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**The NSR: Impacts on the Nenets Autonomous
Okrug Regional Development and
Social/Economic Conditions of
the Nenets Population**

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Expanded Use of the Northern Sea Route

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**Title: The NSR: Impacts on the Nenets Autonomous Okrug
Regional Development and Social/Economic
Conditions of the Nenets Population**

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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.

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TABLE OF CONTENTS

	Page
Acknowledgements	3
INTRODUCTION	3
West Arctic in the INSROP Studies.	3
The Nenets Autonomous Okrug - a new commercial and transport interest in the NSR west sector.	4
Methods.	5
PART I. POPULATION AND ITS ETHNO-DEMOGRAPHIC FEATURES	6
1.1. Administrative set-up peculiarities	8
1.2. General characteristics of population	10
1.3. Demographics	14
1.4. Migratory processes	19
1.5. Labor forces	22
1.6. Unemployment	23
1.7. Medical-social situation	24
Part II. NATURAL RESOURCE POTENTIAL AND ECOLOGICAL SITUATION	29
2.1. Non-renewable resources. Oil and gas	30
2.2. Renewable resources	36
2.2.1. Pasture resources for reindeer-breeding	37
2.2.2. Fishery resources	39
2.2.3. Resources of marine mammal hunting	41
2.3. Protected areas	43
2.4. Ecological situation in the NAO	45
2.4.1. Radioactive contamination problem	46
2.4.2. Air pollution from local sources	48
2.4.3. Natural water contamination	53
Part III. STATE OF THE LOCAL ECONOMY	55
3.1. Reindeer breeding	55
3.2. Oil and gas industry activities	62
3.2.1. Oil development	63
3.2.2. Gas development	65
3.2.3. License agreements	66
3.2.4. Oil delivering to consumers	67

3.3	Transport infrastructure and perspectives on its development	70
3.3.1.	Marine and river ways	70
3.3.2.	Surface transport ways	76
3.3.3.	Air transport capabilities	77
PART IV. LEGAL REGULATION OF ECONOMIC ACTIVITY IN THE NENETS AUTONOMOUS OKRUG		78
4.1.	Federal legal regulation of regional economic activity	79
4.2.	Local legal regulation	81
CONCLUSIONS		83
APPENDIX 1. TABLES		87
APPENDIX 2. FIGURES		89
REFERENCES		90

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To complete this work, the author visited the Nenets Autonomous Okrug (NAO) two times (in September and December, 1997) to collect information about the economy, and on social, ecological, and health issues.

The following organizations were visited: Departments of the NAO Administration, the State Statistical Department, the State Committee of Ecology and Protection of Environment, the local native organization "Yasavey", the Committee on the Affairs of Northern Minorities of NAO, the Assembly of the NAO deputies, etc.

The author wishes to express her deep appreciation to all persons with whom she worked for their full support of her studies. In particular, the Governor, Mr. V.Ja.Butov, and the heads of the Administration Departments and local Committees who spent much time with the author discussing problems with the current situation and the future plans for the socio-economic development of the NAO.

INTRODUCTION

West Arctic in the INSROP Studies. The multi-disciplinary approach of the INSROP studies includes a wide range of economic, social and cultural issues affected by the NSR. The geographical area of the INSROP interests encompasses territories wider than those which have been traditionally accepted by the Soviet/Russian concept of the Northern Sea Route. Thus, the western portion of the Russian Arctic, which is usually not considered part of the NSR, has already been evaluated by the INSROP project with regard to the possible impact of the NSR development and to the interdependence of regional industries with transport services (INSROP Working Paper NO 16-1995 and INSROP Working Paper NO 54-1997, in framework of Sub-program III: Trade and Commercial Shipping Aspects).

The Russian western Arctic, from the Kola peninsula to Taimyr, was considered together with the northernmost parts of

other European countries (Norway, Sweden and Finland), in a study which has focused on the analysis of four competitive industries: fisheries, mining, forestry, and oil and gas. Further development of the NSR depends not only on the status of these industries, but also on the transport capabilities necessary for the industrial use of natural resources.

During the current transitional period of the Russian economy, Russian attitudes toward the different parts of the Russian North and the Arctic have changed. Territories which can deliver goods that yield maximum profits in the national and/or the international markets have gained attention. Accordingly, the role of transportation costs in maximizing profits appears to have attracted investors to some northern territories due to their closeness to the central regions of Russia, and to the international markets. This proximity to markets seems to have been favored even over the higher levels of natural resources found in further territories.

For example, the remote location, severe climate, and complex permafrost conditions of the Yamal peninsula forced the postponement of large gas field development in favor of the hydrocarbon resources of the Nenets Autonomous Okrug (NAO) and the Russian western arctic shelf zone. According to the latest development plans for the oil and gas industry, the Yamal peninsula needs more time to solve difficult investment issues and extraordinarily complex engineering problems. Consequently, the peak of industrial and transport activities connected with this area along the NSR, should not be expected earlier than 2005. In contrast, the Russian Arctic western offshore and NAO's activities are growing more rapidly than analysts predicted it 2-3 years ago.

The Nenets Autonomous Okrug - a new commercial and transport interest in the NSR west sector. The Nenets Autonomous Okrug (NAO) has attracted the attention of oil companies from several countries. They are interested in this region both as consumers and developers of oil and gas fields. Oil and gas development in NAO requires transport both for equipment and goods to supply the oil and gas industry in the area, and for transport of oil and gas out from the region to

the consumers in Russia and internationally. This could lead to a significant cargo volume using the Northern Sea Route as pointed out in the regional shipping scheme for the Barents and Pechora Seas.

What is the situation in the Nenets Autonomous Okrug today, and how can all these planning activities affect and change the social and economic life on the regional and local levels?

Among the northern regions of Russia, this okrug has been mentioned rarely either in scientific literature or official documents.

In its history the Nenets Autonomous Okrug has its own peculiarities. NAO has been known as a remote reindeer-breeding region of the Russian North a sparse population, including northern minorities. It was not a place where national interests were concentrated. Nevertheless, the geological surveying and prospecting for hydrocarbon reserves has been conducted since the middle of the 20th century. Geological forecasts place the potential hydrocarbon reserves of the Timan-Pechora oil and gas province as the second largest in Russia and the fourth in the world.

These large deposits of oil and gas were discovered quite recently--in the 1980's-1990's. During many decades this okrug was in the shadow of rapid industrial growth in adjacent regions such as the Komi Republic to the south and the Yamal-Nenets and the Khanty-Mansi okrugs to the east [see figure 1]. Secondly, due to testing of atomic bombs conducted by the Soviet-Union on Novaya Zemlya, situated to the north of NAO's sea shores, information about this region was practically closed. In the official statistical yearbooks, the NAO was mentioned only as a part of the Arkhangelsk oblast, practically without separation of data relevant to the okrug itself. At present, the situation is changing very slowly. The okrug's Statistical Department is only beginning to create a modern system of data gathering, processing and assessment.

Methods. This paper is based on local sources of information in the NAO together with available working papers of various institutions in Moscow. For a better understanding

of the most important questions of resource management and interaction among social groups the author conducted personal interviews with the heads of administrative departments, local committees and business enterprises. Organizations made available their annual working reports, statistical data and plans for future development.

This report also draws on the analytical documents prepared for the State Duma Commissions, research institutes studying oil and gas resources, the State Committee on the Northern Development Questions, and others.

For the most part statistical materials have been included in original tables prepared for this report. Available official statistical data, published in Statistic Yearbook, widely used by many authors of the INSROP Working Papers, are presented here only for comparison with other regions adjacent to the Nenets okrug. This allows for a better understanding of the role of this okrug in the Barents Region today, and its perspectives. Original maps for this report were developed in the laboratory of arctic studies within VNIISI using statistical data and materials received directly from the NAO.

PART I.

POPULATION AND ITS ETHNO-DEMOGRAPHIC FEATURES

Within the framework of INSROP, the indigenous peoples of the Russian North, inhabiting the areas affected by the NSR, have already been assessed from different points of view. The legal status of all northern minorities and their economic development were analyzed by G.Osherenko et al. (13) for each 5-year period from the October Revolution to present. This study includes assessment of interaction of the NSR use with economic activities of indigenous peoples living in territories adjacent to the NSR.

All these minorities had to change their traditional style of life during the Soviet period. The efforts of the Soviet authorities were connected with new organizational forms--collective farms, while the branches remained as they were: reindeer breeding, hunting, and fisheries. The idea of

providing the younger generation of indigenous people with higher or special education and industrial skills, prevailed in the Soviet society, and to some extent it had been implemented. As in other arctic countries, efforts to involve natives in industrial branches were not too successful. The system of free schools allowed for education and training, but the results depended also on indigenous people's abilities and interest in acquiring new professional skills. Only a small portion of the indigenous population agreed to completely change their style of life and moved to urban areas; some of these returned to their communities.

Another important focus of INSROP studies is the impact of development on indigenous peoples of the Russian North. INSROP Working Paper NO.90-1997 by Winfried K.Dallmann (12) provides a comprehensive review of the northern aboriginal minorities of the Russian Federation. This paper accented questions of historical/ethnographic peculiarities and environmental changes due to industrial impact. The lands traditionally used by northern indigenous people are under strong and long-lasting impact of industrial development of natural resources. Dallmann notes that indigenous people have never been asked to give away their homelands for other purposes. Since the colonization of the North, however, large parcels of indigenous land have been gradually converted into areas for alien settlement, transport routes, industry, forestry, mining and oil drilling.

Fortunately, the situation is changing, although very slowly and not always efficiently. The order, which existed for more than 70 years, when the local social interests had been neglected in favor of "the national strategic interests", was recognized by the new democratic Russia as unacceptable. Now the regional authorities, the Okrug Administration, represents the social-economic interests of the native people of the region. Furthermore, in accordance with the new drafts* of the Federal Laws, under consideration in the State Parliament of the Russian Federation since June 1997, these obligations should be delivered to the aboriginal communities (Russian singular "*obshiny*"). If these drafts are adopted as Federal Laws, the industrial companies, both national and foreign, will

be required to conduct negotiations with indigenous peoples regarding a withdrawal of their homelands for industrial needs, and the land use and development will be negotiated among three parties: local administration, indigenous peoples, and the industrial enterprise.

1.1. Administrative set-up

The Nenets Autonomous Okrug, in accordance with its constitutional status, is a subject of the Russian Federation; it is also a part of the Arkhangelsk oblast. As other autonomous okrugs of Russia such as the Yamalo-Nenets, the Khanty-Mansy, the Dolgano-Nenets (or Taimyr), the NAO does not have political autonomy from the larger oblast (province). Only the Chukchi Autonomous Okrug succeeded in legally separating from the Magadan oblast in 1992. Administratively the Nenets okrug was formed July 15, 1929, first as a national okrug, and since 1980, as an autonomous okrug. It occupies the northeastern part of the European Russian North, stretching along the southeastern part of the Barents Sea. The area of NAO is 176700 sq. km, including two arctic islands: Vaigach and Kolguev. The local authorities of the Arkhangelsk oblast governed the archipelagic islands of Novaya Zemlya. But since 1957, before the start of series of atomic tests, the aboriginal population (300-400 persons) was moved either to Kolguev Island or to Nar'yan-Mar, when governance of Novaya Zemlya passed into hands of military authorities.

The NAO is the only subject of the RF which has no internal regional subdivisions. It is evidence of the undeveloped territorial organization, which results from the limited economic activities and relatively sparse population, 0-0,3 persons/sq. km (27 times lower than in the RF). (Figure 1).

Economically, all autonomous okrugs have independent budgets, and are directly subordinate to the central Government of the Russian Federation (RF). Therefore, at present, the social and economic life of the northern territories is regulated mainly by okrug authorities and through ongoing federal programs. Among these, the most important are: "State

Program of Economic and Social Development of the Russian North", "State Program of Social and Economic Development of Indigenous Peoples of the North to 2000", "Children of the North", "State Program of Moving a Part of the Population from the North".

These programs, started in the 1990's, have been aimed at the transition of the northern economy to the new market conditions, and adaptation of the population to the democratic reforms. As time has shown, these programs are not efficient, and the reasons were partly analyzed by Alexander Granberg in INSROP Working Paper NO.74-1997 (11). He attributed this low efficiency to the extremely large area under the northern programs (up to 60% of the whole territory of Russia), and the passive attitude of the regional leaders in supporting the programs. State programs have been conducted under conditions of the current investment crisis in Russia, with significant reductions of federal budget investments. In no year have the financial obligations proclaimed in these programs been fulfilled. This is particularly true of the Federal Program of Social and Economic Development of the Indigenous Peoples of the North to 2000. This Program became the continuation of the previous one, which lasted from 1991 to 1995, and which had been funded at only about 30% (or lower) of the planned level. The financial state of the new Program to 2010 is similar.

In "old Soviet times", the limited sums which were delivered from the federal budget to the local authorities for implementing the social and economic programs were often used locally for quite other purposes due to weak control from central financial bodies, and simultaneously, an increase of independent decision making by local powersg concerning distribution of funds both from the federal budget and local sources.

Unfortunately, the social and economic problems of relatively small groups of native peoples have never been a main concern for the local authorities. Social and economic development issues of the indigenous people have been considered and invested in only after other problems of the autonomous okrug were addressed. Therefore, one of the

objectives of the latest RF Government's Resolution, concerned with the reorganization of the state policy in the North (Dec.30, 1997), is to create administrative and economic mechanisms which will ensure that federal support will be received directly by those for whom it was intended.

1.2.General characteristics of population

The autonomous okrugs in Russia have been named for the indigenous peoples living permanently in the respective territories. The Nenets people are the most numerous group among the northern minorities. They can be encountered from Kola peninsula to the coastal areas of the eastern side of the mouth of the Yenisei River. They are concentrated in three autonomous okrugs: the Nenets, the Yamal-Nenets, and Taimyr (Dolgano-Nenets). The total number of the Nenets population reached 34190 (Census of population, 1989). The distribution of Nenets in Russia is presented in Table 1.

Table 1.

Distribution of Nenets people in Russia, 1990

Name of region	Number of Nenets population	% to total Nenets population
Tymen oblast	22,619	66.2
Including:		
Yamal-Nenets A.O.	20,917	61.2
Khanty-Mansi A.O.	1,144	3.3
Arkhangelsk oblast	7,178	21.0
Including:		
Nenets A.O.	6,423	18.8
Krasnoyarsky kray	2,661	7.8
Including:		
Taimyr (Dolgan-Nenets) A.O.	2,446	7.2

Source: The main indicators of the economic and cultural development of the northern minorities. State Statistics Committee of the RF. Moscow, 1990.

The native language of the Nenets people belongs to the Samoedic group of languages, Ural linguistic family. The share of the northern minorities of the total population of the

okrugs ranges from less than 1% to 19%. For NAO, this share is rather high, numbering about 14,8%, and along with Nenets there are about 5000 Komi people, or 9% of the total population.

The maximum population refers to 1990, when about 55,000 lived in the NAO. During 1992-1994 about 7,000 persons left when the migration wave out of the Russian North peaked. Among the 48,000 remaining, more than half are concentrated in two urban settlements: Nar'yan-Mar - 19,200 (in 1990 - 20200), the administrative center of the NAO, and its satellite - Poselok Iskateley - 7,400 (8600 in 1990), where geologists and their families dominate. Together these two urban settlements create one administrative unit governed by the Nar'yan-Mar Town Council. (See Table 2).

Table 2.

Dynamics of the NAO population during 1990-1996 years
(thousand of people to the 1st of January)

	1990	1994	1995	1996
Total	55.0	50.9	49.3	48.1
Including:				
Urban areas:	34.2	30.9	29.6	28.7
Nar'yan-Mar	20.2	20.0	19.6	19.2
Poselok Iskateley	8.7	7.9	7.6	7.4
Anderma	5.3	3.0	2.4	2.1
Rural areas	20.8	20.0	19.7	19.4

Source: Statistical Book 1990, Socio-economic development indicators of the NAO. Arkhangelsk Regional Statistic Department, 1991. Demographic situation in the NAO. The NAO Statistic Committee, July 1996.

In the third urban settlement, Anderma, the population dropped from 5300 to 2100 following the sharp reduction of geological survey work during the last five years. In spite of this decline, urban population remains at 59.7 % of the total okrug population. The rural population totaled 19,400 persons in 1996 (40.3% of the total) which changed a little during the transitional period; the reduction did not exceed two thousand persons. The rural population is unevenly distributed between

so-called "rural councils" (*sel'skie sovety*, Figure 1). The national composition of rural settlements is mixed and includes the following nationalities: Russians, Nenets, Komi, Ukrainians, and Belorussians. The first two of these are the most dominant. A few communities are predominately native, with the Nenets population accounting for 85-90%. Typical native Nenets communities are: Nelmin-Nos, Ust'-Kara, and Indiga.

In 1997, the population of Nenets reached 7,152, with 6,487 living in rural areas. According to the last two censuses in 1979 and 1989, and the selected accounting of the number of indigenous minorities in all okrug settlements by the local Association of Nenets people "Yasavey" in 1995-1996, a slow growth of indigenous people in absolute figures can be detected, although their share in the total population might decrease.

Table 3.

Dynamics of the population of NAO including the share of Nenets people

	1979	percent to total	1989	percent to total	1996	percent to total
Total population	47,218	100	53,912	100	48,100	100
Nenets	6,031	12.7	6,423	11.9	7,034	14.6

Totally, the NAO has about 60 communities scattered over more than 500 kilometers. The population in such communities varies from 30 to 1200 people; small villages with a population of 100-150 people are the most typical. The latest data regarding the distribution of Nenets in the NAO is shown in Table 4.

Table 4.

The distribution of population by
*sel'skie sovety** including Nenets of the NAO

Jan.1 1997.

	The name of rural area (<i>sel'sky sovet</i>)	Central settlement of rural area	Number of total population/Nenets (persons)
1.	Andegsky	Andeg	228/29
2.	Varandeysky	Varandey	140/140
3.	Velikovochny	Velikovochnoe	
4.	Kaninsky	Nes'	1,624/652
5.	Karsky	Ust'-Kara	729/559
6.	Kolguevsky	Bugrino	435/416
7.	Kotkinsky	Kotkino	496/22
8.	Malozemelsky	Nelmin-Nos	1,092/1,040
9.	Omsky	Oma	1,233/527
10.	Peshsky	Nizhnyaya Pesha	1,462/88
11.	Primorsko-Kuysky	Krasnoe	1,814/858
12.	Pustozersky	Oksino	1,214/230
13.	Tel'visochny	Tel'viska	947/42
14.	Timansky	Indiga	954/502
15.	Khorey-Versky	Khorey-Ver	937/452
16.	Khosedo-Khardsky	Khosedo-Khard	795/317
18.	Shoinsky	Shoina	n-a/117
19.	Yusharsky	Karatayka	765/404
20.	Anderminsky	Anderma	2,100/61
21.	Iskateley urban area	Iskateley	7,400/47
22.	Nar'yan-Marsky urban area	Nar'yan-Mar	192,200/557
	Total population		47,100
	including Nenets		7,152

* *sel'skie sovety* unite settlements for local governance but do not have territorial boundaries.

Source: The socio-economic passports of the NAO rural councils. Data collected by The Indigenous People Committee of the NAO Administration, 1997.

1.3. Demographics

The demographic situation in the NAO reflects the processes common for the whole of the Russian North: waves of population migration, low indices of natural growth, decreasing number of births and increase in mortality. Nevertheless, in order to have a more objective picture, it is necessary to compare the NAO with other administrative areas, such as neighboring regions in the Russian part of the Barents region: Murmansk oblast, the Republic of Karelia, Arkhangelsk oblast and the Komi Republic. (Tables 5a-f, Figures 3-8).

Table 5.

Comparative demographic data on the northern regions of the European part of the RF

(a) Dynamics of number of population

Name of Adm. Unit	Y E A R S			
	1993	1994	1995	1996
Republic Karelia	794	789	785	780
Komi Republic	1,228	1,202	1,185	1,173.6
Arkhangelsk oblast	1,548	1,535	1,521	1,507
Nenets A.O.	51	49	48	47.3
Murmansk oblast	1,092	1,067	1,048	1,032.7

(b) Dynamics of number of rural population.

Name of Adm. Unit	Y E A R S		
	1993	1994	1995
Republic Karelia	205	203	204
Komi Republic	311	302	303
Arkhangelsk oblast	414	408	401
Nenets A.O.	20	20	19
Murmansk oblast	82	81	83

(c) Dynamics of number of urban population.

Name of Adm. Unit	Y E A R S		
	1993	1994	1995
Republic Karelia	589	586	581
Komi Republic	917	900	882
Arkhangelsk oblast	1,134	1,127	1,120
Nenets A.O.	31	29	29
Murmansk oblast	1,010	986	965

(d) Dynamics birth/1000 of citizens.

Name of Adm. Unit	Y E A R S		
	1993	1994	1995
Republic Karelia	8.8	8.6	8.5
Komi Republic	9.8	9.7	9.3
Arkhangelsk oblast	8.9	9.2	8.7
Nenets A.O.	11.4	13	12.4
Murmansk oblast	7.2	8.5	8.1

(e) Dynamics death/1000 of citizens.

Name of Adm. Unit	Y E A R S		
	1993	1994	1995
Republic Karelia	14.8	16.8	16.3
Komi Republic	11.8	13.2	12.6
Arkhangelsk oblast	14.3	15.6	14.6
Nenets A.O.	10.3	10.5	11.7
Murmansk oblast	10.1	11.7	11.4

(f) Dynamics of natural growth/1000 of citizens.

Name of Adm. Unit	Y E A R S		
	1993	1994	1995
Republic Karelia	-6	-8.2	-7.8
Komi Republic	-2	-3.5	-3.3
Arkhangelsk oblast	-5.4	-6.4	-5.9
Nenets A.O.	1.1	2.5	0.7
Murmansk oblast	-2.9	-3.2	-3.3

Source: Annual Statistical Book "The Regions of Russia" Moscow, 1996.

The comparison of data presented in the tables above reveals that demographic are stronger for more industrially developed regions than for the Nenets autonomous okrug. Slowed industrial production, increased emigration, growth of unemployment, and simultaneous increase in living cost, and psychological stresses have combined to produce the demographic situation. The Nenets AO has similar, but not so pronounced problems. The quality of life in this okrug was historically lower than in the adjacent areas. The present gradual worsening of social life is not something new.

More detailed data regarding the change of demographic situation in the NAO, only confirms this conclusion. Furthermore, as everywhere, negative changes are more notable in the urban areas than in rural ones. But for the rural areas there are other problems, mainly for the indigenous population. Most notably, the worsening of natives' health, which might be a consequence of the general socio-economic crisis affecting all communities. Naturally, the traditional economy of the indigenous minorities, which was always supported from federal budget, is suffering most due to a sharp decrease of federal investments, being especially vulnerable under new market requirements.

Table 6.

Demographic indices for the Nenets autonomous okrug

Demog. Ind.	1990	1991	1992	1993	1994	1995	1996
Total pop.	55,000	54,100	52,000	51,300	49,800	48,400	47,100
Includ.:							
Nenets	6,423	6,400	6,700	6,400	6,400	6,400	7,034
Children until 14 years.	15,751	15,400	19,800	13,880	13,350	12,690	12,320
Urban areas	34,200	33,400	31,800	32,000	29,900	28,600	28,000
Rural areas	20,800	20,700	20,200	19,300	19,900	19,800	19,750
Births total	928	858	713	582	649	594	544
Includ.:							
Nenets	211	213	172	172	164	168	151
/1000 persons	16.5	15.6	13.7	11.3	13	12.2	11.5
Includ.:							
Nenets	32.2	33.3	25.6	26.6	26.7	26.6	21.5
Death total	371	364	413	513	521	55	471
Includ.:							
Nenets	59	55	76	107	109	103	87
/1000 persons	6.7	6.7	7.9	10	10.4	11.3	10
Includ.:							
Nenets	9.2	2.8	11.3	16.7	17.1	16.1	12.4
Infant mortality total	27	13	19	9	11	11	13
Includ.:							
Nenets	9	6	6	1	5	7	8
Until 1 year / 1000	29.6	14.8	24.9	14.7	17.5	18.6	23.2
Includ.:							
Nenets	43.1	28.2	32.4	5.8	30.1	41.7	51.0
Number of nomadic families	-	-	-	-	57	178	299

Source: Statistical data of the Medical Department of the NAO Administration, 1997.

