail.com/)

31 *Atlas avtomobilnykh dorog SSSR,* pp. 83-84

32 Including Chukotka autonomous okrug, which pulls down the average considerably.

33 *O razvitii ekonomicheskikh reform v regionakh Rossiysskoy federatsii* (Yan.-Sen. 1993), p. 65.

One of the main truck routes in the Far East is the route from Never and Berkatit to Yakutsk. A second goes from the port of Magadan to upper Kolyma and Yakutsk. The *road* between Magadan and Yakutsk is still not operating on a permanent basis. East of Yakutsk, before crossing the Aldan River, there are evidently some stretches without the necessary foundation for spring and autumn conditions. The same is true for substantial parts of the road going westwards from Yakutsk to Vilyuysk, a distance of nearly 600 kilometres, and also parts of the continuation of this road, leading to the diamond mining town Mirny in the south-west of the Republic. From Mirny there is one road going southwards to the town Lensk on Lena River (about 230 km). This river port serves as a transport node for deliveries to and from the mining industry in the area. In addition there is a 700 km eastward road Yakutsk-Yugorenok, to the border with Khabarovsk kray. This road is also of low standard. Besides the roads mentioned there are some stretches in the Yakutsk area and short roads in and around the scattered settlements in the north.[34]

3.3 Aviation

There are airfields at almost every settlement in the Russian north. However, there are only a few airports which are considered to be on a federal or international level. Of a total number of 400 operating airfields in the Russian Far East only 27 had an official classification as of 1993. In addition to the province capitals' airports only Komsomolsk-na-Amure (Khabarovsk kray), Mys Shmidta (Chukotka a. ok.), Chulman and Tiksi (Sakha Republic) are used by the federal airlines. Because the natural ground is used as airstrip at most smaller settlements, operations will usually have to stop during the thaw in spring and the rainy season in autumn. Air transportation is of crucial importance for the survival of the communities in the high north. Most important is transportation of people and supply of medical services. In extreme cases planes and helicopters have been used for bringing in fuel and staple food. However, as a transportation system aviation forms no alternative or 'competiton' to NSR. The development and maintenance of air transportation in the North should rather be regarded as a prerequisite for sustaining settlements. If air transportation is unavailable economic development is unlikely to take place.

34 *Atlas avtomobil'nykh dorog SSSR.*

3.4 Waterways

Sea and river transport is of crucial importance in Siberia and the Far East. Table 3 shows that in Tyumen oblast and the Republic of Sakha the length of waterways is 3-4 times the provision of surfaced roads. Even in Krasnoyarsk kray, which is far better equipped with alternative transport ways, the length of waterways about equals the length of roads. For the remote areas of the High North river transportation is in many cases the sole means of transportation.

The main rivers, all flowing in a south-north direction, are from west to east: Ob, Yenisey, Lena, Indirka, Kolyma. But also many tributaries and some other 'independent' rivers are important waterways. Since the potential of the rivers is so tightly connected with the location of natural resources and settlements, resources, rivers and ports are presented in conjunction in the next chapter.

Table 4: Sea and River Shipment Volumes to the Russian High North, (including European Russia), (million tons)

	1987	1990	1991	1992	1993
River transport		49.0	46.1	42.6	35.0
Sea transport	-	15.5	14.9	11.1	8.0
thereof NSR	3.5	2.5			

Sources: *Razvitie ekonomicheskikh reform v regionakh Rossiyskoy Federatsii*, Goskomstat Rossii, Moscow, 1994; *Statisticheskiy Press-byulleten'*, No 6, Goskomstat Rossii, M. 1994; *Transport i svyaz' Rossiyskoy Federatsii. 1992*, Kratkiy statisticheskiy sbornik, Goskomstat Rossii, 1992.

Data on shipments presented in table 4 correspond to the impression of a drastic curtailment in economic activity in the North. According to Ivanov et. al. (1998) the total cargo traffic along the NSR was reduced by 50 per cent from 1991 to 1995.[35]

Shipments of fuel constitute between a third and a quarter of total freight volume to the Far North in Russia. In 1997 the total volume was 28.9 mill. tons (including both areas in European Russia as well as the Far East), of which 8.7 mill tons were oil products, a 25 per

35 Y. Ivanov et. al (1998) INSROP Working Paper no. 96: *Current Use of the Northern Sea Route*, p. 9.

cent reduction since 1992.[36] In table 5 shipments of oil products to the relevant northern areas are indicated.

Table 5: Shipments of oil products to the Far North 1997 (thousand tons)

Western Siberia	615
Eastern Siberia	601
Northern part of the Far East	2,190
Total	3,406

Source: Andrey Krivorotov: 'Kraynyy Sever v torosakh rynka' *Neft i Kapital,* 2, 1998.

Of the total shipped volumes some 80 per cent are by boat, of this again a quarter is sea transport - the rest on river vessels. From these data it is not possible to say exactly how large the oil product volumes coming in by NSR are, but a rough estimate indicates well below 0.5 mill tons. One source indicates a need for 10 ice-breaking tankers capable of carrying 250,000 tons of petroleum products per shipping season.[37]

There have been serious problems in financing the required deliveries of fuel as well as other products. Deliveries have been dependent on direct or indirect subsidies. In some instances shipments have been curtailed, leading to critical situations. As a whole deliveries have already been dramatically reduced. It is difficult to imagine they can be reduced much more without an accelerated reduction of the population in the northern areas.

