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**Impact of the Northern Sea Route and the
Lensky Riverine Steamship Line Functioning
on the Socio-Economic Situation and
Development of Sakha Republic (Yakutia)**

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Lensky Riverine Steamship Line Functioning on the
Socio-Economic Situation and Development of Sakha
Republic (Yakutia)

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FOREWORD - INSROP WORKING PAPER

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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.

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Summary

The paper deals with the impact of the traditional transport system on the socio-economic activities in Sakha Republic (Yakutia) and its development.

The Northern Sea Route serves 12 arctic and northern uluses (regions) covering a half of the Republic's territory. The Murmansk Shipping Company (basic port-Murmansk), Far East Shipping Company (basic port-Vladivostok), Prymorsk Shipping Company (basic port- Nakhodka) and Arctic Shipping Company (basic port-Tiksi) are involved in transportation of goods for the Republic of Sakha along the NSR. The sea shipping companies account for 45% of the total volume of the goods carried.

The Lensky Riverine Steamship Line supplies 55% of the total volume of goods for the Republic. The "river-sea" type ships are used for export and delivery of goods to the mouths of the Anabar, Olenyok, Yana, Indigirka and Kolyma rivers.

The Northern Sea Route ties sea and river routes into an integrated transport system and thereby contributes to solving the most pressing social problem of today: supply of the population of the Republic with fuel, provisions and goods. As a compensation for transportation expenses, every year the Republic receives state financing support (in 1998 - 841 million roubles). In 1997, organising measures taken by the RF Government produced a 20% increase in the volume of goods delivered to the Arctic region of the Republic, as compared with 1996.

The transport support to the indigenous peoples' activities in the Arctic zone of the Republic is improved in compliance with the Federal Program "Economic and Social Development of the Indigenous Peoples of the North until 2000". The major portion of the Program's budgetary resources (51%) is channelled to renovation of the river, road and air transport in the areas inhabited by native population.

The Northern Sea Route serves as a transport foundation of the development of foreign economic, social and cultural links for the Republic of Sakha. The volumes of goods supposed to be transported to the Republic after 2005 in case of its steady economic development can exceed 1 million tons per year.

International sea tourism on the NSR basis can become a source of currency for the Republic's budget. Realisation of the international transit traffic project via the route: Europe-NSR-Lena River-Railway-Asia can have a positive influence on the socio-economic situation in the Republic.

The priority development of transport in the areas of intensive economic activity in the Republic will reduce the rate of non-indigenous peoples migration from the Republic, bring down unemployment, contribute to growth in the living standard.

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Abbreviations

ASC	- Arctic Shipping Company
CIS	- Community of Independent States
GNP	- Gross National Product
HEMD	- Hydrometeorological and Environment Monitoring Department
JSC	- Joint -Stock Company
JSC "LRSL"	- Joint- Stock Company "Lensky Riverine Steamship Line"
KSC	- Kolymskaya Shipping Company
NSR	- Northern Sea Route
NSRA	- Northern Sea Route Administration
RF	- Russian Federation
SCTP	- Scientific Centre for Complex Transport Problems
SCCAR	- Scientific and Co-ordination Centre for the Arctic Research of the Russian Academy of Science
SOE	- State - Owned Enterprises
YRSL	- Yanskoye Riverine Shipping Line

Introduction

The main objective of the paper is to assess the impact made by the development of the marine and river transport on the socio-economic situation in Sakha Republic (Yakutia).

The title problem was treated in the following works of the Russian and foreign authors within the INSROP framework: Arctic Zone of the Sakha Republic (Yakutia) (1996, No. 49) and the Russian North generally (1997, No. 93 and 1998, No 111). All these works have been taken into account in the paper.

In this paper, the most essential suggestions in terms of socio-economic forecasts of changes in the situation in the Republic of Sakha (Yakutia) have been made in relation to the development of regional freight traffic. In this connection, due consideration is given to diverse transport systems of goods delivery to ports of destination over the territory of the Russian North and Sakha Republic (Yakutia).

The impact of the NSR extends to the Arctic zone of Sakha Republic (Yakutia). The rivers of the Republic (Lena, Anabar, Olenek, Yana, Indigirka, Kolyma) are linked by the Northern Sea Route into a common transport system covering a half of the Republic's territory. The transport system "NSR-rivers" serves 12 northern and arctic uluses (regions) of the Republic.

The paper outlines also the project of the international transit route "Europe-NSR-Lena River-Trans-Siberian Railway-Asia". This project involves the inland regions of the Republic with promising deposits of raw materials in international co-operation.

Certain factors such as complicated physical and geographical conditions in Sakha Republic (Yakutia) with over 40 per cent of its territory located beyond the polar circle, an extensive coastal zone exceeding 2000km, a complex relief with 70 per cent of the territory covered by mountains and plateaux and a great number of waterways overall length of which tops 12 000 km - are considered to be objective preconditions which are historically responsible for formation and effective operation of water transport as a keystone of socio-economic infrastructure of the Republic and an important component of the transportation system of the whole Russian Arctic and North regions.

1. Methods and Subject of Research

Sakha Republic (Yakutia) as a subject of the Russian Federation has an optimal, from the self-administration standpoint, structure divided into 33 uluses and 2 city areas.

With location, natural conditions, population density and transportation system taken into account, uluses and areas may be attributed to three zones. In the Arctic seaside zone there are five uluses that occupy over one third of the Republic's territory and have low population density (less than one person per 100 sq. km) with prevailing fur breeding and fur and fish trade.

Resources comprise gold, copper, tin and coal. There are also some seats of industry. Transport system is based on the Northern Sea Route, the Lensky Riverine Steamship Line (LRSL), the Yanskoye Riverine Shipping Line (YRSL) and the Kolymenskaya Shipping Company (KSC).

In the Central zone there are 15 uluses occupying areas from 32 000 to 318 100 sq. km each. Population density ranges from 1 to 10 persons per 100 sq. km. Livestock farming and seats of crops-growing are in progress. Resources and mining industry are associated with gold, platinum, oil, gas, mercury, pyroschists, mica, coal, timber and construction materials. A transport system is based on LRSL, YRSL, KSC and the Republic's highways.

The Southern zone consists of 13 uluses and 2 city areas.

Ulus areas range from 11 700 to 166 700 sq. km, city areas reach 100 sq. km. Population density in uluses varies from 1-5 to 20-30 persons per 100sq. km; in city areas it ranges from 15 to 600 persons per 100 sq. km. Resources and mining industry are associated with gold, diamonds, platinum, iron ore, mica, gas, oil, coal and timber. Livestock farming, agriculture, river-, motor-, railway-, air- transport and gas pipelines are rather well developed.

The existing transport system is of exceptional importance for socio-economic activities in Sakha Republic (Yakutia) and for successful development of the region. The activity of the Republic's existing river transport structure which includes the Arctic Marine Shipping Company (ASC), 3 shipping companies i.e. LRSL, KSC and YRSL, 8 ports i.e. Tiksi, Zeleny Mys, Yakutsk, Nizhneyansk, Belogorsk, Lensk, Olekma, Khandyga, practically encompass all uluses and areas, with NSR and LRSL being leading companies among them.

Transport accounts for about 13 per cent of GNP. At the beginning of the nineties up to 37 million tons of goods were carried every year (32.1 per cent by rail, 30.4 per cent by water, 35.9 per cent by truck) and freight turnover reached 13 million t -km. Water transport is of paramount importance for the Arctic seaside and a main part of the Central zone uluses. Its transport communications ensure viability and operation of national economy entities of all kinds of property and provide potential for reliable foreign economic links.