The statistical demographic data reveals quite definitely a worsening of the situation among the Nenets population, particularly a warning state as to the infantile mortality and deaths among adult Nenets population. As will be described in the next chapter of this report, devoted to the socio-medical situation in the okrug, the cause of such a poor state stems from the low level of medical services in remote communities

and undeveloped transport and social infrastructure. The high rate of illness has increased due to wide spread alcoholism among indigenous people, particularly during the last decade, when people were stressed by the new economic conditions without appropriate help from regional and federal authorities. The positive signal of the natural growth is explained by traditionally high birth rates among natives, but the absolute figures of this index are declining.

1.4. Migratory processes

The beginning of the 1990's marked a critical period for both the northern economy and for northern specialists. During this time the region experienced substantial out migration as large percentages of employment age people relocated to other areas. The most intense era of emigration lasted until 1994; however the NAO continued to suffer out migration until 1997.

The indigenous population has been the most stable social group within the NAO, exhibiting no migrational tendencies. They positively refused to be relocated in 1997 when the NAO administration closed the rural settlement of Varandey and attempted to move people to other parts of the RF--mainly to the Arkhangelsk, Kirov, and Vologda administrative regions. The administrative relocation attempt, funded by the Federal "Move from the North" Program, aimed to gradually withdraw the so-called "extra" population from the northern regions of Russia. The push to relocate the Nenets, however, was driven by different motives. The authorities wanted to evacuate people from their coastal homes where industrial production on the shore of the Pechora Sea had caused heavy marine abrasion. The State Committee for Social and Economic Development of the North agreed to help these people move using funds of the "Move from the North" program, and find housing for them in other parts of the Nenets okrug.]

Although the indigenous population of the okrug has remained stable, a study by the author of passports from *sel'ski sovety* showed a degree of indigneous migration within the okrug directed toward the okrug's center and other urban centers. The impetus behind this movement is the search for

employment and improved financial status. At present, however, the lack of available housing and employment opportunities raises doubt to whether this sort of internal okrug migration will be sustained.

Analysis of migratory flows into the Nenets okrug shows that the people who came to the okrug were originally from the urban areas of the northern, north western, and central administrative regions. Within the Nenets AO population today, Russians constitute 72% of the total population - or about 35,000 people, which makes them the most numerous of national groups. The second largest group of newcomers to the okrug were from the Povolzje areas and the Ukraine. Altogether, non-native migration into the okrug over the past 25 years resulted in a doubling of the population. During the period of heavy emigration from 1990-1996, these geographic areas became the destination of 76% of migrants.

Table 7 gives the picture of geographical distribution of migratory flows in the NAO in 1995.

Table 7.

Number of migrants who arrived in and left the NAO
regarding directions of their move
(in % to the total number of migrants, 1995)

Number of immigrants			Number of emigrants		
From this region	From other regions of Russia	From other states	To this region	To other regions	To other states
27,6	48,9	23,5	12,4	78,5	9,1

Source: Regions of the Russian Federation. Annual Statistic Book. The State Statistic Department of the RF, Moscow, 1996.

The basic factors which affect the okrug's population are migratory processes and indicators of natural growth. As one can see from Table 8, natural growth can not compensate for the loss of population due to negative migration.

Table 8.

Indicators of natural growth and migration in changes
of the Nenets AO population

	1993	1994	1995
Total change			
(+) growth			
(-) reduction	-1.4	-1.6	-1.2
thousand of people			
including:			
Natural growth	+0.0	+0.1	+0.0
migrations	-1.4	-1.7	-1.2

Source: Data of the State Statistic Committee of the NAO, 1997.

The national policy in the former Soviet Union for indigenous peoples declared that all nomadic families should be gradually transferred into the rural settled population. Naturally, this process faced strong opposition from indigenous peoples. The desire to reflect this movement of nomadic families in the official statistics led to the concealment of actual data. The families who refused to live in villages, and who wished to conserve their traditional nomadic lifestyle, were simply excluded from the statistical survey documents. This explains why the official statistical reports before 1990-1992 failed to show that nomadic families actually existed. Later in the 1990's, this process of concealing data was condemned, and now the official statistics show a substantial number of nomadic families practically everywhere in the Russian North.

The decay of Soviet initiated collective farms has resulted in an increase in the number of individual reindeer-breeders who returned back to nomadic life with their families. This new tendency has been reflected in the current statistical data, such as the growth of nomadic families in the NAO from 57 in 1994 to 299 in 1996 (Table 6).

1.5. Labor forces

Ambitious plans for future economic development within the okrug place great importance on the status of available labor forces. The number of people engaged in the economy of the NAO has increased with the growth of the total population. According to the data of the Okrug Employment Service, this number increased from 14,975 persons in 1975 to 22,678 in 1985, and to 26,721 in 1991. In 1990, when the total population reached its highest level of 55,000, the labor force employed 24,252 persons, or 44% of the population. Interestingly, the emigrant flow, which began in the NAO in 1991, did not have a negative impact on the growth of the working population. During the period of steady emigration, the number of working people actually increased by 2,469 people. This was due to available labor resources in the okrug, numbering 33,160 persons. However, this number does not adequately reflect the total population at working age. In 1991 the working age population was 37,424, in addition to around 6000 people retired on personal preference.

The reduction of the total population after 1992 affected the number of people engaged in the economy, but not significantly - it is fluctuating around 25,000. There has, however, been a restructuring of the labor force between industries which corresponds to changes in the economy of the okrug. A considerable increase in personnel was registered in the oil and gas industries, and in the construction and building industries, while a decrease in forestry occurred due to mechanization of many processes and reduction of manual labor use. Other branches of the economy, such as food industry, communications, transport, and trade have increased, but not significantly.

The distribution of labor force is unequal between branches of the economy. The major portion of working people are engaged in industrial construction and transport, while agriculture and non-material production have a rather low share. Agriculture and fishery are the primary economic

branches which employ indigenous people, with a total employment in both branches of a little over two thousand.

Due to a general trend in Russia of decreasing birth rates during last ten years, the NAO is experiencing a decline in the number of children needed for maintaining the labor force in the future. According to the statistical report data, the number of people younger than 16 years old is steadily dropping. To meet the increasing demand for labor after 2000, workers will need to be recruited from other regions, most likely from other subregions of northern Russia. Another warning signal is the aging of the total population. This is due first to a decrease in the number of births, and second to the present impossibility for retired people to leave the North, having lost their savings in the devaluation of 1992. From 1985 to 1994, the number of retired people has grown while other demographic processes have stagnated.

1.6. Unemployment

Unemployment is a comparatively new problem for the citizens of the former Soviet Union. However, in the North this phenomena has harsher forms and consequences than in other regions, as the alternatives for finding replacement jobs are limited. The NAO has no reliable statistical data on this question, because the Labor Exchange Center of the okrug was created quite recently, and unemployment figures are scarce in official reports. The data available in the NAO Statistical Department refer to 1996, while unemployment data in the okrug is not available in the Annual Statistical Book "The Regions of Russia", 1996, 1997.

The local Employment Center registered 1,021 persons as officially unemployed in 1996. The situation in rural areas is worse than in towns. Due to the economic crises in all spheres of agriculture and worsening of the social situation, the unemployment among Nenets population became the main concern of the NAO Administration and Nenets Association "Yasovey". The registered unemployment among the Nenets reached almost 11% and a similar percentage is expected as concealed unemployment. The average figure for unemployment in the okrug is 7,1% (in Russia

- 3,5%). The most desperate areas of unemployment are in native rural settlements: Nel'min Nos - 135 unemployed, Ust'-Kara - 43, Karatayka - 37, Indiga - 37. Among all unemployed persons, 41% are young people age 16 to 29.

Unemployment among aboriginal people is a complex social problem not only connected with the economic situation, but also with the difficulty of psychological adaptation to the new requirements of modern life. The vulnerability of the social systems of the northern native peoples can be compared with the vulnerability of the northern ecological systems. Both social and natural systems are adapted to the severe climatic conditions of the far North, but when affected by external factors with loads beyond their adaptive capabilities, they may be damaged beyond their ability to fully recover.

As a result, social diseases such as psychological and nervous disorders and alcoholism are widespread among native groups. Unfortunately, the successful way out of such a state is extremely rare; it might be practically possible where native peoples are able to return to their traditional occupations, and if other groups of the population, adjacent to them, do not infringe upon their rights. Small groups of young natives, however, have adopted a new style of life, left their traditional homelands and successfully work in the new industrial enterprises and services. But their share in aboriginal society is negligible.

1.7. Medical-social situation

The complex economic and social problems of the society have a direct connection to the health of the population. As the statistical reviews show, the regional differences in the medical-social situation vary considerably in different regions of Russia. There are, however, some common features due to similarities in the natural environment and in the organization of the public health system. Due to severe climatic conditions, all systems of human organism are in long-lasting tension. Certain diseases are prevalent among people living in the North. The most prevalent are respiratory disorders (among adults -34%, teen-agers - 36%, children -5%), second - nervous

disorders (11.8, 8.4, 8.2 respectively), and third - diseases of the digestive organs for adults (7.5) and infectious and parasitical diseases among teenagers and children (8.3 and 7.3% respectively) [3].

The differences between native people and new comers are leveling out because many indigenous people have changed their traditions during last decades with respect to housing, diet, and clothing which has diminished their originally high protective strengths in cold climate. Along with such a leveling of differences regarding general-spread diseases, there are quite specific features of indigenous people's health, as these social groups are less adaptive compared with the others in the North, to any economic, social and environmental changes.

The social-medical situation in the NAO is characterized by a slow but permanent increase of deaths in the population, which takes place simultaneously with a general population reduction. Furthermore, the indices of morbidity among all age groups of population are higher than in Russia, and in the Arkhangelsk region, in which this okrug is administratively included. According to the data of the Medical Department of the NAO Administration, the reduction of total population was 15% during the last decade, while the increase of disease reached 50%. There have been increases both in the growth of general morbidity of the population and in diseases discovered for the first time in a person's life. Specialists report that chronic diseases are occurring more often, both among adults and children (Ryabikov, 1997).

According to the International Classification of Diseases (the 9th revision), during the last decade deaths due to disease have increases among all classes of diseases:

- Tumors and pathology of pregnancy increased 1.7 times
- Infectious and cardiovascular diseases - 1.9
- Accidents, injures, poisonings and nervous disorders - 2.0
- Diseases of digestive organs and bone-muscle system - 2.2
- Congenital anomalies - 2.3
- Diseases of urine-genital system - 2.7
- Skin diseases - 3.2

- Diseases of endocrine system and blood-forming organs - 3.5.

In 1996, the number of visits to hospitals and nursing points increased to 1575.4/1000 persons, which exceeded the regional level by 24%. The rising death rate has become a serious problem within the okrug. The NAO exhibits certain demographic trends common to Russia's most northern areas, and particularly to groups of indigenous people. These are namely, high premature death rates, and high levels of mortality among working age people (47,3% in 1996 among total died), resulting mainly from accidents, poisoning and injuries (50%). Also to be noted is the high percentage of men among these deaths (in 1996 65% of all dead were men and 15% were women). This tendency has prevailed for many years: 39% in 1987 and 44,6% in 1996 (in Russia - 30%).

The causes of death have the following distribution:

- Cardiovascular diseases - 52% of total died,
- Accidents, injures and poisoning - 27%,
- Tumors - 10%.

One of the most serious medical-social problems of the northern population is the rapid growth of tuberculosis, which started in 1992. Although the NAO does not have the highest figures of death from tuberculosis in the Northwest region of Russia compared with other administrative districts, certain characteristics of the okrug make it particularly vulnerable to this disease such as: large territory and scarce population, small rural communities without links to each other (the distance between them might be more than 500 kilometers), absence of roads, high tariffs on air flights inside the okrug, and growth in the number of nomadic families who have practically no access to medical services. All these circumstances have resulted in an increase of tuberculosis by 52% during the last five years. Among the Nenets, the morbidity doubled, while the total morbidity from all diseases among Nenets is 3.5 times higher than among non-natives.

The worsening of the local situation with tuberculosis was discussed at a meeting of specialists in Nar'yan-Mar, October 10, 1997. For many years the local Department of pulmanology,

together with the St. Petersburg Research Tuberculosis Institute, conducted annual tests of individuals and treatment courses among the Nenets Okrug's population. Consequently, tuberculosis morbidity was cut to just a few cases among the Nenets population. However, the Department has been hampered by severe financial problems, as are many other medical institutions funded by the state budget, and as a result they are not able to carry out all needed medical services. In addition, the remoteness of most settlements and the transition of many families to a nomadic style of life are steadily leading to loss of progress in this field. The specialists registered a growth of acute forms, a high percentage of infected people and a large number of cases in neglected condition during the last five years. Together, these circumstances can accelerate the spread of tuberculosis among the population, particularly among indigenous people. This problem is directly connected with the difficult social conditions in the rural areas, and is exacerbated by widespread alcoholism.

From the ethnographic point of view, a return to the nomadic style of life has its positive aspect: people have an opportunity maintain their traditions and skills and transfer this valuable experience to their children. But from a medical point of view, this transition will not provide an appropriate system of health care. In addition, the existing system of primary and secondary education is not adapted to the present life of children from nomadic families who are located far from schools for long periods.

The most difficult indigenous population to study with regard to their current health situation are the reindeer-breeders, who left the collective farms and united into three nomadic "*obshina*". These *obshina* are bound together by family relations and the owning of common reindeer herds, and closely resemble the old tribe system when several families lived together, connect now these new unions. The three *obshina* are "Kanin", which has 294 people, including 151 children and consisted of 11 reindeer-breeding brigades; the Union of reindeer-breeders "Erv" - 36 brigades, 144 persons, including

50 children; and lastly *obshina* "Yamb-To" - 22 brigades, consisting of 136 people, including 63 children. The problem is that these large groups are moving over the tundra for many hundreds of kilometers without an appropriate material base and means of communication. They appear from time to time in different communities, having no time for visiting medical points. It is practically impossible to provide regular preventive care, let alone provide treatment for the many members of these groups with chronic diseases in neglected condition. Being in contact with people in small communities located on reindeer migration routes this presents a real danger of the spread of infectious diseases and a breakout of epidemics.

The transition to the new organizational forms of native economy cannot be solved simply by withdrawing people from collective farms. To organize a normal life for all members of such new unions it is necessary to develop all other elements of the social infrastructure including public health, and adapt these to the new conditions.

Evaluating the social-medical situation in the NAO, it is impossible to avoid such a painful issue as the impact of nuclear tests at the archipelago Novaya Zemlya on the population's health. For many years this problem was excluded from open debates and even today there is no reliable data about consequences of nuclear tests on the lifespan of local people. The total capacity of all nuclear explosions, conducted there from 1957 to 1990 was 233 megatons, or 94% of all nuclear weapon tests in the Soviet Union. There were 113 total explosions during that time, including 87 in the atmosphere, 3 under water and 42 under ground (18).

Medical specialists in the okrug have suggested that nuclear testing may be the cause of recent increases in incidents of cancer and other diseases among the local population. For example, the rate of cancer deaths is growing 5 times quicker in the NAO than in the Arckhalsk oblast as a whole. Likewise, the incidence of diseases of thyroid gland and the total incidence of all cancer forms have respectively increased 4 and 3.5 times the average incidence within the

Arckhalgelsk oblast. Such diseases as tumors have increased in the NAO 22.8%, while in Russia this increase was only 2.7%, and in the Arkhangelsk oblast 1.2%. Congenital anomalies increased 2.6 times between 1987 and 1996, and have caused 10% of all infant deaths. The conclusion made by specialists is that increases in all of these disease indices are connected with the long-term impact of small doses of radiation (5). Therefore, nuclear contamination in the NAO should be included in an assessment of the general ecological situation in the okrug, particularly with the distinctive facts of increased morbidity among the population.

PART II

NATURAL RESOURCE POTENTIAL AND ECOLOGICAL SITUATION

The Nenets autonomous okrug was known for many decades as a remote Northern area, characterized by a poorly developed local economy with reindeer breeding and fishery as main branches. This district, being part of the Arkhangelsk administrative region, couldn't expect significant economic help from the region's budget, as the Arkhangelsk oblast itself was for many years in a hard financial situation.

The main cause of such a state was the federal policy of distributing federal funds for regional development to the regions of strategic interest to the former Soviet Union. First priority was given to the regions where extracted raw materials and finished products supplied the national industry and export needs with oil, natural gas, gold, diamonds, non-ferrous metals etc.

The Arkhangelsk oblast, with its regional specialization in woodworking, pulp and paper industries, was not included in this list. Furthermore, the export links existing between Arkhangelsk oblast and the countries of the so called "socialistic camp" in Eastern Europe were based on the agreements in the framework of cooperative activity of the Council for Mutual Economic Aid. These agreements fixed extremely unprofitable terms for the Russian side, including

the Arkhangelsk oblast. As a result of such a ruinous "cooperation", which lasted for many years, the economy of the Arkhangelsk region entered the market economy in a weak state. Naturally, the marginal northeast area of this region, the NAO, appeared in an even worse economic situation.

2.1. Non-renewable resources. Oil and gas.

During the last years the prospects of regional development in the NAO have mainly been connected with the use of potential hydrocarbon resources. The famous Timan-Pechora oil and gas bearing province is located in two Northern territories, the Komi Republic and the Nenets Autonomous Okrug, and stretches far to the north towards shelf waters of the Pechora Sea. Being that it is in the more favorable climatic conditions and situated closer to the other regions of the Central Russia, the Komi Republic was transformed in the 1970-80's into the main fuel-energy base of the European Russian North. However, successful results of geological surveys in the NAO, and the discovery of large oil and natural gas deposits after almost 30 years of exploration have positioned the NAO as a new high perspective fuel-energy base in the Russian North. In total, 75 oil and gas fields have been discovered in the NAO up to 1995. This number includes 64 oil fields, 6 oil/gas/condensate and 3 gas/condensate fields, 1 gas and 1 gas/oil field with explored reserves of 865.5 million tons of oil, 20.2 million tons of gas-condensate and 460.4 bln cub.m of gas, the category A+B+C1 (15).

Table 9 shows the allocation of explored hydrocarbon reserves of the Timan-Pechora province.

Regarding the geological estimates, the unexplored oil potential in the NAO is 2,407 million tons, free gas - 1170 billion cubic meters, condensate - 44 million tons, dissolved gas - 133 billion cubic meters. As of January 1, 1997 only 20.2% of explored reserves were being developed and only 1.4% of all reserves had been extracted. The density of resources comprises 19,300 tons/square kilometer.

Table 9.

Resource potential of the Timan-Pechora Province

	Total	Land	Shelf
Number of fields	78	75	3
Including:			
Oil fields	63	62	1
Oil and gas fields	10	9	1
Gas fields	5	4	1
Developing fields	3	3	0
Resources:			
Oil (mln. tons)			
Accumulated output	9	9	0
Reserves (A+B+C ₁ +C ₂)	1,231	1,160	71
Resources (C ₃ +D ₁ +D ₂)	3,240	1,233	2,007
Natural gas (bln. cub. m)			
Accumulated output	2	2	0
Reserves	564	490	74
Resources	2,859	458	2,401

Source: Krotova, 1996

Table 10 shows the allocation of fields on the land and on the shelf areas of the Pechora Sea, which are included in the sphere of Timan-Pechora Company interests.

The high potential of hydrocarbon reserves in the arctic shelves opened new prospects for the Russian oil and gas industry, and put new challenges before industrial companies. To successfully explore and operate in the arctic's extremely cold and icy waters will require a new class of special technology and engineering, along with the cooperative efforts of many investors. Additionally, development of these resources will necessarily need to involve other branches of economy. The Western part of the Russian arctic shelves (shelves of the Barents, the Pechora and the Kara Seas) contains 66.3% of all oil and gas potential of the whole Russian shelf. According to estimates of the Russian experts, the arctic shelves will be the main oil and gas producing areas in the 21st century.

Table 10.

Oil and gas resources.

Regions	Oil, million tons			Natural Gas, billion cubic m		
	Accumu- lated output	Reserves (A+B+C ₁ + C ₂)	Resources (C ₃ +D ₁ + D ₂)	Accumu- lated output	Reserves (A+B+C ₁ + C ₂)	Resources (C ₃ +D ₁ + D ₂)
Komi Republic	354	616	1,090	380	209	856
NAO:						
Land	9	1,160	1,233	2	490	458
Shelf		71	2,007		74	2,401
Northern Region						
Total	363	1,847	4,330	382	773	3,715

Source: (16)

As one can see from this table, although the NAO oil and gas industry is in the beginning of its development, its indices for future operation and output are higher than that for the Komi Republic. The other very important and distinctive feature of the NAO fuel-energy complex is the prevalence of oil in the hydrocarbon reserves. This makes the Timan-Pechora fields more attractive for Russian and foreign investors and will accelerate their development.

The Pechora Sea, with its oil and gas-condensate fields, should play a significant role in the long term development of the arctic shelf. The feasibility study for development of the Priraslomnoe oil field, located 50 kilometers northwest of the on-shore Varandey oil field and 980 km from Murmansk, was completed in 1998. Two other oil fields, Pomorskoe and Severo-Gulyaevskoe (geographically included in one group with the Priraslomnoe field), comprise an area for potential exploration and profitable use of a complex and expensive on-shore and offshore infrastructure. The total estimation of economically recoverable reserves of oil (categories C₁+C₂) exceeds 73 mln tons and a share of C₁ comprises 36%.

In the shallow waters of the Pechora Sea shelf, eight high potential oil and gas structures have been prepared for geological drilling: the Varandey-sea, Medynskaya-sea, Polyarnaya, and Alekseevskaya (all are on a depth less than 20 m), and the Yuzhno-Dolginskaya, Severo-Gulyaevskaya, Vostochno-Gulyaevskaya and the Prirazlomnaya on a depth less than 30 m.

The coastal areas of the Pechora Sea have ten oil/gas bearing structures located on marshy and flooded territories. Among them, the following structures present the most interest: Kaminskaya, Yuzhno-Vangureyskaya, Zapadno-Kaminskaya (adjacent to Khyl'chuyusskoe oil field on the Pechora Sea coast) and Perevosnaya (on the coast of Khaypydyr Bay (Khaypudyrskaya Guba), 60 km east from Varandey). [Table 11, Figure 9].

The development of prospective fields is directly connected with the latest federal laws regulating resource management. Among them, the Federal Law "About Production Sharing Agreement" (APS) (1996), allows foreign investors to conduct their activity on a more reliable profit and tax basis. In accordance with this law, the fields designed for development on the base of production sharing agreements, should be considered regarding their specific conditions and get a permission to be included into the tender list. The hydrocarbon fields of the NAO were referred to as such fields due to extremely complex natural conditions for their development, and the lack of regional infrastructure. Simultaneously, it was recognized that these fields have a special social significance and need large investments from foreign sources. The oil and gas fields, which might be developed on the basis of APS and submitted for consideration by the RF Parliament are represented in Table 12. (27).