It is quite obvious that several settlements along the Arctic coast are dependent on deliveries via the NSR, but their size does not make such deliveries a very interesting proposition seen from the point of view of shippers or suppliers. This being said, as long as deliveries are being paid they represent a market niche, and there have been reports of a certain competition among shipping companies and oil companies to handle volumes to different sections of the North. During the navigation season of 1993 and 1994 the Russian-Finnish joint venture, Arctic Shipping Service (ASS), developed ice class oil transportation along the Northern Sea Route. It started in 1993 with one ship making three deliveries from Arkhangelsk to the Yana River delta in the Sakha Republic. The next year two additional ASS vessels and four Latvian oil tankers operated on the sea route. During the sailing season they delivered 300.000 tons of

36 Data in the rest of this section are from Andrey Krivorotov: 'Krayny Sever v torosakh rynka' *Neft i Kapital,* 2, 1998, where not otherwise stated.

37 'Lukoil builds tanker in Germany', *Novecon - Reuter textline,* 3 March, 1998. Source: Russky Telegraf. (Database)

oil products.[38] One vessel made it all the way to the Kolyma River, where a shipment of diesel and gasoline was delivered. Lukoil is building its own fleet of 5 fortified tankers to serve this area through its own subsidiary *Lukoil Arktik Tanker*. This will help replace the 8-11 foreign tankers which have been used in recent years. The intention is also to use these tankers to ship out crude oil from new fields in the north.[39]

Thus as long as the Russian government is able to support the Northern areas, we will regard the present volumes as a base volume for deliveries. The question which will be raised below is whether there are prospects for substantial increase in activity in the areas served by the NSR that would require deliveries and, perhaps more important, shipments out of the area.

4. Rivers, ports and resources in Western Siberia, Eastern Siberia and the Russian Far East

The purpose of this chapter is to identify the resource potential and projects for industrial development which may be affected by or may affect usage of the NSR. The reports rely on conclusions from previous INSROP working papers for the western parts of the Siberian north. A general overview and updated information on regional economic development, rivers, ports, and cargo volumes transported along the NSR, can be found in reports by A. Granberg, Isakov et al., and Y. Ivanov et al.[40]

In general there has been reduced river and sea shipment in the Russian high north since 1990. The question now is whether this is only a temporary setback or whether there is a commercial basis - within the new economic framework - for increased traffic. The discussion below is organised around the main waterways and sea ports.

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38 *Kværner Magasinet,* 24-27,1995. The ASS vessels are registered in Russia. This means that they are permitted to land cargo at Russian military bases.

39 *Izvestiya,* 26 November, 1997.

40 INSROP Working Paper 19-1995 III.01.1*: The Significance of the NSR for Regional Development in Arctic Areas of Russia.* By A.G. Granberg.

INSROP Working Paper 74-1997: III.02.3: *Selected Studies in Regional Economic Development along the Northern Sea Route.* By A.G. Granberg.

INSROP Working Paper 87-1997, III.2.2 *Regional Port Development along the NSR.* By N. Isakov et. al

INSROP Working Paper 96-1998, IV.1. *Current Use of the Northern Sea Route.* By Y. Ivanov et. al

4.1 Western Siberia

4.1.1 Ob, Irtysh.
Ports: Labytnangi, Salekhard, Khanty-Mansiysk

The Ob-Irtysh with ports Labytnangi, Salekhard, Khanty-Mansiysk and others as well as the river fleets and transport volumes and costs as of 1994-1995 are described by T. R. Ramsland in INSROP Working Paper 44-1996.[41] He concludes that in spite of falling transport volumes, lack of capital, unemployment and other consequences of the general economic decline, the infrastructure on the rivers are in moderate to good condition. In meeting the increased transport demand following the expected development of the oil and gas sector in Western Siberia, the rivers and northern ports are competitive with the railway.

The potential for oil and gas transport from Western Siberia along the NSR are treated in several different INSROP publications[42]. There are also realistic plans for increased shipments of natural gas liquids from the Yamburg field from a terminal on the Taz peninsula. In short terms, this seems to be one of the most promising areas for extended use of the NSR.

4.2 Eastern Siberia

4.2.1 Yenisey, Angara, Podkamennaya Tunguska, Nizhnyaya Tunguska, Kureyka.
Ports: Krasnoyarsk, Lesosibirsk, Igarka, Dudinka

Port infrastructure is covered in INSROP Working Paper 44-1996 III.01.3: The Northern Sea Route and the Rivers Ob-Irtysh and Yenisey, by T. R. Ramsland. This area probably has the biggest potential with regard to utilisation of the NSR. It is treated in detail in INSROP Phase II project III.01.5 The Angara and Yenisey Region, Cargo Generating Area for the NSR. Supervisors: Trond Ramsland and Alexander Granberg. Reports forthcoming December 1998.

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41 INSROP Working Paper 44-1996 III.01.3: *The Northern Sea Route and the Rivers Ob-Irtysh and Yenisey.* By T.R. Ramsland.

42 INSROP Working Paper 56-1996 III.07.3: *West Siberian Oil and the Northern Sea Route: Current situation and Future Potential.* By V. Kryukov, A. Moe & V. Shmat.
INSROP Working Paper 22-1995 III.01.3: *Development of Oil and Gas Exports from Northern Russia.* By A. Backlund.
INSROP Working Paper 48-1996 III.07.3: *Marine Transportation of Oil from Timan Pechora and from Inland Russian Fields.* By D. Andresen & A. Backlund.
INSROP Working Paper 86-1997 III.07.4: *Seaborne Exports of Gas from Yamal.* By N.A. Isakov, E.G. Logvinovich, F.A. Moreynis, A.E. Nikulin, N.V. Popovich, A.N. Silin, N.N. Stenin, I.L. Sverdlov & V.A. Erashov.

