

# SPATIAL ASPECTS OF TERRITORIAL DEVELOPMENT

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## Integration of Economic Space of the Northern Region: Features and Problems of Ensuring\*



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**Abstract.** Russia's transition to the market in the 1990s which led to the destruction of a unified national economic complex, existing technological, cooperative, social, and other ties between the territories and, as a result, to the disintegration of the country's economic space extremely aggravated the problems of the Northern regions' development. In the context of trade liberalization, when competition began to prevail over cooperation, there was a significant reorientation of economic entities from domestic to foreign markets and their integration into global value chains. In this situation, the production potential and resources of the North were used not only for domestic consumption and accelerated Russian economy development but also for export in the form of low-grade products. This economic pattern leads to significant socio-economic costs, destruction of the domestic market integrity and its space fragmentation. These circumstances make it more urgent to find effective mechanisms for integrating the Northern regions into the national economic space. The purpose of this work is to study the features and problems of ensuring spatial integration of the Northern region's economy. To achieve this purpose, a critical analysis of theoretical and methodological approaches to the interpretation of the essence and factors of ensuring spatial economy integration has been carried out. The key features of transformation and integration processes in the Russian North (RN) in the post-Soviet period have been revealed. The author shows that the cooperation relations of the RN with other regions of the country which have been preserved since the Soviet time are an objective basis for the integration processes development.

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However, their progress is hindered by negative demographic processes that limit the integration development in the region's labor market; a decrease in the space transport connectivity level due to the significant destruction of the system of intraregional aviation and inland water transport. The paper identifies transport connectivity of the main economic centers of the RN and "bottlenecks" in the region's transport infrastructure development. The authors substantiate conceptual basis for ensuring spatial integration of the Northern region's economy.

**Key words:** economic space, spatial integration, Northern region, transport infrastructure, Russian North.

### Introduction

The growth of the disintegration processes, the USSR collapse, and the economy transition to market conditions in the 1990s led to the destruction of the common economic space and national economic complex, the weakening of existing cooperative, technological, social, and other ties between the regions. According to L.B. Vardomskii, the economy collapse and other socio-economic problems aggravation were largely due to the economy disintegration which coincided with the "shock" nature of the ongoing reforms. Thus, in most of the USSR republics in 1989, the share of inter-republican exchange accounted for more than 90% of exports, and imports – for more than 70% of a total product volume (including exports and imports)<sup>1</sup>. However, the Soviet collapse led to a sharp destruction of relations between the republics, and the disintegration processes became relevant for the Russia's regions. In particular, only in 1990–1994, the share of interregional turnover in the country's GDP decreased from 25 to 16% [1].

At this stage, the regional competition relations began to significantly prevail over their cooperation which led to destructive processes (increase of the territories' differentiation by their development level, compression and disintegration of the economic space) [2].

In this regard, the position [3–10] on the need to focus on cooperation, coordination, and integration of regional efforts in their socio-economic development is becoming increasingly developed in economic science and practice. It should also be noted that the competition itself is undergoing evolutionary changes, taking qualitatively new forms, where the role the competition and cooperation increases [11].

Space integration creates conditions for the accelerated growth of the country's economy through the effective exploitation of the economic "core" of the regional socio-economic systems and development based on this, using the advantages of specialization and cooperation of long value chains. Ultimately, this leads to an increase in the efficiency of the use of natural resources, labor resources, production, and technical base and regions' infrastructure.

This task is particularly relevant for the Russia's Northern regions, as the Far North zone and its equivalent localities cover nearly 65% of the country's area, and more than 60% of its territory lies to the North of the 60<sup>th</sup> parallel [12]. The Northern regions have a huge natural resource, transit, and geostrategic potential. At the same time, the economic activity liberalization in the early 1990s led to the fact that these resources were used not so much for domestic consumption and the country's economy development, but in the

<sup>1</sup> Source: *Socio-economic Development of the Post-Soviet Countries: Results of the Twentieth Anniversary*. Moscow: IE RAS, 2012. P. 400.

form of low processing products that were sent for export. So, if in 1995 mineral products accounted for 42% of the export structure, in 2018 they accounted for 65%. This was achieved due to the accelerated growth in exports of crude oil (from 144.4 to 261 million tons in 2000–2018), petroleum products (from 62.7 to 150 million tons), and natural gas (from 194 to 221 billion cubic meters)<sup>2</sup>. According to the researchers' opinion, the production curtailment of high-value products and the exports growth of raw materials lead to the significant costs for the country's economy [13; 14].