Table 11.

The Perspective Pechora Sea oil-bearing structures

Name of structure (sea depth)	Expectancy of ice season months	Distance to shore, km	Square sq. km	Productive complex	Depth of product. Layers
Varandey-sea (5-20 m)	7-8	13	48	Carbon, Devon, Silur	4,000
Prirazlomnaya (20m)	7-8	57	44	Perm, Devon	4,500
Polayrnaya (18m)	7-8	45	34	Perm, Devon	4,500
Severo-Dolginskaya (45m)	7-8	135	260	Perm, Devon	4,500
Uzno-Dolginskaya (25m)	7-8	123	665	Devon, Silur	4,500
Severo-Gulyaevskaya (20-30m)	7-8	75	198	Perm, Devon	4,500
Zapadno-Gulyaevskaya (35-40m)	7-8	120	76	Perm, Devon	4,500
Vostochno-Gulyaevskaya (20-25 m)	7-8	60	48	Perm, Devon	4,500
Bol'shegulyaevskaya (45m)	7-8	140	48	Perm, Devon	4,500
Severo-Pomorskaya (37 m)	7-8	60	96	Trias, Devon	4,500
Russkaya (50-60 m)	7-8	70	613	Carbon, Devon	5,000
Papaninskaya (100-120 m)	7-8	160	300	Trias, Carbon	4,000
Sakhaninskaya (130-150m)	7-8	150	165	Trias, Perm	4,000
Alekseevskaya (18 m)	7-8	90	176	Trias, Devon	4,500

Source: (26).

Table 12.

The list of fields in the Nenets Autonomous Okrug included in the draft the Federal LAW "About the list of fields which should be developed on the base of PSA". *

Agreement objects	Reserves A+B+C1 (mln tons)	User of geological site
Timan-Pechora Province fields		"Arkhangelskgeoldo-bycha"
Varandeyskoe	19.6	
Verhne-Kolvinskoe	1.5	
Visovoe	12.6	
Labaganskoe	22.8	
Naul'skoe	38.9	
Passedskoe	3.6	
Romana Trebsa	52.2	
Syurkharatinskoe	8.1	
Titova	46.8	
Toraveyskoe	47.6	
Yzhno-Toraveyskoe	11.5	
The northern territories:		"Arkhangelskgeoldo-bycha"
Insyreyskoe	5.7	
Khyl' chyusskoe	4.2	
Uzhno-Khylchyusskoe	6.3	
Yareyuskoe	13.0	
Ardalinskaya group of fields:		Joint Venture "Polar Lights"
Ardalinskoe	14.8	
Vostochno-Kolvinskoe	2.8	

*Agreements on production sharing regarding these fields should pass through the Russian Parliament.

The hydrocarbon reserves of the Timan-Pechora Province have been highly explored. According to current estimates, those reserves already discovered could produce oil for 144 years. Thus, this region is expected to be among the best oil producing areas of Russia. At the present time geological surveying has been reduced and difficulties have arisen in

carrying out operational plans for the fields prepared for development. These difficulties are connected with the growing financial problems of Russian companies, as well as the uncertainty surrounding the participation of foreign partners and the interrelations between industrial companies and local authorities. The local authorities are not satisfied with the financial results of the work done by the industrial companies in light of the okrug's needs. More specifically, the existing terms of industrial activity did not bring the substantial income to the local budget which had been initially expected. Therefore, the local Administration insists on the revision of the terms and the sharing of revenues with the local budget. This issue has become a source of increased tension among all interested parties.

2.2. Renewable resources

The complexity surrounding the natural renewable resources of the NAO might be deemed typical for subarctic regions of the Russian North. Yet compared with other regions within the European part of the Russian North, the natural landscapes and wildlife of the NAO have suffered less impact from industrial development. Due to the rapid growth of oil and gas activities, this situation is expected to change in the forthcoming decade, presenting serious concern for the local population.

The biological resources of the subarctic tundra provide the basis for the existence of indigenous people and their traditional lifestyle and culture. Almost the only lowland arctic and subarctic tundra areas in Europe occur within the Nenets Okrug. The southern part of the okrug has small sites of forest-tundra, which occur with taiga in river valleys. The total area covered by forest vegetation in the okrug amounts to less than 5.5%, while in river valleys it is 14.6%. The eastern part of the okrug, called the Bolshezemelskaya tundra, has large reserves of fresh water with a widespread system of lakes. In some areas, approximately 70% of the territory is covered by lakes. Traditionally, the okrug was known for its rich reserves of valuable fresh water species and anadromous

fish. Fish is an important element of the local peoples' diet along with reindeer meat and wild marine animals. Fishing is known as a traditional branch of the Nenets Okrug economy, yet the high price paid for valuable fish species has propelled the industry beyond its use by indigenous people or for local consumption.

2.2.1. Pasture Resources for reindeer breeding

The Nenets okrug is one of the main reindeer-breeding regions of the Russian North; which itself is the largest such district in northern Europe. The present structure of the NAO land fund reflects this main specialization in the okrug's land use (Table 13).

Table 13.

Land Types and Land Uses in the NAO in 1995

	Category of lands	Area	
		hectares	percent of total
1.	Agricultural lands	25,884	0.1
	arable land	175	
2.	Forests and bushes	974,762	5.5
3.	Bogs and marshes	1,190,490	6.7
4.	Lands, covered by water	1,000,375	5.6
5.	Reindeer pastures	12,974,776	73.4
6.	Constructions and buildings	2,069	0.01
7.	Roads	7,234	0.04
8.	Disturbed lands and lands under recovering	4,033	0.02
9.	Non-used lands	1,501,425	8.5
	Total	17,681,048	100

Source: (8).

Over 70% of the okrug's lands has been used for reindeer breeding for many decades, and even not one century, brought in a reduction of pasture's reserves. The resources of these lands

are such that they can sustain the maintenance and even further development of the traditional reindeer economy. Local experts from the Agricultural Department and the Land Resource Committee confirmed that the pastures in their current state are able to maintain the present number of reindeer. Herd size was not greatly affected by Soviet reorganization of herding. The reindeer-breeders are required to adhere to the recommended number of reindeer, determined in accordance with the local pasture capacity.

The specialists of the NAO Agricultural Department do not agree with the conclusions of the experts of the St. Petersburg Institute of Agriculture of the North regarding the future state of reindeer herding in the okrug. The St. Petersburg experts who were involved in the feasibility study of oil field development projects in the NAO (1996) concluded that reindeer-breeding as a traditional branch of the economy has no possible or actual capacity for effective development owing to exhaustion of natural pastures. This conclusion was favorable to Conoco, the oil company that paid for the feasibility study. The company needed confirmation from scientists that using the non-renewable resources of the NAO is the only effective means of economic development of the okrug. If the okrug Administration adopts this conclusion as a basis for reconstructing the local economy, it may lead to social and economic tragedy for the entire Nenets population. The conclusion from the St. Petersburg experts was not an objective assessment but was construed for the benefit of Conoco. Unfortunately, the point of view and conclusions of the St. Petersburg study was widely spread by oil interests as the view of the Russian scientists, which is incorrect. The inaccurate assesment of NAO renewable resources can have a harmful effect on the ability of the Nenets people to safeguard natural resources for the preservation of their traditional lifestyle.

The pasture resources of the NAO have great potential: in total the reindeer breeding holdings (presented in different forms of property) have at their disposal 15,560,000 hectares of land, including 11,676,000 hectares of pasture ranges. The carrying capacity of these ranges is about 180,000 reindeer.

All holdings, in fact, had about 170,000 reindeer according to the 1997 Annual Report of the NAO Department of Agriculture in Nar'yan Mar.

The last decades of industrial activity have resulted in some damage to pasturelands. According to the assessment of specialists from the Land Tenure Agency (Murmansk) which carried out these investigations for the Nenets okrug, during the period 1978-1989 the area of pasture lands was reduced by 6% due to uncontrolled use of cross-country transport and geological surveys. As a consequence of such vehicle damage, some pasture areas, with the most valuable vegetation cover - mosses, were lost. While pastures are recovering slowly, the mosses are replaced by grass which may be used by reindeer only in the summer. Consequently, the undamaged winter pastures appear to be overexploited which leads to worsening of the general situation, and valuable winter and fall pastures were transformed into lands of limited use. The local Land Resource Committee suggested special rules for the use of technical equipment in the tundra.

For the local Departments responsible for land use and protection of the environment, the situation with reindeer ranges remains a main task in monitoring work. Simultaneously, the Agricultural Department of the NAO Administration is trying to improve the extensive technology of reindeer production to increase profits.

2.2.2. Fishery resources

The fishery resources are one of the real riches of the Nenets okrug. Surrounded by waters of the White, Barents, and Kara Seas, the okrug has more than 3,000 kilometers of marine shores, more than 4,000 kilometers of inland rivers, and numerous lakes. Particularly important for local fisheries is the delta of the Pechora River, 210 km in length and 45 km in width at its mouth. All these waters provide feeding, spawning, and wintering grounds and routes of migrations for many fish populations. Fisheries specialists assess the ichthyo-fauna of the district to be very rich. Among the valuable species, 19 have commercial significance: marine fish - navaga, Pacific

herring, plaice, smelt; anadromous species - Atlantic salmon, Arctic char; semi-anadromous fish - Siberian white salmon, lake white fish; fresh water fish - pike, burbot, perch, trout, etc. (29).

Studies by the Arkhangelsk Institute of Fisheries ("SEVPINRO") assess the current state of marine populations as good. Although the volume of the catch has dropped considerably in recent decades, the decline is connected more with internal economic and organizational problems of the fisheries than with the available resources. In contrast, the populations of Atlantic salmon and Siberian white fish are in trouble. These two species were overexploited by national and foreign commercial fisheries in 1970-1980's. In the 1980's the situation became critical for survival and preservation of fish populations. The largest European population of the Atlantic salmon was concentrated in the Pechora River (where it is regionally called "Pechora salmon") (29).

Additionally, the fish populations have been impacted by anthropogenic activity in the Nenets Okrug and the Komi Republic. Particularly harmful effects are connected with oil spills and discharge of untreated industrial wastes into the rivers. Special studies, conducted in basins of the Pechora and the Kolva rivers demonstrated serious changes in the vital organs of fish when under the impact of different contaminants. The bottom sediments of the arctic coastal and shelf areas are rapidly accumulating hydrocarbons in places such as the Korovinskaya and the Golodnaya Bays which are the main feeding areas for the Siberian white fish. Overall, industrial impacts have reduced the fish population by 3-4 times (29).

Specialists also assessed the situation with the Atlantic salmon as critical. A special program for the recovery of valuable species in the Pechora basin was established by the experts of the NAO Fish Resources Department and submitted in 1997 for consideration by local Administration. The Nenets okrug cooperates in its efforts with the Komi Republic as they both are involved in management of the Pechora salmon population. During winter and spring, Atlantic salmon congregate in feeding areas of the arctic seas. Herring and

other small fish are main species in their diet. From August until late fall, the Atlantic salmon migrates from Greenland along Norwegian fjords and the Kola peninsula to the Pechora Bay and further to the Pechora river and its tributaries: Usa, Tcil'ma, Izhma, Pizhma, Shugor, Podcherem. These rivers reach south into the territory of the Komi Republic. Questions regarding the sustainable use of this valuable species have been the theme of debates between Komi Republic and Nenets Autonomous Okrug during last ten years. Unfortunately, reduced quotas and the introduction of a full seasonal prohibition of catch for 7 years (since 1989) led to widespread poaching along the Pechora river, which particularly disturbed the most sensitive spawning and wintering areas. The number of fish has been reduced five fold. A new policy for sustainable use of fish resources should be implemented. Specialists from the Arkhangelsk and Komi Republic Scientific Center have suggested the construction of several fish hatcheries in the Pechora River basin, as well as special environmental programs for protection of aquatic habitat. (29)

2.2.3. Resources of marine mammal hunting

Hunting of marine mammals is a traditional occupation of the local population, and particularly of indigenous people. In the Nenets Okrug, ringed seal and bearded seal were the main species hunted. Distribution of ringed seal in the Barents Sea is rather well known and volumes of catch have been regularly registered, while data about bearded seal is limited. The hunting areas of the Barents Sea are located mainly in its southeastern part. The most productive areas are Cheshskaya Guba (points: Ludovaty, Vizhas, Oma, Pesha, Belushje, Volonga), Indigskaya Guba, Sengeysky Island, Kolokolkova Guba, Kolguev Island, Pechorskaya Guba (points: Farikha, Alekseevka, Dresvyanka, Chernaya), and the Pesyakov, Varandey, and Vaygach Islands (Figure 8).

The main volumes of catch were usually connected with three main areas: Cheshskaya Guba, Kolokolkova Guba, and the Sengeysky and Kolguev Islands. The famous Russian biologist Yury Timoshenko (SEVPINRO), who investigated the state of the

ringed seal population in Barents Sea in the 1970's, wrote that the percentage of mammals caught from each of these areas has varied throughout the years. For example, the Kolokolkova Guba might one year provide half of all caught seals (24). The highest number of caught mammals was registered in the 1960's, with 7 to 9 thousand animals caught, while in the 70's the number already reduced to 1.2-1.5 thousand. The volume of ringed seals caught depends on many factors: ice and meteorological situations, numbers of marine fish, and number of feeding seals during the main hunting seasons in fall and winter. However, the author concluded that the sharp reduction of volumes during the last years primarily resulted from loss of interest by local people in hunting. Among the main reasons for this he cited: low prices for pelts, weak organization of commercial use, and reduction in the number of professional hunters. At present marine mammal hunting no longer has a high commercial significance but continues to play a very important role in providing indigenous people with such products as meat and fat, essential for their protein-rich diet, which enables them to live in a cold climate where there is a shortage of other vital elements. Skin of ringed seal, being warm and durable, is also widely used by northerners for clothes and shoes.

Ringed and bearded seals are of great importance for the normal functioning of the Arctic ecosystem as a whole. These animals play an important role in the traditional lifestyle of indigenous people. The survival of these marine mammal populations depends on the protection of their habitats and migratory routes. Prospective intensification of the Northern Sea Route use will affect all wildlife populations along the ice edge and littoral waters. For marine mammals, free access to open water polynyas is crucial for their survival. Caravans of ships, moving through polynyas can increase mortality of marine mammals, which may be concentrated there for rest and breathing. Frightened by ships and noise, marine mammals may be forced from polynyas and breathing holes. The risk is particularly great for young animals, whose deaths have been

watched frequently by biologists and sailors in the Arctic seas.

2.3. Protected areas.

Creation of protected areas in the NAO began with establishment of the local Committee of Ecology and Protection of the Environment in March 1989. In that year, the Committee introduced special regulations for lands included on a list of "The Limited Economic Activity Zones" in the NAO. These regulations have been accepted by the NAO Executive Committee (March 31, 1989), [8]. Designation of selected zones of limited activity is permanent. Protection is directed at the preservation, recovery, and reproduction of valuable biological, landscape, and geological objects. The withdrawal of lands from these zones for industrial purposes requires special permission and consideration of each case by the Deputee Assembly and Administration of the NAO. The following areas of the NAO have been designated as Zones of Limited Economic Activity:

1. Malozemel'skaya zone.
2. Kanino-Timanskaya zone.
3. Vaygachskaya zone.
4. Yugorskaya zone.
5. Kolguevskaya zone.
6. Vashutinskaya zone.
7. Khaypydyrskaya zone.
8. All flooded marine coastal areas.
9. Water protecting zones of rivers and lakes.
10. Forest area More-Yu.

The Committee also created two nature reserves (or "zapovednik" in Russian): the Nenets *Zapovednik* and the Bol'shzemelsky *Zapovednik*. The protected status of such areas triggers strict prohibition of any industrial activity, but allows the indigenous people to conduct their traditional activities in accordance with the requirements of taking special care for biological resources. Both protected areas are

included in the international circumpolar system of arctic wildlife refuges (14). The decision about their creation had two stages: the first one in 1996 on the local level by the NAO Administration and the second - in 1998 on the federal level by the RF Government.

The Nenets *Zapovednik* is one of the largest in the Russian North. It spreads over 313,400 hectares including continental and island lands - 52,650 hectares from the state fund of reserved lands and 78,850 hectares, which belong to the Vyucheyksy collective farm (without withdrawal from collective farm use) and 181,900 hectares of marine areas. In addition, a two-kilometer protected buffer zone stretches along its perimeter. The high ecological value of this area was recognized due to richness of the arctic fauna and flora, particularly marine mammals, waterfowl and anadromous fish. As to wetland habitats, these areas were assigned the status of internationally significant habitats under the Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat (30), due to their position as the summer resting, nesting, and feeding areas of 30 species of waterfowl. Eleven of these species are included in the Red Book of endangered and threatened species.

The territory of the Nenets *Zapovednik* includes the Zakharjinsky Shore along the Pechora Bay, the Pechora river delta, portions of the Vostochnaya Neruta river delta, along with a coast of Bolvanskaya Bay, the Gulyaevskie Koshki islands, and the following islands in the south-east part of the Barents Sea: the Matveev, the Golets, Dolgy, Bol'shie and Malye Zelentsy. The marine sections of the "*zapovednik*" include Korovinskaya, Srednaya, and Kusnetskayab Bays, parts of Bolvanskaya Bay, a ten-kilometer zone along Zakharjinsky Shore and a two-kilometer zone around the Peninsula Russky Zavorot and all islands.

The Bolshezemelsky *zapovednik* consists of two areas: the *zapovednik* itself and a wildlife preserve, ("*zakaznik*" in Russian) situated in the western part of the Yugor Peninsula. The latter also has a status of federal significance. From a botanical point of view, the area of *zapovednik* is reknown as a

meeting location of European and Asian flora species. It also has valuable lake, river, and marsh habitats for waterfowl and other wild animals. The total area of this *zapovednik* accounts for 338,000 hectares and it is located on the territory of four reindeer farms. As previously stated, the creation of this protected area does not require the withdrawal of this land from traditional use.

In 1996 the local Committee on Ecology and Protection of Environment began a new initiative to create three other protected areas. The final decision on the organization of one of these, the Shoinsky *zakaznik*, was signed by local authorities on January 15, 1997. It comprises 164,000 hectares, and is located in the northwest part of the Kanin Peninsula and the area between the Shoina and Torna rivers. The main focus of protection is the waterfowl and coastal-river areas of the White Sea.

The other two protected areas are: "Nizhnepechorsky", which is adjacent to the Nenetsky *Zapovednik* and should play a buffer role for *zapovednik*; and "the Varandeytsky", which embraces the Varandey projection and the Peninsula Medynsky Zavorot. These areas have a large significance for waterfowl and for the reproduction of several populations of salmon, which use a system of lakes in the area for feeding.

Each of these three protected areas are also attractive for oil and gas exploration. The list for new tenders in the next 2-5 years includes oil and gas fields at the borders of these protected areas. As already mentioned above, the new regime approach for protected areas allows for the conduct of subsistence activity by indigenous people, but strictly prohibits industrial works. These areas have become a tangle of severe contradictions between oil companies and local institutions responsible for protection of environment and supported by the groups of indigenous people.

2.4. Ecological situation in the NAO.

To date industrial activity has disturbed only .02% of the territory of the NAO. New large areas of oil and gas, however,

are slated for future use. Many Russian industrial companies have licenses for development, and a list of new lease areas has been announced for tender in 2005. Although the okrug has a great concentration of oil and gas, reserves should be managed to allow other activities that support the regional economy and local populations, and protect the natural environment.

Intensification of industrial activity in the NAO has coincided with the beginning of active work by the local division of the RF Committee of Protection of Environment. This new territorial administrative body, created in 1989, is attempting to learn from the experiences of adjacent administrative regions. Local authorities in these neighboring regions were hindered by a lack of control over increasing industrial activities, characterized by their inability to introduce regulative measures independent of federal bodies. Additionally, from the 1960's to 1980's federal Russian law provided no environmental rules or requirements for industrial companies. Fortunately at present, new legislation - the Federal Law on Protection of Natural Environment of the Russian Federation - provides local authorities with the full responsibility for land use and protection of the environment.

2.4.1. Radioactive contamination problem.

There are more questions than answers regarding the impacts of nuclear tests at the archipelago Novaya Zemlya on the NAO's natural environment and on the population's health. Medical analysts have recognized that the declining health of the local population during the last 20 years is directly related to the nuclear weapons tests. Specific features of the arctic environment exacerbate these health effects. Reindeer meat is a staple of the local diet, particularly for indigenous people. The comparison of tundra vegetation showed that the lichens, main components of the reindeer diet, have an absorption capacity 100 times the absorption capacity of grasses. Moreover, lichens have selective capability to extract cesium-137, cesium-134 and strontium-90 from soils in spite of practical absence of roots. Thus, lichens absorb cesium 200 times more than grasses (to 4%), strontium - of same level, to

0.1-0.2%. In addition, assimilation of radionuclides by human beings from reindeer meat is 10 times higher than from bread. Doses close to the maximum permissible level were registered among reindeer-breeders and reindeer five years after the last explosion (7).

Although the nuclear weapons tests were discontinued in 1990, islands of the archipelago Novaya Zemlya remain one of the main nuclear waste storage sites. Nuclear contamination of adjacent areas is a real danger as storage sites are filled beyond their capacities and do not meet safety standards and sanitary-hygienic norms.

Comprehensive investigation of the radio-ecological situation of the archipelago Novaya Zemlya, the Kolguev and the Vaygach Islands and adjacent marine areas began in 1993. Before that year there was virtually no control over the radioactive situation. In accordance with the President's Decree "About the test site at Novaya Zemlya" (# 194, 1993), preparatory work to conduct two to four nuclear test explosions per year should be done in case the moratorium on testing is lifted. A moratorium has been in place from 1990 to the present.

One nuclear explosion for so-called "peaceful purposes" occurred in the NAO on May 2, 1981, to stop a fire at a well of the Kumzhinskoe gas field, in the vicinity of the settlement of Oksino, near Nar'yan-Mar. When attempts to stop the fire by other means were not successful, the Ministry of Geology decided to try a nuclear explosion. To date there has been no assessment of the consequences of that event to the natural environment or the health of the local population.

The population of the NAO received small but repeated doses of radiation from a series of nuclear weapons tests on Novaya Zemlya between 1958 and 1990. In 1958 there were 26 atmospheric and underwater tests; in 1961, 24 atmospheric tests; 1962 - 36 atmospheric tests; 1964-1990 - 42 underground tests. Specialists have noted a correlation of small doses with diseases such as tumors and cancer in this region.

The Arctic Monitoring and Assessment Program (AMAP) analyzed the radionuclide transfer in the food chain assessing the average dose to the members of Arctic population, as well

as the collective dose to the Arctic population. AMAP's calculations showed that bomb fallout would contribute, in total, about 750 additional cases of fatal cancer. Confirming the substantial role of the local diet, AMAP studies showed that internal doses were very dependent on food habits. People living wholly on local products, such as reindeer and caribou, have received much higher doses than those mostly eating food imported from temperate regions. People living on marine fish and marine mammals have received the lowest dose (6). To better understand and receive more information about the impact of small doses on the population, wild and domestic animals, and accumulated radionuclides in terrestrial and marine ecosystems, the Nenets okrug could be used as a test area by international teams of scientists. The results would have a circumpolar significance.

2.4.2. Environmental pollution from local sources

Compared with adjacent, industrially developed regions such as Arkhangelsk and Murmansk oblasts, and the Komi Republic, the Nenets Autonomous Okrug has rather modest indicators of anthropogenic impact on the environment. Due to the limited number of stationary industrial sources of pollution, the total volume of emissions is dozens of times less than in other northern regions (Table 14.).

Table 14.