Studies focusing on the lower Angara region have already indicated a clear potential for increased cargo on the NSR, especially timber and minerals.[43]

The Norilsk mining complex and the port Dudinka account for the main part of the cargo transported along the NSR: 70 per cent of Russian copper, 90 per cent of nickel (20 per cent of world production), 90 per cent of cobalt, 100 per cent of platinum (40 per cent of world production). Freight shipment from the west to this area in 1994 constituted - to Dudinka 354.5 th. t, to Dikson 0.8 th. t., and to Khatanga Bay 53.1 th. t. The maximum for the previous years were 813.3, 18.6 and 90.2 respectively. A substantial part of this decrease is due to a sharp drop in the transport of nickel ore from Norilsk to the nickel plants on the Kola peninsula. Exports of nonferrous metals, on the other hand, show a rising tendency. [44]

Igarka is the main port on the Yenisey for shipment and transshipment of timber.[45] Timber shipments from Igarka, mainly for export, showed steady volumes of 700-570 th. t. during the 1980s. From 1990 to 1994 the volumes of timber shipments from Igarka to the NSR decreased even more than the volumes from Dudinka; from more than 710.7 thousand tons to 129.5 thousand tons.[46]

In the Turukhansk district three oil and gas fields Lodochnoe, Tagulskoye, Vankorskoye (close to the Yenisey) have been identified with total reserves (C1+C2): oil - 235.4 mill. tons, gas - 142.1 bill. m^3, condensate - 3.6 mill. tons. This should imply a possible annual oil production of 3 mill. tons.[47] An alliance of the Russian companies Slavneft and Eastern Oil Company have won the right to develop Lodochnoe and Tagulskoye.[48] In the Nizhnyaya Tunguska basin (territory of Evenk autonomous okrug) there is graphite, nonferrous metals, oil, diamonds, copper ore, copper sandstone with silver. A joint venture between a Canadian company and Almazy Rossii has been formed to carry out surveys and identify diamond resources in the Tychany region located relatively close to the Podkamennaya Tunguska river.[49]

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[43] M. K. Bandman, V. V. Kuleshov, V. Yu. Malov: *Nizhnee Priangarye: Logika razrabotki i osnovnye polozheniya kontseptsii programmy osvoeniya regiona,* Novosibirsk: Institut ekonomiki i organizatsii promyshlennogo proizvodstva, 1996.

[44] A. Granberg (1997): *III.02.3 Selected Studies in Regional Economic Development along the Northern Sea Route.* INSROP Working Paper 74-1997, pp. 35-36.

[45] For more information about Igarka see INSROP WP 87-1997, III.2.2 *Regional Port Development along the NSR.* By N. Isakov et. al., p. 48-49, Granberg (1997) op. cit., pp. 38-41, and Ramsland (1996) op. cit., p.27.

[46] N. Isakov et. al: *Regional Port Development along the NSR.* INSROP WP 87-1997, p. 48., Granberg (1995): *The Significance of the NSR for Regional Development in Arctic Areas of Russia.* INSROP Working Paper 19-1995, p. 15.

[47] Granberg, (1997), op. cit, p. 41

[48] *Interfax*, 19 January, 1998, Source: World Reporter (Database)

[49] *Kommersant*, 21 March, 1998 via Responsive Database Services.

The Tunguska coal basins are largely unexplored and plagued by permafrost conditions, far from the markets.[50] Given the situation in the coal market it seems unlikely that this resource will have any commercial significance in the foreseeable future.

Another important resource in this area is the Kureyskoye graphite deposit. This is a main deposit of graphite with proven reserves (A+B+C1) of some 9.78 mill tons.[51]. Another deposit is Noginskoye with reserves of 1.3 mill. tons. This deposit was producing 47,000 tons per year by 1990.

4.2.2 Khatanga, Kotuy.
Port: Khatanga

The central part of Taymyr peninsula is 'served' by the river Khatanga and its tributary Kotuy. The port is Khatanga on the river which flows into the Khatanga bay. At present there is no economic activity with any cargo potential reported. There are, however, deposits of minerals and metals in the Maimecha-Kotuy province - raw phosphate, titanium, iron ore, niobium, rare earth metals - which may conceivably be exploited in the future.[52] The large coal deposits in this area would seem commercially irrelevant.

4.3 The Russian Far East

4.3.1 The main waterways

The Lena River and its tributaries constitute the main routes of river transportation in the Russian Far East. The main port and entry point to the Lena River, Osetrovo, is situated outside the Sakha Republic - in Irkutsk oblast, Eastern Siberia. Here the railway connecting the Trans-Siberian with BAM from the west crosses the Lena.

Transport on Lena and the other Russian Far Eastern rivers is problematic for various reasons. One of them is shallowness. From the port of Osetrovo to the mouth of Vitim there are depths

50 Craig ZumBrunnen: *Resources*. in: Rodgers (ed): *The Soviet Far East Geographical Perspectives on Development*, London and New York: Routledge, 1990, p.85

51 Goskomstat Rossii: *Mineralno-syrevaya baza RF*, Moscow 1992.

52 Granberg (1997) op. cit. p. 38

of approximately 2 m, and 2.6 – 2.9 m downstream from Vitim. From Yakutsk and below a channel of 3.5 m can be maintained through to the Arctic.[53]

Of the tributaries, Vilyuy below the hydro-electric station can be used for navigation, but it is very shallow. The river Vitim is navigable up the Romanovka, and below Luzhki there is a guaranteed depth of 1.9 m. While the upper reaches of Aldan are quite shallow (1.4 m between Tommot and the river Uchur), the lower parts have depths of 2 m, and could be deepened further for coal traffic.[54]

The smaller northern rivers Olenyok, Yana, Indigirka and Kolyma are navigable and used for supplying settlements in the High North. Depths range from 1 m on upper Yana and Kolyma to 2 m on the lower reaches and the Indigirka.[55]

Depths vary greatly with the seasons. Usually, there is a short period of high waters or flood during spring runoff[56], followed by very low waters the rest of the summer. Since the rivers are shallow even at best conditions, summer droughts often put an end to navigation. During the winter, most of the smaller rivers freeze to the bottom, and all river transport is closed down. The average ice free season ranges from 76-93 days at the river mouths to 129 days at Osetrovo[57]. The short navigation seasons put great demands on timing, and often cargo will get stranded at Osetrovo - the bottleneck in the Far Eastern transport system - at the end of the season.

