

**INSROP WORKING PAPER
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**The Significance of the NSR for
Regional Development in
Arctic Areas of Russia**

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Sub-programme III: Trade and Commercial Shipping Aspects.

Project III.01.1: The Significance of the Northern Sea Route for
Regional Development in Arctic Areas of Russia.

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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

The main objective of the present paper, prepared within the framework of INSROP, is the assessment of the NSR significance for the economy of Russia nowadays and in the future (especially for its northern and Arctic regions) with the account of opportunities given by international economic cooperation. The fact, that this paper is a number one in Sub-programme III: "Trade and Commercial Shipping Aspects", is also taken into consideration in the content of the paper.

Three stages of the NSR development are distinguished in the paper: 1) development of the NSR as the main transport line in the Russian Arctic (up to the end of 1980s); 2) period of political and economic transformation in the USSR and Russia (up to the present moment); 3) the nearest future and long-term period according to the forecasts of economic development in Russia and international economic cooperation in the NSR zone, as well as the possibilities for other transport networks use.

The author tries to answer the following main questions:

- are economic stabilization and subsequent development of the North (including the Arctic) necessary for the national, and, possibly, for the world economy, and what are the requirements to the scale and structure of the economy of the North;
- is it possible to develop the economy of the Russian North without the NSR or under its depressive state, but with the emphasis on other transport systems;
- what are conditions for and directions of the restoration and increase of shipments and traffic capacity of the NSR;
- what kind of policy should the state pursue in relation to the NSR;
- what are the potentialities for international economic cooperation in the NSR zone.

Materials on the economic development of Russian northern regions (official statistical data; federal programmes and forecasts; studies of economic institutes, including those carried out with the participation of the author), on the NSR operation (data of the Marine Transport Department of the Ministry of Transport, reports of the Institute of Marine Transport, results of other INSROP projects, information on projects on the international cooperation in the NSR zone, are used in the paper. Many ideas and much information were obtained by the author owing to friendly contacts with Russian colleagues within INSROP - Yu.Ivanov, V.Mikhailichenko, V.Peresykin, A.Ushakov.

Critical remarks and recommendations, made by official reviewers J.Baerenholdt (Denmark) and A.Bond (USA) are taken into consideration in the final version of the paper. The author expresses his sincere gratitude to the reviewers.

THE SIGNIFICANCE OF THE NSR FOR REGIONAL
DEVELOPMENT IN ARCTIC AREAS OF RUSSIA

(Working paper on topic III.0.1. of the International project
"Development of the Northern Sea Route")

2. The role of the North and the Arctic in the economy of Russia

2.1. The North and the Arctic: economic regioning and state-administrative division

The notions "*the North*" and "*the Arctic*" are conventional: their boundaries are determined in different ways, depending on the purposes of regioning.

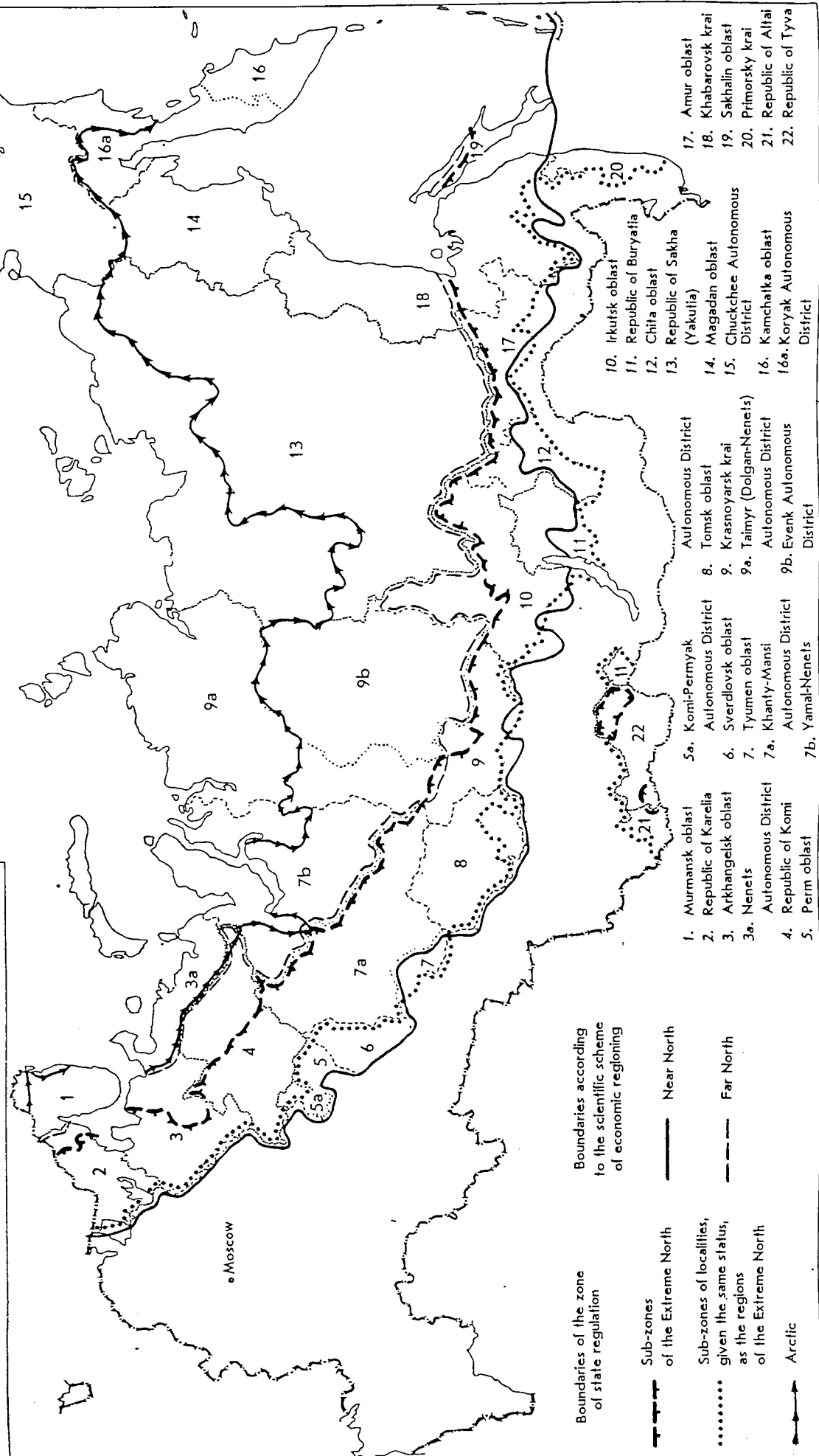
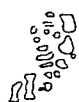
In the USSR and post-Soviet Russia *regions of the Extreme North and localities, given the same status*, were being distinguished for many decades for the purposes of public regulation of the regional development - establishing privileges and compensatory payments to the population, special terms for regional budgets making, financial support to provide freight deliveries, etc. Their boundaries were regularly revised in accordance with the State Acts (1). According to the Resolution of the Council of Ministers of the Russian Federation (from 11 March 1980) 4 autonomous districts (Nenets, Yamal-Nenets, Taimyr, Chuckot), 6 administrative districts and administrative units in Murmansk oblast and 5 administrative districts in the Republic of Sakha (Yakutia) were attributed to the Arctic zone - a part of the Extreme North, adjacent to the Arctic Ocean and characterized by the most uncomfortable natural conditions. Thus, Russian Arctic, as an object of public economic regulation, occupies significantly larger territory, than the Arctic limited by physical-geographical criteria (southern boundary of "physical-geographical" Arctic passes across the islands of Novaya Zemlya and stretches further to the east along the coast of the Arctic Ocean).

According to the new pattern of economic regioning, developed by research organizations on the basis of criteria of transport-geographical position, favourable natural conditions and good organization of the territory for life activities, the zone of the North is distinguished, and within this zone - sub-zones of the *Near* and the *Far North*. The Arctic is a part of the Far North zone (2). The southern boundary of the Far North approximately coincides with the southern boundary of the Extreme North, while the southern boundary of the Near North coincides with the southern boundary of localities, given the same status with the regions of the Extreme North. This pattern of regioning of the North was adopted as a basis while preparing the State Master Programme of Economic and Social Development in the Russian North (3). It is assumed, that scientific scheme of regioning will be used by the state bodies when revising the boundaries of the regions of the Extreme North and localities, given the same status.

On Map 1 zones and sub-zones of the Russian North according to the two mentioned patterns are plotted, as well as their correspondence to the state-administrative division of the Russian Federation¹⁾. Whole territories of 16 subjects of the Federation lie within the zone of the North, it also comprises parts of territories of 11 more subjects of the Federation.

¹⁾ At present the Russian Federation comprises 89 subjects: republics, krais, autonomous oblast, autonomous districts, cities of Moscow and St.Petersburg.

ECONOMIC REGIONING AND ADMINISTRATIVE- TERRITORIAL DIVISION OF THE NORTH OF RUSSIA



Total area of the zone of the North is approximately 11.5 million sq. km (64% of the territory of Russia); population is 11.5 million, including 32% - in the European North, 32% - in the North of Siberia, 35% - in the North of the Far East economic region (3). More detailed data on the population distribution in the North can be found in Table 1.

Table 1

Territory and population of the subjects of the Russian Federation, attributed to the zone of the North

Subjects of the Federation	Territory, Th. km2	Population, Th. pers. (as of 01.01.1994)
----------------------------	-----------------------	--

Subjects of the Federation, fully located in the zone of the North

Murmansk oblast	144.9	1091.5
Republic of Karelia	172.4	794.2
Arkhangelsk oblast	587.4	1548.0
incl.: Nenets Autonomous District (A.D.)	176.8	50.9
Republic of Komi	415.9	1228.1
Komi-Permyatsky A.D.	32.9	160.3
Yamal-Nenets A.D.	750.3	468.8
Khanty-Mansi A.D.	523.1	1312.6
Taimyr A.D.	862.1	49.2
Evenk A.D.	767.6	22.6
Republic of Sakha (Yakutia)	3103.2	1060.7
Sakhalin oblast	87.1	698.6
Kamchatka oblast	472.3	404.0
incl.: Koryak A.D.	301.5	35.4
Magadan oblast	1199.1	306.9
Chukchi A.D.	737.7	113.1

Subjects of the Federation, partly located in the zone of the North (the list is incomplete)

Tomsk oblast	34.0	270.0
Krasnoyarsk krai (without Taimyr A.D. and Evenk A.D.)	459.3	565.4
Irkutsk oblast	475	778.2
Republic of Buryatia	95	86.3
Chita oblast	129	38.3
Amur oblast	217.7	186.0
Khabarovsk krai	676	675.4
Primorsky krai	65	150.9

The zone of the Russian Arctic occupies (according to the applied criteria) from 2.5 to 3.3 million sq. km; about 1.8 million pers. live here at present (4).

2.2. Natural resources

The significance of northern and Arctic regions for the Russian economy (earlier - for the economy of the whole USSR) is determined, first of all, according to the availability of various and rich natural resources: mineral, biological, water.

Share of the North in the explored resources of mineral raw in Russia makes up 60% on the average, while for many valuable kinds of resources it is 70-90%. Distribution of the largest deposits of mineral resources is shown on Map 2.

Major Russian reserves of oil, gas and gas condensate are concentrated in Timano-Pechora, West-Siberian, Lena-Tunguska oil and gas provinces, Anadyr oil and gas area, shelf zones of the Barents, Pechora, Kara, Chuckchi, Bering and other Arctic seas. Major coal reserves are located in Pechora, Tunguska, Lena, South-Yakutian basins, numerous oil-bearing fields in the North-East.

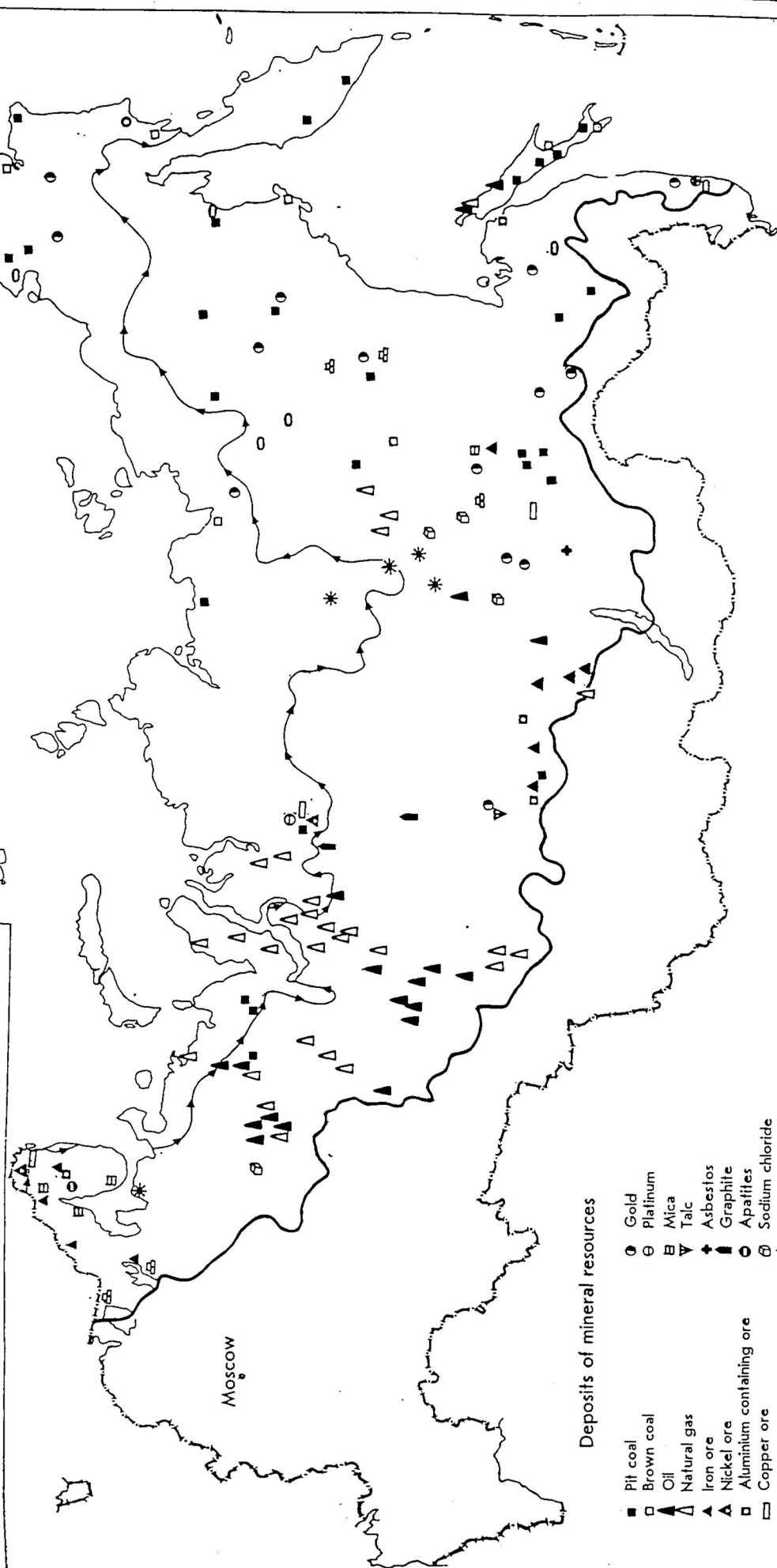
The North occupies leading positions in possessing reserves of ores of many non-ferrous metals - copper, nickel, aluminium, tin, tungsten, lead, cobalt, etc., precious metals - gold, platinum, silver, as well as of rare metals, contained in complex ores (gallium, zirconium, niobium, tantalum, strontium, sphene, etc.).