Industrial and municipal emissions in atmosphere, 1996.

Name of region	Total volume, tons
Arkhangelsk oblast	505,000
Nenets Autonomous Okrug	32,700
Murmansk oblast	747,000
Komi Republic	879,000

Source: (14).

The largest volume of air emissions in the NAO refers to 1994 in which year it reached 46,150 tons. The following year many industrial enterprises closed, leading to a decrease of pollution to 24,000 tons (a 52% reduction). In 1996 the rate of

economic depression slowed a little, and there was only a 4.5% reduction of emissions volume. In 1996 66 of the 70 enterprises in the NAO had 578 sources of air pollution. As shown above, the economic depression affected mainly industrial enterprises, while the number of construction and agricultural firms in the region increased.

The total volume of air pollutants from stationary and moving sources is presented in Table 15.

Table 15.

Total volume of contaminants, tons/year

	1996	1995
Total in region	32,705.998	27,727.446
Including:		
Solid wastes	1,509.707	1,678.785
ash	574.295	794.207
soot	1014.45	888.337
lead	0.962	1.241
Gaseous and liquid	31,116.291	26,048.661
a) from stationary sources	27,974.47	23,321.749
Including:		
solid	1,577.295	1,168.436
gaseous and liquid	26,397.175	20,653.31

Among the main polluters of the environment in the NAO, the local Committee of Ecology and Protection of Environment listed the following enterprises and services (Table 16).

Table 17 shows the emissions contribution of main industrial sources broken down by specific pollutants for the period 1994-1996. Table 18 reflects the level of emissions of pollutants from moving sources - mainly transport means: motor-road, air, railroad, river, and marine. Marine transport has not been evaluated due to its negligible use before 1996.

According to the NAO Committee on ecology, several possible measures could be taken to help remedy the air pollution problem. The main pollution source is the combustion of oil and gas products, and the burning of natural gas in

flares and barns. A possible action might be to prohibit flaring gas. In order to reduce ash and soot, specialists suggest converting the municipal power stations and boilers from solid and liquid fuel to natural gas. In general, air pollution in the NAO is relatively low, due mainly to the comparatively low level of industrial development, not to application of adequate environmental technology and effective regional regulation.

Table 16.

Industrial enterprises of NAO as main polluters

1. The Arkhangelsk Oil and Gas Producing Company	14,065.61	20,653.313
2. CONOCO oil-development joint venture "Polar Lights" -	1,886.61	6,775.874
3. Arctic State oil/gas expedition	5,120,886	2,279.235
4. Municipal Housing Service ("Okrzhilcomservis")	774.795	5,571.995
5. Municipal electric power station	580.405	571.119
6. The State Enterprise "Arcticmorneftegasrasvedka"	851.782	1,041.846
7 The local enterprise "Amdermaservis"	392.491	445.111
8. Amderma oil/gas geological survey expedition	35.24	362.619

Source: (2).

* The drafts of these new Laws are described with more details in the fourth part of this Paper.

Table 17.
The industrial enterprises of the NAO and main pollutants of their emissions

Enterprise name	Contaminants tons/year										Emissions	
	Ash	Soot	CO	NO ₂	SO ₂	CH	Acrolein	Total 1999	1995	1996		
Arctic State oil/gas expedition	0.04	3,480.86	3,976.2	147.18	28.919	486.43	1.27		2,279.24	284.74		
CONOCO oil-development joint venture "Polar Lights"		2.211	1419.6	264.08	264.08	197.78	0.186	3	1,493.32	864.91		
The Arkhangelsk Oil and Gas producing Company		409.27	3518.3	157.25	157.25	9,967.		1	6,775.87	40,621		
The State enterprises "Arctic-morneftegasras-vedka"	0.673	11.228	498.4	268.56	268.56	47.218	2.654		1,041.85	321.68		
Municipal Housing Service ("Okrzhilcomservis")	226.67	18.271	137.48	340.99	340.99	43.04	4.298		5,571.99	1,181.21		
The local enterprise "Amderma-servis"		11.769	99.956	210.37	210.36	26.29	2.268		445.11	447.87		
Municipal electric power station		7.92	299.38	236.37	236.36	19.01	1.899		571.119	693.3		
Amderma oil/ gas Geological Survey Expedition		1.081	8.575	19.343	19.343	2.443	0.244		362.619	355.87		
Total								8	18,541.1	44,771		

Source: (2)

Table 18.

Emissions of pollutants released in atmosphere from moving sources, 1996		Total volume of air pollutant (tons/year)						
Transport means	Total	Including:						
	1	CO	Hydrocarbons	Nitrogen oxides	Sulfur oxides	Acrolein	solid particles:	
							soot	Lead
Motor-road	2752.1	569.064	459.404	171.971			3.185	0.962
Rail-road		6						
Air	513.58	110.787	19.554	4.23			3.983	
Riverine	21.413	10.278	77.085	8.565	1.0278		4.283	
Marine								
Total	3287.1	690.129	556.043	184.765			11.450	0.962

Source: (2).

2.4.3. Natural water contamination.

The regional Committee of the Environment regards water pollution as more serious than air pollution. It is recognized as tense but not yet critical, as the Pechora river has not fully lost the capacity to dilute contamination to harmless levels. Nevertheless, the present situation should not distract from the real danger of possible contamination in the future, and from the worsening of the situation due to oil and gas activities which are predicted to rise sharply after the year 2000. At present, the current volume of discharges into water reservoirs of the region accounts for 1.5 thousand tons per day, or 574 thousand tons per year. The main problem is the discharge of untreated or insufficiently treated sewer waters, resulting from both the lack of sewage treatment installations and the poor operation of existing systems. In 1995 two new treatment installations were constructed at the Vasilkovo gas field (Enterprise of "Severgasprom", Russian Joint Stock Company GASPROM), and the old refining installations were upgraded at the local meat processing plant.

Additionally, the Pechora Fish Processing Plant in Nar'yan-Mar does not meet sewage treatment standards and is one of the main "contributors" to contamination of the Pechora River. The local food processing enterprises together with agricultural farms and municipal and housing services contribute to the contamination of water resources. Phosphates increased 29.8% during the last two years; nitrites increased 27%, and ammonium nitrogen more than doubled (2.7 times). Together with increased hydrocarbon contamination from developing oil and gas fields, these pollutants affect the valuable fish resources of the Pechora River basin and the Pechora Sea. Analyses of specimen of Pechora white fish, made by specialists of the Okrug Fish Inspection Board in 1995-1996, showed a high concentration of oil in vital organs and changes in behavior. Indirect impact to fish populations was attributed to negative changes in feeding conditions, reduction of spawning areas, and worsening of the physiological condition of fish. These factors together had led to a decrease in fish resources in the Pechora River basin and the Pechora Bay.

Table 19.

Discharged sewer waters and their main ingredients

Main ingredients of water contamination	Discharged sewer waters in natural reservoirs		Permitted max discharge tons/year
	1995	1996	
Discharged sewer waters (thous.cub.m)	574.7	686.5	
Including: Suspended particles	10.45	15.60	8.87
BAO20*	11.8	18.86	6.09
Nitrites	0.037	0.04	0.123
Phosphates	1.075	1.10	1.925
Ammonium nitrogen	6.05	2.68	4.44
SSAS**	0.02	0.60	1.324

* BAO- biologically absorbed oxygen

* SSAS - synthetic surface active substances

According to the local Committee of Ecology, the main sources of insufficiently treated sewage waters are the Town Municipal Service ("Gorcomservis") and the oil/gas producing company "Arkhangelskneftegas".

The future plans for oil and gas development, including construction of land based and off-shore infrastructure, presents a serious danger for the environment of the NAO. Much attention should be paid to the assessment of potential impacts of contamination of marine and terrestrial ecosystems by hydrocarbons. Russia does not have sufficient experience in protection from and preparedness for oil spills in the Arctic. As is known from the 1989 Alaskan accident of the tanker "Exxon-Valdez", which happened in more favorable climatic conditions than those of the Kara Sea, a comprehensive system for prevention and mitigation of potential oil spills is necessary.

Designing such a system would be very complex from a technological and engineering point of view, and implementation would be very expensive. Considering the large number of countries that will be consuming NAO oil and whose shores might be affected by an oil spill, it is reasonable to assume that there would be strong interest in developing an oil spill prevention and mitigation program. An initiative by all concerned countries to establish such a system could prompt international industrial companies and federal and regional bodies to join efforts in creating one.

Industrial impact to the region's lands will increase considerably due to designation of new areas for industrial development. To regulate this process a new "Code of Guidelines and Rules" was prepared by the local Committee of Land Resources and Land Use in 1997 and, after a year of discussion, entered into force in 1998. The Code identifies the local administrative bodies which should control and supervise industrial use of natural resources and land, lists documents which should be prepared and submitted to these institutions for agreement and confirmation, and requires permits for any activity and putting sites at stakeholders' disposal for such an activity. This document also includes a provision regarding a control order over execution of these rules and a responsibility for violation of them.

PART III.

STATE OF THE LOCAL ECONOMY

This section addresses the state of the local economy: its resource potential, its role in the national and regional economy, and the financial capabilities resource developers.

3.1. Agricultural complex and traditional economy

Reindeer-breeding, hunting, fishing, together with food processing and municipal services, were and still are the main occupations of the NAO population. The local fishery

enterprises, collective reindeer farms and small cattle farms are united into a regional agro-industrial complex. According to the data of the Agricultural Board of the NAO Administration, this complex in 1997 included:

- Seven fishery collective farms,
- ten agricultural collective farms (reindeer collective-sharing and agricultural cooperatives),
- two state enterprises - Nar'yan-Mar Experimental Production Farm and Hothouse "Solnyshko",
- the Nenets *obshina* (association) "Kanin",
- The Union of Reindeer-Breeders "Erv" (38 reindeer-breeding farms),
- Reindeer Breeding Association "Jamb-To",
- two food processing plants (both are share-holding companies "Meat Products", and "Vita"),
- several hunting groups and small cattle stock farms.

Statistical information about reindeer breeding in Nenets okrug is presented in Table 20.

The main occupation of the indigenous people was and still is reindeer breeding. As one can see from the list of reindeer farms in Table 21, a new process of partial withdrawal of reindeer-breeders from collective farms began in the 1990's. People are uniting into unions of free cooperators or farmers, bringing with them their share of property - their own reindeer and necessary equipment. The local Administration Agriculture Department and Committee of land resources allocates practically the same pasture lands for the use of these unions as were used before by members of collective and state farms. (Table 21, Figure 10).

The Nenets Okrug's reindeer-breeding indicators 01.01.97

	collective sharing									
	Narjana-Ty	By Vyucheys kogo	Harp	Vosk-hod	Ras-svet Severa	Put' Il'ycha	Druzhba narodov	Krasny Oktyabr	Zapol-yar'e	
Number of public reindeer	7527	11736	11044	7056	15835		10206	5146	2885	
Number of reindeer-breeding brigades	4	7	8	5	9	11	7	4	2	
Average number of reindeer in one herd	1882	1677	1381	1411	1759		1458	1287	1442	
Load on breeder	38	75	92	67	67	93	63	42	14	
Number of private reindeer	251	192	167	181	260		276	172	288	
Number of owners	1162	2239	4593	1087	2623		2305	3454		
Number of reindeer in private property	59	101	62	63	166		116	55		
More than 250			1					1		
from 201 to 250			1					1		
from 151 to 200			2					2		
from 101 to 150			16		1		4	6		
from 50 to 100	6	7	18	1	13		9	26		
from 10 to 50	28	65	20	22	53		32	19		
less than 10	25	29	4	20	99		71			

(Continues next page)

	Joint Prod. cooperative Indigsky	Collective -sharing enterprise Kolguevsky	Experimental production holding	Obshina "Kanin"	Reindeer- breeders union "ERV"	Total in Nenets okrug
Number of public reindeer	13,114	6,267	7,444	16,315	6,563	121,138
Number of reindeer- breeding brigades	8	2	4	11	5	(87)76
Average number of reindeer in one herd	1,639	3,133	1,861	1,483	1,313	1,594
Load on breeder	67	26	41	143	62	890
Number of private reindeer	202	330	226	137	134	188
Number of owners	1,099			8,998	6,563	34,123
Number of reindeer in private property	38				38	698
More than 250					5	7
from 201 to 250					11	13
from 151 to 200					4	8
from 101 to 150					8	35
from 50 to 100	6				10	96
from 10 to 50	26					285
Less than	6					254

Source: The Statistical Report of the NAO Agricultural Board on reindeer-breeding

Table 21

Reindeer breeding holdings of the NAO

Name of holdings	Total square thou.ha	Pasture of brigades	Number of brigades	Number Of Reindeer	Last year of tenure
1.C/f "Severny Polus "	2,326.8	1,482.6	11	22,000	1985
2.C/f "Voskhod"	872.7	553.9	5	10,300	1985
3.C/f "Zapolyar'e"	517.5	310.7	3	5,800	1985
4.S/f "Indigskiy"	1,419.3	1,112.5	8	16,000	1985
5.C/f "Vyucheytsky"	943.4	688.1	7	10,250	1994
6.A/c Nar'yan-Ty	624.2	494.6	4	10,210	1981
7.Exper-prod. Holding of N-M agri.st.	833.1	648.1	6	9,000	1982
8.C/f "Harp"	1,447.7	1,155.9	8	20,100	1995
9.Reindeer breeding Union "Erv"	606.4	420.6	7	5,100	1995
10.A/p cooperation Dryzhba narodov	1,580.1	1,215.9	11	14,000	1982
11.C/f "Put Il'ycha"	1,460	1,150.8	9	21,000	1983
12.A/p cooperation "Rassvet Severa"	1,506.7	1,151.3		18,350	1983
13.C/f "Krasny Oktyabr"	911.3	866.8	5	6,100	1995
14.A/e "Kolguevsky"	513.1	425.1	2	5,900	1996
Total	15,562.3	11,676.9		5,900	

Abbreviations:

C/F - collective farm (kolkhoz)

S/F - state farm (sovkhoz)

Experimental production holding of Nar'yan-Mar agricultural station

A/p - agricultural production cooperation

A/e - agricultural enterprise

Source: Reindeer Breeding Holdings of the NAO. 1996. Murmansk enterprise of the Tenure Research and Design Institute.

Nevertheless, the transformation of property holdings from collective to cooperative and private resulted in little change

in the economic situation which remains rather difficult for all reindeer breeding operations. None of them can exist without material help from the federal or regional budget, without support in establishing cooperative links between reindeer-breeders, service providers, and consumers of reindeer products. The problems of marketing, storage and processing of reindeer meat, and implementation of new technologies for full use of raw materials were not solved in the Soviet period. Under the new economic conditions, these problems became more acute, while the gap between income and real needs of the indigenous people grew. The average income in reindeer breeding is only 47% of the average income in other branches of the local economy in the NAO.

Due to low economic efficiency of their labor, reindeer owners have to increase the number of reindeer to survive. This disturbs the vulnerable equilibrium between the pasture capacity and number of reindeer, and leads to overexploitation of grazing lands and deterioration of their quality.

The transition from the old system of agricultural support and organization to a new one based on cooperative or private property is not supported by everyone. Many members of collective farms do not want to withdraw from old structures for several reasons. First, there is no assurance that such enterprises will be viable under conditions of overall economic crisis in Russia. Additionally, the new cooperative structures have to assume all responsibility for their operations. The first attempts to establish such systems among reindeer-breeders and fishermen were not successful enough to encourage others to follow. As a rule, cooperative structures are accompanied by many organizational and financial obstacles, including outright opposition of local agricultural officials to the new enterprises.

The transformation of agriculture in Russia is proceeding slowly, with many failures, bankruptcies etc. - common phenomena throughout Russian history. In the North this process is more complicated because of limited market capacity for indigenous people's goods. Huge problems exist due to long distances between producers and consumers, high transport

tariffs, and cancellation of centralized supply which previously provided necessary equipment and means of communication. As a result, reindeer breeding, as a branch of the economy, is almost never profitable, although its resource potential and social demand remain. This branch needs new organization with federal and municipal support, to transform subsistence from an extensive to intensive way of development, in other words, to create real conditions for increasing its efficiency. To continue irregular and insufficient federal help, without serious reorganization of the branch, makes no sense as it means the maintenance of a feeble system.

Unfortunately, new developments in the traditional economy are very weak, and federal support does not adequately meet current requirements. It is unreasonable for some economists and bureaucrats in federal institutions to expect that the traditional economy of indigenous people, including reindeer breeding and fishing, are capable of independently achieving a stable and profitable state without any external support. This is true of agriculture in the North, as well as some other kinds of economic activity under extreme geographical conditions. Being socially very significant for the existence and survival of indigenous people, those branches of the traditional economy should get financial help from federal and regional budgets, as well as from other sources: industrial companies operating in the indigenous territories, special funds etc. This aid should be directed creating new places of employment for indigenous people and to increase their labor efficiency.

Local industries such as municipal services of Nar'yan-Mar and other communities, food processing, the timber industry, and production of building materials may be attractive for young generations of indigenous people. At present, as is common everywhere in the North, economic production is decreasing with the reduction of employment opportunities. However, the situation in the local economy differs in each branch: sharp decrease in sawn timber and timber production for export, fish and marine products cans; slow growth in production of some kinds of food products; and distinctive

increases in production of oil and gas, meat and meat products, and dairy goods. A rise of all local industry development is expected from increases in oil and gas activities and population growth.

Current and future oil and gas activities impact local subsistence in numerous ways. First, areas licensed for oil and gas exploration, construction of roads, pipelines, camps and other objects, are located on pastureland. Therefore, reduction and degradation of due to industrial activities, concerns such collective farms as "Harp", where several groups of oil fields are located (Varandey, Torayveyskoe, Naulskoe, Labaganskoe, Titova, Trebsa, Shapkinskoe, Hylchuyusskoe, Jareiuskoe); collective farm "Druzhby narodov" (oil fields Oshkotynskoe and Vostochno-Kolvinskoe), collective-sharing holdings "Nar'yana-Ty" (Kumzhinskoe oil-field), and "Vyucheyskogo" (Korovinskoe oil field), "Put'Ilyicha" (group of Kharyaga fields, Oshskoe, Khanoveyskoe oil and gas fields).

According to data of the local Committee of Indigenous People, NAO Administration (Jan.1 1996), a total of 39,433 hectares of reindeer pastures have been transferred to industrial use for geological surveying, extraction of oil and gas, and location of other industrial objects.

The following section of this paper discusses the current situation with oil and gas industry and development of the regional transport infrastructure assigned to serve future industrial growth. These fields of economic activity will impact local social and economic life, and most particularly indigenous people whose lands of traditional use comprise 72% of the okrug's territory.

3.2. Oil and gas industry activities.

Beginning in 1992, the Nenets Autonomous Okrug became a producer of oil and natural gas. Both national companies and joint enterprises are engaged in development of oil and gas fields in the NAO. All together 74 licenses for exploration of fields have been distributed among industrial companies.

3.2.1. Oil development.

In 1996 only two of the 72 oil fields discovered in the NAO, the Ardalinskoe and the Kharjaginskoe, and one gas-condensate field, the Peschanoozerskoe, produced oil, with total annual output of about 3,000 thousand tons. From the beginning of production in 1992 through 1996, 1.4% of proven oil reserves (11.9 million tons) have been produced, while 20% of reserves have been under exploration. Output of the developed oil fields is presented in Table 22.

Table 22.

Oil Production in the NAO 1992-1996

Oil field Characteris- tics	Y E A R S				
	1992	1993	1994	1995	1996
Total output in thous. tons	1,776	1,657	1,860	2,586	2,966
Including:					
Khar'yagins- koe	1,776	1,629	1,473	1,343	1,502
Ardalinskoe	346	1,202	1,399		
Peschano- ozerskoe	28	41	41	65.4	
Fund of acting wells, total number	119	109	110	116	122
Including:					
Khar'yagin- skoe	113	99	91	93	100
Ardalinskoe		7	10	10	
Peschano- ozerskoe	6	10	12	13	13

Source: Kratova, 1996.

Ninety percent of economically recoverable resources (Category 1, C1, - 148.9 million tons), as well as all reserves of category C2, are concentrated at the Kharjaga oil field and the rest are at the Ardalinskoe oil field.

The operational work at the Ardalinskoe oil field is conducted by "Polar Lights", a joint venture of the American

company "Conoco" and the Arkhangelsk Oblast's geological enterprise, "Arkhangel'skgeologiya"¹. This joint venture is developing several fields, known as the Ardala Complex, which includes the Ardalinskoe, East Kolva (*Vostochnokolvinskoe*), and Dyusushevskoe oil fields. This complex contains about 15 million tons of recoverable deposits. Despite high level support from the Russian Government and a series of special tax conditions, the project faced a series of bureaucratic hurdles from the local governments of the NAO and the Arkhangelsk oblast, and from the Foreign Economic Department of the Ministry of Fuels and Electric Power. Nevertheless, after personal participation of the Prime Minister in reviewing all documents of the project, the joint venture received a final license which included rights to the three fields mentioned above together with the neighboring Oshkotynskoe field, with preliminary estimation of reserves about 12.4 million tons (20).

The owner of the license for exploration of the Khar'yaga oil field is the oil/gas production company "Arkhangel'skneftegas", which belongs to the Stock Holding Company "Komineft". Only two of the 19 oil fields prepared for exploitation neighbor the Khar'yaga field - *Yuzhno-Khylchuyusskoe* (63 million tons - C1) and *Severo-Khar'yaginskoe* (6.4 million tons). These fields are considered to have the first priority for future development.

The extracted oil is delivered by the pipeline system of the Stock Holding Company "Transneft" to an oil processing plant in Ukhta in the Komi Republic [Figure 11]. According to the official statistics regarding sales, 52% of the oil products from these fields are distributed inside the national market, including 12% - in other regions of Russia.

The *Peschanoozerskoe* gas-condensate field (the Kolguev Island) has been steadily increasing its oil output since 1993.

¹ A brief description of Russian companies and joint ventures, active in the Nenets autonomous area, is provided by S. Høifødt, et. al in INSROP Working Paper No 54-1996, III.02.3: "Selected Issues on Regional Economic Development along the Northern Sea Route."

There are two operating companies: the Share Holding Company "Arkhangelskgeoldobycha" and the State Production Enterprise "Arktikmorneftegaspazvedka". Since beginning exploitation 208,600 tons have been extracted, or 6% of recoverable resources. All extracted oil has been delivered by tankers for export. A new experimental installation for oil processing was put into operation in 1997 with an annual capacity of 20,000 tons of crude oil. This processing facility produces gasoline (38%) and diesel fuel (51.5%). Consumers of these products are mainly local enterprises: "Arkhangel'skgeoldobycha", a few enterprises in Nar'yan-Mar and the rural community Bugrino on Kolguev Island.

3.2.2. Gas development.

Among the 12 gas fields discovered in the NAO, only one, Vasilkovskoe, is under operation. Located 60 kilometers northeast of Nar'yan-Mar, it supplies two settlements with gas - Nar'yan-Mar-town and the rural community Krasnoe (center of the Union of reindeer-breeders "Erv"). It is the first developed gas field of the Nar'yan-Mar group. The volume of production is regulated by consumer orders and does not exceed 102 million cubic meters of natural gas, for which four acting wells are in operation. Accumulated output in 1996 was 2.4 billion cubic meters of natural gas and remaining reserves of category C1 comprise 79.5 billion cubic meters (25).

