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Problems of the European North of Russia and the Possibilities of Its Participation in the Development of the Arctic Zone of the Russian Federation*

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Abstract. The challenges that Russia has to face due to the unstable geopolitical situation in the world make it necessary to search for internal sources of development and enhance the efficiency of territorial management. Under the circumstances, in our opinion, the priority object of state policy should be the Northern and Arctic territories, which have a huge natural resource and economic and geopolitical potential. At the same time, their development in the post-Soviet period has accumulated a set of issues that require understanding and development of mechanisms to address them, which is the goal of the present paper. The analysis has shown that the market reforms of the 1990s carried out in the European North of Russia and in its Arctic zone led to increased depopulation, degradation and primitivization of industrial production, curtailment of agricultural production, decline in the quality of life, growth of concentration of economic and social activity in the "nodal" points and degradation of the potential of peripheral municipalities. On the basis of a comprehensive analysis of socio-economic development and strategic planning documents of the European Union, we have found out that these territories have objective prerequisites for the diversification of production on the basis of deep processing of raw materials, broad cooperation and interregional integration. We prove that the interregional integration of

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the territories of the European Union and its Arctic zone with the more southern regions of the country will facilitate the formation and development of long technological chains in priority sectors (oil refining, forestry, civil and science-intensive engineering, etc.) that go beyond the Arctic zone of the Russian Federation. At the same time, we prove that the Vologda Oblast can play an important role as an outpost for the development of the Arctic. We propose priority tools for development of transport and logistics system in the region; this will eliminate the infrastructure constraints of economic growth and ensure the integration of the European part of the Arctic zone of Russia into the single economic space of the country. Further directions of research on this issue will be a detailed substantiation of the proposed mechanisms of interregional integration of the territories of the European North and its Arctic zone.

Key words: European North of Russia, Arctic zone of the Russian Federation, socio-economic development, territorial-economic system, technological chains, transport system, strategy.

Introduction. Russia, the largest country in the world, is characterized by huge interregional differences in natural resources, ethno-social, structural, historical, climatic conditions and development factors; that is why it needs to take into account spatial aspects. In this regard, we agree with Academician A.I. Tatarkin who noted that "the optimal use of economic space has always determined and will determine the political, national, demographic, social and economic identity of the Russian state" [1]. Along with this Academician P.A. Minakir and Doctor of Sciences (Geography) A.N. Demyanenko pointed out that "the economic space of modern Russia is a unique phenomenon, beyond any doubt. And it is not only that it is extensive and diverse, but also that for at least the last two decades it has been subjected to radical transformations" [2].

At the same time, a complex and extremely painful tangle of problems, challenges and threats has formed in the spatial development of modern Russia. There are even foreign studies where an attempt is made to estimate the annual losses of the Russian Federation due to inefficient spatial organization of the country[1]. It is obvious that finding solutions to them requires public administration using the tools of regional, structural and investment, innovation, social, and environmental policy.

An important role in the development of the country, of course, should be played by the regions of the North and the Arctic[2] of Russia, which have a huge geostrategic and natural resource potential. At the same time, the potential of these territories is currently not used to the fullest extent due to the violation of the main economic ties between the regions of the country in the post-Soviet period, the deterioration of the quality of human capital, and the destruction of infrastructure[3]. These negative processes lead not only to the compression and defragmentation of the economic space of the country, but they are also factors that cause an increase in threats to its national security [3, 5].

[1] In particular, according to the Brookings Institution (Washington, D.C., USA), they are estimated at 2.3–3.0% of GDP [3].

[2] The world community has not clearly established the boundaries of the Arctic yet. Usually they are the Arctic circle –66°33' (Canada – 60°, Norway – 65°), while the July isotherm for these territories is 10° C (USA). In Russia, the boundaries of this macroregion were approved by the decree of the President of the Russian Federation "On land territories of the Arctic zone of the Russian Federation" (dated May 2, 2014 No. 296)

[3] Thus, the share of inter-regional turnover in Russia's GDP decreased from 25 to 16% in a relatively short period (1990–1994) [4]. After that the restoration of economic ties within Russia was extremely slow.

The European North of Russia (Arkhangelsk, Vologda, Murmansk oblasts, Komi and Karelia republics, and Nenets Autonomous Okrug) is one of the key and largest (1,466 thousand sq.km) regions of the European part of the country; the region has a favorable economic and geographical location (in the North it is washed by the Barents and White seas; in the West it borders on Finland and Norway; thus it has huge opportunities for the development of foreign trade; in the East and South – on the economically developed Urals and Central Russia, respectively).

The leading branches of specialization of the European North are the forest industry complex, ferrous and nonferrous metallurgy, chemical industry, fuel and energy complex; all of them are based on the rich mineral resource base of the region. Part of its territory belongs to the Arctic Zone of the Russian Federation (AZRF) and is characterized by very severe climatic conditions.

We share the viewpoint of V.N. Lazhentsev, RAS Corresponding Member, who suggests that the development of interregional economic integration along the line of "North–South" and the integration of the region into the economic space of the country will provide an effectively use of the resources of the European North and will help find a solution to strategic issues of development of the Arctic Zone of Russia as a whole [6]. At the same time, effective management of these processes, in our opinion, requires a comprehensive study of the features and systemic problems of development of the territories of the European North of Russia, as well as substantiation of effective mechanisms for their participation in the implementation of the strategy for development of the Arctic Zone of the Russian Federation. This is the *goal* of our present work.

To achieve this goal it is necessary to consider the following *tasks*:

1) analyze trends and identify key problems in the socio-economic development of the territories of the European North of Russia;

2) identify long-term guidelines and features (contained in the strategic documents of regional development) of the "Arctic vector" in the development of the subjects of the European North of Russia;

3) identify promising areas and substantiate the mechanisms for the participation of the European North of Russia in the strategy for development of the Arctic Zone of the Russian Federation.

Theoretical aspects of the research. Domestic economic and geographical science has significant research experience in the analysis of the processes of development and management of the Northern and Arctic territories and in the role of these territories in the spatial development of the country.

In general, the majority of research on spatial issues started during the Soviet era. In particular, the following scientists carried out the research on theoretical substantiation of trends and regularities in the placement of productive forces in the Soviet Union: *G.M. Krzhizhanovsky*[4] (considered the national economy as an integral system, the key element of which is electrification; he laid the foundations for the creation of energy-industrial complexes; he justified the need for electrical supply of industrial areas from large district power plants), *I.G. Aleksandrov*[5]

[4] See, for example: Krzhizhanovsky G. *The Main Tasks of Electrification of Russia.* Kharkov: Vseukrainskoe gosudarstvennoe izdatel'stvo, 1920. 60 p.; Krzhizhanovsky G. *Economic Problems of the RSFSR and* the Work of the State General planning Commission (Gosplan). Moscow, 1922. 126 p.

[5] Aleksandrov I.G. *Economic Zoning of Russia.* Gosplan. Moscow, 1921. 15 p.; Aleksandrov I.G. *Fundamentals of Economic Zoning of the USSR. M*oscow; Leningrad: Ekonomicheskaya zhizn', 1924. 75 p.

(together with G.M. Krzhizhanovsky, he carried out research on economic zoning of the territory of the USSR), developed scientific foundations of the concept of power and production cycles and territorial production complexes that were further developed by N.N. Kolosovsky), *V.M. Chetyrkin*[6] (studied the problems of economic zoning – the idea of a nodal economic problem), *N.N. Nekrasov*[7] (developed the principles of formation and development of national economic and territorial-industrial complexes, acted as the scientific supervisor of complex research on the development of general schemes of development and placement of productive forces of the USSR for the future), *A.E. Probst*[8] (created the scheme of zoning for the fuel and energy complex of the country, developed the idea of the so-called "concenters"), *V.S. Nemchinov*[9] (comprehensively studied the construction of industrial, coal-metallurgical bases and hydroelectric power plants in the upper Yenisei and in the Amur basin, considering them as the centers of future large general economic complexes), *S.V. Slavin*[10] (substantiated the inextricable link between the development of the North and the economic development of the entire USSR; actively proposed to move to a single socio-economic management of the region), *A.G. Granberg*[11] (studied the national economy as a system of regions interacting in a market environment with state regulation; elaborated regional development programs – in Siberia, the Far East, the North, as well as major regional transport projects), *A.G. Aganbegyan*[12] (made a significant contribution to the development of the first scientifically substantiated concept of the state and prospects of the productive forces of Siberia and the Far East and the works on optimal planning for the development and placement of industries).