It is also appropriate to introduce V.A. Kryukov's opinion which will be true not only for the Eastern territories with special economic regimes (ASEZ, SEZ), but also for the Northern regions for which the task of integrating into the Russia's economic space is acute: "An enclave economy does not produce the desired results if it is completely "self-oriented"... out of connection with the surrounding region and the country as a whole" [15].

This actualizes the task of developing effective mechanisms for integrating the Northern regions' space along the "North-South" line.

*The purpose* of the work is to study the features and problems of ensuring spatial integration of the Northern region's economy.

Achieving this purpose requires solving the *following tasks*:

- critical analysis of theoretical and methodological approaches to the interpretation of the nature and factors of ensuring the integration of the region's economic space;
- analysis of key features of transformation and integration processes in the economic space of the European North of Russia in the post-Soviet period;

– substantiation of the conceptual framework for ensuring spatial integration of the Northern region's economy.

#### **Theoretical aspects of the research**

To understand the essence of the spatial integration, we should first determine what is meant by the category "integration". So, according to the philosophical encyclopedia, it is understood as a development associated with the integration of previously heterogeneous parts and elements into a whole. At the same time, these processes can take place both within the framework of an existing system and lead to an increase in its integrity and organization; or when forming a new system from previously unrelated elements<sup>3</sup>.

In P.Ya. Baklanov's work, integration understands as "uniting and establishing stable ties and dependencies in the socio-economic, political and geopolitical spheres at the regional, interregional and interstate levels" [8]. At the same time, the scientist noted that there are no pure inter-industry and inter-district relations; as such relations are formed between economic entities of various industries that are geographically located in different regions. These are the links that are integrated in the form of inter-sectoral and inter-territorial ones.

In turn, L.I. Abalkin interpreted integration as "the economic entities' unification deepening of their interaction, the relations development between them" [7]. G.S. Vechkanov considers integration as a connectivity *state* of differentiated parts into a whole, as well as a *process* leading to such a state [16]. Such processes are based on the economic interests of economic entities at the country's and region's level (integration as the final stage of social organization of the economy-concentration,

<sup>2</sup> Source: Rosstat data.

<sup>3</sup> *Philosophical Encyclopedia*. Moscow: Soviet encyclopedia. Main editorial board: L.F. Ilyichev, P.N. Fedoseev, S.M. Kovalev, V.G. Panov, 1983.

specialization, combination and cooperation). Only then does this process end with the administrative integration at the regional and municipal levels. In fact, V.N. Lazhentsev holds the same position [14; 17].

The authors of the Institute for Economic Research of RAS Far Eastern Branch under the leadership of P.A. Minakir understand the economic space integration as the “integration of economic systems of its selected regions which acts as the basis for the emergence of general system with a new quality”. At the same time, integration and disintegration (fragmentation) are opposite processes, but they are closely related to each other [9]. E.M. Buchwald notes that spatial integration can be considered in two aspects: as a natural result of market mechanisms and as an object of state’s purposeful policy [18].

Taking into account the critical analysis of the existing interpretations in this article, the author understands spatial integration of the regional economy as a controlled process of strengthening the connectivity of segments of the regional economic and institutional space as a result of the scale and contacts’ intensity growth between its elements [19–22].

Based on the theory and practice, the key common factors for ensuring regions’ spatial integration include:

1) their territorial proximity (B. Balassa, J. Weiner, J. Tinbergen);

2) formation and development of industrial relations within the framework of the social labor division (cluster theory and TPC);

3) territories’ resource complementarity; however, according to the opinion of D.P. Frolov and R.S. Mirzoev [23], the resources similarity can encourage competition to replace the regions’ cooperative interaction;

4) common infrastructure (transport, energy, financial, information, etc.);

5) problems similarity in the territories’ development;

6) high capacity of the regions’ internal markets which encourages the production and trade relations development;

7) presence of traditional historical ties, the need for joint search for solutions to common problems (for example, for the Far North territories), etc.