Water transport is the most common mode used to carry freights between the subjects of the Russian Federation from entry-, sea- and river transshipment points to republican and regional depots. The network of Sakha Republic (Yakutia) waterways comprises coastal NSR routes in the Laptev and East Siberian seas connecting ports of other subjects of the Russian Federation, that is, Murmansk, Arkhangelsk, Dickson, Khatanga, Provideniya, Petropavlovsk Kamchatskiy, Vanino, Vladivostok, Nakhodka.

Reliable operation of the NSR section of Sakha Republic (Yakutia) predetermines functioning and successful development of its national economy, social conditions of life in

coastal uluses as well as in a number of the Central zone uluses. The NSR operation represents one of the main directions in Sakha Republic (Yakutia) foreign economic relations. Oil products, foodstuffs and technical cargoes are delivered from basic Arctic ports. Operating NSR terminals present the ports which were faced (in the early nineties) with decline in traffic volume and difficult financial situation followed by drop of revenues, reduction in appropriation of funds for maintenance, modernisation and replacement of port equipment. The existing directions of cargo delivery (Lenskoye, Yanskoe, Indigirskoye and Kolymaskoye) are not used in a regular manner; commodities to be shipped are presented with delay; time-schedules of their delivery and transshipment are usually not kept to. All these factors necessitate the establishment of federal control over cargo traffic activities, strict financial liability of all transport network participants.

Future various transport modes in Sakha Republic (Yakutia) may be described (SCTP, 1998, see Fig. 1) as follows:

Anabar-Olenekskoye direction:

1. Railway-river mode with the reloading on river ships in Osetrovo (Yakutsk), further - on mixed vessels to the bars of the rivers Olenek, Anabar, delivery to the destination points by river ships.

2. Railway-river-motor road mode - reloading on river ships in Osetrovo, further - on river ships to the port Lensk, then - by motor transport through the motor road Lensk-Mirny-Aikhal and motor zimnik (winter road) Aikhal-Olenek, Aikhal-Anabar.

Lenskoe direction:

1. Railway-river mode.

Transportation by railway from all regions of Russia to Osetrovo (Yakutsk) and further - on river vessels to Tiksi.

2. Railway-sea mode - from the West (reloading from railway transport on sea ships in Vanino, Nakhodka, then - to Tiksi).

Yanskoye direction:

1. Railway-river-motor road mode - the use of mixed vessels with reloading in Osetrovo (after the completion of railway construction - in Yakutsk) up to Kular, Ust-Kuiga, Batagai - transportation by river transport and to Deputatsky - by motor transport;

2. Railroad-sea-river mode - shipping cargoes by sea vessels from Murmansk, Arkhangelsk up to the Yana river bar, reloading on river transport, transportation to Kular, Ust-Kuiga, Batagai and further - delivery by motor transport to consumers;

3. The same mode with reloading in the ports of the Far East (Nakhodka, Vanino).

4. Railway-river-motor road mode via Osetrovo (Yakutsk) to Khandyga and further - transportation by motor transport to consumers (Batagai, Deputatsky).

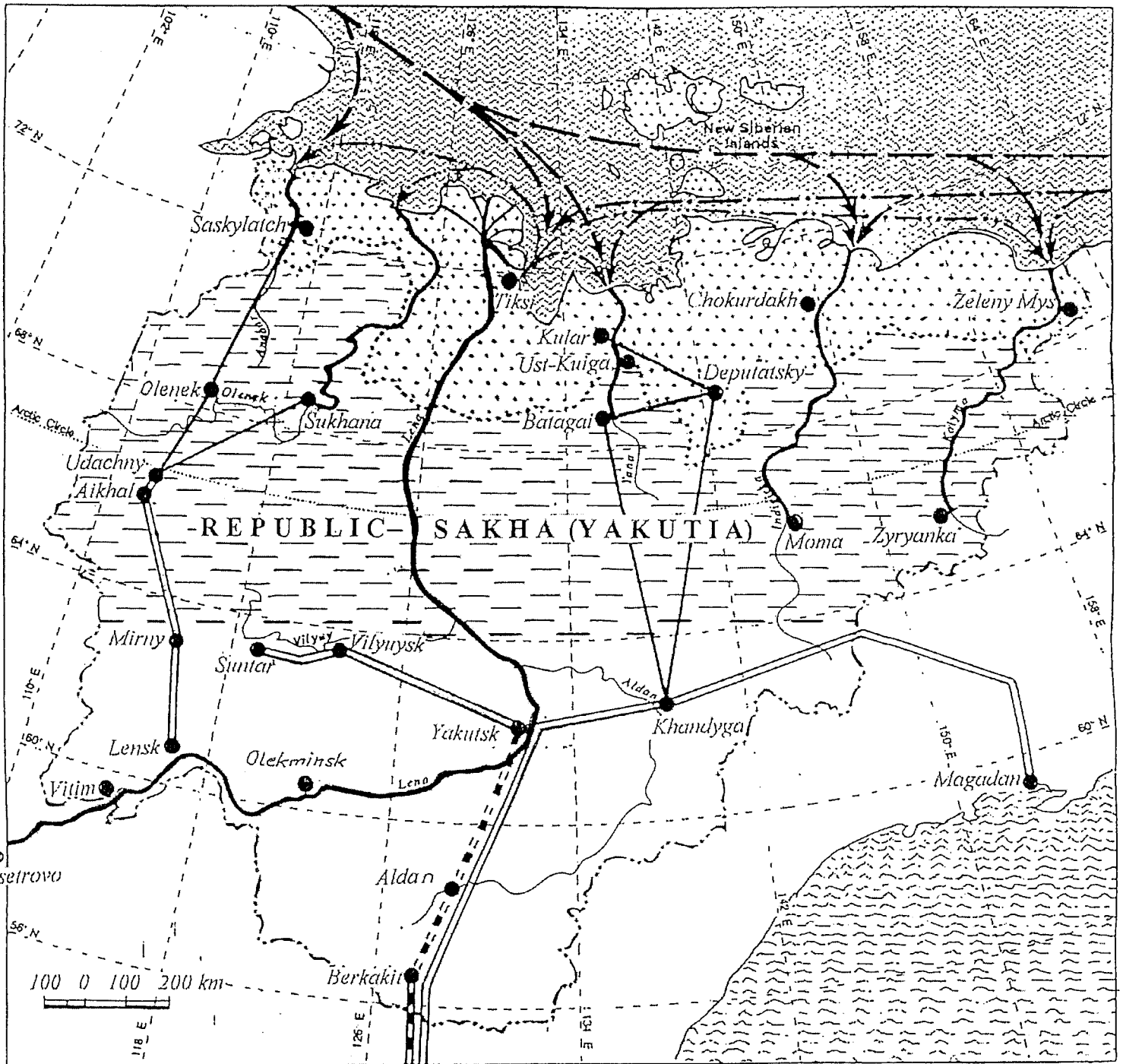


Fig.1. Main directions of cargo transportation along the Northern Sea Route to Republic Sakha (Yakutia)

- — — Delivery of cabotage cargo along the NSR from West
- · — Delivery of cabotage cargo along the NSR from East
- · · — Intra-Arctic transportation of cabotage cargo along the NSR
- — — Active railway
- · · · — Railway on Yakutsk in stage of design
- — — Motor road
- — — Motor zimnik
- — — Navigable part of the river
- ▨ - Arctic zone: «NSR - Rivers»
- ▨ - Central zone: «Lena river-Rivers-Motor zimnik»
- ▨ - Southern zone: «Railway-Lena river-Motor road»

Indigirskoye direction:

1. Railway - river mode -reloading of cargoes in Osetrovo (Yakutsk), then on mixed vessels to the Indigirka river bar and on conventional river vessels to Chokurdakh and Moma.

2. By marine transport from the West to the Indigirka river bar with reloading on river ships and delivery to Chokurdakh and Moma.

3. The same, reloading of cargoes from railway transport to the sea ships in Vanino, Nakhodka. By marine transport from the East and then according to the second mode.