Largest in the world deposits of apatite-nepheline ores are found on Kola Peninsula, rich deposits of diamonds - in Republic of Sakha (Yakutia) and Arkhangelsk oblast. Besides, reserves of iron ores, sulphur (in complex ores), various raw materials for chemical industry and building materials production are rather significant.

One should take into account that many regions of the North, especially of the Arctic and Arctic shelf are insufficiently explored from the geological point of view, and it implies high probability of discovering here new large deposits of mineral resources. At the same time, many rich deposits of raw resources, being developed now, are close to depletion (for example, deposits of copper-nickel ores of Kola Peninsula and Taimyr, gold and tin placers in the North-East, gas fields near Nadym and Novy Urengoy). Therefore, exploration and preparation of new raw reserves becomes necessary to maintain at least the achieved level of development.

In the zone of the Near North main forest resources of Russia are concentrated (See Map 3), consisting mainly of the most valuable coniferous species. About 60% of fish resources and sea animals are concentrated in the seas of the Arctic Ocean and the northern part of the Pacific Ocean. Northern Taiga and tundra are inhabited by many valuable animal species, including about three million reindeer. However, excessive and inefficient exploitation of biological resources (and adverse impact of other sectors of economic activity) has brought large damage to them, affecting natural regeneration of these resources. Further use of biological resources is permissible only within the model of sustainable ecological and economic development.

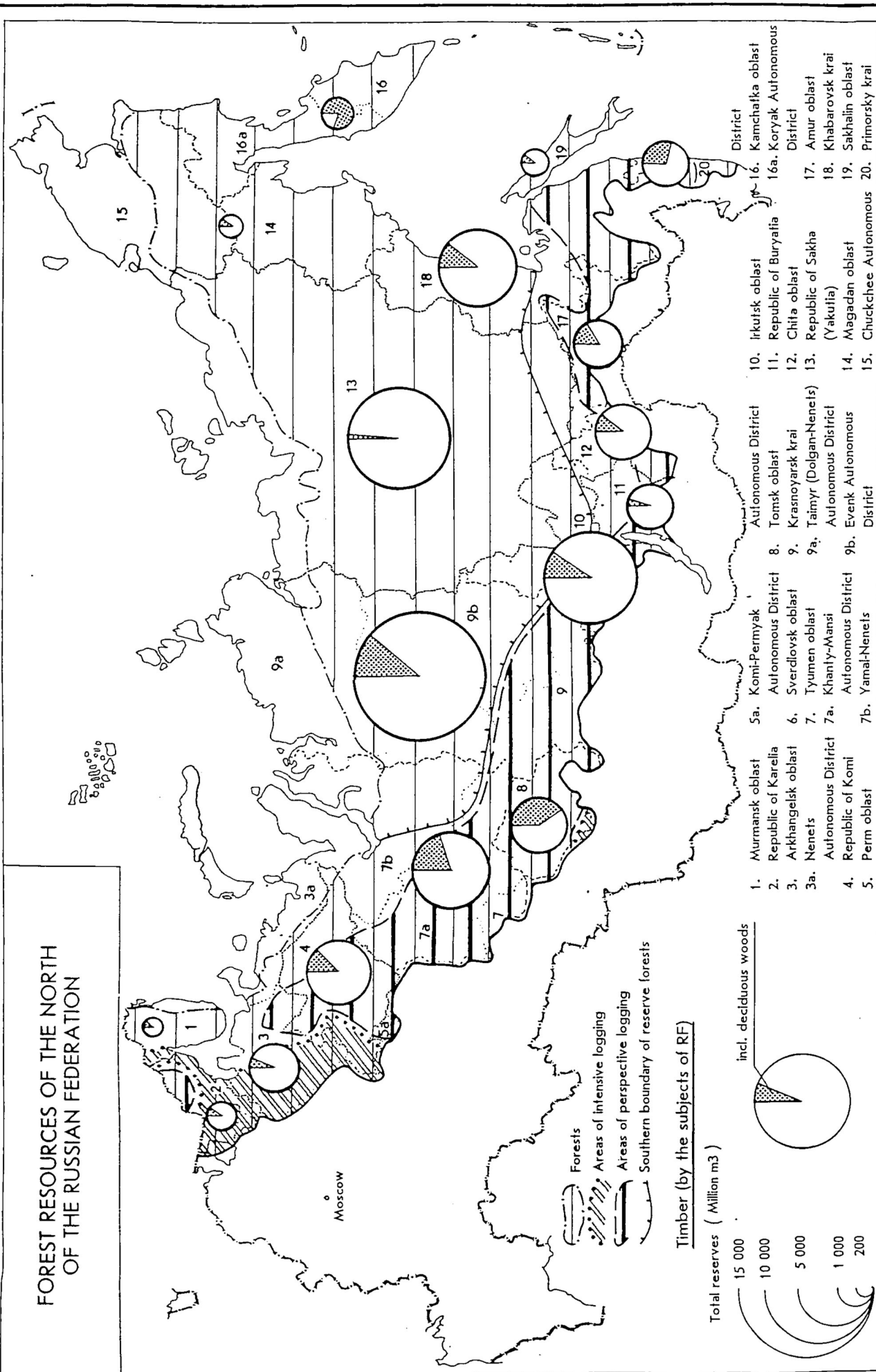
MINERAL RAW RESOURCES OF THE NORTH AND THE ARCTIC ZONE OF THE RUSSIAN FEDERATION



Deposits of mineral resources

- | | |
|----------------------------|----------------------|
| ■ Pit coal | ○ Gold |
| □ Brown coal | ⊖ Platinum |
| ▲ Oil | ⊞ Mica |
| △ Natural gas | ▽ Talc |
| ▲ Iron ore | ◆ Asbestos |
| △ Nickel ore | ⊙ Graphite |
| □ Aluminium containing ore | ⊖ Apatites |
| □ Copper ore | ⊖ Sodium chloride |
| ○ Tin ore | ⊖ Diamonds |
| ○ Mercury containing ore | ⊖ Building materials |
| ⊖ Complex ore | |

FOREST RESOURCES OF THE NORTH OF THE RUSSIAN FEDERATION



2.3. Production and export

Large-scale industrial development of resources of the North has started in the 1930s, and in 1960s-70s the North has already become the main power resource base of the USSR. In 1989, when the economy of the USSR reached its peak, 425 million t of oil, 558 billion m3 of natural gas, 147 million m3 of timber was produced in this region. Today (data for 1993-1994) the North occupies dominating position in Russia in the output of oil (73%), natural gas (92%), nickel (76%), tin (83%), lead concentrate (65%), titanium concentrate (100%), diamonds (almost 100%), gold, platinum and other noble and rare metals, apatite concentrate (which is used for the production of 60% of phosphorous fertilizers). Share of the North in aluminium (32%), copper (about 50%) production, workable wood logging (over 40%), fish and sea products yield (over 50%) is also large. Some additional data are given in Table 2.

Table 2

Output of some kinds of industrial products in the regions of the North, 1994

	Output	Share in total output of Russia
1	2	3
<u>Republic of Karelia</u>		
Iron ore, million t	6.2	8.5
Workable wood, Th. m3	3859.0	5.2
Sawn timber, Th. m3	754.0	4.0
Paper, Th. t	554.0	25.0
<u>Republic of Komi</u>		
Oil, incl. gas condensate, million t	8.0	2.5
Natural gas, billion m3	3.8	0.6
Coal, million t	22.7	8.9
Workable wood, Th. m3	5682.0	11.3
Sawn timber, Th. m3	843.0	4.5
Paper, Th. t	372.0	16.8
Plywood, Th. m3	87.7	10.6
<u>Arkhangelsk oblast</u>		
Workable wood, Th. m3	8372.0	11.4
Sawn timber, Th. m3	1902.0	10.1
Paper, Th. t	177.0	8.0
Cellulose, Th. t	1212.0	35.0
Fish and other sea products yield, Th. t	133.0	3.9
<u>Murmansk oblast</u>		
Iron ore, million t	7.2	9.8
Apatite concentrate, million t	4.3	98.0
Fish and other sea products yield, Th. t	490.0	14.4

1	2	3
<u>Khanty-Mansi A.D.</u>		
Electric power, billion KWh	48.3	5.5
Oil, million t	169.9	53.8
Workable wood, million m3	3.5	4.7
Sawn timber, million m3	0.7	2.7
<u>Yamal-Nenets A.D.</u>		
Natural gas, billion m3	555.0	91.4
Oil, million t	38.4	12.2
<u>Tomsk oblast</u>		
Oil, million t	6.8	2.2
<u>Krasnoyarsk krai</u>		
Electric power, billion KWh	6.6	0.75
Nickel ore	...	52.0
Nickel	...	40.0
Blister copper	...	45.0
Cobalt and nickel electrolytic powder	...	100.0
Workable wood, Th. m3	3009.0	4.1
Sawn timber, Th. m3	851.0	4.5
<u>Irkutsk oblast</u>		
Electric power, billion KWh	40.6	4.6
Aluminium rolled wire	...	43.0
Workable wood, Th. m3	4784.0	6.5
Sawn timber, Th. m3	650.0	3.5
Cellulose, Th. t	718.0	20.7
Primary aluminium	...	19.5
<u>Republic of Sakha (Yakutia)</u>		
Diamonds production	...	99.8
Gold mining	...	20.8
Tin production	...	43.4
Coal, million t	10.9	4.0
<u>Khabarovsk krai</u>		
Primary oil refining, million t	2.5	1.35
Workable wood, Th. m3	2566.0	3.47
Sawn timber, Th. m3	234.0	1.24
Fish and other sea products yield, Th. t	168.0	4.9
<u>Primorsky krai</u>		
Fish and other sea products yield, Th. t	120.0	3.5
<u>Kamchatka oblast</u>		
Fish and other sea products yield, Th. t	587.0	17.3
<u>Magadan oblast</u>		
Gold mining	...	18.4
Fish and other sea products yield, Th. t	62.4	1.8

1	2	3
<u>Sakhalin oblast</u>		
Oil, incl. gas condensate, million t	1.5	0.5
Coal, million t	2.9	1.1
Workable wood, Th. m3	1074.0	1.5
Paper, Th. t	11.0	0.5
Fish and other sea products yield, Th. t	368.0	10.8

In the composition of industrial produce leading places are occupied by fuel-power complex - 38%, timber complex - 17.5% and metallurgy - 15.5% (71% in total). Produce of these branches not only met the demand of all Russian regions and republics of the former USSR, but was also exported to many countries of the world. At present goods export from the North accounts for about 60% of hard currency receipts in Russia.

Efficiency of the Northern economy, in spite of enormous costs and losses in the development and exploitation of natural resources and during transportation, is confirmed by a number of macroeconomic indices. In particular, the North generates 20% of national income, while its population is 7% of the Russian total (3)¹⁾.

Specialization of the North in mining and processing of natural raw resources is economically justified. Intentions to locate here enterprises of manufacturing industry, not associated with the use of natural resources (for example, mechanical engineering and light industry) came into contradiction with the terms of economic competitiveness even under planned economy. Such enterprises are collapsing during transition to the market. To a great extent it can be related to numerous engineering-technical, repair, "subsidiary" agricultural enterprises (or corresponding shops of main enterprises), operation of which was conditioned most of all by unreliable transport-supply linkages with more southern industrial and agricultural regions.

High technology enterprises of military industry, which lost their military orders, represent a special problem. The most typical example is production of atomic submarines in Severodvinsk. It is inexpedient to liquidate such enterprises; they should be re-oriented, first of all, to manufacturing of new technics for the North, for instance, of equipment for oil and gas production on the shelves of Arctic seas.

2.4. Perspectives for the development

Russian North is the place, where social and economic contrasts are concentrated. Here both positive and negative features of political and economic systems of the USSR are manifested to the greatest extent (5). That's why the North is suffering from the difficulties of transition period and economic crisis most of all (See item 3).

¹⁾ According to the methodology, used in Russian statistics, produced national income includes net income, generated only in the branches of material production.

Does the economy of the North have any perspectives for the future, and is it expedient to pursue protectionist state policy towards the North? This question often becomes the subject for discussion among politicians and scholars. It is discussed in more details in item 6. Here only main arguments for the necessity of further development of the North for the benefit of Russian economy will be provided.

Shift of raw mining and its primary processing to the North and directly to the coast of the Arctic Ocean has been occurring in Russia (USSR) for several decades already. This tendency will continue in the future, for there are no other acceptable alternatives for Russia. First, main reserves of untapped power, mineral and forest resources are concentrated in the northern regions; second, it is vital for the Russian economy to maintain and even increase production of the "northern" raw both for domestic and export needs for a long time in the future. Third, the North will undoubtedly keep its large significance both for the system of national security of Russia and as the only reserve of available spare territory.

Therefore, development of transport network, providing reliable performance of the Northern economy and its ties with other regions of Russia and foreign economic partners, is one of the major problems of Russian economy.

3. Development of the NSR as a main transport line in the Russian Arctic¹⁾

3.1. Impact of the NSR on the regional development

Economic development of the Russian Arctic, and to a significant extent of the whole Russian Far North, became possible only due to the NSR. It is the only latitudinal line, connecting all Arctic and Subarctic regions of Russia. Together with numerous rivers, falling into the Arctic Ocean, the NSR forms an integral water-transport system, handling bulk of "northern" freight. Railroads, constructed mainly in meridional direction, provide linkages of the NSR with the transport network of Russia and the former USSR. There are practically no main motor roads in the Arctic. Instead, winter ice roads ("zimniki") are used, many of them have exits to the ports and port terminals of the NSR. Main oil and gas pipelines, laid in the Arctic and the Far North, operate only in the southern and western directions (exceptions are: gas pipeline Messoyakha - Norilsk and small-size gas pipelines, supplying Yakutsk from the west). On Map 4 main elements of the transport network of the North are shown.