However, it should be noted that the presented list is not exhaustive, and other specific factors may also play a significant role for different types of the regions (for example, border regions, Northern regions, etc.), as well as spatial economic systems at different levels (supranational, national, regional, local).

#### **Main research results**

Across the entire zone of the country’s North<sup>4</sup>, an important place is occupied by the territories of the *Russian North*<sup>5</sup> (RN: Arkhangelsk, Vologda, Murmansk oblasts, Komi Republic, Karelia, and Nenets Autonomous Okrug). This region’s importance in the country’s spatial development is caused by the fact that, according to the Russia’s Spatial Development Strategy up to 2025, RN is a *geo-strategic territory* (a significant part of it relates to the Arctic zone of the Russian Federation); a buffer zone through which the cooperation with

<sup>4</sup> The Northern regions of Russia, in accordance with the current legislation, include 13 entities, territories of which are fully refer to the Far North and localities equated to them (Republic of Karelia, Komi Republic, Arkhangelsk Oblast, Murmansk Oblast, Nenets AO, Khanty-Mansi AO, Yamalo-Nenets AO, Chukotka AO, Republic of Yakutia, Republic of Tuva, Kamchatka Krai, Magadan Oblast, Sakhalin Oblast), as well as 11 entities of which partly belong to the Far North and localities equated to them (Republic of Altai, Amur Oblast, Republic of Buryatia, Zabaykalsky Krai, Irkutsk Oblast, Krasnoyarsk Krai, Perm Krai, Primorsky Krai, Tomsk Oblast, Tyumen Oblast, Khabarovsk Krai).

<sup>5</sup> Researchers usually include the Vologda Oblast as a part of the Northern territories of the European part of Russia (historically, it belonged to the North within the framework of the USSR economic zoning system, for example, it was a part of the Northern territory (1929–1936), the Northern economic region (1982–present)).

the European countries is conducted; this is the beginning of the Northern sea route as one of the main international maritime arteries.

The European North can be considered a region in the full sense of this word. As P.A. Minakir mentions, there are three key conditions for the regions' allocation within the economic space: 1) high economic relations closeness within the region; 2) openness, i.e. its integration into the system of external markets for the region; 3) the performance of certain functions and the presence of clearly distinguished specialization in the national economy. At the same time, the latter, according to the classics of the Soviet economic school (S.V. Bernstein-Kogan [26], I.G. Aleksandrov [27] and others), is the key in zoning.

Speaking about the economic specialization of the Russian North in the national labor division in the USSR period and now, it should be mentioned that the region continues to act as a "resource store", "currency shop" of the country based on the dominant sector of extraction of mineral and forest products that comprise the region's economic core. The localization coefficients, calculated earlier [28] for the main economic activity types, confirm that the leading specialization branches in the region within the national economy are the forest industry complex, ferrous and non-ferrous metallurgy, chemical industry, fuel and energy complex, and transport.

The post-Soviet period influenced on the RN spatial development which was manifested primarily in the *depopulation and compression of the developed space* (the population's concentration and economic activity in the "nodal" points and the increase in the area of the economic periphery). In particular, in the Komi Republic, the share of Usinsk as an industrial center increased from 12.7 to 37% of the total Republic's production, and, in 14 municipalities out of 20, this indicator

decreased. Syktyvkar's role in the total population has increased from 19.8% to 30.6%, while the number of remote municipalities is decreasing. As T.E. Dmitrieva notes, the total reduction of the Komi population, on the one hand, led to a decrease in physical population's density and, on the other hand, to the growth of social density<sup>6</sup>. As a result, the resettlement contrast (the ratio of social and physical density) has significantly increased: from 22 times in 1989, 36 times in 2002 up to 52 times<sup>7</sup>.

In general, the permanent RN population decreased by almost 1.6 million people in the post-Soviet period. The highest depopulation rates were typical for the Murmansk Oblast (in 1990–2018 from 1190.1 to 750 thousand people, or 37%), the Komi Republic (33%), and the Arkhangelsk Oblast (27%). One of the key reasons is a significant *migration outflow* (Tab. 1).