Kolymskoye direction:

1. Railway - river mode via Osetrovo (Yakutsk) with the use of mixed vessels on the section to Zeleny Mys and river vessels to Zyryanka.

2. Railway-water mode via Osetrovo (Yakutsk) with the use of river transport on the sections Osetrovo (Yakutsk) - Tiksi and Zeleny Mys - Zyryanka and of marine transport on the section Tiksi-Zeleny Mys.

3. The same, with reloading of cargoes from railroad transport to marine transport in the ports of Murmansk and Arkhangelsk.

4. The same, with reloading of cargoes in the ports of Vanino and Nakhodka.

Intrarepublican coastal shipping is of great importance and includes, in particular, oil-product deliveries, for example, from Tiksi to the basins of Khatanga and Anabar rivers.

Insignificant freight volume is transported by ASC vessels (36200 tons in 1997, total volume by marine transport in 1997 - 132100 tons). In 1997 there is a tendency towards the growth of coastal and export-import cargo traffic activity (Tables 1,2 and 3).

Main marine transport efforts will be likely directed towards export services, transportation and transshipment of foreign trade cargo, reliable support of coastal uluses.

The comparison of foreign imports and exports with imports from and export to others parts of Russia with the use of sea and river transport shows (see Tables 1 and 2) that in 1997 no foreign imports existed. The import from others parts of Russia amounted to more than 3 million tons. The foreign export was inessential: 10 thousand tons. The export to others parts of Russia and the CIS countries market included products of mining industry: gold, diamonds and tin. Small volumes of coal to Chukotka and wood to Magadan and Khabarovsk regions were exported.

Table 1. The volumes of marine and river shipments of Sakha Republic (Yakutia), ths.t*

Modes of transports	1985	1990	1995	1996	1997
Marine (NSR)*	410	207	1	71	132
River (LRSL)**	14800	11500	4200	2400	3300

Table 2. Dynamics of the export-import shipments of Sakha Republic (Yakutia), ths.t*

Export, import***	1985	1990	1995	1996	1997
Export, total	112.2	189.7	19.6	-	10.0
incl. coal	-	25.9	-	-	-
timber	89.9	147.6	19.6	-	4.7
scrap metal	22.3	16.2	-	-	5.3
Import in tanks	-	-	-	4.0	-

Table 3. Freight turnover of the ports of Sakha Republic (Yakutia), ths.t*

Ports, sort of cargo	1985	1990	1995	1996	1997
Tiksi, total	714.2	484.0	68.8	36.4	43.0
incl. timber	231.1	226.3	19.3	-	4.7
in tanks	129.2	16.4	6.2	9.5	8.6
Zieleny Mys, total	551.3	430.5	38.0	26.6	39.0
incl. coal	185.3	55.3	-	-	-
in tanks	210.5	218.0	28.6	24.0	14.5

* Soyusmorniiproject, 1998

** River Transport Service, 1998

*** Outlook for export and import shipments is presented in the INSRUP DISCUSSION PAPER III.01.5 - 1998 "Cargo-Forming Potential of the Republic of Sakha, Chukot Autonomous District and other Far-Eastern Regions for the Northern Sea Route" and in the INSRUP DISCUSSION PAPER WP-3-1998 "Potential Cargo Flow Analysis and Economic Evaluation for the Simulation Study".

The set of goods being carried by river transport is highly impressive. It comprises oil and oil products, timber and lumber, coal, ore, ferrous metals, fertilisers, chemicals, construction materials, agricultural products.

LRSI share prevails in transportation of all goods (85 per cent of oil and oil products, 78 per cent of dry goods, 49 per cent of construction materials, 82 per cent of coal, 93 per cent of ores and metals). Over the past years the tendency showed up towards sudden decline in shipped goods: in 1997, total shipments declined more than threefold compared with 1990 (Table 1).

River transport plays a leading role in a system of goods delivery to uluses in the Central zone as well as to those in the Arctic zone. Over the past years practical experience has demonstrated the need to preserve essential elements of the tried-out planned system to control goods delivery and development of riverine fleet resource base.

River transport activities of the Republic should be evidently focused on ensuring regular navigation through all riverine communications, maintaining them in working

conditions, co-ordinated work with the NSR and other types of transport, developing mixed "river-sea" navigation.

The complete satisfaction of requirements for development of river navigation (new icebreakers, ice-strengthened cargo ships, port) can increase the navigation duration from four to six months. This period of river navigation will correspond to the period of sea navigation along NSR on the route Murmansk-Tiksi.

The navigable lengths of the rivers are presented in Figure 1.

Reliable service of industrial complex of the Republic, its territorial and industrial structures for development of mineral resources being in short supply, in particular, in Yanskoye mining industry region (tin, gold, antimony), Deputatskiy (tin, tungsten) and Kularskiy (gold) mining industry centres shall be placed among the priority lines of activities of the Republic's transport system.

Transport plays an important role in ensuring operation of construction industry, design and survey as well as building organisations. Routes of cargo transportation, its structure and volume depend upon a number of factors including search for and prospecting of construction raw materials deposits, exploration and development of discovered deposits of gravel, gypsum, brick clay, basalt, limestone etc. The transport system is closely linked up with operation of SOE "Sakhavneshtroy". The transport network provides for co-ordination of timber and woodworking industries operation involving, in particular, all 9 timber industry enterprises (Vitimskoye, Olekminskoye, Lenskoye etc.) engaged in production of saw-timber materials and wood export.

Socio-economic role of transport system is also reflected in foreign economic relations of Sakha Republic (Yakutia) which intensity is rightfully considered by many experts as an important factor of stability and successful economic development of the Republic. Trade partners of Sakha Republic (Yakutia) represent 36 foreign countries including developed nations (their share in the foreign trade turnover runs to 80 per cent). In the middle of the nineties export potential exceeded \$1.5 billion. Such maritime countries as Japan (70 per cent), Great Britain (8 per cent) and Korea (4.5 per cent) are in the export lead. The structure of export commodities comprises diamonds, gold, coal (32 per cent of production output), and timber (4 per cent) and scrap metal. The cost of import goods and services reached \$250 million. Machines, equipment, means of transportation (74 per cent), manufactured goods (19 per cent), construction and mineral raw materials (5.5 per cent) are reckoned among import structure. The share of some developed countries in import is as follows: Japan - over 19 per cent, USA - 11 per cent, Canada - 14 per cent, Great Britain - 4 per cent. The network of foreign trade goods transportation shall include water transport.

Within the next 10-15 years, Sakha Republic (Yakutia) will supply antimony, tin, coal and timber to the world market apart from diamonds and gold. Besides, additional supply of coal (up to 20 million t), gas (up to 20 billion cbm), oil and iron ore are

anticipated as well.

The strategic support of socio-economic stability and successful development of Sakha Republic (Yakutia) on the part of republican and federal authorities are likely to be considered as hopeful and promising due to the performance of more than 25 integrated programs. It assumes the availability of reliable republican, federal and foreign financial sources, their optimal use under the strict control and systematic updating of the programs. Substantial development of the Arctic transport could be apparently achieved within the framework of the following federal programs: "Revival of the Russian Merchant Fleet", "Inland Water Ways of Russia" for 1996-2000 and "On Measures of Support for Stable Functioning of the Russian Inland Waterways" (introduced by the Decree of the President of the Russian Federation of November 28, 1997). However, due to the lack of finance resources the above-mentioned federal programs were implemented in 1995-1997 to not more than 30 per cent. Financial crisis in Russia in 1998 resulted in such a situation where amounts of financing support to the federal programs in the 1999 Federal budget were significantly reduced and therefore some programs were cancelled.