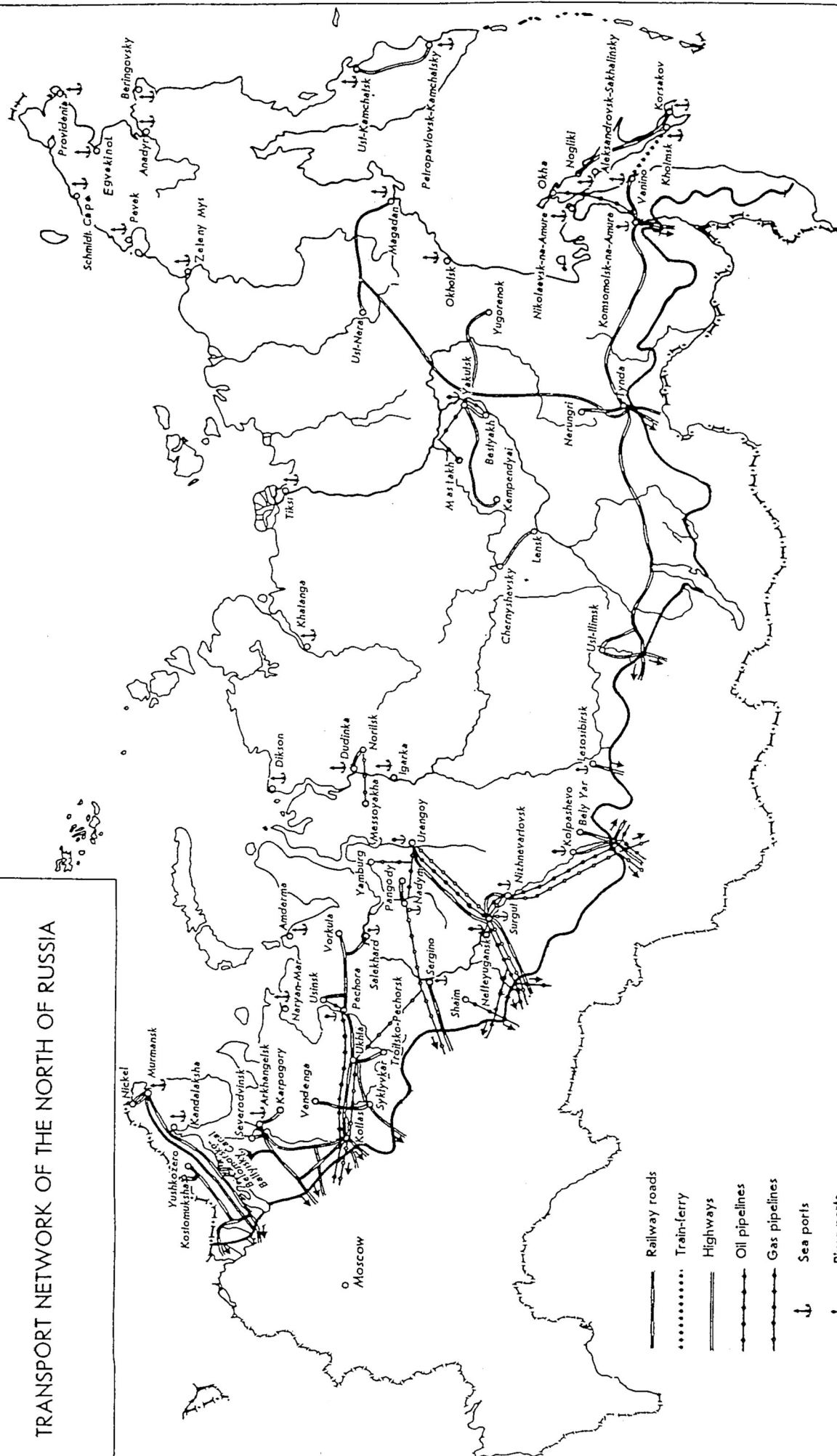
The zone of economic impact of the NSR extends from the Arctic coast to the inland territories for hundreds and even thousands of kilometers, especially along the basins of Siberian and Far East rivers, flowing into the Arctic Ocean.

1) Two notes should be made here.

1. It is meant, that main physical characteristics of the NSR (variants of routes, conditions for shipping, ecological requirements, etc.) are given in INSROP sub-programmes I and II.

2. In contrast to the adopted professional-nautical definition of the "NSR" (from the islands of Novaya Zemlya to the Bering Strait), the NSR is interpreted in the present "regional-economic" paper as the whole Russian part of the route between the Atlantic and Pacific oceans, i.e. from the west of Kola Peninsula to the ports on the southern coast of Chuckchi Peninsula.

TRANSPORT NETWORK OF THE NORTH OF RUSSIA



The NSR services the main industrial complexes of the Arctic and Subarctic regions: mining-metallurgical and mining-chemical complex of Kola Peninsula, West-Siberian oil-gas complex, Norilsk industrial unit, mining industry of Yakutia and Magadan oblast, Chuckotka, timber-exporting enterprises of Arkhangelsk oblast, Krasnoyarsk krai, Yakutia, as well as many individual industrial enterprises, construction sites, airports, military units, expeditions, scientific stations, small settlements, etc. Marine transport is the only mean of transportation of the greater part of freight for some localities in the Russian Arctic (islands in the Arctic seas, parts of the coast in the West and East Siberia, Chuckotka, etc.).

Growth of the population in towns, cities and settlements, adjacent to the NSR, serves the evidence of the NSR importance (See Table 3)¹⁾. It can be seen from the Table, that the process of rapid growth of the population in cities and towns as well as of new towns emerging along the NSR went on till the end of 1980s. Decrease of the urban population, occurring in recent years, is the consequence of deep economic crisis in the Arctic.

Table 3

Dynamics of the population in towns, cities and urban settlements, adjacent to the NSR
(Thousand pers.)²⁾

	1959	1970	1979	1989	1994
Murmansk	221.9	308.0	381.0	468.0	443.5
Kandalaksha	37.0	43.0	48.0	54.1	53.2
Arkhangelsk	258.1	343.0	385.0	415.9	414.9
Severodvinsk	79.0	145.0	197.0	248.7	245.2
Naryan-Mar	13.2	17.0	19.0	20.2	20.0
Vorkuta	83.0	90.0	100.0	115.6	109.1
Amderma	-	-	-	5.5	3.0
Nadym	-	-	26.1	55.6	48.7
Novy Urengoy	-	-	-	95.3	86.9
Dikson	3.5	3.9	4.0	4.4	1.6
Norilsk	118.3	135.5	180.0	174.0	163.4
Dudinka	16.3	19.8	24.8	32.3	31.3
Igarka	14.3	15.6	16.4	18.8	14.5
Tiksi	4.8	8.1	9.5	11.9	8.0
Pevek	-	10.5	11.1	12.9	9.3
Zeleny Mys (Cherskii)	-	9.5	9.7	11.5	8.5
Shmidt Cape	-	1.8	3.3	4.6	3.1
Providenia	4.8	6.6	4.6	5.4	3.9
Anadyr	-	7.7	12.2	17.7	14.1

Irregularity and seasonal performance of the Arctic marine transport, especially in the situation when there are no other alternatives, lead to the formation of large inter-navigation and reserve stocks of goods at the warehouses of industrial, trading and other

¹⁾ This Table is given on the recommendation of the reviewer Dr. J.Baerenholdt.

²⁾ Data of the State Committee on Statistics of the Russian Federation.

enterprises in the impact zone of the NSR, as well as of accumulated reserves, in the ports of shipments and trans-shipment points. Such reserves in the regions of the North-East should be almost equal to the volume, required to meet demand for two years. These reserves represent material values costing tens of billions of dollars, and the storage process requires significant expenditures on construction and operation of storage facilities, attraction of additional number of specialists. Failures in marine transport performance often paralyze the economic activity and life itself in vast Arctic and Subarctic regions, or cause urgent need in using costly air transport for delivering food, diesel fuel, metals, construction materials and other similar mass goods.

Improvement of regularity and reliability of the NSR operation in combination with the use of other kinds of transport is especially important for the increasing of the economy efficiency in the eastern part of the Russian Arctic.

3.2. Stages of the NSR development

If not looking far back into the history, four stages should be distinguished in the NSR development: 1) individual expedition voyages (before 1932); 2) organization of regular shipping, construction of special fleet and ports (1932- early 1950s); 3) completion of the exploration of the NSR track, its development into a regularly operating main line in summer-autumn navigation season (1950s-1970s); 4) start of the year-round use of the NSR (since late 1970s).

The goals of the NSR development were being defined as economic development of Arctic and Subarctic regions of Russia went on, they were also conditioned by the interests of national security (as the State leaders understood them). It was no mere chance, that the Northern Navy was created just at the time, when the NSR management body was established (1932). In 1950s the Arctic became the place, where the most powerful nuclear weapon was tested. Naturally, militarization of the Arctic hampered international use of the NSR, and enormous military expenditures of the USSR bound up the possibilities for the economic, technical and social development of the Arctic.

In 1930s a task was set forward to transform the NSR into a regularly operating main line, providing reliable linkage of the economic core of the USSR with the Far North and the Far East, at least during traditional navigation period. Start of the large-scale development of raw resources in the North required not only to increase sharply the volume of freight shipments along the NSR, but also to improve reliability of deliveries and to speed up shipments.

The problem of organization of regular shipping in the seas of the Russian Arctic during traditional navigation season was solved in general in the second half of 1970s due to putting into operation of powerful atomic and diesel-engine ice-breakers and transport ships fitted for sailing in ice, reconstruction of main Arctic ports. The Arctic marine fleet was enriched by atomic ice-breakers of "Arktika" (75 Th. hp) and "Taimyr" (48.3 Th. hp) type, ice-breakers with diesel-electric units of "Yermak" (41.4 Th. hp) and "Kapitan Sorokin" (24.8 Th. hp) type, ice-breaking transport ships "Norilsk" and "Vitus Bering", bulkers of "Dmitry Donskoy" type, packeted timber

carriers of various types, container ships, multi-purpose ships of the "sea-river" type, tankers and other ships - more than 180 ships all in all with total deadweight about 2 million t. In 1960s-1980s large work was done on the reconstruction of Dudinka, Pevek, Zeleny Mys, Tiksi ports. Simultaneously new technical equipment for the provision of shipping was introduced (navigation-hydrographic, aviation, space communication, etc.), system of centralized management of the Arctic marine transport system (AMTS) was improved.

Transition to the year-round navigation along the NSR was carried out in stages. At first there were experimental voyages at early and late dates of the navigation season. These were: voyages in high latitudes of ice-breakers "Lenin" and "Vladivostok" in May-June 1971 from the west to Pevek, experimental transit voyages of atomic ice-breaker "Sibir" (Murmansk - Dudinka) and of diesel-engine "Kapitan Myshevsky" (Murmansk - Magadan) in May-June 1978 and some others. Since late 1970s round-year shipping is regularly performed in the western part of the NSR (Murmansk - Dudinka), that allowed to establish a reliable transport-technological scheme of interaction between industrial regions of Kola Peninsula and Norilsk. By 1989 winter shipments by the Kara Sea reached their peak - 1454 Th. t, or 34% of the annual total volume of shipments.

Specific features of the current stage of the NSR performance (it would be fair to consider it as the 5th stage) are that it combines adjustment of the NSR to new geopolitical and economic conditions in Russia with mastering the experience of prolonged and round-year navigation (especially for transit shipping) and the start of the international use of NSR.

3.3. Dynamics of shipments

Data on the volumes and directions of freight shipments along the NSR from 1945 to 1990 are given in Table 4. The maximum volume of shipments (6578.6 Th. t) was reached in 1987. In comparison with 1945 the volume of shipments in 1987 increased 14.8 times, and in comparison with 1960 - 6.8 times¹⁾.

Growth of freight traffic along the NSR after 1960 was connected first of all with the intensification of mineral resources development. In the western part of the NSR it was production of natural gas and oil in the north of Tyumen oblast and development of Norilsk mining-metallurgical works (copper, nickel, noble and rare metals). In the eastern part of the NSR - formation of industrial complexes, extracting and refining ores of non-ferrous and rare metals, mining of gold and valuable minerals in Chuckotka and in the north of Yakutia.

Since 1968 transportation of copper-nickel ore, and later - of nickel matte, from Dudinka to Murmansk, to "Severonickel" works, as well as of metals and sulphur for domestic plants and export has started. Freight shipments of Norilsk works exceeded the

¹⁾ Data on the volumes of shipments differ in different sources. The largest noted difference was 300 Th. t in 1990. In some cases all shipments along the NSR are taken into account, in other cases - only shipments, carried out by the ships of the Marine Transport Ministry (Department). In recent years a part of shipments was carried out by river ships and foreign vessels.

Table 4

Dynamics and directions of freight shipments on the NSR, 1945-1990, Th. t^{*)}

	1945	1960	1970	1980	1985	1987	1990
Deliveries to the Arctic from other regions of the USSR (coasting), total incl.:							
from the West	71.4	349.1	1563	2279.9	2760.6	2943.6	2490.4
from the East	63.9 7.5	188.1 161	932 631	1418.9 861	1649.9 1110.7	1308.1 1135.5	1355.1 1135.3
Deliveries to other regions of the USSR from the Arctic (coasting) 1556	116.2	113.4	392.7	1292.3	1561.3	1684.7	
Intra-Arctic coasting	85.4	88	340.7	398.6	411.8	358.6	136.2
Foreign trade shipments incl.:	171.1	412	683.6	980.6	1409	1590.7	1212.8
Export	51.3	412	616.9	888.1	1007.5	1080.9	1201
Import	119.8	0	66.7	92.5	401.5	509.8	11.8
Transit	0	0	0.1	0	38.1	1	115.1
Total volume of shipments	444.1	962.5	2980.1	4951.4	6181.3	6578.6	5510.5
Reference							
Total deliveries to the Arctic (coasting and import)	191.2	349.1	1629.7	2372.4	3162.1	3453.4	2502.2
Total dispatch from the Arctic (coasting and export)	167.5	525.4	1009.6	2180.4	2569.3	2765.6	2757

*) "Soyuzmorniproekt" data.

value of 2.5 million t and made up 40% on the average of the total volume of shipments along the NSR. Winter shipments (November-May) reached in 1989 1256.9 Th. t (49% of the total volume of shipments on Dudinka line).

In March-April 1976, in view of planned development of natural gas field on Yamal Peninsula, a pilot voyage of diesel-engine ship "Pavel Ponomarev" was carried out towards Cape Kharasavey, with unloading of cargo on fast shore ice. Later such voyages were made every year and by 1988 the volume of shipments reached 102 Th. t (including 88.4 Th. t in winter-spring season), but then they were stopped because of conservation of preparatory and construction work at gas fields on Yamal.

Since 1979 sea shipments of big-diameter pipes and equipment for main pipelines construction in the north of Tyumen oblast have started from the West-European countries and to a lesser extent from Japan. Freight was delivered on sea ships to the area of Novy Port in the Ob river Bay and transferred by means of floating cranes, to the river platforms, which were then towed to Nadym. The volume of pipes shipments reached its maximum value (432.8 Th. t) in 1988, after that import of pipes stopped.

Siberian timber is exported along the NSR mainly through the port of Igarka; in 1980s it was stabilized at the level of 700-750 Th. t.

Shipments in other directions - archipelago Novaya Zemlya, Franz Josef Land, Amderma, etc. and further to the east of the Vilkitsky Strait - were always less significant in volume. But there are practically no alternatives for these shipments, and they are connected with the necessity to cross the areas covered with thick ice, that's why they are considered to be the most difficult and risky ones in the system of transportation operations.

Shipments in the eastern part of the NSR provide supply of industrial complexes in coastal regions, as well as of Indigirka and Kolyma points via ports of Shmidt Cape, Pevek and Zeleny Mys. Share of shipments from the ports in the eastern region in freight traffic is also not large. They are represented by export of mine posts from Tiksi to Japan, which reached 174.6-195.6 Th. t in 1987, and small quantities of metal scrap (also to Japan) - 21.2-21.8 Th. t in 1987-1989 - from the ports Zeleny Mys and Pevek. Export of coal from Kolyma via Tiksi in 1989-1992 was stopped as unprofitable.