At the same time, population mainly migrates to the Northwestern Federal District and Central Federal District. In particular, in 2018, residents of the Murmansk Oblast mostly left for other entities of the Northwestern Federal District (24,846 people, 62.3%): Saint Petersburg (5,871 people, 14.7%), Leningrad Oblast (2,649 people, 6.6%); Republic of Karelia (1,206 people, 3%); Central Federal district entities (7,827 people (20%): Moscow Oblast (1,485 people, or 4%) Moscow (1,072 people, 2.7%).

In 2018, most of the population moved from the Komi Republic to Saint Petersburg (2,576 people, 11.4%), Moscow and the Moscow Oblast (2,614 people, 11.5%), the Kirov Oblast

<sup>6</sup> Social density is the arithmetic mean of the densities of inhabited territories, weighted by population.

<sup>7</sup> Dmitrieva T.E. Spatial development of the Northern region. In collection: *Actual Problems, Directions, and Mechanisms of the North Productive Forces Development – 2014*. Materials of the Fourth all-Russian scientific seminar: in 2 parts. Institute of Socio-Economic and Energy Problems of the North, Komi RC UB RAS, 2014. Pp. 79–89.

Table 1. Coefficients of the population's migration growth (outflow), people per 10 thsd. people

Territory	Year								2018 to 1990, per mill
	1990	1995	2000	2005	2010	2015	2017	2018	
<b>RF</b>	<b>19</b>	<b>44</b>	<b>25</b>	<b>20</b>	<b>19</b>	<b>17</b>	<b>14</b>	<b>9</b>	<b>-10</b>
<b>NWFD</b>	<b>-8</b>	<b>3</b>	<b>-0.2</b>	<b>27</b>	<b>51</b>	<b>16</b>	<b>55</b>	<b>36</b>	<b>44</b>
<i>Republic of Karelia</i>	-35	-16	-13	-115	-54	-12	-31	-21	14
<i>Komi Republic</i>	-134	-178	-108	-163	-139	-102	-112	-111	23
<i>Arkhangelsk oblast (including NAO)</i>	-78	-89	-79	-72	-82	-68	-69	-62	16
<i>Nenets Autonomous Okrug</i>	-170	-275	-62	-21	-50	23	-53	-89	81
<i>Vologda Oblast</i>	-20	21	1	-4	-17	-17	-31	-38	-18
<i>Murmansk Oblast</i>	-77	-254	-167	-169	-69	-57	-46	-59	18
Kaliningrad Oblast	78	119	60	33	62	82	99	95	17
Leningrad Oblast	62	126	83	146	150	68	171	239	177
Novgorod Oblast	-1	67	10	-1	-21	7	-31	-32	-31
Pskov Oblast	17	87	4	-31	-50	-1	-9	-29	-46
Saint Petersburg	24	37	37	128	157	49	121	52	28

Own calculations based on data of the Federal State Statistics Service.

(1,791 people, 8%), and Krasnodar Krai (1,632 people, 7.2%). People also migrate from the Republic of Karelia mainly to the Leningrad Oblast (616 out of 9,530 people), Saint Petersburg (521 people), and the Central Federal District (254 people – primarily, to the Moscow Oblast)<sup>8</sup>.

One of the key migration factors is the *decline in the role of many compensatory mechanisms*. In particular, if in 2005 the ratio

of the average wage to the subsistence rate was higher than the national average in most of the RN entities; nowadays, such ratio is only in the Murmansk Oblast and the NAO (*Tab. 2*).

At the same time, the rate of such outflow may soon become critical, given the fact that most young people and working age people are leaving the RN<sup>9</sup>. In turn, in St. Petersburg, this ratio increased from 3.1 to 5.7 times over the period of 2005–2018.

Table 2. The ratio of the average wage to the subsistence rate (a set of fixed goods), times

Territory	2005	2010	2015	2018	2018 to 2005, +/-
<b>RF</b>	<b>2.80</b>	<b>3.55</b>	<b>3.60</b>	<b>4.28</b>	<b>1.48</b>
<i>Republic of Karelia</i>	2.71	2.97	2.65	3.34	0.63
<i>Komi Republic</i>	3.10	3.46	3.43	4.11	1.01
<i>Arkhangelsk Oblast (including NAO)</i>	no data	2.80	2.76	3.84	-
<i>Nenets Autonomous Okrug</i>	4.41	4.17	3.81	4.28	-0.13
<i>Vologda Oblast</i>	2.93	3.06	2.84	3.66	0.73
<i>Murmansk Oblast</i>	2.60	3.48	3.39	4.31	1.71
Kaliningrad Oblast	2.11	3.22	2.93	3.14	1.03
Leningrad Oblast	3.04	3.86	3.90	4.46	1.42
Novgorod Oblast	2.46	3.01	2.86	3.05	0.59
Pskov Oblast	2.32	2.76	2.15	2.76	0.44
Saint Petersburg	3.11	4.71	4.40	5.71	2.6

Own calculations based on the data of the Federal State Statistics Service.