The next stage of development of the Nar'yan-Mar fields is preparation of the Layavozh gas-condensate field. Located 85 kilometers southeast of the Vasilkovskoe gas field, it is one of the largest gas fields in this group and in the okrug. According to the current plans of the operating company, the Layavozh field will reach full capacity in 2001. Its potential resources are estimated at more than 110 billion cubic meters of gas, over 8 million tons of condensate and over 42 million tons of oil. Due to its proximity to the Khar'yaga pipeline system, it is reasonable to expect accelerated development. Along with Kumzhinskoe, Korovinskoe and Vaneyvissskoe gas fields, the Nar'yan-Mar fields group has excellent perspectives.

All industrial works associated with development of the Nar'yan-Mar fields group are executed by the Enterprise "Severgasprom", Russian Joint-Stock Company GASPROM. This company is multifunctional carrying out recovery, transport and processing of gas in northwest Russia. Since 1993, "Severgasprom" has been engaged in construction of an industrial complex, including infrastructure such as roads and pipelines, to enable increased production of gas in the Vasilkovskoe field to 240 million cubic meters per year.

3.2.3. License agreements.

In the Russian Federation a federal Law "About mining" (also known as "Law on underground resources"), 1995, determined an order of receiving rights for conducting industrial works, connected with use of non-renewable resources. According to this Law, any geological or industrial company can get a license through tender or auction. Before this Law came into force, a temporary "Regulation about licensening" was issued by the State Committee on Underground Resources in 1993. These regulations gave industrial companies which had already executed works in the NAO the right to obtain licenses on their areas without tender or auction. Thus, most existing companies obtained rights to conduct geological surveys, exploration drilling and industrial exploitation of oil and gas fields. This enabled them to avoid the expensive procedure of tender or auction. The local budget of the Nenets Autonomous Okrug, however, received no revenue or compensation from companies operating on its territory. Furthermore, several of the companies holding licenses were financially incapable of fulfilling their obligations, yet prevented other companies from applying for licenses on these perspective areas.

Since 1993 ten companies have become owners of licenses on 44 fields. The term of seven of these licenses should have expired on 1 January, 1997. The local Committee on Geology and Natural Resources reviewed the licenses in October, 1997, and withdrew five licenses from companies which did not carry out their obligations as license owners.

Among the licenses, the company holding the most licenses is "Arkhangel'skgeoldobycha": it owns 23 licenses, including 12 for exploitation and 11 for geological surveying. Three licenses were granted to the State Enterprise "Ukhtaneftegasgeologiya", four to "Polar Lights" Company; other companies own only one or two licenses.

3.2.4. Oil delivering to consumers.

One of the main problems of the Nenets oil and gas industry is forming an infrastructure system which can allow for expanding industrial activity and deliver all necessary goods and loads to and from the Nenets region.

One of the main elements of such a system is the "Northern Gates" Project, which includes construction of a marine terminal complex for the transport of crude oil from onshore and offshore fields via the Northern Sea Route. In INSROP Working Paper No54-1996 mentioned above, this project has been suggested as a possible solution for future transport problems.

The handling capacity of this terminal is assessed at 30 million tons of oil per year for approximately 40-50 years, which is comparable to that of Novorossiysk, Russia's main southern port on the Black Sea. Construction of the terminal complex needs about US \$5 billion of capital investment, including \$400 million dollars of current expenditures per year. According to the main Russian participant "Timan-Pechora Company", construction will provide jobs for approximately 86 thousand people.

The "Northern Gate Project" unites several oil and gas development projects. Crude oil, produced at their fields, will be delivered through systems of on-shore and off-shore pipelines to the terminal, where it will be delivered by tankers to consumers in western countries.

During the past several years, six different possible locations for terminal construction were under discussion. Three locations were dismissed as requiring further assessments. One of them, marine terminal "Varandey" was initially accepted, but a final decision has not yet been made.

Table 24.

Oil development projects involved in the "Northern Gate".

Name of project	Rate of oil production	Investors (thous.tons per year)
Central Khoreyverskoe	EXXON	7,285
Timan-Pechora	Timan-Pechora Co	9,201
Prirazlomnoe	BHP	5,728
Southern Khylycheyu	CONOCO	5,982
Layavozh	Saga-SHELL	1,881
Southern Shapkinskoe	SeverTEK	1,039
Total		30,416

Source: (17).

The first of the remaining three locations involves choosing a place on the shores of the Nenets Autonomous Okrug. Varandey, Indiga and Kolguev Island were offered as possible sites. All of these places are situated in the eastern part of the Barents Sea, which is covered by ice more than six months a year. The second possible location would be to construct the terminal off-shore, in open water, free from ice all year round. One option for this is to locate the terminal west of Kolguev Island and use a system of marine pipelines to deliver raw oil from the fields. The third, so-called "southern variant" involves the use of existing and prospective pipelines, which would deliver oil to the new marine port on the Baltic Sea. This system would deliver oil from a variety of fields in the Nenets Okrug and Komi Republic.

It is expected that the final decision will depend mostly on the cumulative costs from oil companies. Important factors affecting the decision include the natural environment (ice conditions, depth of water etc.), and expenditures for building pipelines to the terminal. The length of pipelines to the terminal from possible locations in Indiga, Kolguev Island and Varandey are presented below in Table 25.

Table 25.

Length of pipelines to possible terminal locations

Terminal location	Length of pipelines, km
Varandey	400
Indiga	700
Kolguev Island	700

All routes have their own complex technical problems. Despite having the shortest length of pipelines, a terminal located in Varandey will need a large diameter underwater pipeline from the coast to the terminal - located in extremely harsh natural conditions. Additionally, the difficult ice situation in Varandey will impact tanker movements as well as pipeline operation.

Nonetheless, the latest information from the Nenets okrug Administration confirmed again that the Varandey marine terminal option is the most preferable, as it allows for use of the richest and best prepared oil fields in the Khoreyver and Varandey-Adz'va districts of the Timan-Pechora oil province. A second argument in favor of this option is that it avoids the high potential risk associated with construction and use of marine pipelines in waters covered by ice for 6 months. Nevertheless, this variant doesn't exclude construction of oil processing objects in the Nenets okrug.

Unfortunately, the jurisdictional uncertainty surrounding underground resources development in Russia has not changed during the last two years, since it was described by Vidgis Nygaard in the INSRP paper "Selected Issues on Regional Economic Development along the Northern Sea Route". The Law "About Agreement on Production Sharing" was adopted in 1996, but amendments to this law, important for its implementation, are still under consideration in the Russian Parliament. The Law "About Continental Shelf of the RF" was accepted in 1997, and will work in cooperation with a new law, the Law "About Internal Waters, Territorial Sea and Adjacent Zone". This latter law has already passed through two hearings, and the

final third hearings are expected to be conducted in fall 1998, after reworking it in the Parliament Commissions.

3.3. Transport infrastructure and perspectives of its development

The Nenets AO is one of the territories of the Russian North with the lowest level of on-land transport infrastructure development. This is considered a serious obstacle for large scale industrial development, as it greatly increases time and necessary investments.

3.3.1. Marine and river ways.

Marine and river routes have played an important role in the economic life of the region, providing communication links between communities, delivering goods from other regions of Russia, and serving the traditional occupations of native peoples such as fishing and hunting of marine mammals. Marine and river ways have also traditionally been the main means of transport. Only recently has the role of air transport begun to steadily grow. Yet even with the addition of air transport, present transport capabilities in the okrug cannot meet the new industrial development needs.

Financial concerns have been, and continue to be, a limiting factor to transport development in the NAO. During the transitional period of the Russian economy, one of the most difficult problems for all northern regions was the sharply increased transport tariff, particularly for marine and air transport services. Today, the use of marine transport ships for local needs is not considered cost-effective due to the limited volume of necessary goods, such as fuel, consumer goods, and food products which are delivered to the district. These goods are first carried by cabotage ships from Arkhangelsk to the Nar'yan-Mar marine port. Further supply of small in-land communities is then executed by local air means, helicopters and airplanes, or by river transport up the Pechora river and its tributaries during the short summer navigation season.

The main route of the NSR passes by the Nenets okrug and makes its first stop in Amderma, while goods for the okrug are delivered mainly from Arkhangelsk by coastal trade vessels, or down the Pechora river from the Komi Republic. The existing marine ports in in the Nenets AO, Nar'yan-Mar and Amderma, are relatively shallow and can only accomodate vessels with maximum drafts of 4.8-4.9 meters and 1.7 meters respectively. Furthermore, existing ports need capital improvement and expansion of capacity. At present the Nar'yan-Mar marine port capacity is 800,000 tons per year. It has good lifting equipment: 12 mobile cranes with a carrying capacity of 20 tons each and two floating cranes with carrying capacities of 16 tons each. The length of berth is 400 meters.

As an alternative to existing ports, the construction of a new port on the coast was considered. Indiga, suggested as a place for possible new port location, is rather attractive because the western part of the Nenets coast has deeper waters and building material sites are available there. But this variant would necessitate construction of a permanent road from Indiga to Nar'yan-Mar, as all other activities are tied with that administrative center.

The Nar'yan-Mar marine port can combine river and marine operations which gives favor to the option restoring and expanding this port. This option would also include use of railroads, which can connect the Pechora River with Vorkuta, Usinsk or other railroad stations, with the effect of uniting all these transport ways into one infrastructure system within the Nenets district.

The question of prolonging the navigation period in the Nar'yan-Mar port involves important considerations. According to the assessment of specialists from "KMY Neste YIT Corp", the thickness of ice during winter months poses an obstacle to navigation (17).

Table 26.

Food, consumer goods and fuel deliveries 1992-1996 (thousand tons)

	1992	1992	1993	1993	1994	1994	1994	1994	1994
	food	oil-products	food	oil-products	food	oil-products	consumer goods	oil-products	coal
Karelia Republic	37.0	880.0	41.6	750.0	120.0	535.0	1570.0	640.0	
Komi Republic	264.2	853.0	330.1	1310.0	180.0	1000.0	27.6	65.3	
Archangelsk oblast	57.9	206.0	257.4	300.0	157.9	150.5	1399.1	1500.0	
NAO	10.3	63.7	11.8	68.5	6.0	90.0	59.1	57.0	
Murmansk oblast	274.8	1534.0	206.2	1170.7	93.9	400.0	1600.0	620.0	

	1995	1995	1995	1995	1996	1996	1996	1996
	food	consumer goods	oil	coal	food	oil	coal	
Karelia Republic	108.0	313.8	164.0	600.0	70.3	1220.0	540.0	
Komi Republic	167.0	40.0	40.0	86.9	210.0	103.3	160.0	
Archangelsk oblast	141.1	69.9	1620.2	2262.1	65.3	1525.0	1584.0	
NAO	8.6	13.2	37.5	28.2	6.2	26.1	32.3	
Murmansk oblast	97.5	62.3	1857.8	932.2	105.0	1836.2	1037.5	

Source: Data of the RF Committee on Statistics and the Committee of the Russian North Social-Economic Development, 1996-1998.

Table 27.

**Thickness of ice in different months
on Nar'yan-Mar route**

Month	Jan.	Feb.	Mar.	Apr.	May	Jun.-Oct.	Nov.	Dec.
Thickness of ice in Cm	50	80	100	120	120	0	10	30

The ice concern is most acute for the narrow canal to port. Icebreakers, however, can help to solve this problem.

Anderma, located at Yugorsky peninsula in the mouth of the Anderminka River, was founded in 1940. It is now an urban type settlement with a population slightly over 2,000 citizens, and a marine port with steady loading of general goods (freight traffic 6-9 thousand tons per/year). Vessels with drafts not more than 1.5 meters, can use the port's seven berths, which have a total length of 517 meters. Vessels visiting this small arctic marine port have their own shipping agendas and only partially satisfy local requirements for fuel and food.

All regions of the Russian North have an annual state program for delivering to them fuel, food and consumer goods. Although all transport means have been used for this program, marine and river transport during summer navigation have been the main sources of transport. Following the latest decision of the Federal Government in May 1998 to increase efficiency in executing the program's objectives, the regions received a right to organize their own delivery systems with regard to the terms and volumes of loads. Money needed to implement these systems will come from the specially created Federal Northern Regions Delivery Fund. (see Table 26. "Food, consumer goods and fuel deliveries, 1992-1996").

A considerable part of these loads is delivered by railroads to Murmansk and Arkhangelsk oblasts, and to the Karelia and Komi Republics, but loads for the NAO are delivered mainly by marine ships and coast trade vessels. The significance of marine transport in the NAO will increase

sharply with the new transport requirements of massive loads being used to supply developing oil and gas fields, and the delivery of raw oil to consumers in western countries. Simultaneously, industrial development will demand the expansion and improvement of existing on-land and river infrastructure systems.

The limited shipping capabilities of the Pechora river and its tributaries result from shallow waters (maximum draft of operating vessels cannot exceed 1.4 meters), and a long frozen period (more than 5 months). In connection with future oil development, large cargo vessels are expected to be used for delivering large volume industrial loads to coastal terminals, which will then be transported further by new roads to the oil fields. At present, a year-round road is under construction from Nar'yan-Mar to the Kharjaga oil field. The existing roads are for winter use only, from November to April. They require maintenance work each year, and can only support cargo weights under 20 tons.

A first step in oil field exploration, as connected with the use of the Northern Sea Route, was the special research project "The future transport infrastructure of the Nenets Okrug." The project was conducted in 1995 by the "Neste YIT Corporation" of the "Kvaerner Masa-Yards Inc.", one of the active participants in the future industrial development of the NAO. The research objective was to assess the possible volumes of loads to be delivered to the Nenets okrug in connection with oil and gas activities, and to design an appropriate scheme for transport infrastructure development that responds to increased transport needs. Although the figures and conclusions were purely speculative, the research did present some insight into the nature of future oil field load volumes and expected NSR freight traffic for the Nenets region.

The project assessed the following oil field areas: Varandey, Khylycheyu, Shapkina-Lajavosh, and Oshkotynskoe. The distance from these oil fields to the coast, and to year-round roads are presented in Table 28.

Table 28.

Distance of key-areas from all year-round road and coastline

Area of oil field	Distance from road	Distance from coast line
Varandey	290 km	50 km
Khylchiyu	140 km	20 km
Shapkina-Lajavosh	40 km	60 km
Oshkotynskoe	220 km	120 km

Source: The future transport infrastructure of the Nenets Okrug, 1995. "KMY Neste YIT Corp".

The main cargo associated with oil field development will be drilling and other equipment, and liquid materials for drilling (drilling solution and fuel). This cargo could be transported by several means including: modules (rated module sizes are: 10m•20m•8m for the largest, and 10m•20m•5m for smaller ones), containers, and liquid bulk and non-liquid bulk. Use of marine route for delivering this cargo is most likely, depending on whether: a) special orders for construction of vessels for this cargo has been already made to the Russian North-Western shipyards, b) large modules (weighing 50 to 200 tons) cannot be delivered by rail-road, c) oil and gas fields are located close to coast, and d) construction and operation costs of year-round roads remain high.

The module method for industrial construction was recognized as the most economical for oil fields under such conditions. Thus, functional modules would be produced at the plants in Arkhangelsk, Western Europe or in the US. The total number of modules is expected to be about 25 units per year for one field, each weighing about 100 tons. Due to their size, such modules can be delivered to the NAO only by ship.

Other important goods that will need to be delivered include fuel, which is particularly crucial during the construction period. Consumption of fuel is estimated at 200 thousand tons per year or 2 million tons for 10 years. Oil fields also need large volumes of cement and drilling mortar - between 9 and 24 thousand tons per year in different areas. Drilling mortar, however, should be withdrawn from the region after being used. Also needed are tubes for pipelines (400,000

tons for the whole region), different general equipment which can be packed in containers (about 240,000 tons for 10 years), and construction equipment (400,000 tons for 10 years). The total volume of loads equals 3.6 million tons for 10 years, or 110-180 thousand tons per year, in addition to 25 modules for each oil field annually.

3.3.2. Surface transport ways

On-land transport infrastructure is minimal in the NAO. Because of the high cost of road construction (around 2 million rubles per kilometer) it is unlikely that overland transport will be improved any time soon. This means that the first priority in transport infrastructure development will be given to marine and river transport, and construction of facilities connected with their use.

Nevertheless, internal roads between oil fields are included in the plans for the okrug's transport infrastructure development. Among such roads the following should be noted:

Roads:

- Kharjaga-Severnaya Kharjaga-Jarey-Yu-Yuzhny Khylychuy
- Yuzhno-Toraveyskoe-Toraveyskoe-Myadeynoe
- Kharjaga-Yuzhno-Shapkino-Pashshor,
- Kharjaga-Vostochnaya Kharjaga-Vostochno-Kolvinskoe

Railroads:

- Jubileynaya station (existing, Komi Republic)-Labaganskaya-Naul'skoe-Yuzhno-Toraveyskoe-Varandeyevskoe fields.
- Jubileynaya station-70-let Oktyabrya-Verhne-Kolvinskoe fields,
- lines from Jubileynaya station to Severokhasedoyevskoe, Sadjaginskoe, and Severo-Saremboyskoe fields.

At present, only one paved road is being used in the central oil region of Timan-Pechora province: Usinsk-Vozey-Kharjaga. Another one, Kharjaga-Nar'yan-Mar, is under construction with 164 kilometers yet to be built. This road will be of great significance to adjacent fields (Layavosh), as well as for local communities' needs. Low levels of current investments limits construction to no more than 6 kilometers

per year. Taking into account the large capital and time requirements for new road construction, it is most likely that existing winter roads will remain the main on-land transport means in the forthcoming years.

3.3.3. Air transport capabilities.

The NAO has only two airports which provide landing strips for big planes: in Nar'yan-Mar and Amderma. Along with these airports, there are 23 points which have takeoff-landing sites for helicopters. The main airport in Nar'yan-Mar has a runway length of 2.5 kilometers. Improvements needed for this airport include increasing the thickness of the pavement, new navigation equipment, anti-freezing equipment for the runway, and serious repairs of fuel storage capacities.

Delivery of food products and light loads from other regions of Russia is carried out by charter flights of the local company "Syr Vark" (aboriginal name of "white bear"). The company was organized two years ago for carrying passengers and light cargo. This service is in addition to regular flights offered by the Russian air company "Aeroflot" which has a passenger tariff that is 30% higher than that of the new local Air Company.

Although air transport will not play a major role in industrial activity in the NAO because of very high cost, airplanes will be used for partial delivery of light cargo, passengers and fresh food. In these cases, the shortened delivery time allowed by air transport is preferred. It is planned that deliveries of light construction elements and other cargo will be carried by airplane to Nar'yan-Mar or Usinsk, and then further by helicopter to the destinations.

During the construction period at oil and gas fields and pipeline routes, a large influx of labor is expected. The delivery of new workers will be conducted mainly by air transport. Most likely those people involved in exploration and construction work will be delivered from Arkhangelsk oblast and the Komi Republic. The Nar'yan-Mar airport will be used as a base, with further delivery of people to construction sites by helicopter.

Even a short analysis of available NAO transport infrastructure confirms the extremely limited capacities of all transport means besides marine and river ways. Marine transport will play a primary role in the future industrial development, although it should be supported by on-land and air transport. The Nenets Okrug is at the beginning of its infrastructure development and is faced with two options. If development is fashioned solely around oil and gas industry needs, this could reasonably be sufficient for the first stage of industrial development. However, further oil and gas field development will occur farther and farther from the arctic coast. Therefore, development of on-land infrastructure which could serve different social and economic requirements of the okrug for many decades, including serving the oil and gas industry, is also necessary. On-land infrastructure development will help to create new opportunities for social development in the Nenets Okrug, and will solve many economic problems. Most important among these problems are the indigenous people's isolation from centers of supply, from the consumers of their production, and from available social services.

PART IV.

LEGAL REGULATION OF ECONOMIC ACTIVITY IN THE NENETS AUTONOMOUS OKRUG.

Regional life in Russia is regulated by both federal laws and local acts and norms. The local laws should not contradict the federal laws. In the absence of federal legislation, however, local laws are drawn up to meet the practical needs of the population. The local legislative body consists of people's deputies and has the right to pass local acts aimed at regulating any issue which falls under regional and local authority.

4.1. Federal Legal regulation of regional economic activity.

Many of the federal laws in effect in the NAO have already been discussed in this report. The Nenets Okrug, as with other resource rich regions of the Russian North, has problems regulating use of natural resources and lands, particularly when home lands of indigenous people become the central interest of industrial companies. In accordance with the new federal laws, regulation of natural resource and land use, and protection of the environment are now the responsibility of local authorities.

Although basic laws in this area have been accepted in Russia, there is a need for additional laws and amendments to give stakeholders and local authorities mechanisms for effective implementation of these laws. At present, many laws have some uncertainties, which allows for different interpretations and applications. This has led to many conflicts within local societies and between natural resource users. Such Federal Laws include:

- Law "About mining" (or Law "About underground resources"),
- Law "About Agreement on Production Sharing",
- Law "About Protection of Natural Environment of the RF",
- Law "About ecological expertise",
- Law "About Continental Shelf of the RF",
- "Land Code",
- Law "About Protection of Atmosphere",
- Law "About Protection of Animal World".

The Law "About the continental shelf of the RF" (accepted by the State Duma October 25, 1995), determines the status of the Russian continental shelf, the sovereign rights and jurisdiction of the RF over the continental shelf, and an order for conducting any type of activity. It is one of three "marine" laws of the Russian Federation which regulate questions concerning shelf waters. The other two laws which have not yet been accepted are: "About internal waters, territorial sea, and adjacent zone of the RF" and "About exclusive economic zone of the Russian Federation". As was

already mentioned, the law "About internal waters..." should pass the last hearings in fall 1998. The third Law "About Exclusive Economic Zone" was accepted October 4, 1996 by the State Duma and rejected by the Council of Federation of the Parliament November 13, 1996, in accordance with article 106 of the Constitution of the Russian Federation. A special Agreement Commission was formed to rework the law and submit it again for consideration by both Chambers of the Parliament.

Unfortunately, Federal laws about the status of indigenous peoples and their rights regarding use of natural resources and traditional lands were not passed through the Russian Parliament, although several editions of such laws have been under consideration in Parliament Commissions since 1991. The Constitution of the RF and several Presidential Decrees have, however, made declarations regarding special care for indigenous peoples' subsistence and respect of their traditions. These declarations were confirmed more strictly by the Federal Law "About State regulation of the Social economic Development of the RF North". Even so, existing legislative base cannot provide indigenous people with real property rights and equal standing in their relations with industrial companies and local authorities.

This situation can be radically changed with the acceptance by the Russian Parliament of new federal laws now under consideration which are in great demand by indigenous communities. The most important questions regarding the status of indigenous communities (tribes; Russian singular: *obshina*) are included in the draft of the Federal Law "About general organization principles of *obshina* of indigenous people of the North, Siberia and the Far East". In accordance with the provisions of this Law, an *obshina*, after official registration as a juridical subject, can take part as an equal partner in negotiation processes regarding land use, withdrawal of their lands from traditional usage, or financial compensations for loss of lands. At present, all of these functions are carried out by the local Administration. This arrangement mirrors the situation of previous years, when compensation assigned for

rural communities could be used for other purposes at the discretion of the local Administration.

The draft of this Law is under consideration along with another Federal Law "About lands of traditional usage of northern minorities of the North, Siberia and the Far East". The central idea of this draft is to place ownership rights in the hands of the *obshina* including use and disposition rights on indigenous homelands. The areas selected and attached to a northern minority's *obshina* should be sufficient for continuation of traditional life, conservation and development of unique ethnicity and cultural traditions. As the owner of such lands, an *obshina* should be compensated for losses incurred in case lands are withdrawn from traditional use for other needs, such as industrial development. The main articles of the this draft law concern different social groups. Given the long history of unsuccessful attempts to pass similar laws in the RF Parliament Commissions, one can hardly expect quick passage of the new draft. Furthermore, the Law "About traditional lands of northern minorities" needs an acceptance of six new Laws and amendments to existing laws. Thus, the following new laws are to be considered:

1. "About northern reindeer breeding", (accepted in 1998),
2. "About indigenous peoples of Russia",
3. "About general principals of *obshina* organization of indigenous peoples of the North, Siberia and Far East".
4. "About fishery",
5. "About hunting and the hunting branch of economy",
6. "About traditional use of natural resources".