Since the 1960s with the direct participation of the academic community, a pre-planned (forecast) document was developed – the General Scheme for development and placement of the productive forces of the USSR. The last General Scheme was developed for the period up to 2005, and the last Comprehensive Program – up to 2010. In the 1970s–1980s, major regional programs were developed (West Siberian oil and gas complex, economic development of the Baikal–Amur Mainline zone), programs for the formation of territorial production complexes focused on the use of rich natural resources (Timan-Pechora, Pavlodar-Ekibastuz, groups of complexes of the Angara-Yenisei region, etc.) [7]. However, unfortunately, many valuable research findings have not been used in practice.

[6] Chetyrkin V.M. *Central Asia: (an Experience of a Complex Geographical Description and Zoning)*. Moscow; Leningrad: Vneshtorgizdat, 1958. 207 p.; Chetyrkin V.M. *Problematic Issues of Economic Zoning*. Tashkent: Fan, 1967. 123 p.

[7] Nekrasov N.N. *Scientific Problems of the General Scheme of Placement of the Productive Forces of the USSR: Theses of the Report at the General Meeting of the Academy of Sciences of the USSR*. Moscow, 1966. 7 p.; *The Economy of the USSR – an Interconnected Economic Complex*. Moscow: Znanie, 1973. 64 p.

[8] Probst A.E. *The Main Problems of Geographical Location of the Fuel Economy of the USSR*. Moscow; Leningrad: Izd-vo Akad. nauk SSSR, 1939. 404 p.

[9] Nemchinov V.S. Theoretical issues of rational distribution of productive forces. *Voprosy ekonomiki,* 1961, no. 6; Nemchinov V.S. *Statistical and economic issues of balance of national economy*. In: Scientific Notes on Statistics. Izd-vo AN SSSR, 1957. Vol. 3.

[10] Slavin S.V., Dogaev Yu.M. Development of the productive forces of the North and problems of regional scientific-technological progress. *Problemy Severa*, 1972, no. 17, pp. 5-20.

[11] *Optimization of Territorial Proportions of the National Economy*. Moscow: Ekonomika, 1973. 248 p.

[12] Aganbegyan A.G., Granberg A.G. *Economic and Mathematical Analysis of Input-Output Tables for the USSR*. Moscow: Mysl', 1968. 357 p.; Granberg A.G., Aganbegyan A.G., Bagrinovsky K.A. *The System of Models of National Economic Planning*. Moscow, 1972. 351 p.

It should be noted that many classical works on Northern studies are currently in demand from the point of view of the formation of the concept of redevelopment of the Arctic (V.V. Ivanter, V.N. Leksin, A.N. Shvetsov, B.N. Porfiriev, A.N. Pilyasov) and the formation of new approaches to the assessment of Northern and Arctic natural resource potential (T.E. Dmitrieva, M.A. Zhukov, V.A. Kryukov, V.N. Lazhentsev, V.G. Loginov, V.S. Selin, S.A. Suspitsin).

A number of European countries are actively conducting research on the development of the Arctic. In particular, research institutions and universities in Denmark (Arctic Research Centre at Aarhus University, Arctic Technology Centre at the Technical University of Denmark), Iceland (University of Iceland, Reykjavik University), Norway (Research Council of Norway, Norwegian National Committee for Polar Research), Finland (Arctic and Antarctic Research Committee of the Council of Finnish Academies, Universities of Lapland, Aalto, Oulu, Turku and Helsinki), Sweden (Swedish Research Council, Swedish Polar Research Secretariat) conduct a set of applied and fundamental studies on the effective use of minerals, water, biological, and tourist and recreational resources; organization of nature protection, biodiversity conservation, organization of environmental monitoring; sustainable development, climate change, study of coastal zones, etc. Scientists from North America deal with similar issues [8–12].

The Northern and Arctic problems in our country are in the focus of attention not only of the scientific community, but also of the state. Back in the Soviet period, a number of legal acts and policy documents on the development of these territories were adopted *(Tab. 1)*.

Table 1. Strategic and program documents for the development of the North and the Arctic in Russia

Period	Strategic and program documents for the development of the North and the Arctic
USSR (1920–1989)	1. GOELRO Plan (electrification plan, adopted by the Council of People's Commissars on December 21, 1921). 2. Joint resolution of the Council of People's Commissars of the USSR and the Central Committee of the CPSU (b) "On the measures for the development of the Northern Sea Route and the Northern economy" (adopted July 20, 1934). 3. The list of regions of the Far North and areas equated to the regions of the Far North, which are subject to the decrees of the Presidium of the Supreme Soviet of the USSR of February 10, 1960. 4. About the adoption of the Regulations on the Commission on Arctic and Antarctic Affairs at the Cabinet of Ministers of the USSR and the Personal Structure of this Commission (Resolution 308 of the Cabinet of Ministers of the USSR dated May 29, 1991).
Russian Federation (1990 – present)	1. Interdepartmental Commission for Arctic and Antarctic Affairs, which replaced the State Commission for Arctic and Antarctic Affairs of the RSFSR (established in 1992). 2. The program for development of hydrocarbon reserves on the shelf of the Arctic seas of Russia, calculated until 2010 (approved in 1996). 3. Federal Law No. 78 "On the fundamentals of state regulation of socio-economic development of the North of the Russian Federation" dated June 19, 1996 (expired in 2005). 4. The concept for state support for the economic and social development of the regions of the North (approved by Government Resolution No. 198 dated March 7, 2000). 5. Fundamentals of the state policy of the Russian Federation in the Arctic for the period up to 2020 and beyond (approved by the Order of the President of the Russian Federation of September 18, 2008 No. 1969). 6. The strategy for the development of the Arctic Zone of the Russian Federation and national security for the period up to 2020 (approved by the President of the Russian Federation on February 8, 2013).); 7. State program "Socio-economic development of the Arctic Zone of the Russian Federation" (approved by the Resolution of the Government of the Russian Federation No. 366 dated April 21, 2014); 8. Draft Law "On the development of the Arctic Zone of the Russian Federation" (not yet adopted). 9. Draft Strategy for spatial development of the Russian Federation for the period up to 2025.
Source: own compilation.	

At the same time, we should note that at present there is no legal act that comprehensively regulates socio-economic development in the Northern regions of Russia. There used to be such a law: Federal Law "On the fundamentals of state regulation of socio-economic development of the North of the Russian Federation" of June 19, 1996 No. 78, which enshrined such principles of governance as state protectionism and selectivity. However, it became invalid in 2005.

The priority directions of the state policy in relation to the Northern regions, enshrined in the Concept of state support for the economic and social development of the regions of the North (approved by RF Government Resolution of March 7, 2000 No. 198), included balanced development of production, preservation of the environment and the traditional way of life of the indigenous peoples of the North. However, many of its provisions, unfortunately, have not been implemented in practice.

For the first time, the Arctic Zone of the Russian Federation was defined as an object of complex state management in 1989 by the decision of the State Commission at the Council of Ministers of the USSR for Arctic Affairs. However, in the 1990s, the Arctic territories were on the periphery of state interests. A new round of development of the Arctic topic dates back to the mid-2000s. Thus, the Foundations of the state policy of the Russian Federation in the Arctic for the period up to 2020 and beyond were adopted in 2008 (approved by the Order of the President of the Russian Federation No. 1969).

Land borders of the Arctic Zone of the Russian Federation were legally determined by the Decree of the President of the Russian Federation "On land territories of the Arctic Zone of the Russian Federation" dated May 2, 2014 No. 296. Along with this, in 2013, the Strategy for the development of the Arctic Zone of the Russian Federation and provision of national security for the period up to 2020 was approved. The state program "Socio-economic development of the Arctic Zone of the Russian Federation" was approved by the RF Government Resolution No. 366 of April 21, 2014 (as amended by the RF Government Resolution No. 1064 of August 31, 2017) was approved. The Strategy for spatial development of the Russian Federation for the period up to 2025, designed by the Ministry of Economic Development of the Russian Federation, names the Arctic Zone of the Russian Federation as one of the geostrategic territories of the country.