<sup>8</sup> Data from the territorial authorities of the Federal State Statistics Service.

<sup>9</sup> In particular, in 2018, 7,093 people left the Arkhangelsk Oblast (including the NAO) (4,608 of them are of working age). The largest group is occupied by people aged 15–19 years (1,399 people).

Another negative trend is a *significant deformation of the RN population's age structure* which is much larger than the national average. So, if the average share of the working age people in the country in 1990–2018 decreased by 1.3 p. p. (from 56.7 to 55.4%), in the Murmansk Oblast this decrease was 5.9 p.p. (from 64.5 to 58.6%), in the Komi Republic – 5.2 p.p. (from 61.6 to 56.4%, *Tab.3*).

In fact, the regions where the share of the working age population was initially higher than the national average (the so-called labor-surplus territories) are losing their labor force. If these processes are not stopped, then soon people may face a significant lack of supply in the labor market and other personnel problems that limit the accelerated economic development of these territories.

One of the indicators for assessing the spatial integration of the regional socio-economic system used in the work of the authors' team from the IEI FEB RAS [9] is the indicator *of integration in the labor market*. It is understood as a free flow of labor resources that ensures a balanced labor market in terms of demand for it (from the capital side) and supply.

Its uniformity is determined by variations in the level of unemployment and labor market tensions.

The highest unemployment rate of 7.8% in 1993 was observed in the Republic of Karelia, the lowest one of 4.2% – in the Vologda Oblast. At the same time, by 2019, the Vologda Oblast is still the most favorable entity for this indicator, and the most unsatisfactory situation is observed in the NAO – 7.9% and Karelia – 7.4%. Despite the reduction in 1992–2019 of the extremely high heterogeneity level in terms of labor market tension, its current value (48.6%, the threshold coefficient value – 33.3%, *Tab. 4*) still indicates a low level of its integration which is not yet able to be provided by migration flows within the region.

At the same time, our calculations show that migration flows between the RN entities are very equal which may indicate that there are favorable prerequisites for the development of integration processes in their labor market. The closest and most equal relations have developed between the Vologda and Arkhangelsk Oblasts and the Komi Republic (Dvino-Pechora territorial and economic system (TES), as well

Table 3. Population structure of the RN entities by the age groups, % of the total population