The federal legislative body should conduct extensive work before these laws become binding documents.

4.2. Local legal regulation.

Given the inadequacy of existing federal legislation, the regions have adopted their own laws and regulations. First, autonomous okrugs of the Russian North have passed their main internal laws: Home Rules (or Charter). In the Nenets Autonomous Okrug, the Nenets Assembly of People's Deputies

adopted a main Law of an equal subject of the Russian Federation on August 11, 1995. This charter law includes provisions on the following: the legal status of the okrug, subjects and issues of local authorities, guarantees of the rights and social interests of the Nenets people; executing authority and local self-management; basic economic and financial principles of the okrug; order of withdrawal and rental of lands for different investors, including foreign ones; use of municipal property; an order of any economic activity at the okrug territory; formation and management of the local budget; judicial power and bodies responsible for protection of internal order.

In accordance with these Home Rules, all questions regarding land use, resource management, and financing of social and economic programs, should be submitted and discussed in the meetings of the Nenets Assembly of People's Deputies. Meetings are, for the most part, open to the public.

In connection with forthcoming expansion of economic activity in coastal and shelf zones of the Nenets okrug due to oil and gas exploration and traffic on the Northern Sea Route, it is necessary to deal in correspondence with the Decree about frontier regime setup, signed by the Governors of the Arkhangelsk oblast and the NAO. This regime embraces the archipelagos of Franz Joseph Land, Novaya Zemlya, the islands of the Barents, Pechora and Kara seas; the five kilometer strip from point Kanin along the coast of the Barents, Pechora and Kara seas to the border with the Yamal-Nenets autonomous okrug, Tyumen oblast; and the five kilometer strip from point Kanin along the White Sea east coast to point Intsy. Special documents and permits are required to visit these places (including visits by trade and cargo ships) or to conduct any activity there.

As mentioned previously, local Regulations exist for "The Limited Economic Activity Zones". Together with limitations of any activities connected with creation of the protected areas, Nenetsky, Bol'shezemelsky and Nizhnepechorsky *zapovedninks* and Bol'shezemelsky *zakaznik*, located mainly in the northern part of the Nenets okrug, these regulations make procedure for

organizing industrial facilities on the territory of the NAO complicated.

The local Committee of Ecology and Protection of Environment requests an Environmental Impact Assessment (EIA) as part of a feasibility study of those projects connected with natural resource development, or the construction of industrial objects which can cause damage to the natural environment. This requirement is an obligatory condition for receiving permission for such an activity in accordance with Federal Law on Ecological Expertise. All scientific results and recommendations produced by the EIA should be delivered to the local Committee of Ecology, which conducts the monitoring of industrial object construction and exploitation.

If a new industrial project concerns the social interests of indigenous people in the Nenets Okrug, the representatives of the local Administration Committee of Indigenous People and Native Organization "Yasovey" are invited to take part in the discussion of the EIA. This practice has already become the norm in institutional relations.

CONCLUSION

The Nenets Autonomous Okrug is expected to be an important new area of commercial interest for the Northern Sea Route by the year 2000. This region is extremely rich in hydrocarbon resources - the main reason for interest and activities of the largest international and national companies.

For all remote regions of the Russian North, as well as for northern parts of the Scandinavian countries, transport plays a crucial role in resource development. The current status of the infrastructure system determines which means of transport will receive priority for further development. The Nenets Autonomous Okrug has limited infrastructure capabilities and is industrially an undeveloped territory; therefore, it has not had large transport needs in the past. Development of on-land transport routes has been delayed by high costs of

construction and use. Large investments in transport have not been prudent as long as the okrug has remained a remote agricultural area with a sparse population. Despite the rapid change of this situation connected with oil and gas development, marine and river ways will remain the basic transport means for the near future and maybe for forthcoming decades, although main roads and feeder roads will be constructed between oil fields and the coastline.

Specific natural conditions of the Pechora Sea (shallow waters and a 5.5 month frozen period) make any use of marine and river infrastructure complicated from an engineering point of view and extremely expensive. The existing capabilities of marine ports are not adequate for the expected volumes of cargo to be delivered to the Nenets Okrug. Expansion and improvement of these facilities are to be carried out along with the creation of new marine terminals, systems of pipelines, and other industrial objects.

The options for the marine terminal location and corresponding schemes of raw oil transport from NAO fields each have their own advantages and disadvantages. What is needed is a comprehensive assessment of all benefits and costs before any one of them is implemented.

The choice of infrastructure scheme depends mainly on the industrial companies that will develop fields, invest in construction works, and carry out delivery of oil and gas, but decisions regarding land based infrastructure will partly address the okrug's needs and thus principally affect the social and economic life of the okrug.

The remoteness of the okrug from industrial areas and the self-sufficient style of life have formed a specific type of settlement among the Nenets people. All communities are located on river or marine coasts, giving people access to water transport ways and providing them with different possibilities of marine subsistence: fishery and/or marine mammal hunting (which sometimes are combined with reindeer breeding).

The appearance of a new, very active, and "aggressive" branch of economy, namely the oil and gas industry, inevitably leads to a changing of traditional land use patterns and

growing social tension. Expected increase in marine vessel traffic along arctic coasts and mouths of rivers will bring disturbances of different types to traditional fishery and marine mammal hunting. It might make worse the depressed state of fishery, an important field of subsistence for local people. The main task of the local authorities is to find a possible balance between rapidly growing industrial activity and the poorly developed local economy that needs financial support. Obviously, one of the possible sources of such support could be the industrial sector, if their interrelations with local communities are characterized by an equitable partnership and mutual understanding.

Expanding use of the NSR is currently stipulated by the oil and gas industry, while needs of the local economy could be satisfied without the expensive services of the NSR. In accordance with the latest decisions of the RF government (May 1998), the delivery of necessary goods (fuel, consumer goods and food) for the local economy and population is under the direction of the local authorities. They will determine how much and by what transport means cargo should be delivered to their region. The attitude of regional authorities to the NSR could change as they investigate and compare all possible variants. Where the interests of local authorities and owners of marine vessels or industrial companies coincide, shipment of locally needed goods can be combined with general deliveries of cargo for oil fields. Local authorities could even require such shipments as a permit condition for industrial companies operating on okrug territory.

Taking into account the rather strict environmental rules of the Nenets Okrug regarding industrial activities and land withdrawal, participation of the industrial companies in "northern delivery" (famous in Russia as "severny zavoz") could have a positive influence on relations with the okrug.

From the point of view of native interest, a rapid growth of industrial activity in the Nenets okrug cannot be assessed only as a negative process which will inevitably bring land and environmental losses for the traditional economy of indigenous peoples. Native peoples of the NAO are in a very hard economic

situation, formed by the transition to a market economy under conditions of sharply decreased federal support. The traditional economy is not able to efficiently regulate such a transition without outside financial help, which is expected to come from industrial companies which have commercial interests in the Nenets Okrug territory. The problem is whether local authorities will be able to place the interests of indigenous people on an equal base with other okrug interests in negotiations with industrial companies. At present, Russian law does not afford indigenous people's organizations the right to take part directly in such negotiations, thus limiting their ability to assert their rights. One can hardly expect the situation to change in the short run owing to the failure of the Russian Parliament to adopt new federal laws strengthening the role of indigenous people.

APPENDIX 1

TABLES

1. Distribution of Nenets people in Russia, 1990.
2. Dynamics of the NAO population during 1990-1996 years (thousand of people to the 1st of January).
3. Dynamics of the population of NAO including the share of Nenets people.
4. The distribution of population by *sel'skie sovety** including Nenets of the NAO Jan.1 1997.
5. Comparative demographic data on the northern regions of the European part of the RF.
6. Demographic indices for the Nenets autonomous okrug.
7. Number of migrants who arrived in and left the NAO regarding directions of their migrations (in % to the total number of migrants, 1995).
8. Indicators of natural growth and migration in the changes of the NAO population.
9. Resource potential of the Timan-Pechora Province
10. Oil and gas resources.
11. The Perspective Pechora Sea oil-bearing structures.
12. The list of fields in the Nenets Autonomous Okrug included in the Federal LAW draft "About the list of fields which should be developed on the base of APS".
13. Structure of the NAO land fund.
14. Industrial and municipal emissions in atmosphere, 1996.
15. Total volume of contaminants, tons/year.
16. Industrial enterprises of NAO as main polluters.
17. The industrial enterprises of the NAO and main ingredients of their emissions.
18. Emissions of pollutants released in atmosphere from moving sources, 1996.
19. Discharged sewer waters and their main ingredients.
20. The Nenets okrug reindeer breeding indicators 01.01.97.
21. Reindeer breeding holdings of the NAO.
22. Oil Production in the NAO 1992-1996.

23. Distribution of licenses on prospected fields between companies.
24. Oil development projects involved in the "Northern Gate".
25. Length of pipelines to possible terminal locations.
26. Food, consumer goods, and fuel deliveries 1992-1996.
27. Thickness of ice in different months on Nar'yan-Mar route.
28. Distance of key-areas from year-round road and coastline.

APPENDIX 2

FIGURES

1. Administrative map of the Nenets autonomous okrug (NAO)
2. Distribution of the NAO population by sel'skie sovety including nenets
3. Population of the European part of the Russian North
4. Urban Population Dynamics
5. Rural Population Dynamics
6. Birth Dynamics
7. Death Dynamics
8. Dynamics of Natural Growth (Decline)
9. Oil and gas resources development of the NAO
10. The NAO traditional economy and protected areas
11. Scheme of main and feeder oil pipelines of the Timan-Pechora Province 1996
12. Industrial and social infrastructure system of the NAO

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Review of INSROP Report

Elena Andreeva: "The NSR - Impacts on the NAO Regional Development and social/economic conditions of the Nenets population".

For decades the Nenets Autonomous Okrug existed as a rather unknown part of the northern area. Administratively it was a remote part of the large Arkhangels Region, and it was also a closed-off area in military terms. Very little was known about the local conditions, except that Novaya Zemlya was a main site for nuclear testing. As the INSROP series of discussion papers tells us, the tables are now turned when it comes to available information. Andreeva's paper is a first - and most important - effort to give an overview of the social-economic situation of the okrug.

She has collected and put together an impressive amount of data to be able to give a fair description of the realities which are facing its inhabitants of today. It is all done from the okrug administrative point of view, which means that we are not informed about how these realities present themselves in the daily lives in the different communities. But the picture she draws is a very serious one and can be presented as following:

Of a population of 48.000 people in the okrug, 7.000 are Nenets (14.6%). They are (almost) all settled in the rural areas, making a living out of reindeerherding and fishing. Their traditional land-use comprises 72 % of the okrug's area. But this area is also on its way to become an object for another kind of economic activity: It represents the second biggest oil- and gas deposit in Russia. The discovered hydro-carbon resources in the so-called Timan-Petchora field has a production estimate of 144 years, according to the current analyses, and this gives us an idea of the magnitude of the changes lying ahead.

If one adds that there are no existing legal regulations or political institutions which take care of the interests of the indigenous population, then the table is set for a rather turbulent situation. Such are the facts in Andreeva's description and these facts must constitute the framework of any scheme which involves the future of the indigenous population in the okrug. Her report continuously brings out this message. The local economy is falling apart together with all infrastructure. The health conditions among the Nenets are much worse than the rest of the population. Infant mortality, tuberculosis and alcoholism are distinct indicators. Finally, decades of nuclear testing has probably led to the fact that the rate of morbidity by cancer is growing five times faster in the Nenets A. Okrug than in the Arkhangelsk Region. This is a description which sadly enough is well known from other parts of the circum-polar world. The indigenous populations of Alaska, Northern Canada and Greenland have for a long time suffered under similar conditions and now the future for the Nenets is at stake.

One problem common to most indigenous populations, is the prevailing idea of economical development. Most of the time it is presented by national authorities as a matter of industrialization and market economy, running contrary to the actual local adaptations. The latter is often regarded as "backwards" or "non-efficient". In these matters I do have a problem with Andreeva's approach. She repeatedly characterizes the local adaptations as a "poor developed economy"(p.32,67) and the underlying assumption seems to be that some unspecified kind of "modern" market economy is the solution. That could very well be the case. But my concern here is that in the search for such solutions, we often tend to forget that the "undeveloped local economy" actually consists of people who are more concerned about household viability and daily needs, rather than abrupt economic changes which might bring reward in a distant future. After all, it was the Russian economist

Chayanov who sixty years ago reported from the Ukrainian countryside that the peasant runs a household, not a business concern. This valuable observation has ever since been relevant for any development scheme in pastoral and peasant societies. I do therefore miss an analyses of the existing household based adaptations regarding reindeerherding and fishing and to what extent these adaptations constitutes possibilities or constraints when it comes to "economic development" from the regional and national authorities' point of view.

But this being said, Andreeva must be credited for showing us the dubious role of science when it comes to economic development. Paid by an American oil company, experts from St.Petersburg have done a feasibility study of the development of the oil fields in the okrug. Their conclusion is that reindeer herding has no future and the pastures are exhausted. The only effective way of regional development, according to their report, is the use of oil- and gas resources. Such conclusions has, as Andreeva points out, nothing to do with the actual economic and ecologic realities in the region and is nothing but another sad example of how "development" is conceived by both scientific experts and industrial companies.

For me, one of the most valuable parts in Andreeva's report, is her description of legal regulations on federal and regional level regarding economic activities in the Nenets A. Okrug. This description is a telling tale of a lack of efficient legal means to take care of the interests of indigenous people, thus creating a situation where their whole future is at stake. I quote Andreeva:"Existing legislative base cannot provide indigenous people with real property rights and equal partnership in their relations with industrial companies and local authorities"(p.86). This is exactly the very situation which the Nenets share with other indigenous groups in the world and which makes possible the massive exploitation going on in their homelands today. It is to Andreeva's merit that she presents this grave reality to the readers of the INSROP-series and thus hopefully to the national governments taking part in this huge circum-polar project.

Tromsø, 12 October 1998
Ivar Bjørklund
University of Tromsø

AUTHOR'S REPLY

Dear Dr.Ivar Bjørklund,

I am very grateful for your review on my draft report. I was extremely pleased that my attempt to collect and analyze disseminated material and poor familiar data about Nenets autonomous okrug altogether in one report has found such an interested reader. I can only repeat that it became possible due to active support of my research by the local authorities and organizations.

The main comment regarding local adaptations to economic development needs my special answer.

I definitely agree with you that the most important concern for indigenous population, as for any rural communities in other regions of the world, are their household viabilities and daily needs. One can easily be convinced in the correctness of Russian economist Chayanov's conclusions, if you live and work with these people. Writing about new economic development for indigenous population, I mean quite another approach than what you described in your review. The market economy became a prevailing idea in Russia during last decade and its main slogan declares a high personal responsibility for adaptations to the new economic requirements. And it means that the strongest social groups have more chances to survive. It is a principally unacceptable idea, regarding northern minorities, whose subsistence needs a support from regional and federal budgets. It's not something new and specific only for Russia, it takes place in Canada, Denmark-Greenland, in the USA-Alaska, and in the Scandinavian countries. It's not a specific feature of Russia, but is a matter of indigenous people's economy. However, the point is that this help should be balanced with their strong will to make their own contribution, therefore this support should not humiliate these peoples.

In this sense, a new industrial development brings real money for regional budgets, which are to be used for all social groups including indigenous people. Again, this development might be destructive for local economy, if such a balance has been ignored or, on the contrary, helpful, if indigenous people's interests are included in priority aims.

Unfortunately, the current Russian legal base is not sufficient for protection of rights of indigenous people and the state should think what measures should be undertaken before such laws will be adapted. The analysis of situation among reindeer breeding and fishing unions shows that these groups became economically more dependant upon regional and local authorities or new market structures than before, as the old order of financial support was mainly canceled, while a new one is not stable and sufficient. That's why people are waiting for any economic development and relevant legislative regulations, which could bring about more stability and solution of daily needs.

Elena Andreeva

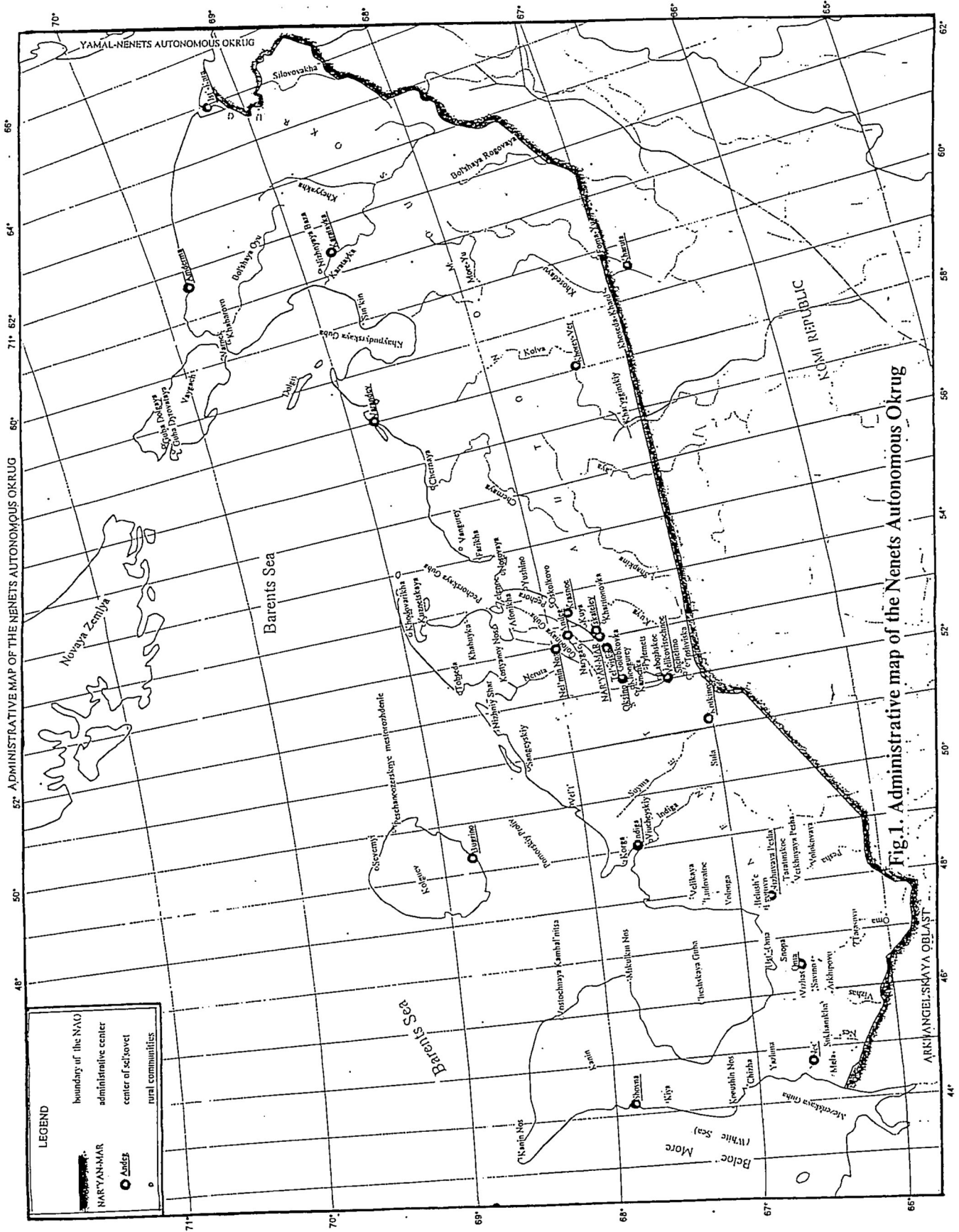


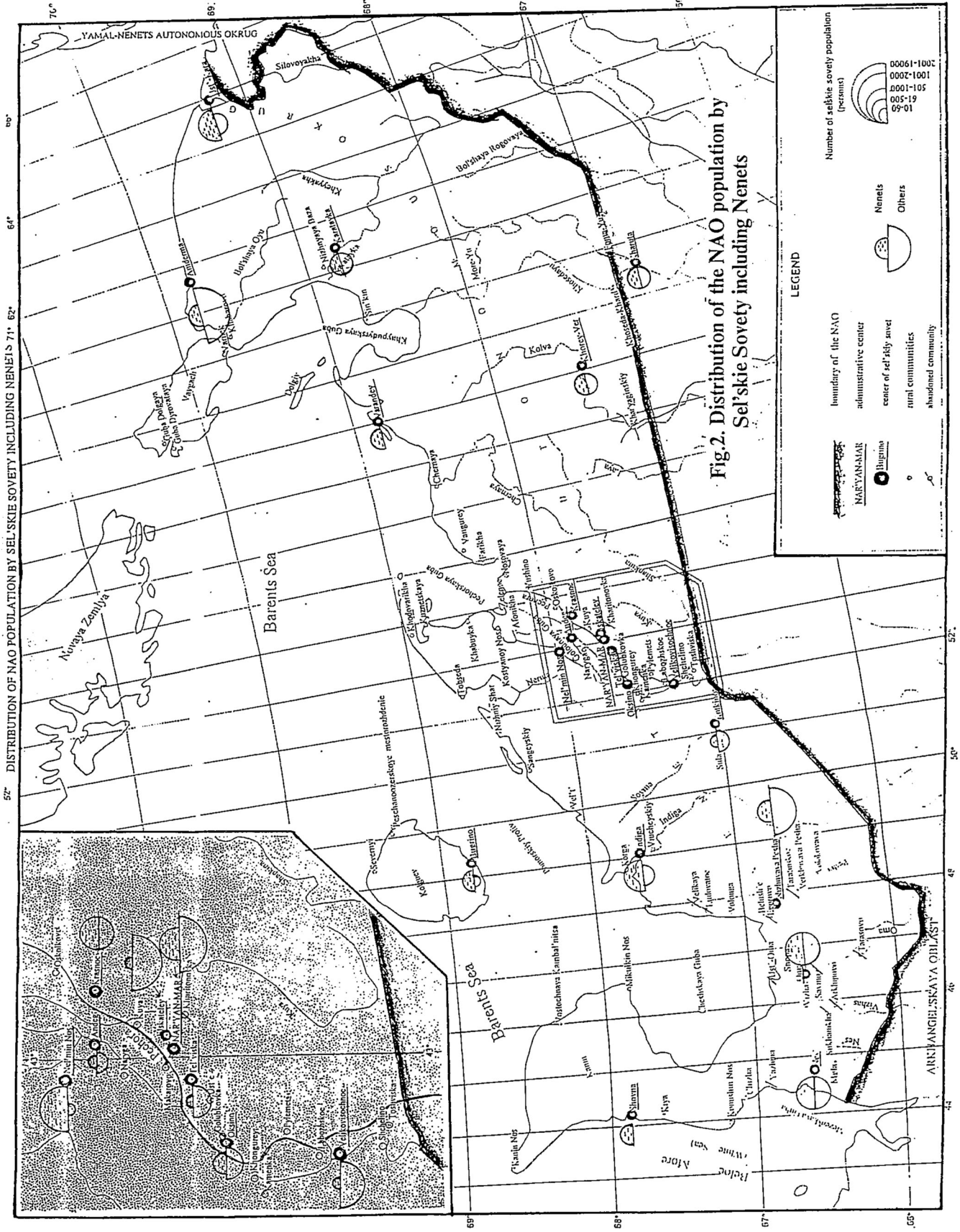
Fig. 1. Administrative map of the Nenets Autonomous Okrug