The intra-Arctic coasting covers shipments by the rivers Lena and Kolyma to the points, which are located along the distance from Khatanga to Shmidt Cape, including Novosibirskiye and Lyakhovskye islands. These are mainly cargoes, arriving by railway to the river port Osetrovo on the Lena River, and partly - local freight (coal, timber). These freight flows were provided earlier only by sea ships, to which cargoes were transferred from river ships in the ports Tiksi and Zeleny Mys. As the development of inland-water transport went on, river ships started to handle the larger part of freight, mainly on the rivers Olenek, Indigirka, Kolyma; sea transport had only to deliver freight to Khatanga, the mouth of the Anabar River, partly to Kolyma, as well as to Pevek, Shmidt Cape and points on islands.

Besides cargo flows that were mentioned, sea transport provides delivery of goods to polar stations and other organizations of Hydrometeorological service, airports, geological and hydrographic expeditions, military units, enterprises and settlements,

about a hundred points in total. The volume of delivered goods varies from several hundred to several thousand tonnes to every point.

The beginning of transit traffic along the NSR goes back to 1935. At that time large political and defense significance was given to this initiative. However, difficult conditions of sailing, short navigation season, high insurance rates, etc. made the NSR transit shipping incapable of competing with other marine and railway transport alternatives. Economic costs outweighed political and military-strategical ambitions. In 1967 an attempt was made to revive freight traffic across the entire length of the system, to encourage foreign cargo- and ship-owners to use this route. However, this attempt didn't get necessary support neither among foreign businessmen, nor of the governmental circles of the former USSR. Realization of this initiative was limited to the transportation of pipes from Japan to Murmansk on the ships "Dubna" and "Ustyuzhna" and to the through voyage of the motor ship "Novovoronezh," with freight from the ports of the West Europe to Japan, and back from Japan to Murmansk. Further attempts to renew such voyages were made during navigation seasons of 1985 and 1986, but they were of isolated character and were discontinued.

Transit shipments along the NSR between the ports in Europe, western part of the USSR and countries of South-East Asia were renewed on the initiative of Murmansk shipping company in 1989. In 1990 their volume made up 115 Th. t. Economic efficiency of these transit shipments in early 1990s is explained by the fact, that highly overstated exchange rate of hard currency in relation to the rouble allowed Russian ship-owners to get significant profit in roubles even considering very low freight tariffs in hard currency. Favourable ice conditions on the NSR which existed for several navigation seasons also facilitated transit shipping; it caused difficulties only in the access areas to the Vilkitsky Strait.

Volume of shipments along the NSR began to decrease after 1987 and reduced by 16.2% over three navigation seasons. Half of this reduction can be explained by the discontinuance of pipes import to the Ob Bay. Freight shipments from the West decreased as a result of decline in investment activity and geological exploratory work, partial use of material reserves. Delivery of goods to the points in the eastern part of the Arctic, Norilsk works' freight shipments, timber export from Igarka have changed insignificantly. Sharp reduction of these freight flows started only after 1990.

Total volume of goods delivered to the Arctic along the NSR exceeded total volume of goods shipped from this region (in tonnes) from the mid 1980s and to the late 1980s. However, this didn't mean that the Arctic was a "consuming" region. The reason is, that many products are transported from the Arctic by other kinds of transport: the most valuable (diamonds, gold, platinum, etc.) - by pipelines. Positive balance of goods exchange in 1990 has formed due to the discontinuance of pipes import¹⁾.

1) Reviewer Dr. J.Baerenholdt raised a question on the export-import balance in money terms. Though such calculations have not been made specially for the regions, drawn towards the NSR, the result can be prognosticated with a high rate of probability: negative balance in plan prices, valid at that time (which robbed raw industries), and significant positive balance in the world prices. Such calculations have been made for Siberia and the North by the Institute of Economics and Organization of Industrial Production (Novosibirsk) with the participation of the author.

4. The change of geopolitical and economic conditions of the NSR operation

4.1. Consequences of the USSR disintegration

After the USSR disintegrated into 15 independent states, the NSR has completely fallen under the jurisdiction of Russia, and Russia has become the only legal successor of the USSR in the Arctic zone. However, a part of the tanker fleet, used in the Arctic, has lapsed to Latvia (31 vessels, 20% of total deadweight of the Arctic tanker fleet). In the 1993 navigation season Russia had to freight not only Latvian, but German tankers as well to work in the Arctic.

Indeed, the significance of the NSR for Russia has increased, for the majority of large sea ports in the European part of the former USSR are now owned by Lithuania, Latvia, Estonia (on the Baltic Sea), Ukraine and Georgia (on the Black Sea)¹⁾. The question of extending the ports of St.Petersburg, Kaliningrad, Murmansk, Arkhangelsk, construction of new ports on the coast of the Gulf of Finland of the Baltic Sea, compensating these losses, is now under active consideration. Export relations of the European North have also changed. In particular, coal export from Pechora Bay to Denmark and Sweden through Tallinn and Riga and to Italy through Ilyichevsk port has almost stopped.

Situation in relation to other transport accesses to the West Europe has also changed (See Map 5). Railway, highway and pipeline accesses of Russia to Europe now belong to Lithuania, Buelorussia, Ukraine, Moldova. These exits, as well as sea ports, are certainly not closed for Russia, but they have become less controllable and more costly due to the sharply increased transit tariffs. Therefore, Russia should inevitably pay more attention to the northern seas in order to secure reliability and efficiency of its ties with Europe.

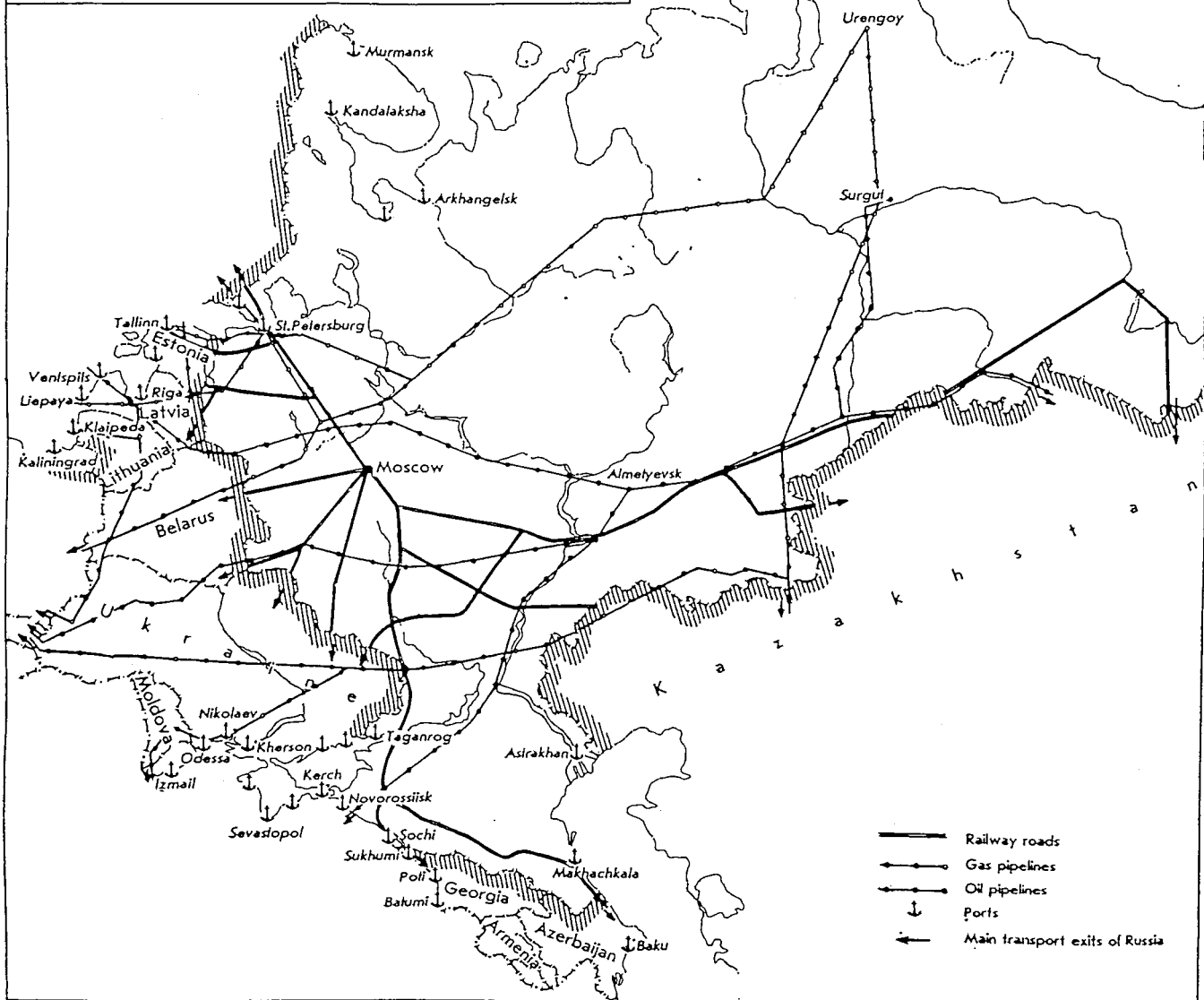
4.2. Opening of the NSR for international shipping

M.Gorbachev has declared in his speech, delivered in 1987 in Murmansk, that the NSR will be open for international shipping. In 1990 "Regulations for shipping along the Northern Sea Route" were approved. They regulate shipping along the NSR on the basis, excluding discrimination for all ships of any state for the purposes of providing safe sailing, preventing and reducing marine environment pollution. In fact, the NSR is completely open to international transit shipping. By now only the port of Igarka is open for calling at to foreign ships, sailing along the NSR. Marine Transport Department agreed to open at least four more Arctic ports: Dikson, Dudinka, Tiksi and Pevek, for foreign ships to call at.

During the 1991 navigation season two foreign vessels were piloted along the NSR: French motor ship "Astrolabe", going as west-to-east transit, and German yacht "Dagmar-Ein" from Naryan-Mar to Igarka. Nordic countries, France, Japan, Canada

¹⁾ All in all, of 37 sea ports in the European part of the former USSR 19 are located on the territory of Russia. Load has especially grown on St.Petersburg and Novorossiisk.

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have expressed interest in the use of the NSR. In June 1990 Soviet-American agreement on sea shipping was signed, envisaging, in particular, provision of preferential access for ships to ports of participants, restoration of the right to ship cargoes from the USA to third countries on Soviet vessels; this agreement could be extended to the NSR as well. At 1991 meeting of the Northern Forum, where plenipotentiary representatives from 14 northern regions of the countries of Europe, America, Asia participated, programme on the international use of the NSR was discussed.

President of Russia Boris Yeltsin has declared in autumn 1991 about the interest of Russian authorities in international cooperation on the NSR, confirming thus continuity of corresponding intentions and decisions of the leaders of the former USSR. In January 1993 Russia has joined cooperation in Barents/Euro-Arctic region.

Demilitarization of the Russian Arctic facilitates international use of the NSR. The number of marine-based missiles is decreasing, reduction of the Northern Navy and other military forces has started. It allows to use disengaged harbours, coastal bases, housing resources, ship repair facilities for the needs of Arctic navigation. Conversion of domestic shipbuilding industry, which worked in the past mainly to military orders, will extend potential in building new types of Arctic vessels and producing technological equipment for the development of the natural wealth of the Arctic, especially of the Arctic shelf. For a long period Russia has been keeping moratorium on nuclear weapon tests on Novaya Zemlya. If the USA agree to halt tests of nuclear weapons completely, Russian nuclear test-field will be closed immediately.

On the whole, changes in geopolitical situation on the territory of the former USSR, improvement of political climate in the North of Europe, liberalization of external economic activity in Russia, create favourable prerequisites for the international use of the NSR.

4.3. Economic crisis and state protectionism

In recent years main negative impact on the NSR operation was produced by general economic crisis in Russia, accompanied by the faults of transition from planned to market economy.

Apparent economic crisis has begun in the country in 1990, when the USSR yet existed. But in the Russian North the crisis, in a dull form, has started much earlier, and was caused by two main reasons: 1) reduction of public investment in the sea fleet and port economy, technical reconstruction of main productions, geological survey; and 2) depletion of a number of large deposits of mineral resources (oil, non-ferrous metals ores, apatites, etc.). Volume of shipments along the NSR started to decrease since 1988. By the beginning of general crisis in the USSR and Russia the economy of the Arctic zone and the NSR had been already in a weakened state.

It were just Northern and Arctic regions that were struck especially painfully by general crisis and faults of transition period, because the former state economic system had the most accomplished forms here, while monopolized and highly specialized economy was not capable of self-regulation. Cessation of public material and technical

supply resulted in the interruption of the regularity in products deliveries from other regions. Most part of industrial enterprises, ice-breaking fleet, ports got into hard financial situation because of prices liberalization and change of the credit system. Inflation shock in the beginning of 1992 has practically annihilated money savings of the residents of the North, who had relatively higher incomes in the past, significantly lessened their real incomes and stimuli to live in the North.

Total volume of industrial output in the Russian North has decreased by more than 40% over last four years. Output of almost all main kinds of products: oil, non-ferrous metals, gold, timber, chemical raw materials, fish, has decreased. Gas production decreased to a smaller extent. Data on industrial production dynamics in the regions, adjacent to the NSR, in 1992-1994 are given in Table 5.

Table 5.

Dynamics of industrial production in the regions, adjacent to the NSR
(1994 in % to 1991 in comparable prices)

Murmansk oblast	62.2
Republic of Karelia	52.3
Arkhangelsk oblast	61.5
incl. Nenets Autonomous District (A.D.)	100.3
Republic of Komi	62.2
Komi-Permyatsky Autonomous District	35.7
Yamal-Nenets Autonomous District	80.0
Khanty-Mansi Autonomous District	59.5
Taimyr Autonomous District	66.2
Evenk Autonomous District	54.8
Republic of Sakha (Yakutia)	75.7
Magadan oblast	73.6
Chukchi Autonomous District	55.2

The volume of geological exploration work in the North has decreased more than twice in comparison with its maximum level, that will cause significant difficulties in the restoration of mining industry in the future. The volume of investments has decreased even more: 5 times over 1991-1994 period! The share of centralized investments decreased from 80% (1989) to 14% (1993). Thus, the federal centre has almost completely stopped investment activity in the North.

Unfavourable tendencies in the development of joint-stock company "Norilsky Nickel", accounting for a significant part of shipments along the NSR, should be noted. Its industrial output decreased in 1994 by 39.2% as compared to 1991; export of main metals has also decreased; given price for nickel on the world market has decreased more than twice.

Decline in production and investment activity in the North has caused the employment problem for the first time in this region. By the beginning of 1994 the number of registered unemployed reached 88.4 thousand persons, and the total number of unemployed - 125.4 thousand persons. This circumstance, as well as decrease in real incomes, loss of benefits in relation to incomes as compared to the residents of other

regions, caused the first in the history of the Russian North wave of mass out-migration (See Table 6.).