Apart from through Osetrovo, freight also enters through the ports and river mouths along the NSR, and from there goes upstream on the northern rives to its destination. Freight going to destinations on the smaller northern rivers will also often come to Osetrovo by rail, travel by river vessel to Tiksi, be reloaded to a coastal vessel to the mouth of another river, followed by a final transshipment to river vessel. Recently river vessels have to some extent started to conduct sea operations all the way out of the Arctic. This has partly to do with the lack of work in the river transport system and the need for additional earnings. During winter boats from the Russian river system are often employed in warmer areas. For the river fleet in the Far East it is natural to seek for work in the geographically close and more economically dynamic South East Asia.

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53 Robert North (1990), op. cit., p. 197.

54 op cit., p. 198.

55 op.cit., p. 198.

56 In 1998 a flood in Sakha caused by ice on the rivers not breaking up in time did immense material damage, and the flooding was also reported to complicate the transport of supplies to the republic's north. *Izvestiya*, 2 June 1998.

57 Robert North (1990), op.cit., p. 199.

There has been a dramatic fall in such so called 'internal Arctic shipping', which in 1995 fell to a mere 6 per cent of the 1991 volume.[58] In 1994 shipments to Kolyma, Indigirka, and the Tiksi-Yana area had dropped to almost insignificant volumes, especially shipments from the east. A similar tendency was seen in shipments to Pevek and Mys Shmidta, though shipments from the east to Pevek still constituted 169.7 thousand tons.[59]

Cargo volumes in river transportation have also dropped steeply. In the Republic of Sakha the decrease was as much as 34 per cent in one year from 1991 to 1992.[60] In the first half of 1998 it decreased by 43.9 per cent compared to the same period in 1997.[61] Passenger transportation on the rivers has been more stable, because heavy price rises on air tickets have forced a substantial share of traditional air passengers to choose other means of transport.

4.3.2 Republic of Sakha

The overall picture of mineral resources in Sakha shows a very rich region, with relatively little production. No wonder that there are high expectations for future developments in the republic.

Table 6: Mineral resources in the Republic of Sakha, pr. 1991.

Mineral	A+B+C1	C2	Prod. 1990
Iron ore	3,518.9 mill. t.	2,233.1 mill. t.	-
Coal	7,635.3 mill. t.	3,866.7 mill. t.	16.8 mill t.
Oil	118,603 th. t.	-	49 th. t.
Gas	897,064 mill. m^3	-	1,402 mill. m^3
Phlogopite(mica)	350 th. t	39.6 th. t.	3.4 th. t.
Apatite	Ore: 1,277.2 mill.t	-	-
	P_2O_5 : 85.6 mill. t		

Source: Goskomstat Rossii: *Mineralno-syrevaya baza RF*, Moscow 1992.

There are several rivers and ports which could be relevant for future extraction of minerals:

58 Y. Ivanov et. al: *IV.1.1: Current Use of the Northern Sea Route.* INSROP Working Paper 96-1998, p. 9

59 A. Granberg (1997), op. cit, p. 43.

60 *O razvitii ekonomicheskikh reform v regionakh Rossiysskoy federatsii* (Yan.-Sen. 1993), p. 64

61 *Yakutiya,* 11 August. 1998.

4.3.2.1 Anabar

The opening of a diamond deposit in the Anabar region was announced in July, 1997.[62] Otherwise no concrete projects of any size is reported for this region.

4.3.2.2 Olenyok

The Olenyok oil shale deposits to the west of Lena, 800 km north-west of Yakutsk are sizeable. But they are not exploited and will probably never be commercially exploitable. The same area also contains a large share of the estimated 30,000 mill. tons of potential oil reserves that could be extracted from tar sands.[63] However, there is no indication that exploitation of this resource is regarded as a commercial option in the foreseeable future.

4.3.2.3 Lena, Vilyuy, Aldan.
Port: Tiksi

The River Lena coal basin was in the mid 1980s estimated to contain some 1.5 bill tons of economically exploitable reserves.[64] There have been great expectations to exports of coal, and in fact in 1991 as much as 108,700 tons of coal from the Sakha Republic was exported to South East Asia and Western Europe by way of transportation along the NSR. However, the next year this export dropped significantly, and in 1993 it stopped completely.[65] Increased transport costs and a weak international coal market seem to have closed this option.

Development of the South Yakutian coal basin, located in the area around Neryungri, may seem like a more imminent option. This basin contains some 500 mill. tons of reserves, of which 72 per cent is reasonably high-quality coking coal.[66] Initial commercial development was done there in the 1970s under an agreement with Japan. Development of the deposit has been linked to the construction of iron and steelworks in the region. The basin is located in the vicinity of BAM which would be the natural transport channel.