LEGEND

- boundary of the NAO
- administrative center
- center of settlement
- rural communities

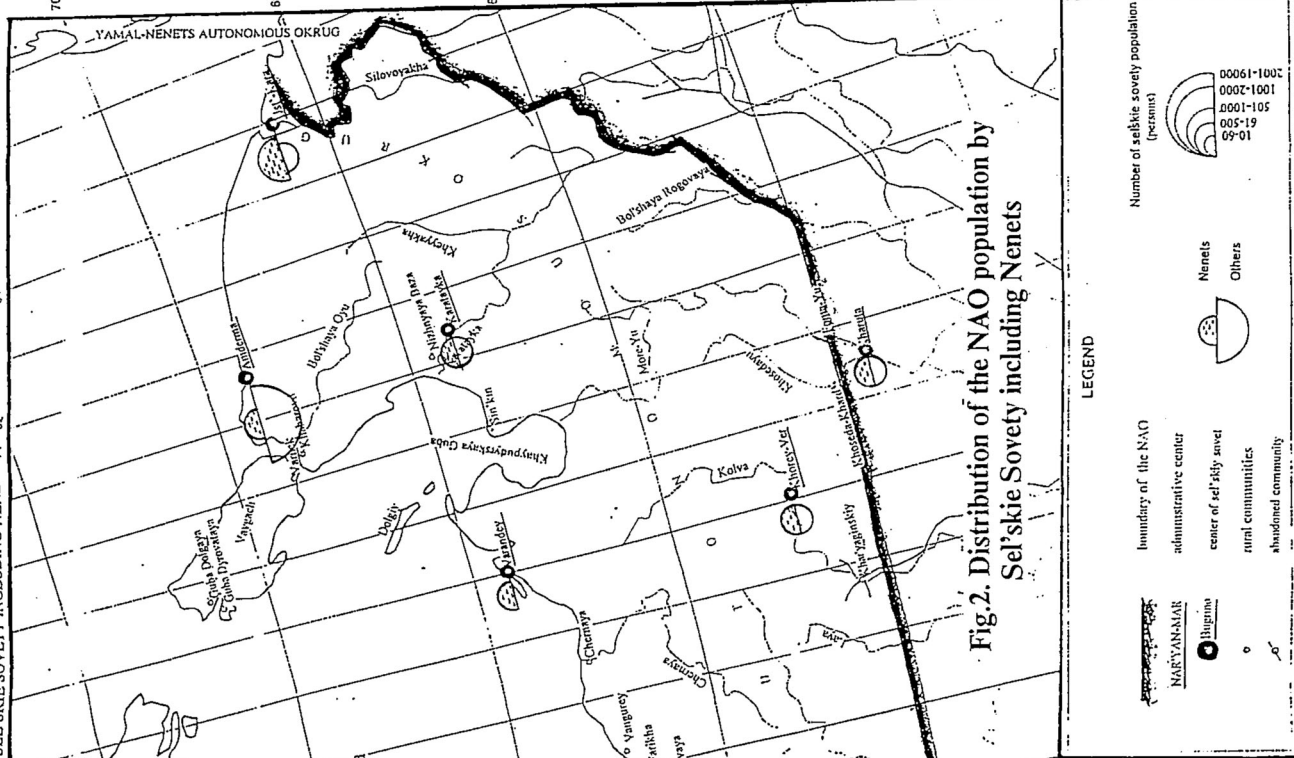
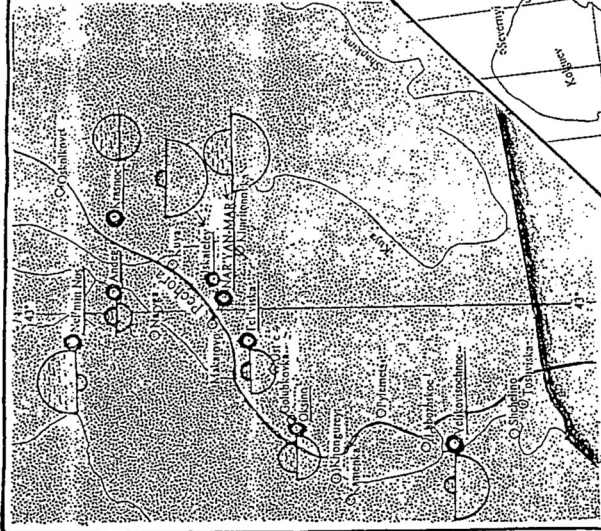
MARKERS:

- NARYN-MARI
- Kara

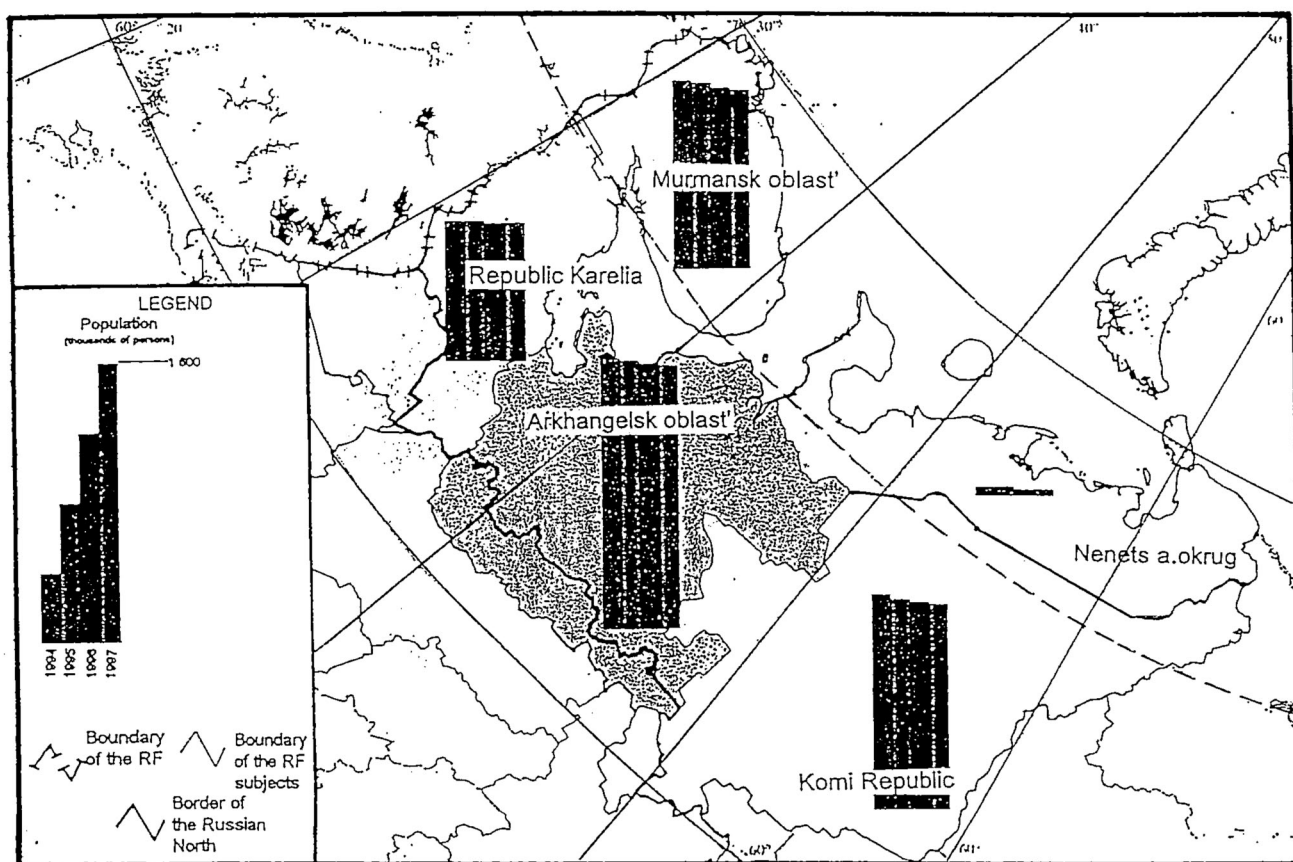


52° 57' 64° 70° 69° 68° 67° 66° 65°

50° 50' 40' 30' 20' 10'



POPULATION OF THE EUROPEAN PART OF THE RUSSIAN NORTH

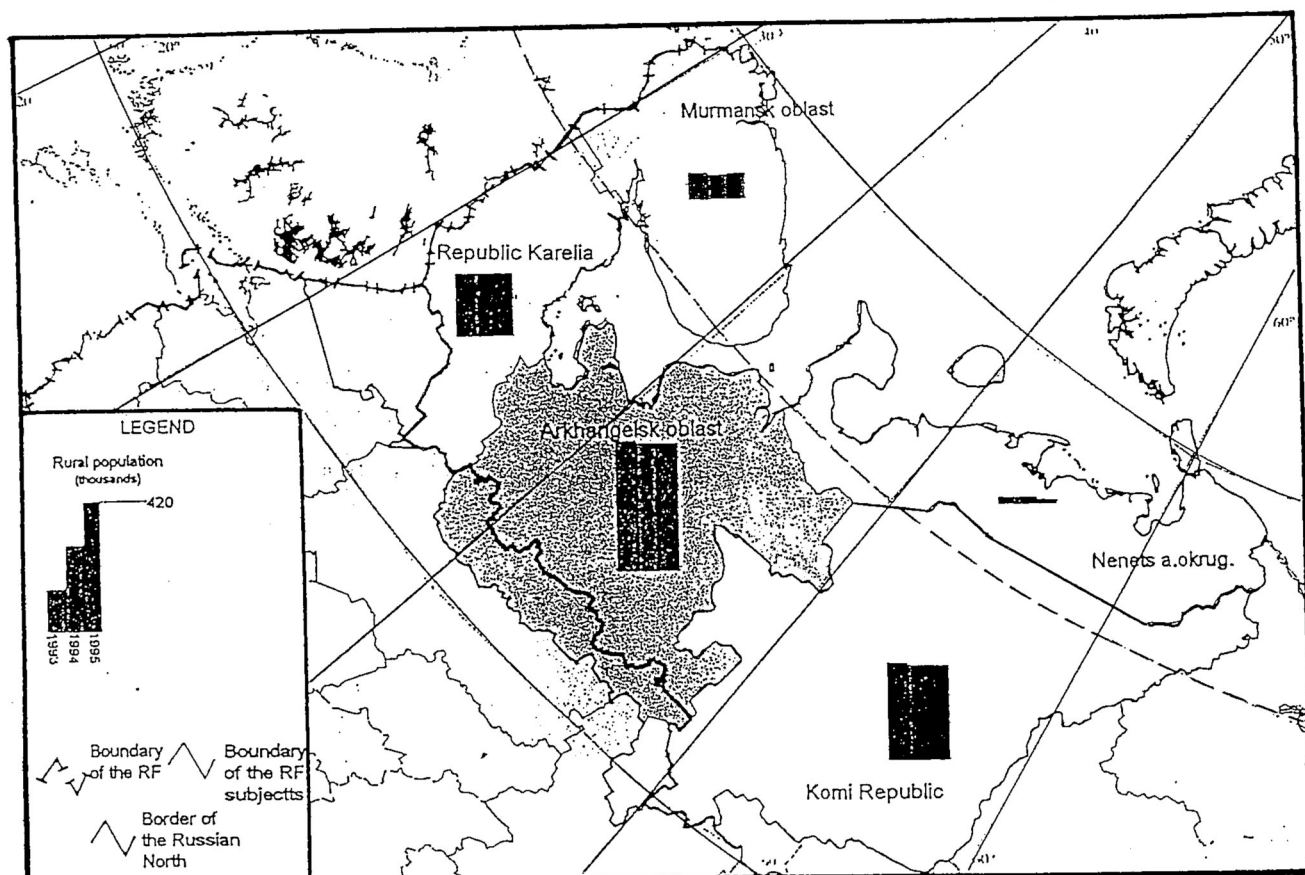


DYNAMICS OF POPULATION, Thousands of persons				
Name of adm. unit	YEARS			
	1994	1995	1996	1997
Republic Karelia	794	789	785	780
Komi Republic	1228	1202	1185	1173
Arkhangelsk oblast'	1548	1535	1521	1507
Nenets a.okrug.	51	49	48	47
Murmansk oblast'	1092	1067	1048	1032

Source: Regions of the Russian Federation. Annual Statistical Book
The State Statistic Department of the RF, Moscow, 1997.

Fig.3. Population of the European part of the Russian North

RURAL POPULATION DYNAMICS

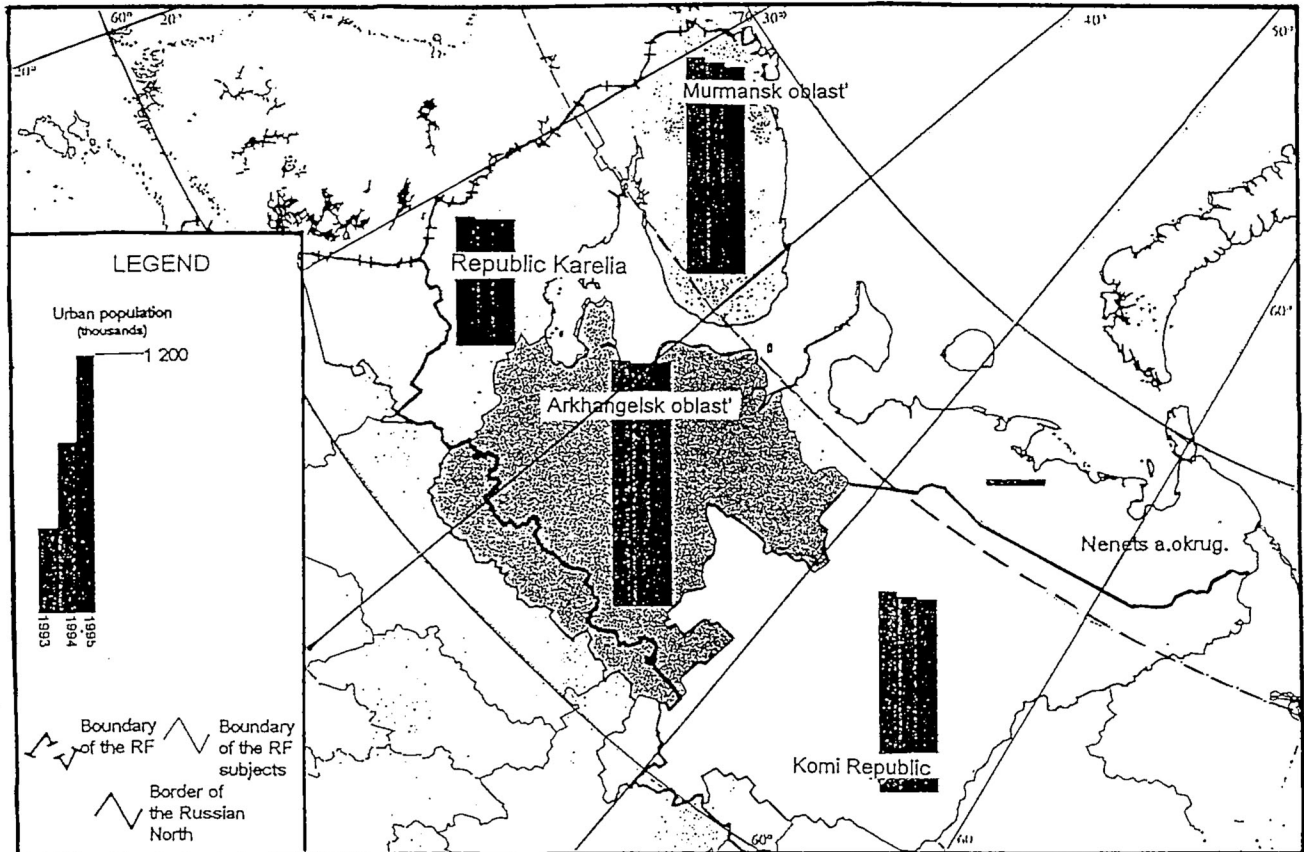


DYNAMICS OF NUMBER OF RURAL POPULATION (thousands)			
Name of adm. unit	YEARS		
	1993	1994	1995
Republic Karelia	205	203	204
Komi Republic	311	302	303
Arkhangelsk oblast	414	408	401
Nenets a.okrug.	20	20	19
Murmansk oblast	82	81	83

Source: Regions of the Russian Federation. Annual Statistical Book. The State Statistic Department of the RF, Moscow, 1997.

Fig.4. Rural population dynamics

URBAN POPULATION DYNAMICS

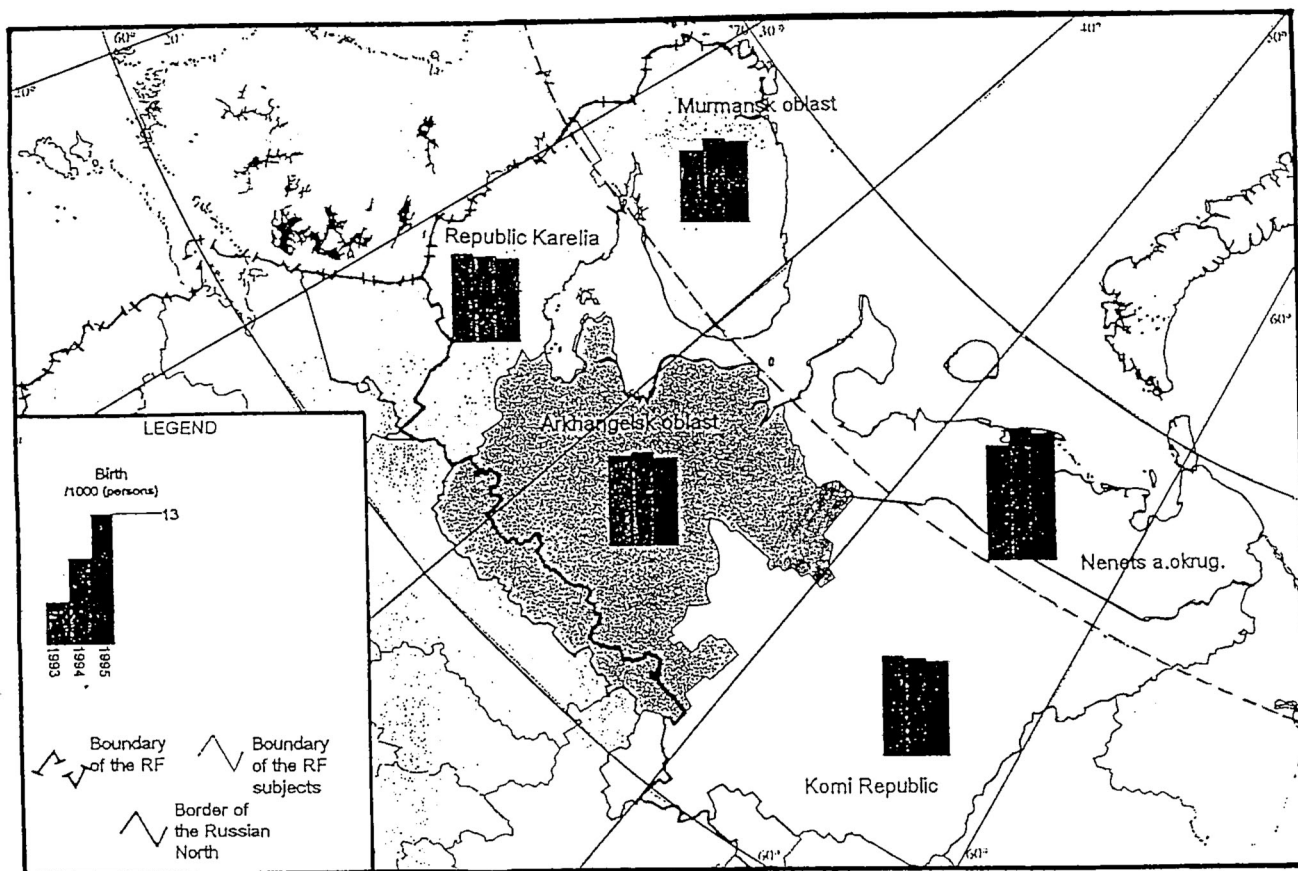


DYNAMICS OF NUBER OF URBAN POPULATION (thousands)			
Name of adm. unit	YEARS		
	1993	1994	1995
Republic Karelia	589	586	581
Komi Republic	917	900	882
Arkhangelsk oblast	1134	1127	1120
Nenets a.okrug	31	29	29
Murmansk oblast	1010	986	965

Source: Regions of the Russian Federation. Annual Statistical Book. The State Statistic Department of the RF, Moscow, 1997.

Fig.5. Urban population dynamics

BIRTH DYNAMICS

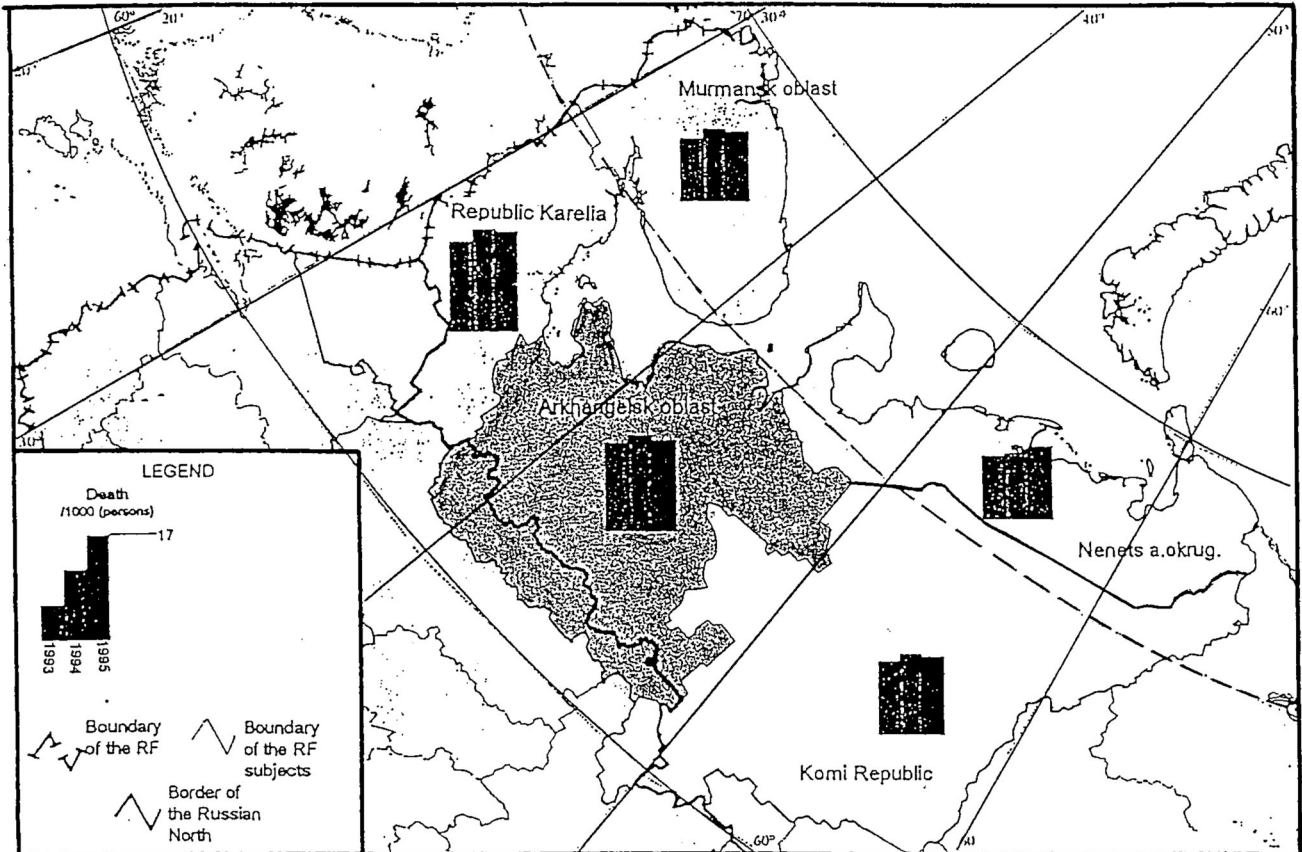


DYNAMICS OF BIRTH per 1000 inhabitants (persons)			
Name of adm. unit	YEARS		
	1993	1994	1995
Republic Karelia	8.8	8.6	8.5
Komi Republic	9.8	9.7	9.3
Arkhangelsk oblast	8.9	9.2	8.7
Nenets a.okrug.	11.4	13	12.4
Murmansk oblast	7.2	8.5	8.1

Source: Regions of the Russian Federation. Annual Statistical Book. The State Statistic Department of the RF, Moscow, 1997.