2. Characteristic of Sakha Republic (Yakutia) National Economy

Industry plays a leading role in the national economy of Sakha Republic (Yakutia) accounting in 1996 for 43 per cent of GNP; the share of construction is 24.2 per cent, of agriculture - 13.6 per cent, of transport - 12.9 per cent and of other sectors - to 6.3 per cent.

Over the past years a setback in production has been observed in the major sectors of the national economy including industries (93.9 per cent), agriculture (99.3 per cent), civil engineering (67.8 per cent), trade (93 per cent). Output in extractive industries came to 96.4 per cent (coal - 95 per cent, gas - 93.4 per cent, oil - 132.2 per cent, gold - 83.8 per cent, diamonds - 98.2 per cent) versus the year 1996. It totalled 84.2 per cent in manufacturing industries (power generation - 93 per cent, timber - 72.9 per cent, construction materials - 75.7 per cent, light industry - 27.8 per cent).

Output growth has been noted only in oil industry, meat and spirits production.

2.1. Main Economic Activities (Table 4)

Industries activity is mainly connected with development of Sakha Republic (Yakutia) mineral wealth and extraction of scarce raw materials. Mining industry totals 75 per cent with non-ferrous metallurgy to prevail. Gold, diamonds and tin of Sakha Republic (Yakutia) take dominating positions at the CIS countries market.

Sakha Republic (Yakutia) made a great progress, especially, in extraction and production of diamonds and their processing at the Republic's factories. Diamond-manufacturing industry is developing in such areas as (1) processing of jewellery diamonds

and manufacturing of brilliants, (2) processing of technical diamonds, production of diamond tools and diamond-containing components.

In Sakha Republic (Yakutia) there are 10 diamond-cutting factories, 7 new factories are to be started. "Almazy Rossii-Sakha" and "Tuymaada Diamond" joint-stock companies are in the lead due to complete manufacturing and operating cycle.

Table 4. Dynamics of the indices of economic development of Sakha Republic (Yakutia)

Indices	Unit of measurement	1985	1990	1995	1996
Industry*	Billion roubles	3.0	4.0	3.2	1.5
	%	75.0	100.0	80.0	37.5
Investments*	"-	3.0	4.2	0.5	0.5
		71.4	100.0	11.9	11.9
Electric power	Billion kwh	no data	8.7	6.9	7.4
	%		100.0	79.3	85.1
Bituminous coal	Million t	14.1	17.3	11.9	10.8
	%	81.2	100.0	68.8	62.4
Natural gas	Million m ³	1.0	1.5	1.65	1.6
	%	66.6	100.0	110.0	106.7
Oil	Ths.t	-	no data	166.0	198.0
Population, total	Ths. pers.	1013	1109	1023	1016
	%	91.3	100.0	92.2	91.6
incl. urban	"-	669	738	658	654
		90.7	100.0	89.8	88.7
rural	"-	344	371	365	362
		92.7	100.0	99.0	97.6

* In 1990 prices.

Sources: - Russian Regions, vol. 1,2, Goskomstat, Moscow, 1997.

-Russian Statistical Yearbook, Goskomstat, Moscow, 1997.

Industry produces about 10 000 t of antimony. Gold-extractive industry progress is associated with processing of low-grade ores with complex composition and ore dumps.

Tin-extractive industry being one of the largest branches in the Russian Federation produces over 5000 t a year.

In 1996, the coal industry produced 10.8 million tons. Operating coal enterprises are provided with reserves for more than 20 years.

There are considerable resources of metallurgical and power generation coal to support successful development of coal industry.

There are also substantial hydrocarbon resources. Gas production has come to 1500 billion cbm. making it possible to meet domestic needs of Sakha Republic (Yakutia) and to supply gas to adjacent regions.

The Republic copes with the task of oil products supply at the expense of domestic reserves.

Timber industry output runs to 610 ths. t of workable wood which is consumed not only in the Republic but in Magadan and Khabarovsk regions as well as by foreign users (by marine transport - 147.6 ths. t in 1990).

There are considerable power generation capacities in Sakha Republic (Yakutia). Energy production amounts for 7.4 million kWh. being also supplied to many Far East regions.

Civil Engineering. Most of industry enterprises are located in the Central, Western and Southern Yakutia. They produce precast concrete, concrete blocks, brick, cement, gypsum and warmers. Civil engineering accounts for 24.2 per cent of GNP.

Its main directions comprise housing construction and individual dwelling houses. In recent years, there has been an observable tendency to cut back the scope of construction work by enterprises and organisations. However, there is a discernible growth of construction work provided by individual builders. For instance, within 9 months of 1997 1854 houses of 144.900 sq. m were brought into service exceeding previous rate by 13 per cent.

Agriculture. Agriculture accounts for 13.6 per cent of GNP. Livestock raising sector is in the lead yielding 85 per cent of gross agricultural production. Beef and dairy cattle breeding, beef herd horse breeding and deer breeding are traditional branches of livestock raising. In 1995 livestock population didn't exceed 423 900 head of cattle, 109 700 hogs, 342 900 deer and 1278 900 head of poultry.

Farming was practised on a limited scale due to complicated climatic conditions. Sown area occupies 140 000 ha. The needs of the Republic in vegetables are met by 15-20 per cent, in feeding stuffs by 60-70 per cent.

In the Northern zone hunting, fishery and fur trade are largely developed. Farming enterprises are being in progress. At present private sector accounts for about 50 per cent of cattle, 70 per cent of hogs and 30 per cent of horses.

2.2 Raw Materials Base

The Republic is rich in minerals and provided with many raw materials for at least 20-30 years.

Diamond province in Western Yakutia is rich in bed-rock and placer deposits.

Gold is extracted in the central, Aldanskiy, Verkhne-Indigirskiy, Allakh-Yun`skiy and Kularskiy gold fields.

Industry is oriented on extraction of ore and placer gold. Commercial deposits of tin, mercury, antimony, tungsten and polymetals are in Verkhoyano-Kolymskiy metallogenic province.

In Aldansky iron-ore province, explored reserves are of more than 3.5 billion tons of iron ore. Metallurgical and power generation coal deposits are located in South-Yakutskiy and Zyrianskiy coal fields, in the republican part of Lenskiy and Tunguskiy fields and in the north-east area of Sakha Republic (Yakutia).

Over 900 deposits and coal shows have been already discovered, 38 of which, having been explored to the most extent, contain balance reserves of 15 billion t.

Kandalasskoye, Dzhebariki-Khayaskoye, Sangarskoye, Neryungrinskoye, Erozionnnskoye, Denisovskoye and Olongrinskoye deposits are being now developed. El`ginskoye deposit is rich in high-quality metallurgical coal with prospected reserves of 1.2 billion t. Phosphate raw materials are located in Aldanskaya, Sette-Dabanskaya and Udzhinskaya apatite-bearing provinces.

Seligdarskoye deposit alone contains 1277 million t of phosphate for open-pit mining.

Kempendaiskiy cement-bearing area (Western Yakutia) has prospective resources of 3-4 billion t of which 11.4 million t have been prepared for commercial development.

In the south of Sakha Republic (Yakutia), there is Aldanskaya phlogopite-bearing province which balance reserves run to 390 000 t 31 oil, gas and condensate fields have been discovered within Sakha Republic (Yakutia) territory. As of the beginning of 1994, explored reserves of A+B+C+C₂ categories came to the following:

- * oil - 254 million t
- * gas - 1310 billion cbm
- * condensate - 30 million t

There is an enormous construction materials base – i.e. 200 deposits have been discovered, 160 deposits have been explored and included in the balance, 36 deposits are being developed.