Roughly the same area has sizeable iron ore deposits. The Chara-Tokko iron deposit in south-western Sakha, west of Neryungri on the border to Chita oblast has estimated reserves (A+B+C1) of ´2,000 mill tons. The coal is low in sulphur and phosphorus which makes it suitable for large-scale steel making and it has been proposed as ore source for an iron and steel plant in the area. The Aldan iron ore deposit, 80-100 km north of Neryungri, has

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62 *Moskovskie Novosti,* 20 July, 1997 (Database)

63 *USSR Energy Atlas*, Central Intelligence Agency, 1985

64 *USSR Energy Atlas*, Central Intelligence Agency, 1985

65 Granberg(1997), op. cit., p. 43.

66 Victor L. Mote (1990): 'The South Yakutian Territorial Production Complex'.
in: Rodgers (ed): *The Soviet Far East. Geographical Perspectives on Development* pp.171-175.

confirmed reserves of some 1,500 mill. tons. It is accessible to open pit mining, but is high in sulphur and silicates. It will require enrichment. The deposits are accessible by the AYAM railway. These deposits have been considered to be the most likely of the iron deposits in the BAM service area to experience commercial development.[67] Altogether it is clear that there are deposits more than adequate to supply a large integrated regional iron and steel complex in this area. The commerciality of such projects is not the issue here, the major point is that the republic has ample opportunities to develop large scale resource based industries in this area which are likely to be served by rail transport and not using the NSR.

Sakha has estimated unproved reserves of oil of some 2.4 bill tons and 9.4 trillion cubic meters of natural gas in a total of 31 hydrocarbon deposits.[68] There are great expectations that these reserves will be the basis for a flourishing industry within some few years. Gas is already produced (about 1.5 BCM per year) from the Vilyuy basin located north-west of Yakutsk, relatively close to Lena, supplying the Yakutsk region. There are also hopes that gas from the Chayadinskoye group of fields further to the Southwest can be developed and connected to the gas export projects bringing gas from Eastern Siberia to China. The first gas in the projected pipelines is expected to come from fields in Irkutsk oblast west of lake Baykal. The reserves are sizeable and the projects seem possible, but again their location make them less relevant in relation to the NSR. It is absolutely impossible to imagine LNG exports from these fields via the NSR.

With regard to oil the situation could conceivably be different. Focus is here on the Talakanskoye oil fields with some 144 million tons of recoverable reserves (C1), and the Botubinskoye field with some 55 million tons.[69] These fields are both located in the area north of Lake Baykal. It would seem technically possible to ship oil via Lena and tributaries to Lena. The distances are very long however, and the costs associated with shipping relatively small units would be high. Ice would limit the season significantly. There are also alternative shipping routes. A pipeline connection to BAM some 6-700 kilometres to the south is possible. A pipe feeding into the pipeline to the Angarsk or Achinsk refineries would also seem realistic. Thus also in connection with most oil development projects usage of the NSR does not stand out as the only option. But there are also indications of possible oil field developments in the north-western corner of Sakha, close to Taymyr which could conceivably be served by a sea terminal. More accurate information is not available.

Other minerals, the extraction of which produces large bulk volumes, include phosphate and apatite. The most commercially viable phosphate mineral base for development clearly

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67 Zumbrunnen, p. 102.

68 *Russian Petroleum Investor*, May 1998.

69 *Russian Petroleum Investor*, May 1998

appears to be the Seligdar apatite-dolomite deposit at the Aldan-Timpton interfluve, 30 km south-west of Aldan. However, the phosphate here is low grade - 6.3 per cent P_2O_5, compared to the Kola deposits with 15 per cent. But it can be enriched to 35 per cent.[70] In 1991, the proven reserves (A+B+C1) were given at 1,277.2 mill.tons of ore and 85.6 mill tons of P_2O_5.[71] Railway seems to be the most probable transportation alternative.

4.3.2.4 Yana.
Port: Nizhneyansk

The Deputatskiy tin mine opened test runs in 1986[72] and was producing at full capacity in 1989. It has produced up to 5 thousand tons of tin annually.[73] During Soviet times tin concentrate was shipped from Deputatskiy by all-weather road to Ust-Kuiga - down the Yana - Nizhneyansk - Tiksi and up the Lena to Osetrovo onto railway.[74] Cost increases and a weak tin market has all but strangled this large project. A complete city for 45 000 people is almost empty. Crews carrying out limited production and maintenance are being flown in.

A joint venture to explore and possibly develop the Kyuchusa gold near Ust-Kiuga on the Yana river has been established.[75] However, there are no reports about concrete investments of any size related to such projects.

4.3.2.5 Indigirka
Gold production at Ust-Nera is mentioned, but there is no indication of bulk producing projects.

4.3.2.6 Kolyma.
Port: Zelyony Mys

The Zyryanskiy coal basin is located between the Indigirka and Kolyma rivers. It covers an area of 7500 km^2. Explored reserves in the 1980s were 192 mill. tons of bituminous coal, but probable - 'prognosticated' reserves were put as high as 30 billion tons.[76] The natural transport channel from this source would be shipment down the Kolymna and via the NSR to

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70 Zumbrunnen, p. 108

71 *Mineralno-syrevaya baza RF*, Moscow: Goskomstat Rossii. 1992 p. 42.

72 Zumbrunnen, p. 106

73 Granberg(1997), p. 42

74 *Russia Far East Update,* 1 June, 1997 (Database)

75 Ibid.

76 *Gornaya Entsiklopediya*, Moscow: Sovyetskaya Entsiklopediya, 1986

Magadan and Chukotka and other destinations in the far East. During 1989-1992 coal was exported from Kolyma via Tiksi, but the export stopped as unprofitable[77]. Due to the prevailing crisis in the Russian coal industry as well as the situation on the world coal market, large scale development of this source in the foreseeable future does not look realistic.

4.3.3 Magadan oblast and Chukotka autonomous okrug. Ports: Pevek, Mys Shmidta, Providenie, Egvekinot, Anadyr, Beringovskiy

Until 1995 Chukotka autonomous okrug was part of Magadan oblast. Hence, statistical data on the oblast from before this time includes the autonomous okrug.

Table 7: Mineral resources in Magadan oblast (including Chukotka), pr. 1991.

Mineral	A+B+C1	C2	Prod. 1990
Coal	757.6 mill. t.	2,120.3 mill. t.	3.0 mill. t.
Oil	3,374 th. t.	-	-
Gas	6,910 mill. m^3	-	-

Source: Goskomstat Rossii: *Mineralno-syrevaya baza RF*, Moscow 1992.