Fig.6. Birth dynamics

DEATH DYNAMICS

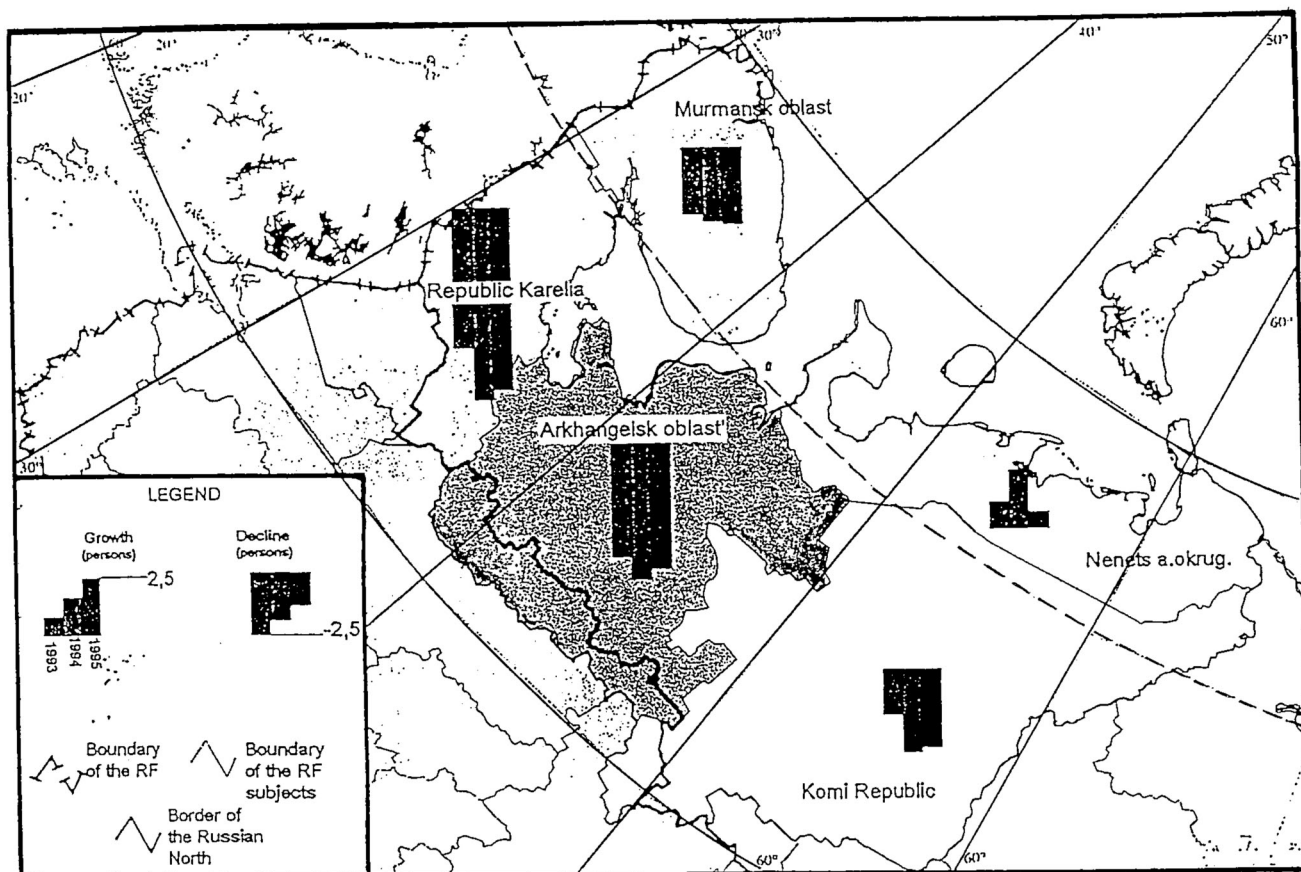


DYNAMICS OF DEATH per 1000 inhabitants (persons)			
Name of adm. unit	YEARS		
	1993	1994	1995
Republic Karelia	14.8	16.8	16.3
Komi Republic	11.8	13.2	12.6
Arkhangelsk oblast	14.3	15.6	14.6
Nenets a.okrug.	10.3	10.5	11.7
Murmansk oblast	10.1	11.7	11.4

Source: Regions of the Russian Federation, Annual Statistical Book. The State Statistic Department of the RF, Moscow, 1997.

Fig.7. Death dynamics

DYNAMICS OF NATURAL GROWTH (DECLINE)



DYNAMICS OF NATURAL GROWTH (DECLINE) per 1000 inhabitants (persons)			
Name of adm. unit	YEARS		
	1993	1994	1995
Republic Karelia	-6	-8.2	-7.8
Komi Republic	-2	-3.5	-3.3
Arkhangelsk oblast	-5.4	-6.4	-5.9
Nenets a.okrug.	1.1	2.5	0.7
Murmansk oblast	-2.9	-3.2	-3.3

Source: Regions of the Russian Federation. Annual Statistical Book. The State Statistic Department of the RF, Moscow, 1997.

Fig.8. Dynamics of natural growth (decline)

SCHEME OF THE NAO OIL AND GAS RESOURCES DEVELOPMENT

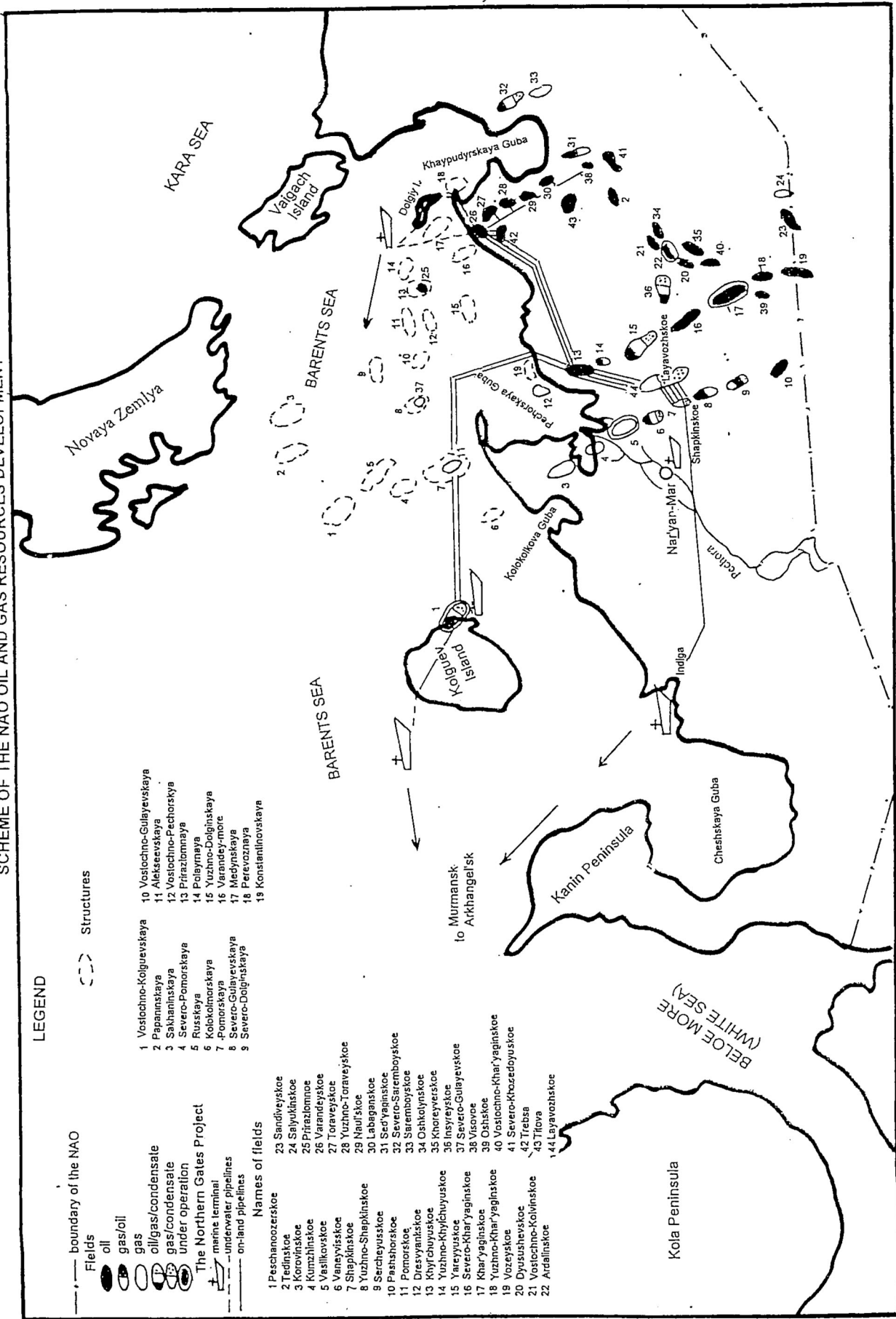
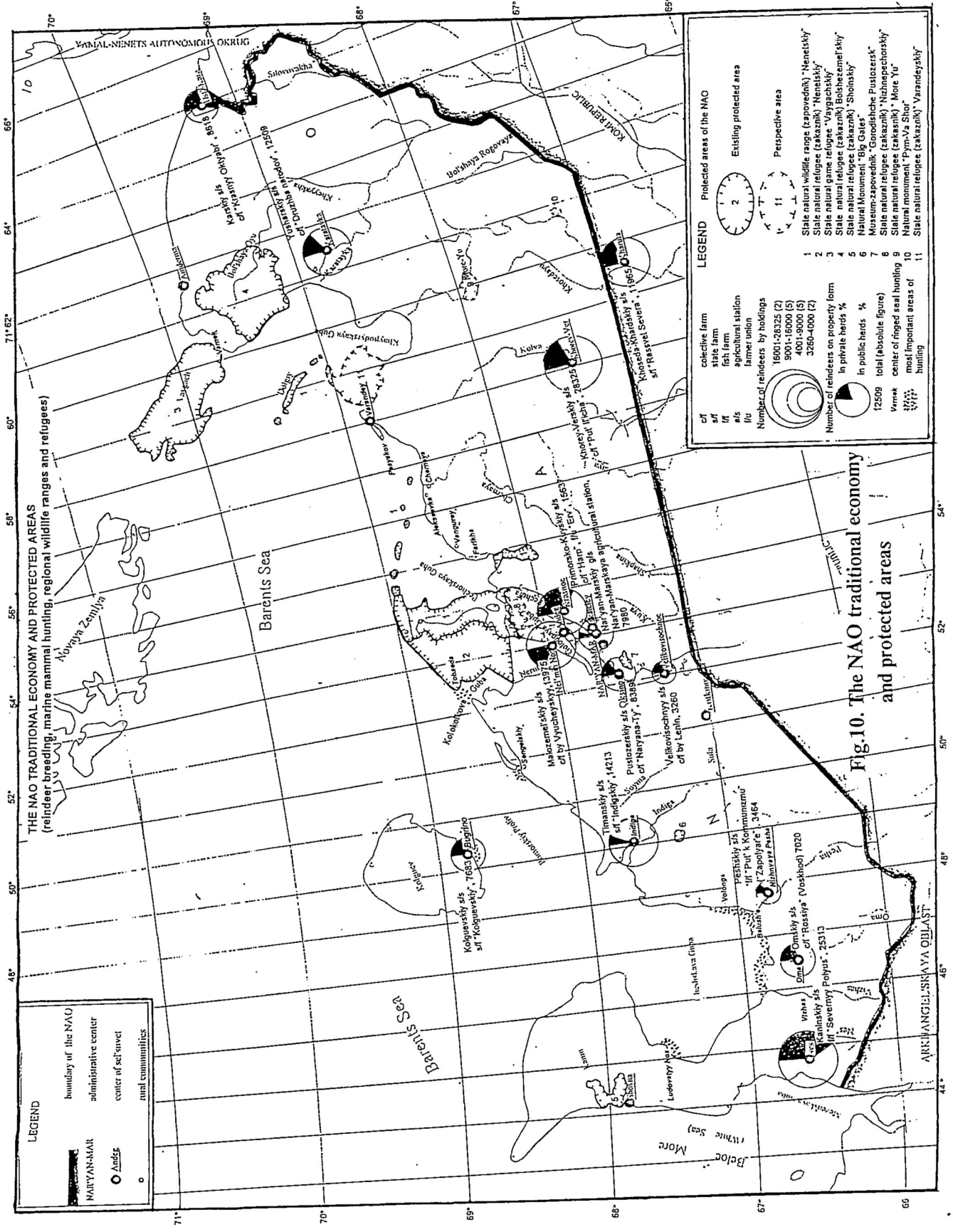


Fig.9. Scheme of the NAO oil and gas resources development



LEGEND

boundary of the NAO
 administrative center
 center of settlement
 rural communities

NAO BOUNDARY

○ ANDER

THE NAO TRADITIONAL ECONOMY AND PROTECTED AREAS
 (reindeer breeding, marine mammal hunting, regional wildlife ranges and refuges)

LEGEND Protected areas of the NAO

Existing protected area
 Prospective area

collective farm
 state farm
 fish farm
 agricultural station
 farmer union

Number of reindeers by holdings

Number of reindeers on property form

in private hands %
 in public hands %

total (absolute figure)
 Versek
 center of ringed seal hunting
 most important areas of hunting

1 State natural wildlife range (zapovednik) "Nenetskiy"
 2 State natural refuge (kazakhki) "Nenetskiy"
 3 State natural game refuge "Vaygachskiy"
 4 State natural refuge (kazakhki) Bolshozemelskiy
 5 State natural refuge (kazakhki) "Shoinitskiy"
 6 Natural Monument "Big Gales"
 7 Museum-zapovednik "Gorodishche Pustozersk"
 8 State natural refuge (kazakhki) "Nizhnepachoskiy"
 9 State natural refuge (kazakhki) "More Yu"
 10 Natural monument "Pym-Va Shor"
 11 State natural refuge (kazakhki) "Varandeyevskiy"

Fig.10. The NAO traditional economy and protected areas

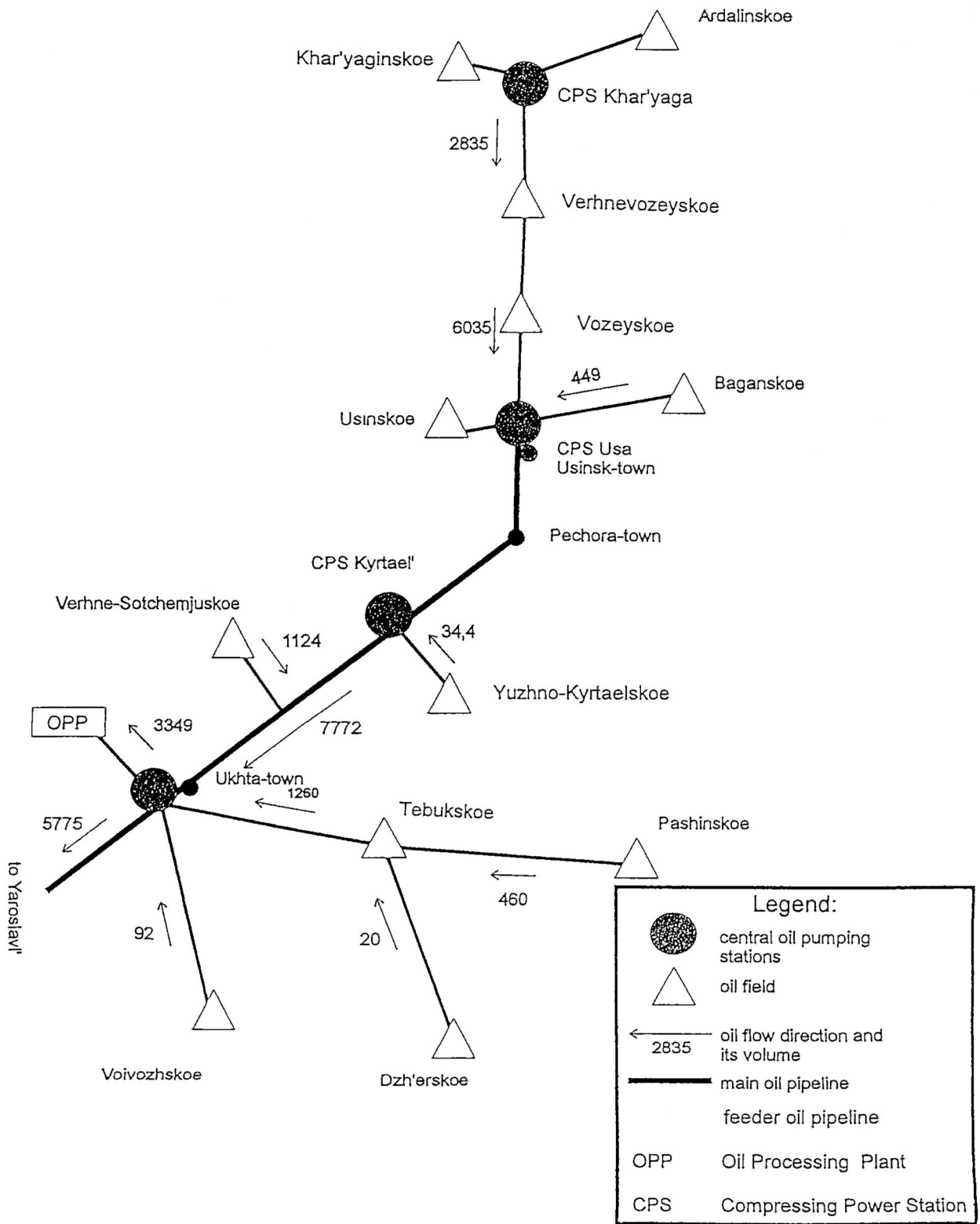
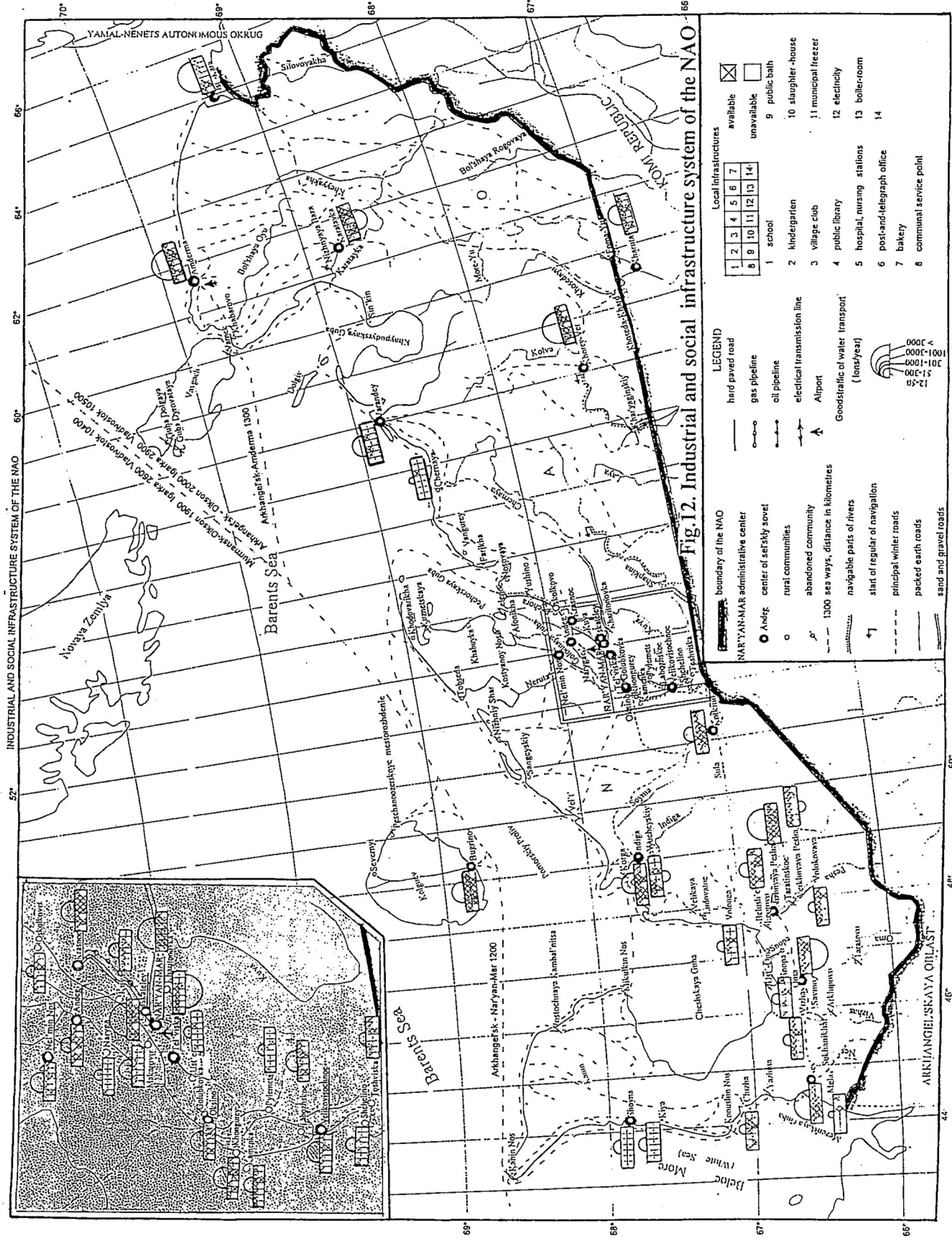


Fig.11. Scheme of main and feeder oil pipelines of Timan-Pechora Province 1996



INDUSTRIAL AND SOCIAL INFRASTRUCTURE SYSTEM OF THE NAO

Fig. 12. Industrial and social infrastructure system of the NAO

LEGEND

boundary of the NAO
 NARYN-MAR administrative center
 center of selsky sovet
 rural communities
 abandoned community
 1300 sea ways, distance in kilometres
 navigable parts of rivers
 start of regular of navigation
 principal winter roads
 packed earth roads
 sand and gravel roads

hard paved road
 gas pipeline
 oil pipeline
 electrical transmission line
 Airport
 Good traffic of water transport (tons/year)
 > 1000
 1001-1000
 1000-1000
 51-500
 12-50

Local infrastructures

1	2	3	4	5	6	7
8	9	10	11	12	13	14

available
 unavailable
 public bath
 slaughter-house
 municipal freezer
 electricity
 boiler-room
 hospital, nursing stations
 post-and-telegraph office
 bakery
 communal service point

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.