Territory	1990			2000			2018			2018 to 1990, p.p.		
	Y	W	O	Y	W	O	Y	W	O	Y	W	O
<b>RF</b>	<b>24.3</b>	<b>56.7</b>	<b>19</b>	<b>19.4</b>	<b>60.2</b>	<b>20.4</b>	<b>18.7</b>	<b>55.4</b>	<b>25.9</b>	<b>-5.6</b>	<b>-1.3</b>	<b>6.9</b>
<b>NWFD</b>	<b>23.1</b>	<b>58.3</b>	<b>18.6</b>	<b>17.6</b>	<b>61.6</b>	<b>20.8</b>	<b>17.1</b>	<b>55.9</b>	<b>27</b>	<b>-6</b>	<b>-2.4</b>	<b>8.4</b>
<i>Republic of Karelia</i>	<i>25.4</i>	<i>57.8</i>	<i>16.8</i>	<i>19.3</i>	<i>61.8</i>	<i>18.9</i>	<i>18.4</i>	<i>53.9</i>	<i>27.7</i>	<i>-7</i>	<i>-3.9</i>	<i>10.9</i>
<i>Komi Republic</i>	<i>27.7</i>	<i>61.6</i>	<i>10.7</i>	<i>21.1</i>	<i>64.9</i>	<i>14</i>	<i>20.3</i>	<i>56.4</i>	<i>23.3</i>	<i>-7.4</i>	<i>-5.2</i>	<i>12.6</i>
<i>Arkhangelsk Oblast</i>	<i>26.4</i>	<i>57.7</i>	<i>15.9</i>	<i>19.9</i>	<i>61.9</i>	<i>18.2</i>	<i>19</i>	<i>54</i>	<i>27</i>	<i>-7.4</i>	<i>-3.7</i>	<i>11.1</i>
<i>NAO</i>	<i>31.4</i>	<i>61.1</i>	<i>7.5</i>	<i>26.1</i>	<i>62.9</i>	<i>11</i>	<i>24.8</i>	<i>56</i>	<i>19.2</i>	<i>-6.6</i>	<i>-5.1</i>	<i>11.7</i>
<i>Vologda Oblast</i>	<i>24.5</i>	<i>54.6</i>	<i>20.9</i>	<i>19.3</i>	<i>59.3</i>	<i>21.4</i>	<i>19.5</i>	<i>53.6</i>	<i>26.9</i>	<i>-5</i>	<i>-1</i>	<i>6</i>
<i>Murmansk Oblast</i>	<i>26.1</i>	<i>64.5</i>	<i>9.4</i>	<i>18.9</i>	<i>67.9</i>	<i>13.2</i>	<i>18.8</i>	<i>58.6</i>	<i>22.6</i>	<i>-7.3</i>	<i>-5.9</i>	<i>13.2</i>
Kaliningrad Oblast	23.1	59.3	17.6	18.4	62.3	19.3	17.8	56.5	25.7	-5.3	-2.8	8.1
Leningrad Oblast	23	56.4	20.6	17.1	60.3	22.6	15.5	56.5	28	-7.5	0.1	7.4
Novgorod Oblast	22.4	54.4	23.2	17.8	57.8	24.4	17.8	52.1	30.1	-4.6	-2.3	6.9
Pskov Oblast	21.2	53.9	24.9	17.3	57.4	25.3	16.7	53	30.3	-4.5	-0.9	5.4
Saint Petersburg	19.9	59.2	20.9	15.2	61.7	23.1	15.7	57	27.3	-4.2	-2.2	6.4

Note: Y – population younger than working age, W – at working age, O – older than working age. According to data of the Federal State Statistics Service.

Table 4. Variation in the level of unemployment and labor market tension in the Russian North at the age of 15 years and older

Common indicator	Private indicators	Years	
		1993	2019
Total unemployment rate, %	Min	4.2	4.5
	Max	7.8	7.9
	Max - Min	+3.6	+3.4
	Max/Min	1.86	1.76
	Variation coefficient, %	23.8	19.6
Labor market tensions*, people	Min	3.2	2.0
	Max	24.5	6.4
	Max - Min	21.3	4.4
	Max/Min	7.65	3.2
	Variation coefficient, %	91.6	48.69
* 1992. According to Rosstat data.			

as between Karelia and the Murmansk Oblast (Karelo-Kola TES). Their activation requires the formation of several new economic growth poles within the region.

The degradation of the grassroots settlement network against the background of further migration to cities, the destruction of existing socio-economic, cultural, and other links between urban and rural areas carries a significant risk to the retention and preservation of the Northern space development. So, in 2010, on average in Russia, the share of rural localities with a population of less than 10 people in its total number was 27%, while in Karelia – 30.4%, in the Arkhangelsk Oblast – 46%, and in the Vologda Oblast – 55%. At the same time, since the 2002 census, this share has increased in all entities (except the NAO).

The presence of prerequisites for the development of integration processes in the region's economic space can be judged by the directions of commodity flows. Thus, the RN entities have quite close relations with each other in terms of the goods exchange. However, this is especially evident in the NWFD (whose borders coincide with the borders of the large economic region "North-West" which had existed before 1982).

In particular, in the structure of the goods, imported to the Republic of Karelia from other regions of the Russian Federation, NWFD accounts for 28% of the total trade flow (2nd place after the CFD accounting for 28.7%); in turn, 45.6% of the product volume, exported from the Republic, also accounts for the NWFO. The main attraction centers for incoming and outgoing goods flows within the district are Saint Petersburg and the Leningrad Oblast (*Tab. 5*).