The main conclusions from the analysis of the data mentioned in this section are as follows:

1. Status and tendencies of changes in the basic sectors of Sakha Republic (Yakutia) national economy can be seen in conditions and characteristics of transport system economic efficiency, in particular, NSR and LRSL.
2. It is these transport organisations that ensure deployment and activities of enterprises in mining, timber (wood export, construction materials delivery) and handicraft industries.
3. Production revival and commencement of steady development of Sakha Republic

(Yakutia) national-economic complex should be preceded by enhancement of transport operation efficiency, primarily, at Yakutsk section of NSR and LRSL.

3. Impact of the NSR on Socio-Economic Development of Sakha Republic (Yakutia)

Impact of more active NSR functioning on pace and directions of Sakha Republic (Yakutia) economic development will certainly show up in two interconnected areas – i.e. in (1) build-up of the Republic's production potential, primarily, in its Northern part; (2) guaranteed employment of population and advance in its living standard as well as decline in social tension.

Growth of the Republic's production potential is contemplated in such directions as new construction and updating of infrastructure and production facilities oriented towards support of NSR activities, restoration of closed temporarily industrial enterprises for extraction and initial processing of the resources that are exported to other countries and form Sakha Republic (Yakutia) specialisation in territorial division of labour in Russia.

Depending on NSR cargo traffic activity various scenarios of industrial potential growth in the Sakha Republic (Yakutia) northern regions should be assumed. Realisation of the unemployed population resettlement program on a Russian North scale is a significant development that specifies features of productive forces evolution. Optimisation of the working people number in the North and, first of all, in the Arctic regions is taken as the basis of this program.

In 1996 the resident population of the Republic was 1016 000 pers. Two thirds of them live in 11 cities and 69 industrial communities, one third - in rural settlements. The largest density is in Central Yakutia (over 18 per cent in Yakutsk), in uluses it averages 35 pers. per 100 sq. km. and in northern uluses it comes to about 1 pers. As of 1989, average age was 27.6 years. More than 80 ethnic nationalities reside in Yakutia, of which Russians are the most numerous (50 per cent of citizens). Yakut-sakhas come to 33.4 per cent. Further by number are Ukrainians, Tatars, Evenks, Belorussians, Evens, Buriats and Yukagirs. During some periods of the Soviet history ratio of migrating population reached 70 per cent. In the nineties population exodus was clearly observed. Material production accommodates 68.5 per cent of economically active population, of which 17.6 per cent are employed in industry, 11.1 per cent - in civil engineering, 11.0 per cent - in agriculture, 0.5 per cent - in timber industry, 11.9 per cent - in transport and communications, 9.4 per cent - in trade and supply, 4.9 per cent - in municipal and consumer services, 6.8 per cent - in public health and social security, 12.6 per cent - in education, 2.4 per cent - in culture and art, 0.8 per cent - in science and 3.0 per cent - in management.

Occupational level doesn't exceed 80 per cent. In 1994 the number of employed persons was equal to 492 500, of which 419 800 were engaged in public sector, 55 100 - in

private sector, 27 600 - worked at other enterprises. As of the end of 1994, officially enumerated unemployed population reached 3130 pers. Decline in the number of employed in production sphere is in progress being accompanied by simultaneous increase in the number of employed in non-productive sphere. In production sphere reduction in the number of employed is mostly related to agriculture (by 11 000 i.e. 18.7 per cent in 1997 versus 1996). Unemployment comes up. As of January 1, 1997, 14,000 pers. were registered by employment service, of which 8,500 pers. had a status of registered unemployed i.e. unemployment growth amounted to 17 per cent. Rural dwellers form the major segment of unemployed population. Women constitute a great bulk of unemployed hereat.

Payment for work (62.7 per cent), pensions and benefits (12.6 per cent) form the main portion of cash incomes of the population. Average wages in 1997 came to 2 200 000 rbl.

Minimum of subsistence in 1997 amounted to 994,000 rbl. for employable population. It reached 582,000 rbl. for incapacitated population.

Cargo traffic boosting via NSR route and realisation of pertinent system of arrangements for development and updating of appropriate infrastructure facilities make it possible to assume with a certain degree of probability stabilisation of socio-economic situation in northern uluses of the Republic, decline in the rate of forced migration, reduction of the share of unemployed in public production and decrease in unemployment rate.

Prospects for development of cargo traffic activity and NSR route navigation allow to evaluate growth of employed in material production at 73.5 per cent including industry (up to 19.4 per cent), civil engineering (up to 13.2 per cent), transport and communications (up to 14.1 per cent).

In the long run, supposed changes will undoubtedly result in enhancement of the population cash incomes as well as growth in the living standard.

3.1. Delivering of Fuel, Provisions and Goods for the Population of Sakha Republic (Yakutia)

In recent year, the main affords of the State, subjects of the Federation and local authorities in the Arctic were directed towards elimination of the crisis in supplying the population of the Russian North with fuel, provisions and goods.

In 1990-1996 the volume of goods delivered by sea and river transport for Sakha Republic (Yakutia) declined almost fivefold (from 11.5 down to 2.4 million tons).

This was due to the following causes:

- elimination, at the time of transition to the market-oriented economy, of the centralised system of goods delivery to the North;

- economic crisis, financial problems the producers and consumers run into;
- destruction of the former intermodal transport system of goods delivery to the North.

In an effort to remove the first two causes the RF Government has established a new system of State support to delivery of foodstuffs and goods to the Northern regions [19]. The measures taken have enabled stabilisation of the volumes of goods delivered.

A growth in cargo flows was recorded in 1997 in the Arctic zone of Republic (by 20% as against 1996). Volumes of goods delivered by the sea and river transport to the Arctic zone of Republic in 1997 are given in Table 5.

841 million roubles from the Federal Fund have been appropriated in 1997 for goods delivery to the arctic regions of Sakha Republic (35% of the total amount appropriated for the Russian North).

Table 5. Volumes of goods delivered by the sea and river transport to the Arctic zone of Sakha Republic (Yakutia) in 1997 (thousand tons)

Regions	Volumes of goods delivered by the marine transport (NSR)*	Volumes of goods delivered by the river transport**
Port of Tiksi	117.6	63.0
Yana river	-	225.6
Indigirka river	-	48.9
Kolyma river	14.5	27.6
Olenek river	-	3.4
Anabar river	-	16.1
Another regions	-	31.0
In total	132.1	415.6

Sources: * - Soyusmorniiprojekt, 1998

** - River Transport Service, 1998.

Elimination of the consequences of the above cause - decline in the volumes of goods delivered to the North due to destruction of the former intermodal transport system - is up to now at the investigation stage. Under market conditions, a rational distribution of cargo flows is expected between various transport modes: sea, river, railway, air and road. Goods are delivered to the Arctic regions of Sakha Republic by heavy-tonnage ships, "sea-river" ships and small ships. The sea-going ships and "sea-river" ships deliver goods to intermediate ports. Small river ships deliver goods from the intermediate ports to settlements located on the sea-side and shallow rivers. Then the goods are transported to the areas inhabited by native peoples, using country roads or winter roads. Such an intermodal transport system for the Arctic regions of Sakha Republic is presently the most realistic and inexpensive. However, set-up of reloading complexes, construction of river

ships and provision of road transport requires considerable expenses.

The measures to develop transport in the areas inhabited by the native peoples are dictated by the Sub-Program "Development of Transport and Communication" being part of the Federal Program [23]. The objective of the Sub-Program is to provide State support to development of the river cargo and passenger transport and roads integrated by the Northern Sea Route into a common transport complex. The major portion (51%) of the budgetary resources of the Federal Program for 1997-2000 is appropriated to achieve this objective.

3.2. Project of International Transit Traffic via the Route: Europe-NSR-Lena River-Trans-Siberian Railway-Asia

The project of international transit traffic via the said route (Fig.2) may be realised after completing construction of the railway over Berkakit – Yakutsk leg.

The length of the transit route under consideration, e.g. between the ports of Tiksi and Yokohama is 1.5 times less than the pure sea route between these ports.