Table 6

Intensity of the population migration in the regions, adjacent to the NSR
(average annual migration balance per 1000 population)

	1981-1985	1986-1990	1991-1993
Murmansk oblast	7.1	3.4	-20.6
Republic of Karelia	1.1	0.3	0.3
Arkhangelsk oblast	-0.8	-1.7	-4.7
incl. Nenets A.D.	3.9	-6.6	-30.2
Republic of Komi	1.4	-2.7	-11.4
Komi-Permyatsky A.D.	-15.4	-8.6	0.4
Yamal-Nenets A.D.	114.9	27.1	-25.5
Khanty-Mansi A.D.	69.9	22.6	-7.4
Taimyr A.D.	9.4	-13.5	-35.5
Evenk A.D.	37.4	16	-37.4
Republic of Sakha (Yakutia)	11.8	2.0	-23.6
Magadan oblast	4.7	-10.6	73.2
Chukchi A.D.	8.7	-14.3	-106.6

The Russian Government has somewhat lately realized, that the Arctic and the NSR are not able to adapt to market conditions and overcome the crisis relying only on themselves, and that it may lead to irreversible losses in the national economy. Since 1992 special anti-crisis and stabilizing measures are being implemented in the area of the North. They include: 1) state order to minimum necessary importation of food, fuel, consumer goods, etc. to the North (along the NSR - 2,100,000 t in the 1993 navigation season); 2) privileged crediting of payments for seasonal cargoes; 3) covering of 50% of cargo shipment tariffs from the federal budget; 4) public subsidies to certain enterprises; 5) provision of export quotas and reduction of customs duties; 6) increase of prices for oil, gas, some non-ferrous metals and raw, regulated by the state; 7) provision of additional privileges to the residents of the North, etc.

However, adjustments, made in financial-economic mechanism, turned out to be insufficient to stabilize the situation in the North, and besides, they were too often revised. Thus, in 1994-1995 the majority of credit and tax privileges was abolished, instead direct financial support to local budgets and transport companies was strengthened.

Attempts to adjust Arctic sea transport to new economic conditions (in particular, further decentralization of management, privatization and sale of a part of the fleet, shareholding of port facilities) has not led, up to the moment, to any positive results. Maybe, the only notable benefit gained by the Arctic transport network from the economic reform, was more free freighting of Russian vessels by foreign shipment

companies and use of earned hard currency for the purposes of financial stabilization of the Arctic fleet.

5. The present state of the NSR

5.1. Organization of shipping

In recent years significant changes in the organizational-economic structure of the Arctic transport network has been taking place:

1. Ministry of Marine Transport was liquidated. It was substituted (but with more limited rights) by the Marine Transport Department (MTD) within the Ministry of Transport. Administration of the NSR is one of the structural subdivisions of the MTD.

2. Besides sea shipping companies, subordinated to MTD, other shipping companies, including foreign ones, have started operation in the Russian Arctic.

3. Ownership of Arctic ports is being transferred to the subjects of the Federation and municipalities.

4. The process of sea shipping companies privatization (shareholding) and selling individual Arctic ships is going on.

Distribution of Arctic shipments between different agencies and companies in 1993 is given in Tables 7 and 8. The major part of shipments is still carried out by shipping companies of the MTD, and among them the Murmansk company - as far as shipments of dry cargoes are concerned, Primorskoye (in the Far East) - oil products.

In 1991 river ships started operation on the sea routes, they have delivered over 30,000 t of oil products from Arkhangelsk to Amderma. In 1992 shipments on river vessels significantly increased; they provide transportation of cargoes from the River Lena to the rivers Yana and Indigirka, their involvement in shipments from the Lena to the Kolyma rivers, from the Kolyma River to Pevek, and in timber export from Tiksi to Japan is extending. Such extension of the region, where river ships sail, is explained by favourable ice conditions in the eastern part of the Russian Arctic during last navigation seasons.

Tankers of Latvian shipping company, which became "foreign" after the USSR disintegration, traditionally participate in Arctic shipments. In 1993 ships of joint Russian-Finnish company "Arctic Shipping Service" (ASS) have started operation on the NSR. Substantial part of oil products, moving from Arkhangelsk to the points of the North-East, was shipped by tankers of ASS (including German ships, held on rent).

After the collapse of the former state system of centralized supplies to the Russian North, adjustment of the Arctic transport system to the realities of transition period goes on rather painfully.

Table 7

Cargo shipments along the NSR, carried out by different companies,
in 1993 (thousand tonnes)*)

	Dry cargo ships	Tankers	Total
MTD shipping companies	2379.3	461.0	2840.3
Foreign ships	20.2	209.3	229.5
Ships of Inland-Water Transport Department	41.2	3.9	45.1
Ships of other departments	1.1	1.4	2.5
Total	2441.8	675.6	3117.4

*) "Soyuzmorniproekt" data

Table 8

Distribution of Arctic shipments among the MTD shipping companies
in 1993, in %*)

Shipping companies	Dry cargo ships	Tankers
Murmansk	59.0	-
Arctic	4.6	12.7
Northern	18.4	1.0
Baltic	0.2	-
Far East	16.6	-
Primorskoye	-	86.3
Sakhalin	1.3	0.0
TOTAL	100.0	100.0

*) "Soyuzmorniproekt" data.

Illusions about the possibility of regulating the ties of the North with other regions with the help of the "free market" itself, vanished very quickly. State regulation is strengthening again.

Mechanism for cargoes transportation to the Arctic, which operated during the 1993-1994 navigation season, included the following main elements: 1) public credits to consignors and consignees, 2) appointment of organizations, responsible for products delivery, 3) approval of cargo shipments plan, 4) establishment of terms of ports opening and closure for the acceptance of cargoes for the Arctic¹⁾. However, operation

¹⁾ In the 1993 navigation season deadline for the acceptance of cargoes was established: for shipments from Vladivostok, Nakhodka, Vanino to Tiksi, Pevek, Zeleny Mys, Shmidt Cape - 10 August; for shipments from Murmansk, Kandalaksha, Arkhangelsk to Tiksi and farther to the East - 15 August.

of this mechanism is unsatisfactory: recipients of credits receive them with large delays; schedule of cargoes delivery to the basic ports (beyond the Arctic zone) is not observed; there are not enough economic incentives for the basic ports to carry out cargo shipments for the Arctic, they prefer international shipments.

As a result, mass shipments along the NSR start with large delays and continue after deadlines. Thus, during the 1993 navigation 56.3% of the total volume of planned cargoes were transported from Vladivostok after 15 August (given the deadline was established on 10 August), 85.6% - from Nakhodka, 67.5% - from Vanino. In the western part of the NSR the bulk of the cargoes was shipped with 20-25 days delay; 76.3% of the total volume of cargoes were shipped to the points on the Laptev Sea and East-Siberian Sea after the established deadline. Cargoes, claimed for transportation in 1993, were delivered after all to the points of destination (with few exceptions) only due to the decrease in the volume of transported goods and more favourable ice conditions. It became impossible to avoid losses in the 1994 navigation. 16 transport vessels were damaged in ice.

5.2. The Arctic fleet

Transport fleet. In 1993 the MTD had 373 transport vessels of ice classes (ULA, UL, L-1), which operated in the Arctic. Ice-breaking transport ships (ULA class) - the most fitted ships for the work under hard ice conditions - account for 13% of total deadweight (31 ships), ships of UL class - 40% (118 ships), ships of L-1 class, which are allowed to work in the Arctic only under favourable conditions, - 46% (224 ships). Average age of ships of ULA and UL classes (11 years) is far from the limit yet; age of 44 ships have exceeded critical level (for the Arctic it is estimated at 15 years); they need replacement in the nearest years. The problem of age of the ships causes more concerns in relation to the ships of L-1 class. Their average age is 22 years, 207 of 224 ships, i.e. 92%, are older than 15 years (See Table 9). As far as specialization of the ships is concerned, the situation is dramatic with timber carriers, supply ships, tankers; the majority of them are to be written off (See Table 9).

Table 9

Composition of the fleet of L-1 class and higher in shipping companies
(as of 1 January 1993)*

Ice class	Average age	Number of ships	Tonnage, Th. t
ULA, total incl.:	11 years	31	298.2
	under 5 years	3	18.6
	6-10 years	21	238.2
	11-15 years	1	12.2
	16-20 years	-	-
	above 20 years	6	29.2

Ice class	Average age	Number of ships	Tonnage, Th. t
UL, total incl.:	11 years	118	915.5
	under 5 years	35	153.8
	6-10 years	11	109.3
	11-15 years	34	403.1
	16-20 years	35	237.9
	above 20 years	3	1.4
L-1, total incl.:	22 years	224	1054
	under 5 years	2	8.7
	6-10 years	13	71.1
	11-15 years	2	3.0
	16-20 years	30	291.1
	above 20 years	177	680.1
TOTAL: incl.:	17 years	373	2267.7
	under 5 years	40	181.1
	6-10 years	45	418.6
	11-15 years	37	418.3
	16-20 years	65	529
	above 20 years	186	720.7

*) "Soyuzmorniproekt" data

Decrease in the volume of shipments along the NSR leads not only to the reduction of the workload of the Arctic transport fleet (See Table 10), but also creates possibilities for quality improvements in the composition of the used fleet due to the disengagement (not writing off) of the oldest and less fitted ships (See Table 11).

Table 10

Dynamics of the workload of the MTD ships, which operated
in the Arctic in 1990-1993*)

Year	Number of operating ships	Number of voyages	Number of voyages per ship
1990	251	886	3.52
1991	243	811	3.34
1992	191	601	3.15
1993	170	469	2.76

*) "Soyuzmorniproekt" data

In 1993 150 of 373 available ships of the MTD were operating on the NSR (40% of the total number and 53% of deadweight). Only 57 of 224 ships (25%) of the lowest class L-1 were used, including ships above 20 years of age - only 37 of 177 (21%).

The most efficient dry cargo ships of "Norilsk" and "Dmitry Donskoy" type carried out 58.2% of the total volume of shipments (27.2 and 31.0% correspondingly)¹⁾.

Data on the specialization of the MTD ships, which operated in the Arctic in 1993 are given in Table 12. Besides ships of the MTD shipping companies, 7 Latvian tankers, 3 ASS tankers, and 2 more ships of Russian departments (12 ships in total) were involved in carrying out shipments along the NSR.

Table 11

Composition of the fleet of L-1 class and higher,
which operated in the Arctic in 1993)*)

Ice class	Average age	Number of ships	Tonnage, Th. t
ULA, total incl.:	10 years	16	169
	under 5 years	1	6.2
	6-10 years	12	140.4
	11-15 years	-	-
	16-20 years	-	-
	above 20 years	3	22.4
UL, total incl.:	11 years	77	730.7
	under 5 years	23	102.7
	6-10 years	7	101.6
	11-15 years	21	310.4
	16-20 years	26	216
	above 20 years	-	-
L-1, total incl.:	21 years	57	298.5
	under 5 years	-	-
	6-10 years	4	17.5
	11-15 years	-	-
	16-20 years	16	145.5
	above 20 years	37	135.5
TOTAL: incl.:	15 years	150	1198.2
	under 5 years	24	108.9
	6-10 years	23	259.5
	11-15 years	21	310.4
	16-20 years	42	361.5
	above 20 years	40	157.9

*) "Soyuzmorniproekt" data

In recent years, under crisis, the Arctic transport fleet is being replenished only due to the contracts with shipbuilders, which were signed before 1991. These are 15 timber carriers (of "Pavlik Vinogradov", "Kapitan Goncharov", "Igor Ilyinsky" type), 11 tankers (of "Partizan" type).

¹⁾ In 1993 ships of ULA and UL classes carried out 58.9% of all voyages, while in 1986 - 46.1%.

Specialization of the MTD ships, which operated
in the Arctic in 1993*)

	Number of ships	Average age (years)
Timber carriers	75	16
Multi-purpose ships	32	13
Tankers	21	17
Bulk carriers	25	12
Refrigerator ships	3	8
Container ships	1	14
Lighters	1**)	5
Total	158	15

*) "Sojuzmorniiiproekt" data

**) Atomic lighter "Sevmorput", used on Dudinka direction.

It is important to remember, that the existing Arctic transport fleet fulfils its current tasks only due to significant reduction of the volume of transported freight and to more favourable ice conditions during several navigation seasons. According to experts' estimates, the first hard navigation season will reveal many drawbacks of the transport fleet. The existing fleet will not be able to cope with the volume of shipments, that was reached in the second half of 1980s.

Transfer of ice class ships to various commercial transport companies, not working in the Arctic, which is practiced at present by the MTD shipping companies, seems to be a rather short-sighted and risky action. Thus, in 1993 Murmansk and Sakhalin shipping companies sold 5 ships of "Norilsk" type.

Ice-breaking fleet. At present 16 line ice-breakers are operating on the NSR: 7 nuclear-powered ice-breakers and 9 diesel-engine ice-breakers (See Table 13). Maximum number of line ice-breakers (18) operated in 1992. A nuclear-powered ice-breaker "Ural" of "Arktika" series is being built in St.Petersburg (Baltic works), but it will be with improved lines, power plant and equipment. Because of insufficient financing, construction is going on slowly, with breaks. The Government has confirmed its intention to complete construction of this nuclear-powered vessel.

Operating line ice-breakers meet the needs of the Arctic shipping completely. As it was the case with the transport fleet, this is explained mainly by the reduction of shipments volume and favourable ice conditions in recent navigation seasons. Even late start of shipping decreases need in ice-breakers in the early, and the most difficult, period of navigation.

Table 13

Composition of operating line ice-breakers in 1993

Name	Date of launching Th. hp	Installed capacity, performance, m	Rated ice-breaking
1. NUCLEAR-POWERED			
"Arktika"	1974	75	2.3
"Sibir"	1977	75	2.3
"Rossia"	1985	75	2.3
"Sovetsky Soyuz"	1989	75	2.3
"Yamal"	1992	75	2.3
"Taimyr"	1989	48.3	1.8
"Vaigach"	1990	48.3	1.8
TOTAL:		471.6	
2. DIESEL-ENGINE			
"Yermak"	1974	41.4	1.6
"Admiral Makarov"	1975	41.4	1.6
"Krasin"	1976	41.4	1.6
"Kapitan Sorokin"	1977	24.8	1.5*)
"Kapitan Nikolaev"	1978	24.8	1.5*)
"Kapitan Dranitsyn"	1980	24.8	1.4
"Kapitan Khlebnikov"	1981	24.8	1.4
"Murmansk"	1968	26	1.4**)
"Vladivostok"	1969	26	1.4**)
TOTAL:		275.4	
IN ALL:		747.0	

Notes: *) After reconstruction ice-breaking performance of the ice-breakers "Kapitan Sorokin" and "Kapitan Nikolaev" was increased up to 2.25 and 2.0 m correspondingly. Data need to be specified, because they were obtained from calculations in the result of the experiment, carried out in ideally flat, and. significantly thinner ice.

***) At present ice-breaking performance has decreased because of age wear.

In 1993 only 9 ice-breakers were operating (6 nuclear-powered and 3 diesel-engine). Distribution of operations in time (in % of calendar period) was as follows: operations in the Arctic - 29.5; operations in other freezing basins - 4.7; cruise voyages - 6.2; other operations - 0.3; repair - 23.1; anchorage - 36.2. Nuclear-powered ice-breakers "Yamal", "Rossia" and "Taimyr" operated in the Arctic most of all. In the eastern part of the NSR nuclear-powered vessels were not used at all. Duration of work during the prolonged period of navigation exceeded duration of work in the summer-autumn season.

Situation with line ice-breakers is becoming more complicated due to the fact, that nuclear-powered vessels "Arktika" and "Sibir", diesel-engine ice-breakers "Murmansk" and "Vladivostok" have to be written off before 2000. The probability of hard ice conditions, that may occur, must also be taken into account.