A similar situation is natural for other RN entities. Thus, in the structure of the product export from the Komi Republic, the 1st place is occupied by the NWFD entities (in general, they account for 53.7% of the total commodity flow: the Vologda Oblast – 31.6%; Arkhangelsk Oblast – 7.3%).

The Murmansk Oblast has close commodity relations with the Vologda Oblast (60.1% of the total volume of domestic export). On the region's territory, more than one quarter of products come from the NWFD territory. In the structure of products, imported to the Vologda Oblast, the Komi and Murmansk Oblast account for approximately 37%.

We should mention that the main categories of products that are exported outside the RN to

Table 5. The main flows of import and export of products on the territory of the Russian North, % of the total volume (except export)

<b>Import</b>		<b>Export</b>	
<b>CFD (28.7%)</b>	<b>Republic of Karelia</b>	<b>NWFD (45.6%)</b>	
Yaroslavl Oblast (16%)		Saint Petersburg (17.7%)	
Moscow (5%)		Leningrad Oblast (13.9%)	
Moscow Oblast (1.7%)		Arkhangelsk Oblast (5%)	
<b>NWFD (28.1%)</b>		Vologda Oblast (3.5%)	
Saint Petersburg (9.9%)		<b>CFD (41%)</b>	
Leningrad Oblast (8%)		Moscow Oblast (19.8%)	
Vologda Oblast (3.6%)			
Komi Republic (3.9%)			
<b>PFD (23.2%)</b>			
Republic of Bashkortostan (7%)		Moscow (14.8%)	
Nizhny Novgorod Oblast (4.7%)			
Samara Oblast (3.9%)			
Perm Krai (3.1%)			
<b>PFD (38.9%)</b>		<b>Komi Republic</b>	<b>CFD (19.5%)</b>
Nizhny Novgorod Oblast (19.4%)	Moscow Oblast (8.2%)		
Republic of Tatarstan (5.6%)	Moscow (5.9%)		
Perm Krai (5.3%)	<b>NWFD (53.7%)</b>		
<b>UFD (19.7%)</b>	Vologda Oblast (31.6%)		
Chelyabinsk Oblast (11.4%)	Arkhangelsk Oblast (7.3%)		
Sverdlovsk Oblast (6.1%)	Leningrad Oblast (7%)		
Tyumen Oblast (2%)	Saint Petersburg (3.9%)		
<b>SFD (14%)</b>	<b>UFD (10.1%)</b>		
Volgograd Oblast (13.2%)	Chelyabinsk Oblast (4.1%)		
<b>NWFD (15.9%)</b>	Tyumen Oblast (3.9%)		
Leningrad Oblast (1.3%)	YNAO (3.1%)		
Saint Petersburg (11.9%)			
<b>CFD (27.3%)</b>	<b>Murmansk Oblast</b>		<b>CFD (15.9%)</b>
Yaroslavl Oblast (11%)			Moscow (7.7%)
Moscow (6.5%)		Moscow Oblast (5.1%)	
Bryansk Oblast (2.9%)		<b>NWFD (68.8%)</b>	
<b>NWFD (26.9%)</b>		Vologda Oblast (60.1%)	
Leningrad Oblast (8.1%)		Saint Petersburg (2.5%)	
Saint Petersburg (6.4%)		Leningrad Oblast (2.5%)	
Komi Republic (4.8%)			
Arkhangelsk Oblast (3.8%)			
<b>CFD (15.9%)</b>	<b>Vologda Oblast</b>	<b>CFD (51.2%)</b>	
Belgorod Oblast (4.9%)		Moscow Oblast (18.1%)	
Yaroslavl Oblast (3.6%)		Moscow (15.3%)	
Moscow (1.6%)		Kostroma Oblast (3.1%)	
<b>NWFD (42.4%)</b>		<b>NWFD (14.4%)</b>	
Komi Republic (18.9%)		Saint Petersburg (10.5%)	
Murmansk Oblast (18.8%)		Arkhangelsk Oblast (1.2%)	
Leningrad Oblast (1.9%)		Leningrad Oblast (1.2%)	
Saint Petersburg (1.5%)		<b>PFD (21.8%)</b>	
		Nizhny Novgorod Oblast (5.3%)	
	Samara Oblast (4.6%)		
	Republic of Tatarstan (3.2%)		