The reliability and safety of transit freight traffic is improved considerably and thus a combined route and traffic is set up. The probability of the easy type of navigation on the western NSR stretch leading to the port of Tiksi is considerably higher than on the eastern NSR stretch (53% against 23%). On the whole the sea and river portion of this route will make it possible to ensure the summer navigational season during four months, whereas the duration of the summer navigational season in the eastern part of the NSR does not exceed three months.

A large proportion of export and import cargo flows for the eastern part of the Russian Arctic may be diverted to this transit route. Putting of the international transit route according to this version into operation will promote the economic development of the RF subjects which depend appreciably on the NSR in their freight traffic activities. The inland regions of the Sakha Republic (Yakutia) and primarily the regions having promising deposits of raw materials will be involved in the international co-operation.

At the same time, this transit route will entail inevitable transshipments of goods: in the port of Tiksi - from seagoing ships to river ships with subsequent transportation of goods to Yakutsk, in Yakutsk - from river ships to railway transport with subsequent transportation to Vladivostok, Nakhodka and Vanino and transshipment from railway to seagoing ships. In this connection, the future transportation system should operate employing means for unitizing cargo on the "door-to-door" principle including the use of lighters and containers, with the large-scale volumes of transit traffic being considered.

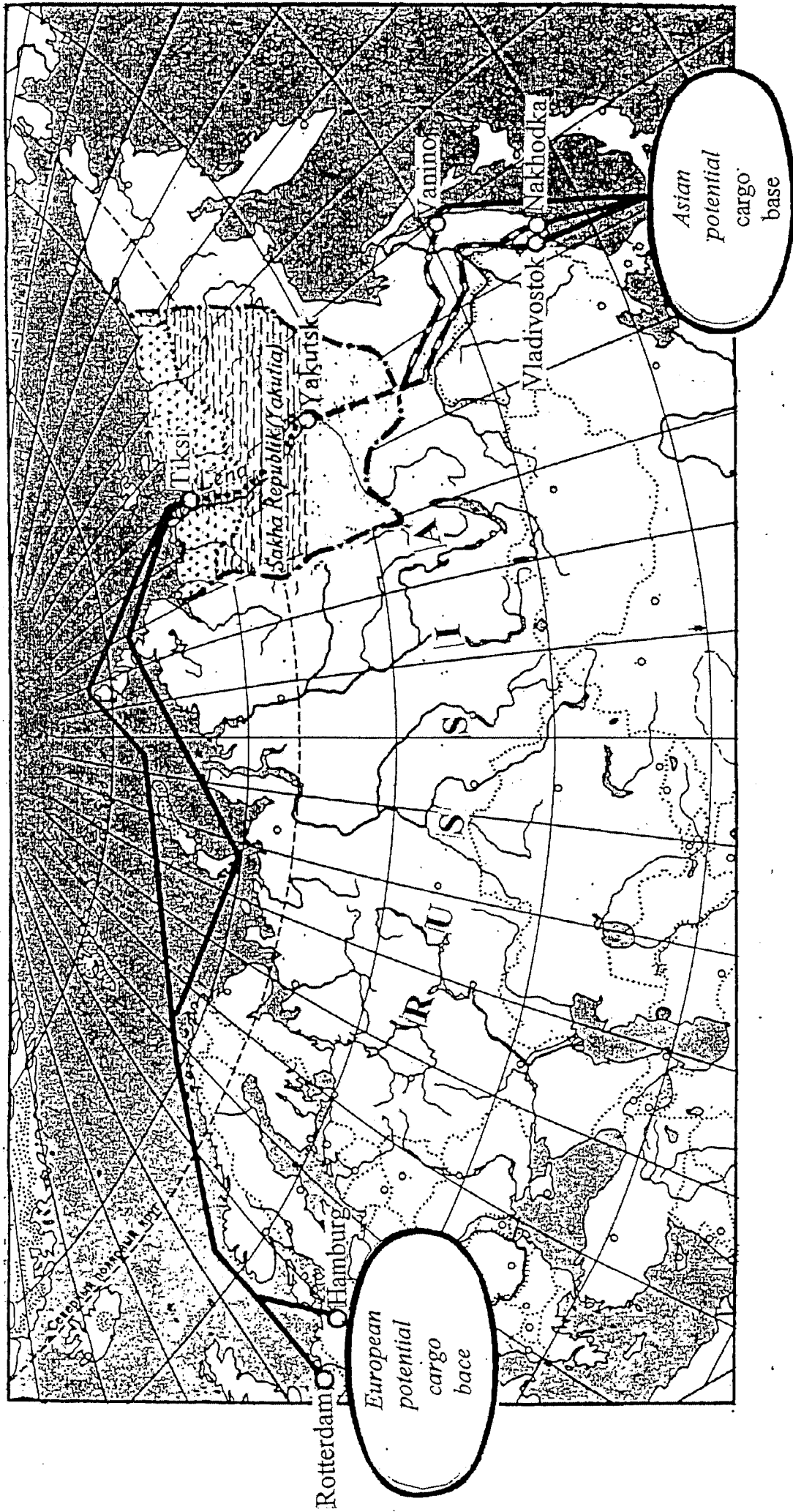


Fig.2. Project of international transit traffic via the route: Europa-NSR-Lena river-Trans-Siberian Railway-Asia

- - Northern Sea Route (NSR)
 - - - Railway on Yakutsk in stage of design
 - Active railways
- Zones of Sakha Republic (Yakutia) provided by the transport systems:
- ▣ - Arctic zone: «NSR-Rivers»
 - ▣ - Central zone: «Lena river-River-Motor zimmnik»
 - ▣ - Southern zone: «Railway-Lena river-Motor road»

Development of the reloading complexes and equipment at the transshipment points should comply with these requirements. Moreover, the complexes should be equipped with modern cargo passage tracing and control systems as well as with systems to ensure high level of services to be rendered to the users. With these elements missing, the system will operate violating delivery dates at each stretch of the transit route.

Completing of the railway to Yakutsk (after 2000) will produce significant changes in the existing transportation system in the Arctic zone of Sakha Republic. A considerable portion of goods delivered will be diverted to the new railway. The following rational schemes of transport for the Arctic zone of Sakha Republic (Yakutia) will be adopted (SCTP, 1998). In the Anabar-Olenekskoye, Lenskoye, Yanskoye, Indigirskoye and Kolymaskoye directions the major volume of all goods will be delivered by railway - river transport means with transshipment in the port of Yakutsk. The railway to Yakutsk will provide reliable access to the deep-water sections of the Lena river and will allow to lessen the distance of the river vessels trips to the Arctic zone by more than 4000 km. After transshipment of goods in Yakutsk to "sea-river" ships, the goods will be delivered by these ships to the consumers-ports on the seashores and riversides. The export of wood through the port of Tiksi will be ceased; it will be diverted to Trans-Siberian Railway. with subsequent reloading of wood to seagoing ships in the ports of Primorye. The NSR freight traffic to the Arctic zone should be regarded as an alternative in case of disruption of navigation (in dry years) on the Lena River. Oil products should be shipped to Arctic zone also by the Lena River. Besides, traditional shipments along the NSR from the European Russia to Tiksi, the Indigirka River bar, and other regions of the Arctic zone should remain.

Sea imports from the Western countries and North America through the port of Tiksi will develop and their volume by 2015 can increase to 100 000 t.

3.3. Co-operation Between the Government of Sakha Republic (Yakutia) and Federal Executive Authorities in Development of the Regional Transport Complex

Sakha Republic (Yakutia) considers the future status of the NSR as a major Joint-Stock Arctic Shipping Company. The Management of the Company is proposed to reside in Yakutsk [20].