The situation with port ice-breakers is more critical. 14 ice-breakers of "V.Pronchishev" type (5.4 Th. hp), built in 1961-1971, have exhausted their rated term, are partly written off or are to be written off. At present the only ice-breakers, fully satisfying to necessary requirements, are the ships "Mudjug", "Dikson", "Magadan" (12.4 Th. hp each), built in 1982-1983 in Finland, while the normal demand is 12 ships.

Perspectives of the Arctic fleet for the nearest future comply, in principle, with the general tendencies in the development of the Russian merchant fleet. According to the MTD estimate, the deadweight of the Russian fleet will make up 25% of 1991 level by 2000.

5.3. Arctic ports

Ports of the Russian Arctic can be divided into two groups according to their affiliation: 1) ports, owned by the MTD: Amderma, Dikson, Khatanga, Tiksi, Pevek; 2) ports, owned by other departments: Dudinka, Igarka, Zeleny Mys, Shmidt Cape, Ryveem. In accordance with the strict notion of the "Arctic", adopted in the Russian marine fleet, ports Murmansk, Arkhangelsk, Naryan-Mar, as well as the ports in the Far East to the south of the Bering Strait, are not related to the Arctic ports, but of course, this can't lessen their role in the Arctic transport supply.

In Table 14 data are given on the operation of Arctic ports in 1993 as compared with 1987, when the largest volume of shipments along the NSR was achieved. Of 11 ports, the volume of handled freight has increased only in Khatanga. Other departments' ports handle approximately 75% of the total freight volume, while the MTD ports - about 25%.

Amderma and Khatanga are the roadstead ports. Port Amderma provides services to organizations and enterprises, located in the vicinity of the port. The role of port Khatanga is significantly larger: the port fleet provides goods deliveries for the needs of enterprises, organizations and settlements, located in a very large region - Khatanga Bay, along the Khatanga River and its tributaries. A part of freight, transported to Khatanga from Tiksi, is delivered to the port dwarfs on sea vessels with the limited draught; the major part of freight is handled in the open roadstead in the Khatanga Bay.

Operation of the port *Dikson* is limited to handling freight for local organizations; its role as a base for fleet servicing, planned earlier, has not been realized, for there were no funds to invest in the reconstruction of the port.

The main task of the port *Tiksi* is transshipment of cargoes, moving from the Lena River to the points of the Laptev Sea and the East-Siberian Sea, as well as coming from the ports of the Far East and North-West, destined for the points of the rivers Lena and

Yana, and for local needs. Timber, destined for export, is also transshipped from rafts and river vessels onto the sea ships in Tiksi.

Table 14

Operation of the Russian Arctic ports
(volume of handled freight, Th. t)*)

	1987	1993
1. Ports of the Marine Transport Department		
Amderma	97.5	7
Dikson	122.3	21.9
Khatanga	45.6	101.2
Tiksi	844.5	153
Pevek	719.7	324.5
2. Ports of other departments		
Dudinka	2477.2	1245.2
Igarka	752.5	296.6
Zeleny Mys (port)	383.9	88.6
Zeleny Mys (roadstead)	51	16.2
Shmidt Cape	131	30.9
Ryveem	25.2	3.7

*) "Soyuzmorniproekt" data.

In the port *Pevek* cargoes are handled for the industry and settlements of Chuckotka, and transshipment of cargoes for the Kolyma is carried out.

Dudinka belongs to Norilsk mining-metallurgical works. The port is located on the right bank of the Yenisei River and its tributary - the Dudinka River, 231 miles from its mouth. Depths at the sea dwarfs are 7-11.5 m, passable depths from the Yenisei Bay are 10.4-10.6 m. The port operates all year round with a break during the high-water period from the 3rd decade of May until the 2nd decade of June.

The port *Igarka* belongs to the Igarka transshipping saw-mill. It is located on the right bank of the Yenisei River, 370 miles from the mouth. Main operations on loading exportable timber onto the sea ships are performed from river barges by means of floating cranes. A part of local sawn timber is loaded from the dwarfs, directly adjoining the saw-mill. Accesses to the port are limited by the Lipatnikovskiye sand bars, where the depths are 6.8-7.2 m. Duration of the navigation season is usually 155 days. Shipping sometimes can be prolonged after freezing over with the help of ice-breakers.

Since 1994 the port *Zeleny Mys* in the mouth of the Kolyma River belongs to the Republic of Sakha (Yakutia), earlier it was affiliated to the Chuckchi Autonomous District. After the reconstruction in 1986-1992 of dwarf front, storage facilities,

engineering communications and other objects its potentialities were improved, but due to limited depths of the Kolyma bar and the port water area it can take only vessels with the draught 4.0-4.5 m. Larger vessels are unloaded in the open roadstead beyond the bar in the area of the harbour Ambarchik. Duration of the navigation season depends on the dates of the river opening and freezing and varies within the range of 95-120 days.

The port of *Shmidt Cape* is affiliated to the enterprise "Severovostokzoloto". It is a roadstead port with seasonal regime of operation and rather severe natural conditions. In 1986 an ice pier with gravel cover, 99-108 m in length and 8.0-8.5 m depth was constructed in Vostochnaya harbour, where vessels could moor to unload cargoes directly to the motor transport. The pier is systematically destroyed and requires reconstruction. Duration of the navigation season is from 80 to 120 days. Port point *Ryveem* with several dwarfs for ice-breakers is located to the east of Shmidt Cape in the mouth of the river of the same name.

Parameters and technologies of cargoes handling in all Arctic ports of the MTD do not meet current requirements and lag behind the potentialities of the Arctic fleet. Of all Arctic ports of other departments only Dudinka and Zeleny Mys are in satisfactory technical condition. The situation is aggravating, since in the last 3-4 years work on the extension and reconstruction of port facilities has almost stopped.

The process of transferring the MTD ports to the subjects of the Russian Federation, municipalities and individual departments is going on at present. Thus, the port Tiksi has become now the municipal property of Tiksi settlement, ports in the Anadyr Bay - the property of Chuckchi Autonomous District, port Dikson - property of Norilsk mining-metallurgical works as a subdivision of the port Dudinka.

5.4. Regimes of shipments

Main tendencies in the NSR intensification include extension of the duration of regular shipping, transition to the round-year navigation, development of transit shipments.

At present annual navigation along the NSR comprises two main seasons: *traditional* and *extended*. The extended season consists of several periods: autumn (after traditional season is over), winter, spring (See Scheme 1).

Scheme 1

Navigation seasons on the NSR

Months of the calendar year											
I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Extended					Traditional				Extended autumn		
winter			spring								

In the section Murmansk - Dudinka round-year shipping with a break for the spring high-water period on the Yenisei River has been taking place for many years already. For example, in 1993 last ship in the spring season left Dudinka in the western direction on 19 May (motor ship "Atmoda"), and the first ship after the high-water period arrived in Dudinka from the west on 28 June (motor ship "Arkhangelsk").

Extended navigation is carried out almost completely by the ULA and UL classes ships with the assistance of ice-breakers (in case of emergency).

In recent years navigation during both traditional and extended, especially during extended, seasons was facilitated by favourable ice conditions in the south-western part of the Kara Sea and in the eastern section of the NSR. Conditions were constantly difficult only at the approaches to the Vilkitsky Strait (from the west and the east). It allowed sailing of transport ships of all classes in traditional navigation season practically without the assistance of ice-breakers.

Increase of *transit* shipments (See items 5.5 and 6) stands against a background of general reduction of the volume of shipments along the NSR. They were carried out by the ships of two types: "Dmitry Donskoy" and "Norilsk", including shipments in the extended season, accompanied by nuclear-powered ships. In 1993 transit voyages were carried out in the period from 25 April until 21 November¹⁾.

5.5. Volumes and directions of shipments

In 1993 total volume of shipments along the NSR made up 3015.7 Th. t, including 2738.7 Th. t by the MTD ships. In comparison with the year, when maximum volume of shipments was achieved (1987), the volume of shipments in 1993 decreased by 54.2%. Decrease in the volume of shipments in 1991-1993 was rather rapid: 1991 - by 12.6%; 1992 - by 20.9%; 1993 - by 22.8%.

Dynamics of freight shipments carried out by the MTD ships in the main directions is given in Table 15. This table is supplemented with the data on shipments, carried out by the ships of foreign companies, inland water transport and ships of other departments (See Table 16).

Table 15

Freight shipments along the NSR in 1991-1993, carried out by the MTD ships (Th. t)*

	1991	1992	1993
I. Shipments to the Arctic from other regions (coasting)	2261.6	1753.4	1202.3
incl.:			
from the West	1193.8	768.2	557.6
from the East	1067.8	834.5	644.7

¹⁾ The first voyage from the West to the East was carried out by the motor ship "Kandalaksha", led by nuclear-powered ship "Rossia", from 25 April till 23 May. The last voyage in 1993, also from the West to the East, was carried out by the motor ship "Kapitan Kudlai" with the assistance of nuclear-powered ice-breakers "Taimyr" and "Yamal" from 6 to 21 November.

	1991	1992	1993
2. Shipments from the Arctic to other regions (coasting)	1450.7	1272.2	753.3
3. Intra-Arctic coasting	170.0	87.8	71.2
4. Foreign trade shipments incl.:	745.5	449.9	503.3
import	1.9	5.2	3.0
export	743.6	444.7	500.3
5. Transit	176.2	202.3	208.6
Transported in total	4804.0	3614.9	2738.7

*) "Soyuzmorniproekt" data.

Table 16

Freight shipments in 1993, carried out by the ships of foreign companies, inland water transport and ships of other departments (excluding the MTD), Th. t *)

Shipments from the West	221.6
Shipments to the West	14.2
Intra-Arctic coasting	24.2
Export (timber from Tiksi to Japan)	17.0
Total	277.0
incl. shipments by tankers	214.6

*) "Soyuzmorniproekt" data.

Table 17

Structure of the total volume of shipments by the regions of the NSR (%)*)

Year	Western section	Eastern section	Transit
1990	70.5	27.4	2.1
1991	67.7	28.7	3.6
1992	69.0	25.8	5.2
1993	63.5	29.6	6.9

*) "Soyuzmorniproekt" data.

Dynamics of aggregated geographical structure of shipments, carried out by all types of ships, is given in Table 17.

The main reason for the decrease in the volume of shipments along the NSR is the decline of industrial production, investment activity, geological exploratory work, decrease of the population in the regions, gravitating towards the NSR.

From this point of view, the situation with the NSR is typical. In the result of economic crisis operation of all kinds of transport is decreasing sharply in all regions of Russia. Failure of organizational-economic mechanism for goods deliveries to the Arctic and Subarctic regions is a specific factor for the NSR (See item 5.1.). Reduction and wear-out of the Arctic fleet and Arctic port facilities is relatively weakly manifested yet (due to decrease in cargo flows and favourable ice conditions).

The most significant reduction of the volume of shipments was observed in the following directions (1993 data are compared to the year, when the volume of shipments was maximum; Th. t).

Deliveries from the West:

- to Dudinka - 398.4 (813.3);
- to Tiksi and the River Yana - 61.7 (384.0);
- to the western coast of Yamal - completely stopped (101.8).

Deliveries from the East:

- to Pevek - 309.2 (474.4);
- to Kolyma - 131.6 (331.0);
- to Shmidt Cape - 152.8 (272.3).

Intra-Arctic coasting - 71.2 (423.9); these data on shipments, carried out by the ships of the MTD, do not account the increase in shipments, carried out by river vessels in the eastern region.

Deliveries from the Arctic to other regions:

- from Dudinka - 697.1 (1728.1).

Export - 503.3 (1590.7); this reduction was mainly caused by the reduction of shipments of products from Norilsk mining-metallurgical works, timber from Igarka and Tiksi, coal from Tiksi and Zeleny Mys.

Import - 3.0 (432.9); the main reason - discontinuance of pipes shipments to the Ob Bay.

Thus, besides the reasons, common to the whole country (crisis), and deformation of organizational-economic mechanism for goods deliveries to the North, significant impact on the reduction of shipments along the NSR was caused by specific *regional factors*: decline of production at the Norilsk mining-metallurgical works, decrease of timber export from the Arctic ports, discontinuance of goods deliveries for oil and gas industry to the Ob Bay and Yamal Peninsula. While assessing the perspectives for the NSR development, attention should be focused on these factors, forming Arctic cargo flows.

5.6. Financial situation

Multiple reduction of public financing of marine transport, liberalization of prices and external economic activity have radically changed financial situation in the Arctic transport system. The largest impact is produced by the following factors: 1) change in the ratio between tariffs for the services produced by the fleet and ports and prices for the products, providing operation of the Arctic transport; 2) faults in profitability of coasting and external shipments. The situation is aggravated by the negative impact of the decrease in the volume of shipments, not only lessening absolute amount of revenues, but also increasing the share of costs, which do not depend on the volume of shipments (especially on the maintenance of the ice-breaking fleet and the NSR infrastructure).

At present transport fleet is the most profitable part of the Arctic transport system. But its profitability varies significantly by the directions of shipments, types of ships, kinds of transported cargoes.

Understated and rapidly falling exchange rate of the rouble has made voyages of Russian ships abroad especially profitable. Public policy of restraining coasting tariffs also contributes to it. In 1993 profitability of coasting shipments made up 67.2%, while that of shipments abroad - 240.2%¹⁾. Shipments abroad, making up 25.9% of the total volume of shipments, brought 62.5% of total revenues and 74.5% of total profit of the MTD transport fleet. Due to the earned hard currency sea shipping companies were able to subsidize ice-breakers and transport ships carrying out coasting voyages, equalizing thus levels of sailors' wages and social welfare, as well as conditions of material and technical provision of the fleet.

Significant faults in profitability of shipments abroad and coasting shipments have not only financial but also social consequences (unhealthy competition for obtaining foreign freights, unjustified large differences in incomes between the crews of the ships, etc.)²⁾. However, the problem of increasing economic incentives for shipping companies and ships to carry out coasting shipments should be solved independently, because the possibilities of redistributing incomes from voyages abroad are lessening with the extension of economic independence of ships (especially after their privatization).

Profitability of coasting shipments also varies significantly. The most profitable are Igarka and Dudinka directions (602.5 and 137.1% correspondingly in 1993); shipments in the eastern section are less profitable on the whole (43.5%), as well as transit (54.8%). Operation of supply ships is unprofitable. Profitability of extended navigation became significantly higher, than profitability of navigation in traditional season.

1) Profitability is calculated according to the formula:

$$R = \frac{I - C}{C} \times 100$$
, where R - profitability in %, I - revenues,

C - expenses.

2) Reviewer Dr. J.Baerenholdt draws attention to this circumstance. His own case study, carried out for the fishing fleet and fish processing enterprises in Murmansk, shows undesirable consequences of large dependence on hard currency revenues.

Ice-breaking fleet is now in a difficult financial situation, in spite of the fact that tariffs for its services are constantly increasing (in 1993 - 3 times). By the beginning of 1994 they increased 1376 times as compared to 1989. Ice-breaking fleet gains significant part of revenues from navigating foreign ships and cruise voyages (in 1993 - 1,946,000 and 1,650,000 doll. correspondingly). In 1993 ice-breakers got state subsidy in the amount of 3943.4 million roubles (12.7% of total expenses). But the major part of this sum was paid in the IV quarter, that's why Murmansk shipping company had to take credits for financial support of ice-breakers in the first half of the year. Almost a half of the subsidized sum was spent to pay interest on credits. It should be mentioned, that depreciation of used ice-breakers (120.1 million roubles in 1993, i.e. 0.4% of total expenses) does not provide any financial base for their overhaul repair and renovation.