The most important role of these territories has been repeatedly pointed out in the speeches of top state officials. Thus, Russian President Vladimir Putin at the plenary session of the 4th international Arctic forum The Arctic: Territory of Dialogue, held on March 29–30, 2017 in Arkhangelsk, noted that "...the importance of the Arctic has increased manifold... We aim to ensure its sustainable development, create a modern infrastructure, develop natural resources, strengthen the industrial potential, improve the quality of life for the indigenous Northern people"[13].

What is the Arctic Zone of the Russian Federation at present? In that part of the land Arctic Zone, the composition of which is established by the Decree of the President of the Russian Federation, it is the most developed and populated (in it the population in 2016 amounted to 2.5 million people; in the American Arctic – 0.8 million people, in the Arctic Europe – 1.3 million people). The total area of the Arctic territories of Russia is about three million km^2 (18% of the territory of the Russian Federation), including 2.2 million km^2 of land *(Fig. 1)*.

[13] Transcript of the plenary session of the 4th international Arctic forum The Arctic: Territory of Dialogue. Available at: http://szfo.gov.ru/press/events/1061/

Figure 1. Borders of the Arctic Zone of Russia (in accordance with the Decree of the President of the Russian Federation "On land territories of the Arctic zone of the Russian Federation" No. 296 dated May 2, 2014)

Arctic Zone of the Russian Federation

1 – Murmansk Oblast

2 – Republic of Karelia (Loukhsky, Kemsky and Belomorsky municipal districts)

3 – Arkhangelsk Oblast (Onezhsky, Primorsky and Mezensky municipal districts, urban districts of Arkhangelsk, Severodvinsk and Novodvinsk, and also those Arctic islands that are under its jurisdiction)

4 – Nenets Autonomous Okrug

5 – Yamalo-Nenets Autonomous Okrug

6 – Krasnoyarsk Krai (Taimyrsky (Dolgano-Nenetsky) Municipal District, Urban District of Norilsk, Municipal Entity the Town of Igarka in Turukhansky Municipal District)

7 – Republic of Sakha (Yakutia) (Abyisky, Allaikhovsky, Anabarsky, Bulunsky, Verkhoyansky, Zhigansky, Oleneksky, Nizhnekolymsky, Srednekolymsky, Ust-Yansky and Eveno-Bytantaisky uluses)

8 –Chukotka Autonomous Okrug

9 – Republic of Komi (Urban District of Vorkuta)

Border of the European North of Russia

At the same time, this macroregion has a huge natural resource potential [13]. Thus, according to the estimates of the scientists[14], the Arctic contains significant reserves of gold (40% of national Russian amount), oil (60%), gas (60–90%), chromium and manganese (90%), platinum metals (47%), and diamonds (100%); the total cost of mineral resources of the Arctic subsoil exceeds 30 trillion US dollars[15]. The share of the Arctic Zone in the volume of production produced by mining and processing industries is 1/5 and 2%, respectively.

Research methods. To achieve this goal, we used the methods of economic, statistical and comparative analysis, generalization, and monographic method. The methodological basis of the study consists of the works of domestic and foreign economists in the field of regional and spatial economy, state and municipal administration, scientists engaged in research on the problems of the North and the Arctic.

The main research findings. The market post-Soviet transformations of the 1990s had a negative impact on the socio-economic development of the territories of the European

[14] Comprehensive scientific and technological program for research, development, creation of products and services for 2018–2025 "Scientific and technological directions of increasing the efficiency of development and use of the Arctic". Available at: http://minec.gov-murman.ru/documents/20-gogoberidze-g.g..pdf

[15] Natural resources of the Arctic. *RIA Novosti*, April 15, 2010. Available at: https://ria.ru/arctic_spravka/20100415/220120223.html

North of Russia [4, 14, 15]. One of the key problems of the European Union, like most other regions of the country, is the reduction of the permanent population *(Tab. 2)*.

Thus, the population of the Murmansk Oblast in 1990–2017 decreased by 26.7%, the population of the Komi Republic – by 22.2%. Depopulation was the lowest in the Vologda Oblast. This is due, among other things, to the outflow of the population from the more Northern territories of the country to this subject. Population decline was even faster in rural areas: during the same period, the number of rural residents in the Murmansk Oblast decreased by almost half, in the Arkhangelsk Oblast – by 38%, etc.

Along with natural population decline, there are processes of its migration outflow, which causes a reduction in the number of inhabitants of these territories. All this leads to the "extinction" of entire settlements, deterioration of management of these territories, and decrease in the connectivity of space.

Negative processes are also observed in material production. In particular, in the field of industry during the last two decades there have been the processes of de-industrialization, which was reflected in the decreasing share of manufacturing industries in GRP (in the Murmansk Oblast during the period under consideration it decreased by 17 percentage points, in the Vologda Oblast – by 9 p.p.).

At the same time, manufacturing activities are significantly inferior to mining activities, occupying a very modest share in the gross regional product; moreover, there exist significant territorial differences. Thus, in 2016, the gross value added in manufacturing in the Vologda Oblast was 37.6% in the GRP of the region, while in the Murmansk Oblast it was only 9.2% (with the average Russian level of 17.3%, *Tab. 3*).

However, the goods produced in the European North of Russia are not innovative. Thus, the share of high-tech and science-intensive industries in the GRP of the Republic of Komi in 2016 was only 12%, in the Republic of Karelia – 16.6%, in the Vologda Oblast – 16.7% (national average value is 20.7%), and the indicator showed a declining trend in all regions over the past 10 years *(Tab. 4)*. It should be noted that according to this indicator, the

Table 2. Population in the subjects of the European North of Russia (at the beginning of the year), thousand people

Territory	Year											2017 to 2000, %	2017 to 1990, %
	1990	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017		
Resident population													
Republic of Karelia	792	729	698	643	640	637	634	633	630	627	622	85.3	78.5
Republic of Komi	1240	1043	985	899	890	881	872	864	856	851	841	80.6	**67.8**
Arkhangelsk Oblast (including Nenets Autonomous Okrug)	1569	1369	1291	1225	1214	1202	1192	1183	1174	1166	1155	84.4	73.6
Vologda Oblast	1354	1290	1235	1201	1199	1196	1193	1191	1187	1183	1177	91.2	86.9
Murmansk Oblast	1189	923	864	794	788	780	771	766	762	758	753	81.6	**63.3**
Rural population													
Republic of Karelia	144	186	171	141	138	135	132	129	127	124	122	65.6	84.7
Republic of Komi	297	258	240	207	203	200	196	193	189	187	184	71.3	**62.0**
Arkhangelsk Oblast	411	343	349	297	289	282	280	27	265	259	254	74.1	**61.8**
Vologda Oblast	462	403	393	350	356	343	339	335	333	329	325	80.6	70.3
Murmansk Oblast	100	71	74	57	57	57	56,6	57	57	57	58	81.7	**58.0**

Source*:* calculated using the data from the official website of the Unified Interdepartmental Information and Statistical System (EMISS). Available at: www.fedstat.ru

Table 3. Share of gross value added created in manufacturing industries, in the GRP of constituent entities of Russia, %*

Territory	2000	2005	2008	2010	2015	2016	2016 to 2000, +/-
Russian Federation	19.3	18.5	19.3	17.7	17.4	17.3	-2.0
Republic of Karelia	18.1	17.6	15.8	17.5	13.4	17.9	-0.2
Republic of Komi	12.1	11.7	11.0	9.7	11.7	11.7	-0.4
Arkhangelsk Obast (including Nenets Autonomous Okrug)**	19.2	18.9	17.0	12.4	13.1	14.0	-5.2
Vologda Oblast	46.9	46.6	50.5	38.1	34.9	37.6	-9.3
Murmansk Oblast	26.1	25.5	15.8	17.5	12.5	9.2	-16.9

* GRP broken down by type of economic activities for 2017 has not been officially published yet (as of February 1, 2009).
** The data are presented for the Arkhangelsk Oblast together with Nenets Autonomous Okrug, because in the statistics for the considered indicator the Arkhangelsk Oblast is presented separately only since 2010. In 2016, this figure was 0.3% for NAO.
Source*:* calculated using the data from the official website of the Unified Interdepartmental Information and Statistical System (EMISS). Available at: www.fedstat.ru.