The idea of establishing a Joint-Stock Arctic Shipping Company is supported by the NSR Administration. The Company is thought to incorporate the State-owned icebreaker fleet and State Hydrographic Department. The Company will have mixed capital: federal, regional (of the Federation's subjects) and share one (of the industrial enterprises in the Arctic). In the future, the foreign capital can be attracted, in particular, foreign shipping companies, shipbuilding yards specialised in construction of icebreakers and icebreaking transport ships can be involved in this venture.

The main function of the Company will be icebreaker escorting of ships via the NSR water under icebreaker assistance. Earnings of the Company will be drawn from the icebreaker, pilot and port dues, as well as through efficient use of the Company's block of shares.

The residence of the Company's Management, in the NSR Administration's opinion, must be in the Arctic, but need not be in Yakutsk. The freight traffic volume at the Western section of the NSR is 3 times larger than that at the Eastern section. Navigation in the direction: Murmansk-Dudinka lasts the whole year round. In this connection, the Company's Management should reside in one of the ports in the Western section of the NSR, while one of the regional body - Marine Operations Headquarters - in the port of Tiksi.

According to the viewpoint adopted by the NSR Administration, the set-up of the Arctic Shipping Company may be considered in the long-term outlook; in other words, the set-up may be postponed temporarily until the annual traffic volume through the NSR increases to 20 million tons. With such traffic volume, the Arctic transport system can become profitable.

At present, the participation of Sakha Republic (Yakutia) in the NSR management is based on the following principles [21]:

- The Northern Sea Route is recognised as a national shipping way of the RF;
- Development of the NSR stretch adjoining the seaside of Sakha Republic is governed by the programs being worked out in association with the Federal authorities. These programs include, development of the Republic's ports; upgrading of navigational, communication, search and rescue and environment monitoring facilities, construction of transport ships for the NSR;
- Use of the NSR is made with due regard for the interests of Sakha Republic;
- Financing of the development activities and distribution of earnings drawn from operation of the NSR stretch adjoining Sakha Republic is based on the share principle.

Co-operation between Sakha Republic and the Federal executive authorities in development of the regional transport complex is effected in compliance with the "Agreement" in the following spheres [22]:

- With the Ministry of Transport of the RF: preparation and implementation of national programs concerning development of the transport complex in the Yakutia;
- With the Russia State Committee for Hydrometeorology: splitting of the territorial Hydrometeorological and Environment Monitoring Departments (HEMD)'s tasks on the federal and regional levels and financing thereof from the federal budget (75%) and budget of Sakha Republic (25%);
- With the State Hydrographic Department - financing of activities relating to creation of new navigational equipment of the sea and river waterways, conducting of hydrographic research on the NSR and rivers, implementation of arrangements to prevent

marine pollution from ships;

- With the Ministry of Foreign Economic Relations of the RF: rendering assistance to the RF's subjects in selection of foreign partners in delivery of goods via the NSR as well as in identification of international organisations supplying these goods.

Conclusions

1. The Northern Sea Route integrating the sea and river routes into a common transport complex of Sakha Republic (Yakutia) solves the most pressing social problem of today: supply of the Republic with fuel, provisions and goods. For this purpose, every year the Republic receives State financing support (in 1998-841 million roubles). Organising and financial measures taken by the RF Government produced in 1997 a 20% increase in the volume of goods delivered to the Arctic regions of Sakha Republic as compared to 1996.
2. Modernisation of the transport support to the native peoples of the Arctic zone of Sakha Republic is in progress, with the Federal Program "Economic and Social Development of the Indigenous Peoples of the North until 2000" (Sub-Program "Development of Transport and Communication") being fully conformed to. The major portion of the Program's budgetary resources (51%) is appropriated for renovation of the river ships and craft, cross-country vehicles, for delivery of personal transport facilities for the native population. The river and road transportation routes to be developed are integrated with the NSR into transport complexes in the areas inhabited by the native peoples of Sakha Republic. However, due to the lack of financial resources the above-mentioned Federal Program was implemented in 1997-1998 to not more than 30 %.
3. The Northern Sea Route serves Sakha Republic (Yakutia) as a transport base for development of circumpolar and international economic, social and cultural relations. In this connection, Sakha Republic (Yakutia) intends to grant the international port status to the port of Tiksi. The Federal executive authorities have given their consent to open the port of Tiksi for foreign ships on permanent basis (now the port of Tiksi and a number of other ports are opened by the annual Decrees of the RF Government only for the Arctic navigation period). The local authorities of Sakha Republic are engaged in preparatory activities aimed at establishment of an appropriate border and customs control in the port of Tiksi.

The volumes of exported and imported goods transported by sea in the interests of the Republic at the stage of its steady economic development after 2005, can exceed one million tons per year. In the eighties, the export volume of wood from Sakha Republic run to 200 thousand tons and of coal - to 100 thousand tons per year. With new railway to Yakutsk to be commissioned after 2000, the export can be diverted to the route:

“Railway-Ports of Primorye”. The import shipments from the countries of West and Northern America to port of Tiksi will be developed.

4. The international tourism on the NSR basis began progressing in Yakutia from 1991. Then the first cruise of the nuclear icebreaker “Sovetsky Soyuz” with foreign tourists on board was arranged along the NSR with a passage to the North Pole. Six exotic points for foreign tourists visiting were opened on the seaside of Yakutia and neighbouring islands. The first experiment on foreign tourism shows that regular contacts with foreign organisations and persons in the area of tourism and business can have a positive influence on the social and cultural living conditions of the native peoples of the North. These contacts can contribute to commercial aspects of development of their traditional industries and crafts. Therefore, the international tourism organised on the NSR basis can become a source of income to the budgets of the arctic uluses of Sakha Republic.
5. Social significance of the NSR development will manifest itself in the fact that top-priority of modernisation and development of the transport infrastructure on the NSR can stabilise the socio-economic situation in the northern uluses of the Republic, decrease the rate of forced non-indigenous peoples migration from the Republic, reduce the share of unemployed in public production sector and decrease the unemployment rate.

Prospects for development of cargo traffic activity and navigation through the NSR as forecasted by the NSR Administration, allow us to evaluate the growth of employed in material production sector of economy to 73.5% including transport and communication - up to 14.1%. In the long run, the supposed positive changes will undoubtedly result in enhancement of the population's cash incomes and growth in the living standard as well.

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Comments on the report ‘Impact of the Northern Sea Route and the Lensky Amalgamated Riverine Steamship Line Functioning on Socio-Economic Situation and Sustainable Development of Sakha Republic (Yakutia)’

This is a short report, considering its subject matter. In my opinion some important issues are omitted:

1. How competitive are the exports of Sakha (Yakutia) on the international commodities market, and how competitive are they likely to be in the future? The report addresses the transport needs of the export sector in purely physical terms (and even then, only on the most general level). But upgrading of the transport infrastructure simply to ensure that potential exports can reach markets would not be economically rational unless there is a reasonable prospect that the exports can be competitive in those markets. Competition in Pacific Rim markets for coal and wood, for example, is extremely fierce at present. Does Sakha (Yakutia) have a reasonable expectation of being able to compete with Australian and North American coal? Or is there an assumption of subsidy for exports and their transport? This topic may of course have been covered in other reports, but if so there should be references to them.
2. The report describes the current division of labour among the various transport modes and suggests that when a railway reaches Yakutsk the division of labour will change. This suggestion seems to derive simply from the existence of the line. No economic rationale is presented. What are the relative costs of movement by the various possible combinations of modes, for moving supplies into and commodities out of the republic? Much of course depends on what volumes of freight can be expected, which takes us back to the first point above.
It might have been worth examining the division of labour among transport modes more broadly. If population and economic activity are declining, what can be said about the relative advantages of using river, sea, rail, truck, and air transport to access the various parts of the republic in future? Or does this report assume that economic activity and population will eventually return to and/or surpass the levels of the mid-1980s?
3. It is also stated that the railway can be expected to facilitate transit traffic between Europe and the Far East. This assertion seems to derive mainly from a reduction of distance compared to existing routes between Europe and the Far East. Again, an economic rationale is needed. For example, what is the basis for expecting that a shorter distance between Europe and the Far East will outweigh the disadvantage of a four-month season?
4. The title of the report uses the word “sustainable”. There is no attempt to address the issue of what is meant by that term. Given that development is expected to rely primarily on non-renewable resources, it would perhaps be better to leave “sustainable” out, or at least to indicate over what time period recommended policies will be sustainable.