Arctic ports bring small profit on the whole, and a number of ports are unprofitable. However, profitable ports (for example, Dikson, Pevek) don't have enough means even for the maintenance of the present level of necessary technical state¹⁾.

Dynamics of profitability of the elements of the Arctic transport system is given in Table 18. In 1992-1993 acceptable rate of profitability was achieved mainly due to shipments abroad. Main (intra-Russian) part of the Arctic transport system has insufficient profitability.

Table 18

Profitability of the Arctic transport system in 1990-1993, %*)

	1990	1991	1992	1993
Transport fleet	86.6	77.8	112.9	145.1
Ice-breaking fleet	24.1	-23.5	-25.1	-6.8
Arctic ports	47.6	25.1	7.9	13.4
Total	53.4	18.5	53.2	58.7

*) "Soyuzmorniiiproekt" data.

¹⁾ Reviewer A.Bond proposes to use revenues from international transit shipments for modernization of the ports. Probably, under the former planned system it would have been so. Now ships and ports are independent economic subjects. Opportunities for the redistribution of revenues between them are restricted by tax legislation.

6. Public policy for the development of the Arctic and the NSR

The necessity of the state support for the economy of the North and the Arctic is acknowledged by all branches of federal authorities, main political parties and political movements. The heated life of the first supreme body of new Russia - Congress of the Peoples' Deputies (1990-1993) knew the only instance of consensus while considering major issues - the adoption of the Resolution on social-economic development of the North, including, as the supplement, Concept of the State Programme for the development of the North (April 1992). Formal benevolent attitude to the problems of the North is typical of the Russian mentality. However, in real state policy, affecting not coinciding interests of different regions, social and political groups, protectionist policy towards the North forces its way with great difficulties.

6.1. New legal base

In recent years work on the legal establishment of the special status for the regions of the North, privileges and compensations for the residents of the North has been intensified in the process of economic reform. But normative-legal acts, which have been adopted by now, have many deficiencies and are often revised, i.e. they do not form a stable legal base, oriented to the regions.

In the end of 1994 a draft federal law *"On the principles of state regulation of social-economic development of the North of the Russian Federation (main directions of the state policy in the North of Russia)"* was submitted to the State Duma. It is intended to be a general law, and a set of special laws should be linked to it.

It is noted in the preamble of this draft law, that Russia is an equal in rights participant of international cooperation of the Arctic countries, and the main aim of the Law is the achievement of optimal combination of interests of the Russian Federation and its subjects, provision of their sustainable development. The draft Law comprises characteristic of the legal status of the North, main principles of the state policy in the North, legal base for the economic development, rational use of natural resources and protection of environment, social development, securing of life activity of small in number aboriginal peoples of the northern regions.

Let us mention some articles of the draft law, closely related to the subject of the paper.

Among the principles of the state policy the following are named: a) regulation of the number of residents in the North at the level of minimum sufficiency, b) public stimulation of the population, working at public enterprises, c) state control over provision of guarantees and compensations to those who live and work in the northern regions, d) target investments in major branches of the economy, including "marine transport, ports and ice-breaking fleet as the means for the Northern Sea Route operation".

It is envisaged to revive the state body for social-economic regulation in the North and to specify its functions¹⁾. Among other functions, this body will be responsible for food, consumer goods, fuel, capital goods deliveries to the regions of the North.

A number of "northern" peculiarities in carrying out economic reform are fixed in this draft law: priority of state property on mining industries; allotment of major shareholder holding and "golden stocks" of base enterprises to the state; privileged taxation of enterprises, producing goods and creating jobs for local population; subsidizing of local budgets, etc. Mechanisms for public supply of goods deliveries to the northern regions, system of guarantees, compensations and privileges for the population are described in details.

In elaboration of the Law "On the principles ..." a bill was prepared on a new system of state guarantees and compensations for those who live and work in the North. The objective of this bill is to guarantee such living standard to the population, which would compensate for unfavourable regional conditions, to prevent spontaneous emigration, to create conditions for the removal of certain categories of the population (for example of pensioners) to the more southern regions and their further social-economic adaptation. Realization of this bill requires additional financing from the federal budget, Pension fund and the State employment fund in the amount of 559 billion roubles per one year.

It is likely, that after these two bills are adopted, the efforts of legislators will be focused on the "northern" aspects of legal regulation in the field of mineral wealth use, continental shelf, protection of environment, marine transport.

6.2. State programmes for the development of the North and the Arctic

Along with taking immediate measures on stabilizing social-economic situation in the northern and especially Arctic regions, the Government of Russia is going to implement a number of medium-term and long-term programmes.

State Programme on the development of the Russian North is being prepared for more than 3 years already. In 1992 "Concept and main directions of the Programme for the development of the regions of the North for 15-20 years" was developed, in 1993 - "Theses of the Russian Programme on social-economic development of the North". In the end of 1994 Ministry of the Nationalities' Affairs and Regional Policy submitted to the Government a detailed project (about 400 pages) titled "State Programme of economic and social development of the North of Russia".

It comprises eight sections on main problems and methods of public regulation, calculated and forecast materials, systematization of the Programme measures, supplements on priority directions of social-economic development of the regions of the North.

¹⁾ In 1991-1993 there was the State Committee for social-economic development of the regions of the North in Russia. Later it became a part of the new Ministry for the Nationalities' Affairs and Regional Policy.

The main objectives of the Programme for the period till 2000 are formulated in the following way:

- satisfaction of the needs of the national economy in resources;
- provision of social guarantees for the population of the North;
- establishment of the system of natural resources use, based on the concept of ecological safety for aboriginal population and of conservation of natural complexes.

The goals of the Programme for the nearest two years are: stabilization of economic and social situation, creation of prerequisites for sustainable development.

Programme measures are divided into three sets: 1) measures of Programme-wide significance (creation of economic mechanism); 2) systematization of measures envisaged by federal target programmes and projects, being implemented on the territory of the North (in 1994 there were over 30 such projects); 3) organizational-administrative and legal provision of the Programme. Total need in investments, required in 1995-2000 for the implementation of the Programme measures, is estimated at 145-155 trillion roubles in 1994 prices. It is expected, that the share of investments made from federal budget will make up 15-20%, that of local budgets - about 10%, and the share of private investments (including foreign) will be 70-75%¹⁾. However, this investment forecast is rather unreliable; for the moment it only reflects the intentions of the Programme developers.

Section "Transport complex". The following main objectives of the development of transport system of the North are named: 1) to provide development of natural resources, to ensure that natural resources and products of industrial complexes of the zone of the North enter Russian and the world market, to provide goods delivery to the North; 2) to increase reliability, timeliness and quality of shipments, freight safety; to reduce the volume of freight in circulation; 3) to reduce the share of transport component in the cost of produced goods. Two new specific tasks, conditioned by the demilitarization of the Arctic, should be mentioned: a) to use transport facilities, owned by the Ministry of Defense of Russia, to provide goods delivery to the North and transportation of goods, produced on its territory, to other regions; b) to involve research-engineering and production potential of the military complex of Russia in the development of new technologies for goods transportation and in the development of transport facilities for the North.

In relation to the NSR this section of the Programme envisages the following actions:

- "revival of the NSR operation", development of sea ports and adjacent terrestrial communications;
- state support of the Arctic fleet modernization, development of shelf oil and gas deposits with the help of marine transport.

The Programme includes the forecast of investments in the NSR (See Table 19). It is expected, that 34% of total investments will be financed from the federal budget,

¹⁾ The amount of financing, identified in the Programme "certificate" (one of the supplements), is more modest: for 1994-1006 - 5.3 trillion roubles, including means from centralized sources - 1.8-2.3 trillion roubles; for 1997-2000 - 15-18 trillion roubles, from centralized sources - 3-3.5 trillion roubles.

13.5% - from the Merchant Fleet Revival Fund, 13% will be financed by the enterprises of marine transport, and from other sources of finance - 39.5%.

Table 19

Forecast of investments in the NSR for the period till 2000
(billion roubles/million doll.)

	1995	1996-2000	All in all in 1995-2000
Transport fleet	692.5/45.6	1167.6/55.0	1796.5/100.6
Line ice-breakers	161.3/-	902.8/93.0	1064.1/93.0
Sea ports	40.9/-	145.6/-	186.5/-
Port ice-breakers	-	255.2/0.3	255.2/0.3
Hydrographic object	63.2/20.0	222.7/80.0	285.9/100.0
Nuclear-powered fleet base.	51.2/-	202.2/125.0	253.4/125.0

It is important to note, that the Programme does not envisage till 2000 investments in such transport communications, which can compete with the NSR (for example, railroads in northern latitudes).

Sub-programme "The Arctic". Attention in this section of the Programme is focused on the peculiarities of the development and public regulation in the Arctic regions. The sub-programme envisages achievement by 2000 of the following main objectives, which are similar to the objectives of the whole Programme:

- efficient and rational development of the Arctic resources for the purposes of stable meeting of the needs of the national economy;
- increase of the population living standard, development of native peoples;
- improvement of ecological situation.

14 priority directions in the development of the economy, social sphere, environmental activity, research, legal regime in the Arctic are enumerated in the sub-programme. It is planned to elaborate the problems of the development of the Arctic in details in the *"Programme of social-economic development of the Arctic regions of the Russian Federation for the period 1996-2005"*.

6.3. Programme of the Revival of the Merchant Fleet of Russia

Perspectives for the development of the material base of the NSR are tied to the *Programme of the revival of the merchant fleet of Russia*. This is a new state programme, adopted in 1993, it has two stages (1993-1995 and 1996-2000) and envisages main tasks and terms of delivery of sea ships and "river-sea" ships, technological equipment for ports, construction of ship-repair enterprises, objects of infrastructure. At the same time the *Fund for the Revival of the Merchant Fleet of*

Russia was established for the purposes of attracting financial means from various sources.

Total volume of investments in the Programme is USD 19.4 billion, 3.7 billion doll. - in the period 1993-1995, and 15.7 billion doll. - in 1996-2000. The sources of financing are: federal budget - 25%, own means of transport enterprises - 15.5%, means from the Fund for the Revival of the Merchant Fleet - 14.5%, attracted means of private home and foreign investors (including credits from home and foreign banks) - 55%.

The Programme envisages delivery of 76 ships to the Arctic transport fleet of total deadweight 914.9 Th. t and estimated cost of 2,428 million doll. Among them are 19 universal dry cargo ships (supply ships), 3 refrigerator ships, 27 bulk carriers, 22 tankers, as well as 5 line cruise ships (for 300 passengers). It is planned to import all these ships, except for supply ships.

Ice-breaking fleet is to be replenished with a nuclear-powered ice-breaker of 55.1 MW capacity and five diesel-engine ice-breakers, 24 MW each. It is specified in the Programme, that "due to the state importance of shipments in this region (i.e. in the Arctic - A.G.), where marine transport is the main and the only kind of transport, financing of the above mentioned fleet replenishment should be provided completely from the state budget".

For the present moment the adopted Programme is being implemented with delays, including measures, concerning the Arctic fleet. Thus, the date of launching of the nuclear-powered ice-breaker "Ural" is shifted to 1998 (60 billion roubles are assigned). Means, assigned for the purchase of tankers of UL class (20 billion roubles) are enough only to buy one tanker, etc. (7).

This situation does not mean any special discrimination towards the Programme under consideration. Insufficient financing of the adopted state programmes is, unfortunately, a typical phenomenon under conditions of investment decline, which is going on in Russia. Nevertheless, the adoption of this Programme, as well as of the State Master Programme of economic and social development of the North, increases chances of the Arctic regions and the NSR both to receive direct investments and to create more favourable economic and legal climate.

7. International economic cooperation in the zone of the NSR

It may seem paradoxical, at first glance, that under economic crisis and acute home political problems Russia is actively promoting the idea of international cooperation in the NSR use. In fact, such a policy is an integral part of the general strategy for stabilizing Russian economy, for intensification of international (external) relations, considering their potential effects, is one of important ways out of the internal crisis.

Legal, political, institutional changes and relative demilitarization, occurring in Russia, create favourable background for the international economic cooperation in the

zone of the NSR. However, there are many specific difficulties, conditioned by natural factors, historical legacy, structural peculiarities of the economy and population.

7.1. International trade and shipments

Export from Russia along the NSR reached its maximum value in 1990 - 1201 Th. t. In the next two years it decreased 2.7 times and then there was a slight increase in 1993 (See Table 20). Main exported cargoes are timber from Igarka and Tiksi, produce of Norilsk mining-metallurgical works (from Dudinka). All other export deliveries are less in volume and unstable. Import to Russia along the NSR was negligible in recent years. In 1980s up to 0.5 million t of large-diameter pipes were imported to the Ob Bay; these deliveries were resumed in 1993, it was connected with the new stage in the development of gas deposits.

Table 20

Export and import of cargoes along the NSR (by the MTD ships), Th. t

	1990	1991	1992	1993
<u>Export (total)</u>	1201.0	743.6	444.7	500.3
incl.:				
Timber from Igarka	711.3	448.2	247.2	296.5
Timber from Tiksi	147.6	47.6	61.1	78.9
Timber from Dikson	-	5.6	2.0	2.2
Non-ferrous metals from Dudinka	163.1	90.7	80.3	116.7
Matte from Dudinka	29.3	17.1	13.7	6.0
Sulphur from Dudinka	106.6	15.1	-	-
Coal from Yakutia	25.9	108.7	39.0	-
<u>Import (total)</u>	11.8	1.9	5.2	3.0
incl.:				
Coal to Novaya Zemlya from Poland	8.9	-	-	
Pipes to the Ob Bay	-	-	-	3.0
Other	2.9	1.9	5.2	-

Transit shipments along the NSR are constantly increasing since 1989. Their volumes were: in 1989 - 55.2 Th. t, 1990 - 115.1, 1991 - 176.2, 1992 - 202.3, 1993 -

208.6 Th. t. In 1993 voyages from the West (Murmansk, Latvia) to Japan, China, Thailand were carried out, as well as from China to the Netherlands, England, Spain, etc.

Increase of foreign freights is very important in the present, difficult for the Arctic fleet, financial situation. As it was mentioned in item 5, in 1993 they accounted for 62.5% of total income, 74.5% of total profit.

Forecasts of the development of international shipments along the NSR are yet insufficiently complete and reliable, for they are not based on clear strategy for the economic development of the northern regions and long-term agreements on cooperation in the NSR zone. Institute "Soyuzmorniiproekt" gave rather careful forecast estimates: export cargoes - 145 Th. t annually (without changes), transit - 115 Th. t annually, i.e. at the 1990 level. Central Research Institute of Marine Fleet, proceeding from the perspectives for the development of oil and gas industry and Norilsk industrial unit, prognosticates more significant volumes of export-import shipments, and estimates the volume of transit shipments by 2005 at 5-7 million t a year.

There is a number of perspective ways to increase the volume of international shipments along the NSR.