Table 4. The share of high-tech and knowledge-intensive industries in the gross regional product of constituent entities of the Russian Federation, %

Territory	2005	2010	2012	2015	2016	2016 to 2005, p.p.
Russian Federation	20.1	19.1	19.4	19.3	20.7	0.6
Republic of Karelia	18.4	17.4	18	18.3	16.6	-1.8
Republic of Komi	13.2	10.3	10.7	13.1	12.0	-1.2
Arkhangelsk Oblast (including Nenets Autonomous Okrug)	18.8	16.9	16.9	18.9	17.6	-1.2
Vologda Oblast	22.8	22.6	21.1	20.3	16.7	-6.1
Murmansk Oblast	18.3	17.1	18.6	19.1	16.9	-1.4
Kaliningrad Oblast	22.6	22.4	23	26.4	23.0	0.4
Leningrad Oblast	14.3	13.7	12.2	13.5	15.2	0.9
Novgorod Oblast	27.7	27.9	30.1	29.3	28.3	0.6
Pskov Oblast	24.1	23.1	23.2	21	19.4	-4.7
Saint Petersburg	28.8	29.6	30.9	31.7	29.8	1.0

Source*:* calculated using the data from the official website of the Unified Interdepartmental Information and Statistical System (EMISS). Available at: www.fedstat.ru

subjects of the European North of Russia are very significantly inferior to other regions of the Northwestern Federal District (for example, the Kaliningrad Oblast and Saint Petersburg), which indicates some primitivization of the economy of the Northern and Arctic territories and the predominance of production of low-value added products in them.

Crisis phenomena are also observed in agriculture in the regions of the European North of Russia. However, despite the decline in agricultural production in 1991–2017, some regions (Vologda Oblast) have retained significant development potential, the implementation of which can solve the problems of food supply in the European part of the Arctic[16].

Disturbed processes of reproduction of fixed capital in key sectors of the economy in the regions of the European North of Russia lead to an increase in the level of depreciation of fixed assets of organizations. Thus, in the Republic of Karelia, the figure was 53%, in the Vologda Oblast – 50.5% (national average level is 50.9%). And in all constituent entities except the Arkhangelsk Oblast, depreciation increased by 1–12 p.p. in 2000–2017 *(Tab. 5)*.

[16] Currently, agriculture in the Arctic specializes mainly in animal husbandry (reindeer husbandry).

Table 5. Depreciation of fixed assets,%

Territory	2000	2005	2010	2011	2012	2014	2015	2016	2017	2017 to 2000, p.p.
Russian Federation	43.5	44.1	45.7	46.3	45.9	47.9	48.8	50.2	50.9	+7.4
Republic of Karelia	40.7	26.0	35.2	37.9	41.5	44.0	47.2	49.6	52.8	+12.1
Republic of Komi	37.6	49.4	54.6	55.3	44.2	45.1	46.0	45.0	47.1	+9.5
Arkhangelsk Oblast (with Nenets Autonomous Okrug)*	51.1.	44.0	36.1	42.8	42.7	45.1	46.8	45.3	48.1	-3.0
Nenets Autonomous Okrug	39.8	38.3	26.1	31.1	33.0	42.1	44.3	43.3	45.6	+5.8
Vologda Oblast	42.2	50.1	46.1	40.9	40.9	45.9	48.7	51.6	50.5	+8.3
Murmansk Oblast	41.8	42.9	42.7	42.8	37.0	38.9	41.9	52.2	43.1	+1.3

* The data are given for the Arkhangelsk Oblast together with NAO, as in the statistics on the considered indicator the Arkhangelsk Oblast is presented separately only since 2013.
Source: *Russian Regions. Socio-Economic Indicators. 2018: Statistics Collection.* Rosstat. Moscow, 2018. 1162 p.

Table 6. Population with incomes below the subsistence level, %

Territory	2000	2005	2008	2010	2011	2012	2014	2015	2016	2017	2017 to 2000
Russian Federation	29.0	17.8	13.4	12.5	12.7	10.7	11.2	13.3	13.3	13.2	-15.8
Republic of Karelia	22.3	15.9	15.6	14.9	15.7	13.6	14.2	16.4	17.3	17.3	-5.0
Republic of Komi	26.3	14.9	15.1	15.6	16.4	13.5	14.3	14.6	16.3	16.8	-9.5
Arkhangelsk Oblast (without Nenets Autonomous Okrug)*	33.5	17.5	14.4	14	14.4	12.9	14.1	15.8	14.7	13.5	-20.0
Nenets Autonomous Okrug	37.9	9.0	5.6	7.5	7.7	6.6	9.0	9.7	10.5	11.4	-26.5
Vologda Oblast	25.5	18.3	15.7	16.8	17.1	13.3	12.9	14.2	13.4	13.6	-11.9
Murmansk Oblast	24.9	19.1	13.8	13.2	13.6	11.3	10.9	12.7	12.8	12.6	-12.3

Source: *Russian Regions. Socio-Economic Indicators. 2018: Statistics Collection.* Rosstat. Moscow, 2018. 1162 p.

Table 7. Cargo transportation by railway, million tons

Territory	1990	2000	2005	2010	2015	2017	2017 to 2000, %	2017 to 1990, %
Russian Federation	2140.1	1046.8	1273.3	1312.0	1329.0	1384.3	132.2	64.7
Republic of Karelia	25.5	14.7	18.7	20.2	27.3	27.6	187.8	108.2
Republic of Komi	55.7	24.9	22.6	20.7	18.3	13.7	55.0	24.6
Arkhangelsk Oblast (with Nenets Autonomous Okrug)*	23.0	9.0	16.0	11.8	10.4	11.1	123.3	48.3
Vologda Oblast	30.7	15.5	17.6	17.6	18.4	20.4	131.6	66.4
Murmansk Oblast	47.2	24.6	27.0	28.2	26.3	29.1	118.3	61.7

Source: *Russian Regions. Socio-Economic Indicators. 2018: Statistics Collection.* Rosstat. Moscow, 2018. 1162 p.

Negative processes in the economy and in the labor market, as well as unfavorable conditions in the North, causing a rise in the cost of living, led to the fact that in the subjects under consideration, despite the positive trend of the last seventeen years, the share of the population with incomes below the subsistence minimum in 2017 was still higher than the national average (13.2%): in the Republic of Karelia – 17.3%, in the Republic of Komi – 16.8%, in the Vologda Oblast – 13.6%, in the Arkhangelsk Oblast – 13.5% *(Tab. 6)*.

Reduction in the volume of cargo turnover of the main modes of transport (primarily railway, *Tab. 7*) in the post-Soviet period (1990–2017) is one of the key indicators that characterize the decline in economic activity in these territories.

At the same time, there is a certain tendency toward the reduction in the proportion of hard surface roads in the total length of public roads (with the exception of the Republic of Komi). These circumstances bring to the fore the problem of ensuring transport connectivity of space and developing logistics in the territory of the European North of Russia.

Thus, the results of the analysis show that there is a whole range of system-wide problems of socio-economic development in the subjects of the European North of Russia. At the same time, objective differences in the prerequisites for and potential of development of these territories further enhance their heterogeneity in both economic and managerial aspects. This heterogeneity is particularly acute at the intraregional level. Hence, there is a need to identify areas with similar development features in order to implement specific methods and tools of their state support.