Also this area is rich in mineral resources and renowned for its production, particularly of gold. In 1996 Magadan produced 21.1 and Chukota 9.1 metric tons, (decreasing from 30.4 and 14.4 tons respectively in 1991).[78] But output in Magadan increased again in 1997 to 26.1 tons.[79] Other production includes tin, wolfram, mercury. Some of this is shipped out through the NSR ports, but the volumes are small. Magadan's first gold refinery, owned by the US-based company Intertech has supposedly been completed at the beginning of 1998. It will have the capacity to produce 40 tons of bullion per year and will take care of all gold produced in Magadan.[80] Until now most of the gold from the Far East has been refined in Kasimov a city not far from Moscow.[81] Krasnoarmeyskiy and Valkumey tin mines are located close to Pevek where processing takes place. Shipping volumes are not known, but this seems to be a major cargo source. Magadan oblast also has some 30 mill.t. prognosticated chrome reserves.

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77 Granberg(1995), p. 15.

78 Matt Sagers: 'Regional Trends in Russian Gold Production', *Post-Soviet Geography and Economics*, Vol. XXXVIII, No 6, 1997, p. 331.

79 *Northern Miner*, 6 April, 1998, via Responsive Database Services

80 *Northern Miner*, 6 April, 1998, via Responsive Database Services

81 *Northern Miner*, 29 September, 1997 via Responsive Database Services.

Supplies for the Magadan oblast gold mining industry will often come on rail to one of the Pacific seaports. The cargo then goes by sea to the Magadan merchant marine port, which until recently has been handling about 4 million tons yearly. By means of a limited, but relatively good road system the town of Magadan is connected to most of the gold mining enterprises in the oblast. To some extent the weakest part of the chain is the sea shipments, because in winter ice covers the Sea of Okhotsk and parts of the Pacific coast. For a long time work has being going on to complete a year-round road connection between Magadan and Yakutsk, from where a main road goes southwards and meets the BAM railway as well as the Trans-Siberian railway. Towards the end of the summer it is fairly simple to go by car from this area to the European part of Russia. Spring and autumn are the most critical seasons. During some weeks it is most probably impossible to use the road between Magadan and Yakutsk. At the same time the ice, if there is any at all, will not be safe for driving the winter roads.

The traditional main area for gold production in Chukotka is Bilibino which is located by a tributary to Kolyma..[82] The Yultin gold, tin, and tungsten mine in the east is accessible by road from Egvekinot. A relatively new mine - Polyarny is located about 90 kilometres west of Mys Shmidta. In the mountainous Chukotka the sparse settlements have not been tied together by a common road like in Magadan oblast, and certainly not with the railway system either. Only a few isolated roads have existed, starting from ports on the coast. Part of the goods brought by ship to the okrug's capital, Anadyr, is transported on river vessels to inland settlements. The cargo may be loaded and unloaded several times. However, a 550 kilometre dirt road from Bilibino to Pevek has now been built and it is supposed to become part of a 1050 km all year highway linking many of the remote areas, including Mys Shmidta, Yultin and Egvekinot.[83]

Reportedly the Russian oil company Lukoil is interested in starting up production of natural gas from fields in the Anadyr river basin. A new subsidiary Chukotka-Lukoil has been established for development of oil deposits in Chukotka.[84] Also Sidanko and BP have announced their intention to develop oil and gas deposits in Chukotka.[85] There are also expectations that at some point it will be possible to produce hydrocarbons from the shelf north of Chukotka.[86]

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82 Zumbrunnen, p. 105.

83 *Itar-Tass*, 29 September, 1997 (BBC Monitoring Summary).

84 *Delovoy Mir*, 3 October, 1997 (Database)

85 *Delovoy Mir*, 4 December 1997 (Database)

86 'Perspektivy neftegazonosnosti shelfa Chukotskogo morya', *Gazovaya Promyshlennost,* February, 1998.

The cargo potential in the Far East as well as the relations with Japan are elaborated in the previously published and forthcoming INSROP publications listed below.[87]

5. Tentative conclusions

The discussion in this report has primarily focused on the areas east of Yenisey. Whereas other INSROP reports analysing prospects in the areas to the West (Ob and Yenisey) have concluded that the potential for increased traffic on the NSR is considerable, the discussion in this paper does not indicate such developments further East.

These conclusions do not necessarily mean that the near future of these regions is only gloom. As discussed in the economic overview in the beginning of this report, as well as in subsequent sections, especially under Sakha, there are other developments which may be regarded as very positive for the economic development of the individual federation subjects. But they are all located more to the south and are naturally linked to other transportation systems than the NSR. The purpose in this report was to identify developments which would naturally be linked with usage of the NSR.

There are certainly many sources pointing out a vast potential of mineral and forest resources. But the outline of industrial and commercial development found in the 'resource-oriented' literature is not corroborated by fresh evidence that commercial actors actually think along such lines. The methodology used to find such evidence is admittedly very crude, and it is quite possible that information about individual projects has been overlooked in the literature and database searches made. On the other hand we would have expected to find several references to 'wild', unrealistic projects. The absence also of this kind of information may indicate that very little attention is being paid by business circles to these vast areas and possible commercial projects there.

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87 INSROP Working Paper 58-1996 IV.2.3: *Regional Cooperation in Northeast Asia: new opportunities for the Russian Arctic?* By H. Simonsen.

INSROP Working Paper no. 100-1998 III.08.1 *The NSR in Japanese Views of Trade.* By K. Shikano and H. Kitagawa.