Opportunities for the use of marine transport for the development of oil and gas deposits on the shelf of the Barents and Pechora seas, in Timano-Pechora province, on the Yamal Peninsula are being studied within the framework of INSROP. Variants of exporting oil, condensate, liquefied gas by special tanker fleet are considered.

After the reconstruction of Norilsk mining-metallurgical works it will be possible to export from Dudinka 0.8-1.4 million t of sulphur and up to 2 million t of iron concentrate annually. In case deposits on the Taimyr Peninsula are developed, approximately 0.3 million t of graphite and up to 5 million t of high-grade coking coal could be exported annually by the NSR.

To our opinion, the project of supplying Arctic and sub-Arctic regions with food, delivered from the West Europe, South-East Asia, America, is quite realistic. Earlier, these Russian regions were supplied with food mainly from western and southern regions of the former USSR. The USSR disintegration resulted in significant reduction of deliveries from the Ukraine, Byelorussia, Middle Asia, Kazakhstan, and agricultural sector of Russia is not able to provide fully the needs of domestic market (for different reasons, one of them is quite commonplace: many kinds of heat-loving vegetables and fruit, coffee, cocoa, etc. are not cultivated in Russia). Since Russia will remain large importer of food, it is important to rationalize the geography and transport scheme of food import.

It is expedient, in particular, to deliver imported food to the Arctic and Subarctic regions not via inland regions of Russia, but directly from exporting countries along the NSR.

It would be also expedient to re-orientate the market of the North-East (Republic of Yakutia, Magadan and Kamchatka oblasts, Chuckchi Autonomous District) to the supply from Pacific countries, taking Alaska model as a basis. The system of food supply to Alaska comprises 4 main elements: 1) delivery of food to Seattle, 2) transportation by

sea on container-refrigerator ships to Anchorage, 3) distribution over Alaska by motor cars and planes, 4) realization through the net of foodstores. Such a scheme may be first tried in one or two coastal cities of the North-East (for example, Petropavlovsk, Anadyr). This food will be, of course, expensive, given the present exchange rate of the dollar. But one should take into account a number of circumstances: 1) the present food market of the North-East is the most expensive in Russia (cost of a monthly food-basket in Magadan, Vladivostok, Petropavlovsk is 5 times higher than in the western regions); 2) this region has significant revenues in hard currency (from sale of gold, diamonds, fish, etc.); 3) the experiment can be supported by humanitarian food help (from the USA, Canada) which was earlier distributed over the whole Russia, thus making it almost intangible (as it was the case with deliveries of butter without compensation from the USA: to 31 regions); 4) the Government of Russia will, probably, agree to target financing of food import to the North-East, reducing at the same time subsidies to national agriculture.

The same idea may be also tailored to addressing the problem of supplying the western part of the Russian Arctic with import deliveries from West Europe and Atlantic coast of America¹⁾.

A number of interesting proposals are set forward by international experts on the NSR: transportation of chemicals from Germany to Japan (low temperatures are required for them), ferrous alloys from Norway to Japan and East Asia, zinc concentrate (up to 1 million t) from Alaska to Europe, apatites from Murmansk to South-East Asia. Proposal on transportation of high-grade coal from Alaska to West Europe (an experimental voyage to Spain had been planned, but it was not carried out) is more disputable. First of all, it is explained by two reasons: 1) the share of transport costs in the price of coal is too large; 2) there are coal deposits along the NSR, that are more close to Europe (Yakutia, lower reaches of the Yenisei River, Pechora basin).

Russian-Canadian project "Arctic Bridge" opens additional opportunities for using the capacity of the Arctic fleet, especially during non-traditional period of navigation. The idea of the transport section of this complex project is to organize regular voyages between the ports Murmansk and Churchill. Main cargoes will be provided by Russia - apatite concentrate, and from the part of Canada it will be grain (at the first stage - up to 2 million t a year, it will allow Russia to reduce and even stop import of grain via the ports of the Black and Baltic seas).

Study of the NSR potentialities for transit shipments along two-way routes: West Europe - East Asia, West Europe - Pacific coast of North America - is one of the main issues of the international project INSROP. It is likely, that popularization of INSROP will reveal new opportunities for transit shipments. Technical potentialities of transit sailing along the NSR could be, undoubtedly, significantly increased. It is necessary to study opportunities for combined shipments, when regional cargoes are combined with transit cargoes.

¹⁾ It is expedient to study the practice of supplying Greenland with food (recommendation of the reviewer Dr. J.Baerenholdt).

Imperfection and instability of customs tariffs and tariffs on sea shipments hinder the extension of international trade on the NSR. But on the whole, the policy directed towards liberalization of external trade is sustained in Russia.

At present there are no privileges and incentives in foreign trade, which take into account specifics of the Arctic. Explaining of increased import duties, which will be introduced from July 1995, by the fact, that they will protect home producers, does not relate to the Arctic. There are no such producers in the Arctic, and transportation of goods from inland regions of Russia remains, as is known, a chronically sore question. The question about special tariff conditions for the Arctic will be inevitably raised once again, probably, in the form of establishing local free trade zones. The draft programme on the development of the North envisages, that up to 50% of revenues from customs duties, taxes on value added and excises, generated from import of goods to the North will be transferred to special trust-funds (funds of "legacy").

7.2. Investments and production

Of course, Arctic and sub-Arctic regions, possessing natural resources, need foreign capital and new technologies to revive production and social sphere, especially under economic crisis. Opportunities for increasing shipments along the NSR are associated with this necessity.

In late 1980s, when the USSR made its economy open to foreign investments, establishment of small joint ventures in fishing and fish and sea products processing, gold mining, deer treatment, etc. has started in the zone of the NSR influence. However, they can't produce significant impact on the shipments along the NSR. Only large-scale investment projects, which could serve as an umbrella to the development of small business, can change the situation radically.

The Programme of the development of the North (see item 6) gives incomplete data on implemented and prognosticated foreign investments (million doll.):

1993 (reported)	- 95
1994 (estimate)	- 92.4
1995	- 453.8
1996	- 538.2
1997	- 518.3
2000	- 1751.3

These data were obtained by summing up investments in concrete objects. The fact, that over a half of all registered investments falls on Nenets Autonomous District (1995 - 308, 1996 - 356, 2000 - 1297.6), is the evidence of the incompleteness of these data. At the same time investments in the objects of Khanty-Mansi and Yamal-Nenets autonomous districts are not taken into account.

In the nearest future foreign investments will be concentrated most of all in oil and gas industries of the western part of the Russian Arctic (coast and shelf of the Barents and Pechora seas).

American firm Conoco became one of participants of the joint venture "Polyarnoye Siyaniye" ("Polar Lights"), producing oil and gas condensate on the coast and shelf of the Barents Sea. Its estimated output is up to 20 million t in 2005. Oil and condensate will be transported by sea. Three large oil companies of the USA ("Texaco", "Exon", "Amoco") and Norwegian "Norsk Hydro" have established a consortium for the development of deposits in Timano-Pechora basin. Initial output - 120,000 barrels per day in 2000. It is planned to create a sea port for oil transportation.

Shtockmanovskoye gas condensate and Prirazlomnoye oil deposits in the Barents Sea are attracting now large attention. Russian joint-stock company "Rosshelf" obtained the right to develop these deposits. Estimated investments, required for this purpose, are approximately 6 billion doll. Probably, "Rosshelf" will use financial and technical assistance of foreign companies. In any case, development and exploitation of Shtockmanovskoye and Prirazlomnoye deposits will increase the volume of shipments along the NSR.

Work has started again on Yamal Peninsula on the development of the largest gas and gas condensate, as well as oil, deposits. It is planned to increase gas production to 90 billion m³ in 2000, to 160 billion m³ in 2005, oil production - to 2.7 million t in 2005. The Government has made a decision to attract in 1992-1998 for this purpose credits from foreign banks in the amount of USD 6.2 billion (2.1 billion - for the development of deposits and 4.1 billion - for construction of gas pipelines, providing export of gas). According to the project, necessary cargoes will be delivered to Yamal Peninsula along the NSR, while gas transportation will be carried out in a traditional way, that is by gas pipelines across the territory of Russia, Byelorussia, Poland, Germany. A group of experts proposes to consider the scenario, envisaging construction of a plant for gas liquefying and export on ships - gas carriers (up to 50 billion m³ per year). In future it is planned to develop the shelf of the Barents Sea.

Coasts and shelves of the Chuckchi, Bering, Okhotsk seas are also perspective from the point of view of oil production. Some deposits, where commercial production is possible, are already explored here. At present Russia does not have at its disposal investment means for the development of this oil province. But this region is the nearest one to large oil companies, operating in Alaska (British Petroleum, ARCO), and it is possible to develop this region using construction, engineering, repair facilities and personnel, working in Alaska. In 1989 ARCO-Alaska and later its affiliated firm have started negotiations on the development of several deposits, which brought no results. Then Bering Strait company conducted negotiations.

One should bear in mind, that organization of oil and gas production is crucially important to Magadan oblast and Chukotka, for 80% of their demand in power is met by coal and the problem of oil products supply (mainly for motor cars and air transport) is becoming most dramatic. It is possible to make a spatial manoeuvre, which can increase the use of the NSR capacity: supply of the Russian North-East with oil products from the Pacific coast of the USA in exchange for deliveries of oil products from Russia (from the western Arctic) to the Atlantic coast of the USA.

The problem of conversion of military ship-building plants, so that they could switch over to building ships for sailing in the Arctic and to production of equipment for the development of natural resources, is extremely important for industrial and transport development of the Arctic. Until recently practically entire capacity of Soviet ship-building industry was committed to building of war-ships, whereas most of ships for the Arctic were purchased in Finland and other countries. Now military orders have been reduced dramatically, but in the absence of foreign investments conversion of ship-building enterprises will take too much time. The largest ship-building enterprise in Severodvinsk, which was engaged in building nuclear-powered submarines, is a typical example. It has become one of participants of "Rosshelf" and is preparing to master manufacturing of equipment for oil production and gas on the shelf.

Reconstruction of the NSR ports and infrastructure of port cities is, in principle, a priority direction. It is just poor infrastructure (social infrastructure as well), that hinders the use of Russian Arctic ports by foreign ships. Nevertheless, no notable efforts are being made in this direction. To a certain extent it can be explained by the fact, that due to decrease in the volume of shipments along the NSR a temporary reserve of port infrastructure capacity has formed.

For almost 10 years attempts are being made in Russia to create *free trade zones* with preferential regime for foreign investors, exporters, importers. State Programme on the development of the North orients to the establishment of FTZ. If we analyze conditions, which are characteristic of FTZ according to international traditions, many port towns along the NSR will turn out to have favourable conditions for the establishment of FTZ. However, to our opinion, it would be too risky to speed up experiments in establishing FTZ in the Arctic. It is expedient to wait for at least first positive results of FTZ functioning in more accessible regions of Russia.

7.3. Other forms of cooperation

The experience in making cruise voyages with foreign passengers on board the nuclear-powered ice-breakers from Murmansk to Franz Josef Land, the North Pole and from Providence Bay along the NSR, testifies to the large potential for the development of Arctic tourism. Main tasks are: creation of special fleet and coast infrastructure for tourism. It is planned to put 5 passenger ships of ice class into operation by 2000.

Development of the NSR and its economic zone can be harmoniously integrated in the system of cooperation between the northern regions of neighbouring countries. First of all, these are the contacts between the northern regions of Nordic countries and European part of Russia, between Alaska and Russian North-East.

Russia takes part in international environmental programmes (for the Barents Sea, Beringia), programmes on radiation safety in the Arctic, promotes development of contacts with aboriginal peoples, joint research.

It would be expedient to prepare within the framework of INSROP projects for the Northern Forum, International Commission for the Arctic, other international, as well as

national governmental and public organizations, on the main directions of international cooperation, related to the development of the NSR.

8. Conclusion

The problems of the development of the Russian Arctic and the NSR are closely interrelated. In the nearest future and in the long-term perspective Arctic regions (and the whole North) will keep its role as the major raw and power base of the Russian economy, and the NSR will remain the main transport line in the Arctic, providing the functioning of its economy. There will be no competing alternatives for the NSR in the eastern part of the Arctic in the foreseen future.

The significance of the NSR for Russia has increased after the USSR disintegration and opening of the NSR for international shipping. To a certain extent the NSR can compensate for the loss of ports on the Black and Baltic seas, direct railway and pipeline exits to the West Europe.

Decline in the volume of shipments along the NSR is explained both by the nation-wide economic crisis and by regional factors: difficult transformation of the organizational-economic mechanism in the Russian Arctic, sharp decrease of production and investment activity on the part of a number of large consignors and consignees. Stabilization and development of Norilsk mining-metallurgical works, export of timber from Igarka, development of oil and gas industries in the western part of the NSR, as well as the growth of transit shipments will be of primary importance in overcoming the decline and restoring the volume of shipments.

The Government of Russia is aware of the fact, that the Arctic and the NSR are not able to adjust to market conditions in a short time, relying only on themselves. Special anti-crisis and stabilizing measures are being taken in the zone of the Arctic. State Programme on the development of the North has been developed, it comprises the sub-programme for the zone of the Arctic. State Programme of the Revival of the Russian Merchant Fleet is adopted; according to this Programme it is planned to equip the Arctic transport fleet with 76 ships and a number of ice-breakers by 2000.

The zone of the NSR impact possesses significant potential for international economic cooperation - extension of export-import shipments (mainly owing to new kinds of cargoes), transcontinental transit, foreign investments in the development of natural resources and infrastructure, international tourism. Intensification of this cooperation is especially important at the stage of overcoming of the economic crisis.

It is expedient to focus further research, related to the strategy for the NSR development, first of all on two problems: 1) comparison of the NSR efficiency with the efficiency of alternative transport systems; 2) divergent tendencies in the development of the western and eastern sections of the Russian Arctic and the NSR.

Objective assessment of the NSR perspectives implies comparison of the NSR with the alternative transport lines: both existing and potential. Up to the present moment, all attention in the studies was concentrated on the comparison of the NSR with transit sea routes through Suez and Panama canals. It was important but insufficient. Latitudinal

railway lines, connecting the Pacific coast and Europe are the present rivals of the NSR in transit communication. This is Trans-Siberian main line, having several exits to Europe. Transcontinental shipments of containers are made by this road. In the future this role can be strengthened by Baikal-Amur main line, as a part of the projected North-Siberian main line, as well as by new transcontinental main line, starting from the Pacific coast of China. Polar railroads, which have been being projected and partially constructed since 1912 (the Great Northern Route, Ob-Murmansk road, Polar main line, etc.) are strong potential rivals of the NSR in providing transport services to the Subarctic regions of Russia. For the moment, these projects are postponed, and evidently, for a long time. Building of railroads, connecting northern oil- and gas-bearing areas of the West Siberia with Siberian-European network is going on, it will take a part of freight of the western section of the NSR. Project of building the railroad Yakutsk - Magadan is also under consideration (the continuation of Amur-Yakutsk main line, which is now under construction), which can lessen the freight flow in the eastern section of the NSR.

It is obvious, that delay in the development of the NSR will urge on competing projects of Subarctic railroads. Therefore, objective assessments and choice of the strategy for transport development are necessary. I hope, that this choice will be made in favour of the NSR, at least, for 20-30 years.

The study of the second mentioned problem has started within the project III.02.3 "Selected issues in regional economic development along the Northern Sea Route".

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**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 improvement 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 specializes 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.