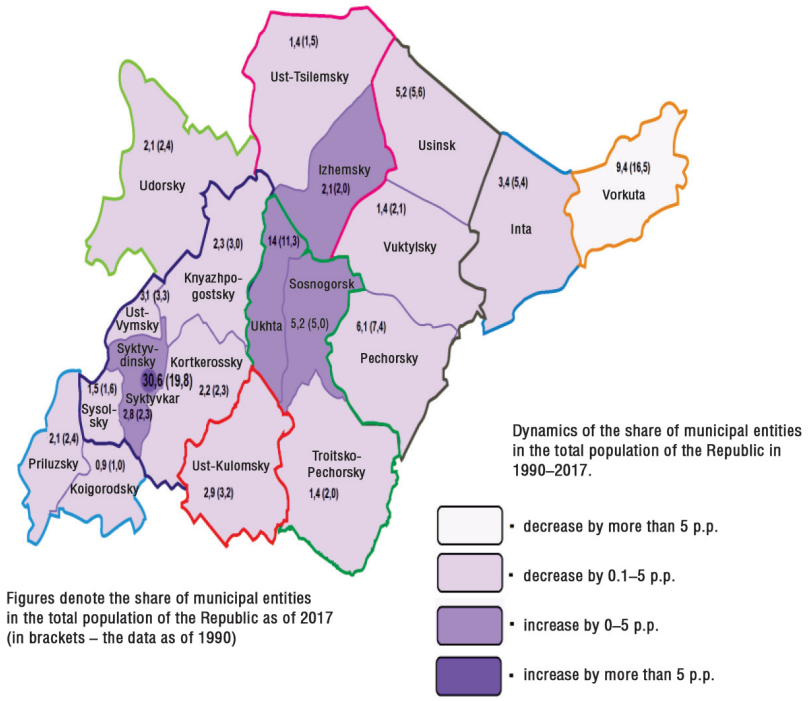
One of the leading scientists engaged in economic and geographical zoning and the study of the processes of transformation of space at the intraregional level, was Doctor of Sciences (Geography) E.E. Leizerovich. In the study of these issues, he used the concept of "economic microdistrict" (EM), which meant intra-republican, intra-krai and intra-oblast communities, which include, as a rule, several rural administrative districts, as well as, most often, one or more cities of extra-district subordination. These territories have a fairly distinctive economic image, and their residents outside the city-center of EM are characterized by a relative unity of lifestyle and quality of life [16, 17]. E.E. Leizerovich allocated 35 economic microdistricts on the territory of the European North of Russia. The following EM are within the administrative borders of the Vologda Oblast and the Republic of Komi *(Tab. 8)*.

The main trend in the development of microdistricts of the European North is the concentration of population and economic activity in the "nodal" points and the increase in the area of the periphery. Thus, the analysis of demographic processes in the intra-republican areas of Komi shows that in 1990–2017 there was a concentration of population near the

Table 8. Economic districts within the Vologda Oblast and the Republic of Komi (according to the classification of E.E. Leizerovich, 2010)

RF constituent entity	Economic microdistricts
Vologda Oblast	1. Vologodsky (city of Vologda, town of Sokol, Vologodsky, Ust-Cubinsky, Sokolsky, Mezhdurechensky, Gryazovetsky, Vozhegodsky, Kharovsky districts). 2. Velikoustyugsky (town of Veliky Ustyug, Nyuksensky, Velikoustyug, Kichmengsko-Gorodetsky, Nikolsky, Tarnogsky districts). 3. Totemsky (Totemsky, Babushkinsky districts). 4. Verkhovazhsky (Syamzhensky, Verkhovazhsky districts). 5. Kirillovo-Belozersky (Vashkinsky, Kirillovsky, Belozersky districts). 6. Vytegorsky (Vytegorsky district). 7. Cherepovetsky (city of Cherepovets, Cherepovetsky, Babaevsky, Kaduysky, Ustyuzhensky, Chagodoshchensky, Sheksninsky districts).
Republic of Komi	1. Syktyvkarsky (city of Syktyvkar, Sysolsky, Kortkerossky, Ust-Vymsky, Syktyvdinsky, Knyazhpogostsky districts). 2. Pechorsky (towns of Pechora, Usinsk, Vuktyl). 3. Udorsky (Udorsky district). 4. Ust-Tsilemsky (Ust-Tsilemsky, Izhemsky districts). 5. Intinsky (town of Inta). 6. Vorkutinsky (town of Vorkuta). 7. Ukhtinsky (towns of Ukhta, Sosnogorsk (Triotsko-Pechorsky district). 8. Southwestern Komi (Priluzsky, Koygorodsky districts). 9. Ust-Kulomsky (Ust-Kulomsky district).

Figure 2. The share of municipalities in the total population of the Republic of Komi and the dynamics of the change in its share in 1990–2017



Municipal entity	Share, %		2017 to 1990, p.p.*
	1990	2017	
Syktyvkar	19.8	30.6	+10.8
Ukhta	11.3	14.0	+2.7
Syktydvinsky	2.3	2.8	+0.5
Sosnogorsk	5.0	5.2	+0.2
Izhemsky	2.0	2.1	+0.1
Sysolsky	1.6	1.5	-0.1
Ust-Tsilemsky	1.5	1.4	-0.1
Kortkerossky	2.3	2.2	-0.1
Koygorodsky	1.0	0.9	-0.1
Ust-Vymsky	3.3	3.1	-0.2
Priluzsky	2.4	2.1	-0.3
Udorsky	2.4	2.1	-0.3
Ust-Kulomsky	3.2	2.9	-0.3
Usinsk	5.6	5.2	-0.4
Troitsko-Pechorsky	2.0	1.4	-0.6
Knyazhpogostsky	3.0	2.3	-0.7
Vuktyl	2.	1.4	-0.7
Pechora	7.4	6.1	-1.3
Inta	5.4	3.4	-2.0
Vorkuta	6.5	9.4	-7.1

* The data are arranged according to the rate of change in the indicator in 2017–1990.
Source: Komistat.

administrative center of the Republic (the development of Syktyvkar agglomeration: the share of Syktyvkar in the total population of the constituent entity increased from 19.8 to 30.6%; similar trends are observed in the Syktydvinsky District); within the Ukhta agglomeration (the share of Ukhta increased from 11.3 to 14%, the share of Sosnogorsk – from 5 to 5.2%, *Fig. 2*).

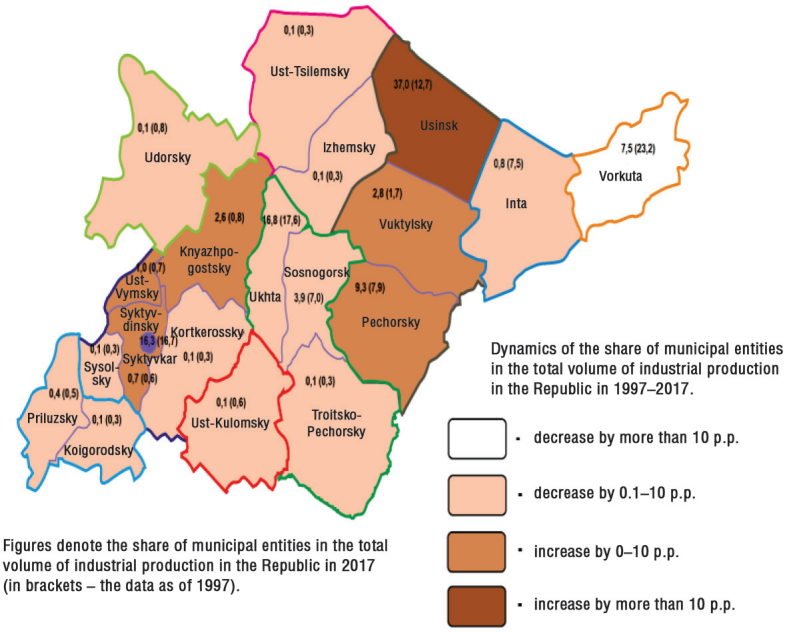
At the same time, in remote areas and in single-industry towns (for example, Vorkuta, Inta) during this period, there was a considerable population outflow due to a decrease in economic activity or shutdown of city-forming industries (primarily coal mining) and resettlement (regulated and natural) to other districts[17].