INSROP Phase II project III.01.6 *The Sakha Republic, Chukotka and the Russian Far East, Cargo Potential for the NSR.* Supervisors Trond Ramsland and Alexander Granberg. Report forthcoming 1998.

INSROP Phase II project III.10.03 Cargo analysis Far East - Europe. Supervisor Trond Ramsland. Report forthcoming 1998.

However, lack of interest cannot be ascribed solely to lack of information. There are several more 'objective' reasons why it is difficult to define commercial projects with relevance for the NSR in the region. Many of the interesting resources to be found (diamonds, gold and other rare metals) do not make up large bulk volumes, although substantial supplies for their exploitation may be needed. Secondly, the one resource which is found in enormous quantities and earlier was regarded as a very promising cargo potential, namely coal, lost its attraction when transport tariffs were raised and the world market price dwindled. With the long term outlook of oversupply on the world market for coal, this situation is likely to continue. Thirdly, other transport options are being developed, in particular the railway. Whereas the general picture at the end of the Soviet period was of an overloaded infrastructure in need of huge investments to increase capacity, the impression is now very different. The economic downturn and higher transport tariffs have freed up capacity, to the extent that the railway is now competing for cargo, and reducing tariffs again.[88]

Base supplies to the communities in the north will continue as long as the federal government and regional governments can afford subsidising them, but their ability is limited. It is likely that the population will decrease further and that as a consequence supplies will also be reduced. Still, supplies will form a source of work for shipping companies working in the eastern part of the NSR. So far it seems that the big cargoes will continue to be concentrated in the western part.

88 Reportedly the Russian railways are now offering to deliver containers from Nakhodka to Brest at the border with Belarus, in just 9 days. *Izvestiya*, 15 april, 1998.

Comments on the Article :

" ECONOMIC DEVELOPMENT IN NORTHERN SIBERIA AND THE RUSSIAN FAR EAST – IMPLICATIONS FOR THE NORTHERN SEA ROUTE."

General Observations.

The report is very clearly set for its general target: the possibility of an increase in traffic on the Northern Sea Route in the light of available information and cautious prediction of economic development in the area served by this route.

The authors avoid any extraneous discussion or advanced reasoning on the possible future state of markets or prices which might be beyond the scope of the present study.

There is some reliance on statistical sources that are notoriously unreliable although the only ones available. In particular the export statistics originating in the Russian Customs Service, known, even to their own President, as prone to understatement of both exports and imports for various reasons e.g. Kalinin automobile imports. The population figures are now under question as there has been, in some areas, considerable avoidance of the internal passport and residence regulations on which these statistics partly depend.

The limitations of a total dependence on supply and export through the Northern Sea Route and the North-flowing rivers are kept in mind throughout and due attention is paid to the interplay between all modes of transport. The impact of changing internal and external costs/prices in the open or semi-open market regime is kept present, as is the varying level of state and local subsidy dependent on the economic considerations of national economic policy.

The Right Questions Are Raised.

1. Which activities will be self-sustaining under the new political and economic conditions?
2. Which direct state subsidies, including indirect defence policy side-effects on civil life e.g. free fuel and transport use, base closures etc., are likely to be withdrawn or reduced in level?
3. What are the implications for the existing transport systems of a halt on heavy capital investment for long-term improvement of their facilities.
4. What are the future prospects for collaboration between foreign and local entrepreneurs and capital in the development of selected areas of economic endeavour on a planned and rational basis? Will the local and national authorities focus and plan for this?

Due weight is given to the search for a policy of sustained economic activity capable of ensuring the survival of the local population. Difficult choices will have to be made, guided by the evolving national political and economic motives for sustaining the Northern population at or near its present level. The exact intention of the national government in this respect has yet to be outlined in public statements.

Economic Policy.

Here the concept of "marginality" is introduced and here again we meet the fact that the distance of any area from Moscow also increases the likelihood of error in statistics of economic activity. It also poses the question of which markets will be the future ones for Russian goods and services.

Analysis Of All Transport Sectors.

Given the subject of the article this section requires particular scrutiny. The concept of " integration " of all transport modes at a realistic level of pricing for both operator and consumer is deemed to be the key for all successful economic systems.

The specialisation of the Northern of the Northern Sea Route in the heavier, bulkier volume cargoes is emphasised. The access to the east-west routes of the southern railway routes is carefully analysed together with a survey of all the possible medium term improvements that the present rail system, is likely to require. A rapid description of the North-South river and road links between the above modes emphasises the scarcity of safe reliable roads. They are, in fact, absent as a transport alternative for many areas.

Aviation is examined in a very brief section. Too brief, when from the preceding sections it appears to be the only real possible integrating means of transport supporting all the others. Human occupation and exploitation of natural resources will continue in the North. This, given the present free choice of occupation and job location for the individual , means an acceptable level of access to most of the goods and services essential to a modern lifestyle must be made available in order to attract the in-comers with the technical skills required by the task of improving the local economy. The traditional local native people will require markets for their produce to keep them above subsistence level.

Only a carefully planned integrated network of scheduled and non-scheduled air services at competitive prices can satisfy this requirement, which will continue to exist even in the presence of abundant pioneering attitudes in the population.

Machinery, spare parts, fuel and food all require to be brought in at varying speeds and intervals. Medical services too must be flexible, ranging from periodic clinics to emergency medivac for critical cases. Such services can determine the total viability of human presence in an area or simply its desirability as a site for new economic activity.

Even now there are many surviving residues of previous economic approaches to air transport and to aircraft fleet management which are harmful to efficiency in the new age of the market economy. The excessive dependence on helicopters (mainly of military design or origin) although it is common knowledge that such aircraft are expensive to buy, run and repair. Some helicopters will always be needed for sites of difficult access but a properly integrated use of fixed wing aircraft would reduce costs and lower prices to the consumer. The easy availability, so far, of surplus military helicopters and pilots has distorted the composition of the existing fleets, raising the fleet costs and creating excessive demand for spare parts.