I have a general comment concerning the use of statistics, mainly on pp. 9, 11, and 14-17. Those for both transport and production should be revised if that is feasible. For example, firstly, figures in the text suggest that Table 1, p.15, could be updated beyond 1993. Secondly, using comparable figures for the various transport modes would present a much clearer picture of the situation. E.g. where figures are provided for one mode, as on p.11, para. 4, similar figures could be given for the others. The same is true of the various sectors of the economy. Thirdly, on p.14, it would be useful to know what years are being compared when describing the "setback in production" (para 3, sentence 1). Fourthly, on p.16 the coal production figure does not fit those in Table 1 for either 1990 or 1993, but the year to which it does refer is not stated. Fifthly, a GSP figure is used on p.9, but GNP figures on pp. 14 and 17. Finally, the figures for wood on p.17 and in Table 1, p.15 are not comparable, since different units of measurement are used. I could give other examples, but the general point is the need to tidy up the use of statistics.

There follow some comments keyed to specific pages:

- | | |
|--------------|--|
| p.4, para.4 | Does "migration" refer to immigration, emigration, or migration within the republic? |
| p.7, para.2 | I cannot follow the sense of this paragraph. |
| pp.8,9 | A division of Sakha (Yakutia) into three regions is used. The only map provided, on p.26, shows a division into two regions. It would help to have a map of the three regions as well. |
| pp. 11, 12 | When discussing maintenance needs, it would be useful to know how the navigable lengths have changed, if at all. |
| pp. 12, 13 | A note of how foreign imports and exports compare to imports from and exports to other parts of Russia would help to make clear the importance of this section. |
| pp. 13, 14 | Is the assumption of financial support realistic? Has recent experience in this regard been "reassuring and promising"? |
| p.32, para.1 | The wording of the paragraph leaves unclear the expected fate of import and export traffic on the NSR after the completion of the railway to Yakutsk. Would all traffic be diverted? |

Dr. Robert N. North
Associate Professor and Acting Head
Department of Geography
University of British Columbia

5 January 1999

23 February 1999

To: Dr. Robert N. North
 Associate Professor and Acting Head
 Department of Geography
 University of British Columbia

Dear Dr. Robert N. North,

Thank you for your comments on the report of project IV.4.1 "Impact of the Northern Sea Route and the Lensky Amalgamated Riverine Steamship Line Functioning on Socio-Economic Situation and Sustainable Development of Sakha Republic (Yakutia)"

We regard all your comments as justified and correct ones. Drawing on your critical comments, we have made some essential amendments and additions to the report.

In answer to your questions, we would like to give some explanations:

1. An answer to your question: "*How competitive are export of Sakha (Yakutia) on the international commodities market, and how competitive are they likely to be in the future?*" can be found in the INSROP DISCUSSION PAPER III.01.6 - 1998 "Cargo - Forming Potential of the Republic of Sakha, Chucot Autonomous District and other Far - Eastern Regions for the Northern Sea Route" and in the INSROP DISCUSSION PAPER WP-3 - 1998 "Potential Cargo Flow Analysis and Economic Evaluation for the Simulation Study".

2. In accord with your comment: "*The report describes the current division of labour among the various transport modes and suggests that when a railway reaches Yakutsk the division of labour will change. No economic rationale is presented*", we have additionally inserted in the report a passage on rational transport modes and Figure 1 (pp. 10-12) on the transport supply of Sakha Republic (Yakutia). The technical and economic feasibility study of the choice of rational transport modes was performed by SCTP in 1998.

3. Our statement "*that the railway can be expected to facilitate transit traffic between Europe and the Far East*" is confirmed by the calculations of CNIIMF. Having in mind tariff preferences for the transportation, the additional profit from carriage of cargoes through the transit way Europa-NSR-Lena River-Trans-Siberian railway - Asia during the summer navigation period may amount to 250 USD per one container and to 10 USD per ton of bulk cargo. The problem of the year-round functioning of this transit way is at the stage of investigation.

4. We agree with your proposal to leave "*sustainable*" out the title of the report.

5. According to your general point concerning "*the need to tidy up the use of statistics*", we have introduced relevant corrections into the text of the report. In particular, cargo flows (Tables 1-3 (p.13)), and the indices of economic development for 1985-1996 (Table 4 (p.18)) have been given.

As to “*some comments keyed to specific pages*”, we would like to give the following answers:

p.4, para.4. Comment: *Does “migration” refer to immigration, emigration, or migration within the Republic?*

Answer: The word “*migration*” means non-indigenous peoples migration from the Republic (see p. 3)

p. 11,12. Comment: *When discussing maintenance needs, it would be useful to know how the navigable lengths changed, if at all.*

Answer: The satisfaction of maintenance needs for development of river navigation (new icebreakers, ice-strengthened cargo ships, port) can increase the duration of navigation from four to six months. The future navigable lengths of the rivers are presented in Figure 1 (see pp. 11,15).

p. 12,13. Comment: *A note of how foreign imports and exports compare to imports from and exports to other part of Russia would help to make clear the importance of this section.*

Answer: In 1997, no foreign imports existed. Imports from others parts of Russia were more than 3 million tons. Foreign exports were insignificant: 10 thousand tons. Export to others parts of Russia and the CIS countries market included the products of mining industry: gold, diamonds and tin. Small volumes of coal to Chukotka and wood to Magadan and Khabarovsk regions were exported (see p. 13).

p. 13, 14. Comment: *Is the assumption of financial support realistic? Has recent experience in this regard been “reassuring and promising”?*

Answer: The social-economic and transport federal programs (more than 25 integrated programs) due to the lack of finance resources were implemented in 1995-1997 to not more than 30%. Financial crisis in Russia in 1998 resulted in a situation where amounts of financing support to the federal programs in the 1999 Federal budget were reduced significantly and some programs were therefore cancelled (see p. 17,35).

p.32. para.1. Comment: *The wording of the paragraph leaves unclear the expected fate of import and export traffic on the NSR after the completion of the railway to Yakutsk. Would all traffic be diverted?*

Answer: The completion of the railway to Yakutsk will produce significant changes in the existing transportation system of Sakha Republic. The export traffic of wood, coal gas and oil will be diverted to the Trans-Siberian Railway. The NSR freight traffic to the Arctic zone should be regarded as an alternative in case of disruption of navigation (in dry years) on the Lena River. Besides, traditional traffic along the NSR from

European Russia to the port of Tiksi, the Indigirka river bar, and others regions of the Arctic zone should remain. The sea imports from the countries of West and North America to the port of Tiksi will be developed: by 2015 its volume can increase to 100 thousand tons (see p. 31, 32, 36).

We hope that after the second revision and language correction the paper will better meet the requirements of project IV.4.1.

Sincerely yours

V. Pavlenko

A. Yakovlev

The three main cooperating institutions of INSROP



Ship & Ocean Foundation (SOF), Tokyo, Japan.

SOF was established in 1975 as a non-profit organization to advance modernization and rationalization of Japan's shipbuilding and related industries, and to give assistance to non-profit organizations associated with these industries. SOF is provided with operation funds by the Nippon 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.

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