The main centers of industrial production of the Republic of Komi are the city of Syktyvkar, and the towns of Usinsk, Ukhta, and Pechora. At the same time, over the past twenty years, the role of Usinsk as a key industrial center has increased significantly, and now this municipality accounts for more than a third of the total industrial production (*Fig. 3*). Its main industry is the production and transportation of oil and gas (LUKOIL and Rosneft operate there, as well as the world's northernmost Yenisei Oil Refinery with a capacity of 1.3 million tons per year). At the same time, a number of single-industry towns of the Republic have significantly lost their positions due to the decline in economic activity.

Similar processes of the concentration of population and economic activity are typical for the Vologda Oblast, the southernmost

[17] *See: Development Potential of Municipalities: Content, Assessment, Management (on the Materials of the Republic of Komi)*. Syktyvkar: Kominauchnyitsentr UrO RAN, 2008. P. 118.

Figure 3. The share of municipalities in the total industrial production in the Republic of Komi and the dynamics of its changes in 1997–2017



Municipal entity	Share, %		2017 to 1990, +/-**
	1997*	2017	
Usinsk	12.7	37.0	24.4
Knyazhpogostsky	0.8	2.6	1.8
Pechora	7.9	9.3	1.4
Vuktyl	1.7	2.8	1.1
Ust-Vymsky	0.7	1.0	0.3
Syktydvinsky	0.6	0.7	0.1
Priluzsky	0.5	0.4	-0.1
Ust-Tsilemsky	0.3	0.1	-0.2
Troitsko-Pechorsky	0.3	0.1	-0.2
Koygorodsky	0.3	0.0	-0.2
Izhemsky	0.3	0.0	-0.3
Kortkerossky	0.3	0.0	-0.3
Sysolsky	0.3	0.0	-0.3
Syktyvkar	16.7	16.3	-0.4
Ust-Kulomsky	0.6	0.0	-0.6
Ukhta	17.6	16.8	-0.7
Udorsky	0.8	0.1	-0.8
Sosnogorsk	7.0	3.9	-3.0
Inta	7.5	0.8	-6.7
Vorkuta	23.2	7.5	-15.7

* Data on the production of industrial products by municipalities have been publicly available since 1997.
** The data are arranged according to the rate of change in the indicator in 2017–1997.
Source: Komistat.

subject of the European North of Russia. Its main support centers are two major cities, acting as administrative (Vologda) and industrial (Cherepovets) "capitals", and their neighboring municipal districts. Thus, in 2017, 73.1% of the population of the Oblast lived in these municipalities, 93.3% of industrial and 65.1% of agricultural products were produced there; they also accounted for 67.5% of investment in fixed capital and 79% of retail trade turnover *(Tab. 9)*.

Thus, in the post-Soviet period in the territories of the European North of Russia there were the processes that led to the transformation of the existing supporting framework. This is manifested in the concentration of economic and social activity in the "nodal" points (as a rule, these are municipalities in which there are large cities, administrative centers or major production) and the degradation of the production, human and infrastructure potential of peripheral municipalities. These processes ultimately lead to the disruption of the connectivity of the economic space and the growth of its fragmentation. On the one hand, this is manifested in the promotion of agglomeration processes[18], and on the other – in the destruction of the potential of territories outside the agglomeration zone. In general, these processes cause further strengthening of the linear-nodal structure of the economy in the European North of Russia.

[18] Our calculations show the possibility of formation and sustainable development of nine agglomerations in the European North of the Russian Federation; they will be the poles of growth and will ensure the connectivity of the region's space [18].

Table 9. The share of Vologda, Cherepovets and their adjacent municipal districts in the values of the key parameters of socio-economic development of the Oblast, %

Territory	Year						2017 to 2000, p.p.
	2000	2010	2013	2014	2016	2017	
Share in the resident population at the end of the year							
City of Vologda, Vologodsky, Gryazovetsky, Sokolsky districts	35.6	37.2	37.9	38.2	38.4	38.5	2,9
City of Cherepovets, Cherepovetsky, Kaduysky, Sheksninsky districts	31.9	33.6	34.1	34.3	34.5	34.6	2,7
Share in industrial output							
City of Vologda, Vologodsky, Gryazovetsky, Sokolsky districts	10.5	13.0	16.1	22.8	18.3	18.6	-
City of Cherepovets, Cherepovetsky, Kaduysky, Sheksninsky districts	84.1	83.8	80.9	71.7	75.1	74.1	-
Share in agricultural production							
City of Vologda, Vologodsky, Gryazovetsky, Sokolsky districts	33.9	40.2	41.7	41.8	44.4	45.8	11.9
City of Cherepovets, Cherepovetsky, Kaduysky, Sheksninsky districts	21.7	24.8	22.2	22.7	21.5	19.3	-2.4
Share in fixed capital investments							
City of Vologda, Vologodsky, Gryazovetsky, Sokolsky districts	27.3	40.2	26.7	29.4	23.2	22.3	-5.0
City of Cherepovets, Cherepovetsky, Kaduysky, Sheksninsky districts	49.9	45.4	59.0	55.7	69.3	45.2	-4.7
Share in retail trade turnover							
City of Vologda, Vologodsky, Gryazovetsky, Sokolsky districts	40.7	40.9	43.4	43.4	43.0	42.7	2.0
City of Cherepovets, Cherepovetsky, Kaduysky, Sheksninsky districts	31.9	36.5	35.5	34.1	35.8	36.3	4.4
Calculated with the use of [19] and Vologdastat data.							

Interregional "North–South" integration and the use of the potential of these regions to address the strategic objectives of the development of the Arctic Zone of the Russian Federation can promote the development of constituent entities of the European North of Russia. The "Arctic" vector was consolidated in the majority of regional development strategies of the subjects of the European North of Russia up to 2025–2030 *(Tab. 10)*.

The analysis of strategic documents allows us to draw the conclusions that the "Arctic vector" of development of constituent entities of the European North of Russia till 2030 consists first of all in further development of resource sectors (production and processing of crude oil and gas, wood processing) and the effective organization of transport and logistic infrastructure to export this production to the Russian and international markets; this vector of development also implies strengthening Russia's defense capability on its Arctic borders and developing the Northern Sea Route. This generally corresponds to the priorities for the development of the Arctic identified at the federal level[19]. Strategic documents of constituent entities of the European North of the Russian Federation propose the development of civil industries (precision engineering, instrumentation, shipbuilding, etc.) on the basis of spatially distributed clusters. However, in our opinion, very little

[19] In particular, the Fundamentals of the state policy of the Russian Federation in the Arctic for the period up to 2020 and beyond (approved by the President of the Russian Federation on September 18, 2008) notes that one of the main national interests in the Arctic is "the use of the Arctic Zone of the Russian Federation as a strategic resource base of the Russian Federation, which provides solutions to the problems of socio-economic development of the country". At the same time, the aim of the state policy is "to expand the resource base of the Arctic Zone of the Russian Federation, which can largely meet the needs of Russia in hydrocarbon resources, aquatic biological resources and other types of strategic raw materials".