The fuel supply problem is not just in terms of transport shortages but also of in-transit guarantees of payment, lack of stockholding finance and lack of continuity of supply at proper prices. That a country possessing some of the worlds largest oil reserves should have difficulties in ensuring properly priced aviation fuel, when total Northern consumption of all fuel and petroleum products is less than 0.5 mill. tonnes, points to the failure of financial planning and of organisation, not to lack of transport capacity.

Unconfirmed reports on the aviation sector seem to indicate that several factors combine to limit the creation of the Alaskan type "bush-flying" of on-demand minor aviation, so successful in that state of the U.S. Some of these factors are due to residual states of mind from former times inherent in the regulatory regime regarding ownership, registration and use of small commercial and private aircraft.

Aviation requires far less fixed capital investment than, say, a B.A.M. type railway extension or a long all-weather trucking road. If flexibly managed, expansion of aviation services has a quick "knock on" effect in the development of economic activity although it does require expertise both in government support and private sector operation of the services to make it work with a minimum of subsidy in the initial phases.

Some local pre-processing of the raw product may offer one way out of the recurring transport bottlenecks. It may not work for all products; not for bulky high volume raw materials. As value is added to a product, near to source, by increasing local pre-processing , the product will be able to tolerate longer journeys to market on higher cost modes of transport.

Knowledge of the true location of the best markets and the identification of commercial opportunities in those areas closer to the point of origin would reduce the European Russia domination of market attraction and would reduce the distance goods must travel for sale.

The N.E. Asia oil and gas pipelines from the Irkutsk oblast through Mongolia and N.China to Korea and Japan would seem to be the one big project that might justify itself in market terms, using the most efficient transport mode, the pipeline, to take the product to an assured market in the above mentioned areas. Any eventual connection to this same pipeline of another one carrying oil from the eventual exploitation of Sakha's oil and gas fields would mean no increase in Northern Sea Route traffic, except for the temporary initial equipment shipment phase of moving bulky plant items and lengths of pipe. The terrible selective impact of falling oil on Russia in particular will put all or part of this project on hold until prices rise again.

Local supply traffic would seem to be the main chance of survival for the Northern Sea Route as the unreliability and uncertainty of transit times (incurring extra interest charges) due to seasonal variation in ice conditions preclude regular through-traffic. This same through-traffic is being targeted as cargo potential for larger, more efficient ships on the southern ocean routes to the Americas and Europe at increasingly competitive rates. The same pressures are at work to remove much through container traffic from the Trans-Siberian railway from the far East to Europe.

The Trans-Siberian railway has its own problems of uncertainty of transport times. Press reports of striking miners and other unpaid workers blocking the line in Eastern Siberia and of traffic saturation of transit slots in Western Siberia have combined to reduce its commercial attractiveness even at lower freight rates. This reality is in contrast to the promised transit time of 9 days from Nakhodka to Brest on the Polish frontier

Conclusions

The article is a good summary of the present situation and future prospects of the Northern Sea Route traffic. The present note may go beyond the immediate brief but is intended to recognise the importance of examining synoptically the interdependence of all the modes within the transport system of which the Northern Sea Route is such an important component.

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Response from the authors:

The authors are grateful for the positive and constructive remarks by the reviewer. Some small changes in the text have been made.

We fully agree with the reviewer that many statistical sources are not totally reliable. Advanced statistical analysis on the basis of such data should be avoided. However, we believe that the official statistics do give a broadly correct picture, sufficient for the relatively rough analysis in this report. With regard to population data which are quoted throughout the report, the problems mentioned by the reviewer probably tend to downplay the real extent of the migration, which means that outmigration from the north is even more dramatic than the official data indicate.

A more thorough analysis of the role of air transportation is requested. A brief analysis is in fact supplied by the reviewer, with which we fully agree. The reason for not giving this mode of transportation more space in the report is that in our context we only wanted to discuss alternative carriers of cargo. Clearly air transportation is not an alternative for carrying the volume and type of cargo suitable for transport on the NSR. However, aviation may play a very important role in delivering small, key components, for example, for various industrial projects. The remarks by the reviewer mainly concern the link between the availability of air transportation and the possibility of sustaining settlements in the north. This is a highly relevant linkage, but it goes beyond the scope of the present report, which focuses on primary industrial activity.

The three main cooperating institutions of INSROP

Ship & Ocean Foundation (SOF), Tokyo, Japan.
SOF was established in 1975 as a non-profit organization to advance modernization and rationalization of Japan's shipbuilding and related industries, and to give assistance to non-profit organizations associated with these industries. SOF is provided with operation funds by the Sasakawa Foundation, the world's largest foundation operated with revenue from motorboat racing. An integral part of SOF, the Tsukuba Institute, carries out experimental research into ocean environment protection and ocean development.

Central Marine Research & Design Institute (CNIIMF), St. Petersburg, Russia.
CNIIMF was founded in 1929. The institute's research focus is applied and technological with four main goals: the improvment of merchant fleet efficiency; shipping safety; technical development of the merchant fleet; and design support for future fleet development. CNIIMF was a Russian state institution up to 1993, when it was converted into a stock-holding company.

The Fridtjof Nansen Institute (FNI), Lysaker, Norway.
FNI was founded in 1958 and is based at Polhøgda, the home of Fridtjof Nansen, famous Norwegian polar explorer, scientist, humanist and statesman. The institute spesializes in applied social science research, with special focus on international resource and environmental management. In addition to INSROP, the research is organized in six integrated programmes. Typical of FNI research is a multi-disciplinary approach, entailing extensive cooperation with other research institutions both at home and abroad. The INSROP Secretariat is located at FNI.