Table 10. Strategic directions and the "Arctic vector" of development of constituent entities of the European North of Russia till 2025–2030

RF constituent entity	Strategic directions of development
1. Arkhangelsk Oblast	I. Development of *transport and logistics infrastructure* (road network, port infrastructure and modern logistics facilities) *to provide access to natural and recreational resources*, including those located in the Arctic Zone of the Russian Federation. II. Ensuring access of enterprises to the resource base, assistance in the development of international and interregional cooperation, increasing the availability of natural resources. III. Allocation of *six main zones of the Arkhangelsk Oblast that unite areas with similar sectoral priorities (including the Arctic territories)*. The developed business and transport infrastructure *will provide the Arkhangelsk Oblast with the status of a pillar region for the implementation of large-scale projects for the development of the Arctic*.
2. Vologda Oblast	I. Long-term management of sustainable development of the territory will include: - balanced spatial planning of resource allocation; - maintaining and improving the quality of regional infrastructure; - use of natural potential and mineral resources. II. *Creating favorable conditions for the formation of production and technological sites that ensure the development of the Arctic Zone*.
3. Murmansk Oblast	Target scenario: "*Murmansk Oblast as a strategic center of the Arctic Zone of the Russian Federation*". I. Implementation of competitive advantages in the sphere of development of hydrocarbon potential of the Arctic shelf, *creation of new types of economic activities (production of liquefied natural gas, oil refining); formation of clusters (technological cluster for offshore production in the Arctic; production and transport and logistics; cluster of Northern design and traditional crafts)*. II. Increasing the role of tourism in the development of the region (Arctic tourism and the expansion of environmentally friendly tourism activities in the Arctic). IV. Creating the conditions for the *use of the potential of foreign economic and interregional relations for the development of the region* (support for non-resource exports; strengthening relations with the regions of the Arctic and neighboring countries).
4. Nenets Autonomous Okrug	Target scenario: *Nenets Autonomous Okrug as a strategically important Russian outpost in the Arctic macroregion*. I. The strategic priority are to raise the status of the Timan-Pechora oil and gas province as the main center of hydrocarbon production and to develop the transport infrastructure to provide access of raw materials to the main world markets. II. Ensuring a *favorable operational and military regime in the Arctic Zone of the Russian Federation*. III. Preserving and protecting the Arctic environment, eliminating the environmental implications of economic activity in the conditions of increasing economic activity and global climate change
5. Republic of Karelia	I. Development of *transport infrastructure* (transcontinental transport corridors, integration into international transport logistics systems). II. Increased *participation in international projects related to the development of the Arctic*. III. Ensuring balanced development of municipal economies (search for and definition of perspective points of growth for each district; expansion of the number of advanced development zones with localization of production connected by single production chains; *development and implementation of complex projects for the development of municipal districts included in the Arctic Zone of the Russian Federation, with the involvement of federal resources*).
6. Republic of Komi	I. *Formation of a support center for the development of the Russian Arctic in the Urban District of Vorkuta* (maintenance of the transport system for the export gas pipelines "Yamal – Western Europe"; implementation of major infrastructure projects providing for the integration of Vorkuta with other regions of the Arctic Zone of the Russian Federation; renewal of the economy by combining coal mining with activities for the development and maintenance of natural resources of the Arctic). II. *Development and implementation of the regional program "Socio-economic development of the Arctic zone of the Republic of Komi", a multi-project "Arctic"* (involves the creation of a key land transport corridor for the development of the Arctic Zone of the Russian Federation with the effective use of the region's potential). III. *Expansion of the Arctic Zone of the Republic of Komi, including other Arctic territories into its composition*. This will ensure the unity of the natural and economic systems not only in the Republic, but also in the neighboring Arctic regions.
Source: own compilation on the basis of analysis of strategic development documents for the subjects of the European North of Russia for the period up to 2025–2030.	

attention is paid to the rational formation of the settlement system, development of its support centers and infrastructure, creation of conditions for improving the quality of life in the territories of AZRF.

At the same time, to address these issues, the Arctic needs *qualified management and working personnel* (in the field of geological exploration, mining, shipbuilding, construction, forest complex, etc.); production of *high-tech products* for the needs of the economy of this macroregion; development and use of *construction technologies and materials* adapted for polar conditions (including wooden housing construction adapted to Arctic conditions); state support to ensure the functioning of the *Arctic transport system*, especially the Northern Sea Route (development of land transport routes leading to Arctic ports), development of *telecommunications infrastructure* (ensuring stable communication, including broadband Internet access); *full-fledged food security* of the population, *medicine, recreation and tourism facilities*[20]. The European North could actively participate in addressing these issues, because it has sufficient scientific, technological, industrial, and agricultural potential.

However, to solve these problems, it is necessary to implement a coordinated policy of federal, regional and local authorities and the business community. However, the State Commission for the Development of the Arctic, which until recently was a coordinating body in this regard, is currently in the process of transformation: its composition was updated in December 2018, and in January 2019, its powers were transferred to the Ministry of the Russian Federation for Development of the Far East. Thus, the question concerning the existence of a single administrative center and its plan of work for the medium and long term is currently open.

The activities of other federal and public structures (for example, the working group "Development of the Arctic and the Northern Sea Route" of the Expert Council under the Government of Russia, the interregional public organization "Association of Polar Explorers", the Association "Arctic Legal Center", the Arctic and Antarctic Council of the Federation Council, the Barents/Euro-Arctic Council, the Arctic Development Project Office, etc.) are mostly advisory and consultative in nature; there is no clear agreement on the plans of activities of these organizations.

In 2015, the agreement on cooperation in the implementation of the state policy of the Russian Federation in the Arctic was concluded between the supreme executive bodies of the Russian Federation subjects, whose territories are fully or partially included in the land territories of the Arctic Zone of the Russian Federation[21]. In our opinion, it is necessary to increase the practical role of this document and its integration with the documents of the federal level and the plans of specific business structures operating in the Arctic Zone of the Russian Federation.

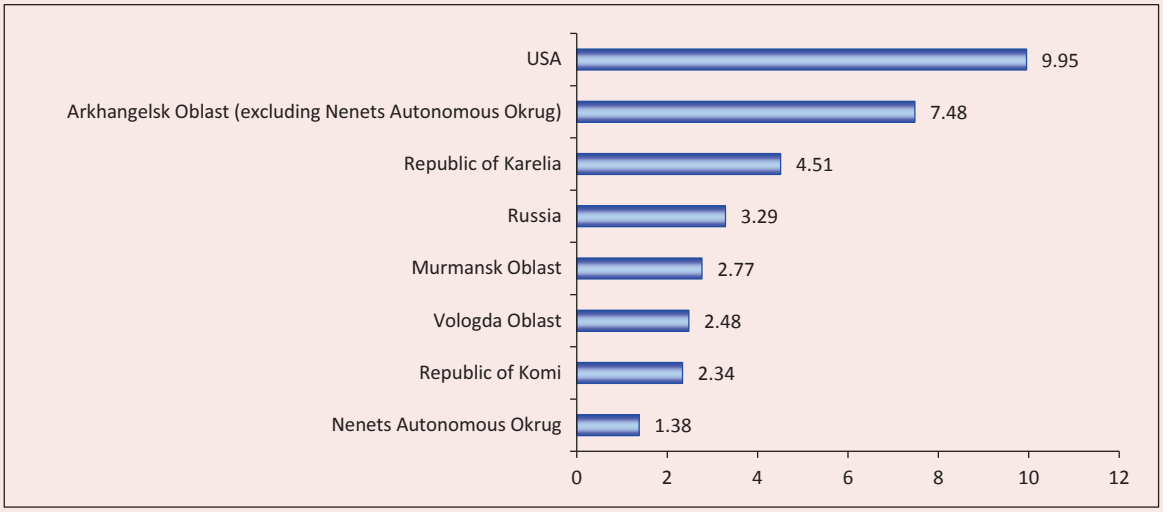
Suggestions and conclusion. Finding solutions to the identified problems of socio-economic development of the European North and its Arctic Zone requires *technological modernization of the economy in the Northern and Arctic territories*, which is currently resource-based and at a low level. This proceeds from the fact that over the past decades Russia was implementing its state economic policy, in which there was a priority of the foreign market over the domestic one.

Thus, the analysis of statistical data and studies of leading scientists shows that in recent years the share of mining in the total industrial

[20] Pilyasov A. Russian Arctic: Current State and Prospects. Available at: http://rosnord.ru/strategy/standpoint/65; Podshibyakova A. Smart North. How technology helps develop the Arctic. Available at: https://knife.media/arctic-technology/.

[21] Agreement on cooperation in the implementation of the state policy of the Russian Federation in the Arctic between the supreme executive bodies of state power of the subjects of the Russian Federation, the territories of which are fully or partially included in the land territories of the Arctic Zone of the Russian Federation. Available at: https://minec.gov-murman.ru/activities/CERArktic/soglach/

Figure 4. Value added multiplier for the regions of the European North of Russia (compiled with the use of [23])



production of the Northern regions is increasing. As a result, even the entities where the manufacturing industry has been in the lead are losing this position in a short period of time. A striking example is the north of the Irkutsk Oblast, which in 2010 belonged to the regions with a predominance of processing industries, and in two years it shifted into the category of natural resource territories [20].

As a result, the current state of industry in the regions of the North and the Arctic is characterized by fragmentation, low competitiveness, weakness of interregional relations, and inefficiency of institutions to promote the industry [21]. At the same time, the existing technological structure of the economy in the majority of the Northern and Arctic regions is characterized by *weak diversification with a predominance of industries of the initial stages of the technological cycle*. The value added multiplier[22] calculated by VolRC RAS researchers for the regions of Russia *(Fig. 4)* proves the above statement.

This problem becomes particularly acute and extremely important, because, according to Academician V.M. Polterovich, "without the help of the state, the market is not able to get out of the trap of technological backwardness" [24].

Therefore, in the current geopolitical and geo-economic conditions, an extremely important task is to develop the domestic market and produce innovative products with high added value on the basis of deep processing of resources of the North and the Arctic. It should be noted that at present there are certain reserves for addressing these issues. Thus, the capacity of the domestic manufacturing industry is extremely underutilized (as of 2017): by 20% – in the production of metal-cutting machine tools, by 14% – in the production of metal-forming machine tools, by 16% – in the production of tractors, by 18% – in the production of bulldozers, by 18% – in the production of excavators[23].

[22] The value added multiplier in this situation is understood as the ratio of the total value of the commodity mass produced by the enterprise to the value of primary raw materials involved in economic turnover. See, for example: [22].

[23] The level of use of the average annual production capacity of organizations for the production of certain types of products (annual data – from 2017) in accordance with the Russian Classification of Products by Economic Activities 2. Available at: http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/enterprise/industrial/#

One of the priority directions for development of the Arctic Zone of the Russian Federation outlined in the Strategy is the implementation of major infrastructure projects providing for the *integration of the Arctic with the developed regions of Russia* for the purpose of effective use of the resource base of the macroregion. In this regard, the key direction for the development of the European North of Russia should be the use of its potential to solve the problems of the Arctic Zone of the Russian Federation, among other things, by developing an effective system of interregional economic cooperation.

In the USSR, effective cooperation was observed as part of a single national economic complex, "each territory of which was associated with other planned and organized economic and resource relations". At the same time, as the authors [25] point out, "it is no exaggeration to say that at that time the Arctic "worked" for the whole of the USSR, and the USSR – for the Arctic".

Thus, one of the main conditions for the effective use of the potential of the European North of Russia and its Arctic Zone is the active development of interregional cooperation along the "North–South" line through the design of interregional production cooperation in the form of vertically integrated technological value chains in non-resource sectors [26]. It should be noted that the first edition of the state program "Socio-economic development of the Arctic Zone of the Russian Federation for the period till 2020" included a sub-program on the development of long technological chains of value added that go beyond the North and the Arctic Zone of the Russian Federation; however, later it was abolished.

In our opinion, the development of vertical integration processes is relevant for such activities as oil refining, wood processing, pulp and paper industry, civil, science-intensive and precision engineering, food production, etc. This fact, in particular, is evidenced by the calculations carried out by VolRC RAS on the example of the integration of an iron and steel enterprise located in the European North, and an engineering economic entity that produces goods for the needs of the Arctic[24].

The need for the production of domestic goods in the framework of the policy of import substitution to solve the problems of development of the Arctic Zone of the Russian Federation was supported by top state officials. For this purpose, in 2017, the Department for Regional Industrial Policy of the Ministry of Industry and Trade of Russia developed a Basic catalog of high-tech industrial products and services for the needs of the Arctic Zone of the Russian Federation (for all federal districts of Russia), which contains information about more than 650 enterprises capable of producing a wide range of high-tech products for the Arctic. District catalogs cover such sections as vehicles, construction, road and special equipment, energy and electrical equipment, and communications equipment[25].

Vertical integration of these industries not only has a financial effect (reduction of production costs, growth of net profit), but also creates new jobs and favorable conditions for the introduction of innovative technologies and further development of production. Thus, the formation of unified technological chains in the economy of the European North and its Arctic Zone will help consolidate and rationally use resources to address critical issues and ensure sustainable development of the country's economy in the long term.

[24] See: *Methods to increase the efficiency of management of socio-economic development of the regions of the North in the context of solving the problems of the Arctic Zone of the Russian Federation: the final report on research*. Executed by T.V. Uskova, S.A. Kozhevnikov. Vologda, 2018. 135 p.

[25] The Ministry of Industry and Trade of Russia has prepared a catalog of high-tech products for the needs of the Arctic. Available at: http://minpromtorg.gov.ru/press-centre/news/#!minpromtorg_rossii_podgotovil_katalog_vysokotehnologichnoy_produkcii_dlya_nuzhd_arktiki

According to the Strategy and the state program for the development of the Arctic, the priority in this macroregion consists in the development of a unified national transport network. This will improve transport accessibility of settlements, eliminate infrastructure constraints on economic growth and create conditions for the integration of the Arctic Zone of Russia into the single economic space [27]. To achieve these goals, a number of projects aimed at the integration of the macroregion with Eastern territories are currently implemented (Belkomur project: Arkhangelsk–Perm; Barentskomur).

At the same time, much less attention is paid to the integration of the Arctic region with the central and southern territories. The importance of intensification of the processes of spatial and territorial development of the North and the Arctic today determines the need for an effective system of coordination of strategic processes in the development of both the leading industries and the infrastructure of the Arctic and Arctic regions [28].

In our opinion, the Vologda Oblast should play an important role as an outpost for the development of the North and the Arctic. One of the priority directions is to transform the city of Vologda into a developed transport and logistics center focused on foreign economic and interregional relations not only of the enterprises of the Vologda Oblast, but also of all regions of the European North of Russia, as well as other regions of the country[26].

This is facilitated by the fact that within the Vologda Oblast there are the following major railway transport corridors: "Transsib" (Vladivostok – Chelyabinsk – Buy – Vologda – Cherepovets – Babaevo – Saint Petersburg); "North–South" (Moscow – Danilov – Vologda – Vozhega – Arkhangelsk with a branch to Vorkuta and Murmansk).

A multimodal logistics center will help establish close cooperation of the Northern and Arctic territories of the country with the southern regions. The center can unite the counter-flows of goods and services to provide the Northern territories with food, essential products, machinery and equipment, and the Southern territories with raw materials and products of their processing for the further development of technological chains.

The results of our analysis indicate that the key problem of the Vologda railway transport hub is its limited capacity. According to the research of JSC Institute for Economics and Transport Development[27] and according to the analysis of the development Strategy of JSC Russian Railways[28], the Vologda transport hub will be a "bottleneck" by 2020.

To prevent this, it is necessary to work out a set of measures for the development of transport infrastructure and logistics services, taking into account international requirements (improvement of warehousing to the level of world standards; modernization of the railway junction, bus station and airport; improvement of transport flows in the city), recommendations for the formation of an effectively functioning urban transport system in Vologda, taking into account the development of agglomeration processes.

Interregional cooperation of the regions of the European North of Russia will help increase the connectivity of the territories, stimulate the domestic market, reduce barriers to the movement of resources, provide the

[26] This approach is enshrined in the strategy for socio-economic development of the Vologda Oblast until 2030 (approved by the Resolution Of the Government of the Vologda Oblast of October 17, 2016 No. 920), where one of the tasks in the field of integrated spatial development of territories is the development of multimodal transport and logistics hubs in agglomerations.

[27] Official website of JSC Institute for Economics and Transport Development. Available at: http://iert.com.ru/index.html?noupdate

[28] Official website of Russian Railways. Available at: http://annrep.rzd.ru/reports/public/ru?STRUCTURE_ID=4498

consumer market with a wide range of goods, and local producers – with a sustainable supply of raw materials and components.

In turn, if federal and regional authorities implement the proposed measures, it will create favorable conditions for sustainable deve-lopment and for the achievement of strategic objectives of the regions of the European North and the Strategy for development of the Arctic Zone of the Russian Federation. However, this requires a review of the main directions of state policy, ensuring the consistency of interests of the authorities, large business structures and the population on the basis of public-private partnership mechanisms in the implementation of major projects in key sectors of the region's economy [29, 30].

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