End of Table 5

Import		Export		
<b>PFD (37.4%)</b>		<b>CFD (24.8%)</b>		
Samara Oblast (11.7%)	<b>Arkhangelsk Oblast</b>	Moscow and Moscow Oblast (12.9%)	<b>NWFD (19.8%)</b>	
Republic of Bashkortostan (10.9%)		Kaluga Oblast (4.2%)		
Nizhny Novgorod Oblast (5.9%)		Kursk Oblast (1.6%)		
Republic of Tatarstan (3.2%)		Leningrad Oblast (6.5%)		
<b>CFD (22.6%)</b>				
Yaroslavl Oblast (10%)				
Moscow and Moscow Oblast (5.5%)				
<b>NWFD (21.7%)</b>				
Vologda Oblast (4.3%)				
Saint Petersburg (3.9%)				
Leningrad Oblast (2.6%)				
Tyumen Oblast (7.5%)				
				Saint Petersburg (3.5%)

Source: own calculations are based on data of Rosstat on the import and export of products in the entities of the Russian European North, as well as on the reports of state authorities of the entities.

other regions are the products of mineral resource complex and processing of natural resources: the Republic of Karelia – crushed stone and gravel, commercial wood, paper, etc., the Komi Republic – coal and its processing products, commercial wood, lumber, non-metallic construction materials, etc., the Murmansk Oblast – crushed stone and gravel, fish, canned fish, etc., the Vologda Oblast – rolled ferrous metals, steel pipes, mineral fertilizers, commercial wood, liquid and dry milk, canned fish, meat, sausage products, confectionery, flour, feed, etc.

In turn, food (candy, beer, sausage, etc.), products of higher technological value added (passenger and freight cars, wagons trucks, compressors, bulldozers and cranes, medical equipment, paints, car tires, synthetic tools, household furniture) are imported to the territory of the European North from the more southern entities of the NWFD (Saint-Petersburg, Leningrad Oblast) and other regions of the Russian Federation.

The analysis of commodity flows allows identifying certain technological chains that have developed on the RN territory and the

previously existing large economic region of the North-West. It is their maintenance and further development that, in our opinion, is the key factor in the integration of the region's economic space.

However, a significant part of trade flows is reoriented toward external markets, not the internal ones. For example, currently, about 65–70% of Karelia's products are sent to foreign markets; in the Murmansk Oblast – 55%, Komi – 40%. In other words, the region is losing significant resources that could have been used to ensure accelerated growth of its economy and improve the northerners' welfare.

The potential for the development of integration processes in space largely depends on the territory's transport connectivity. One of the key types of transport support for the North during the Soviet era was the aviation including intraregional and local significance. It allowed connecting not only the Northern regions with more Southern territories but also hard-to-reach localities in the region.

At the same time, the market reforms of the 1990s had an extremely negative impact on its development. Thus, in the work, air passenger

Table 6. Features of the aviation transport development in the Russian North in the post-Soviet period

Air cluster	Development characteristics
<b>1. North-West</b> (in 1990, it included the airports of St. Petersburg, Pskov, Petrozavodsk, Vologda with an annual passenger turnover capacity of more than 20 thousand people)	In 1990, its main contacts were the North Caucasus (20.8% of its passenger traffic), the Central (14.5%), the Kola air cluster (12.5%), and the European North (9.4%). Later, they were completely replaced by the Central (63%) and Kaliningrad (about 8%) clusters. On other routes from St. Petersburg to the territory of the European Union, the volume of passenger traffic significantly decreased: in 1990–2006* to Murmansk – by 87%, Arkhangelsk – by 81%.
<b>2. Kola Peninsula</b> (in 1990 – Murmansk, Kirovsk)	In 1990, there were 2 airports, and by 2006 – only Murmansk. Its contacts with airports in the European North have completely disappeared. There was a spatial reorientation of air passenger connections: instead of the main direction in 1990, the North-Western cluster (52% of the flow), the priority direction was Murmansk – Moscow (2/3 of the total passenger traffic). Especially noticeable from the point of view of the connectivity of the REN space is the loss of the previously quite busy Murmansk – Arkhangelsk line.
<b>3. European North</b> (in 1990 – Arkhangelsk, Kotlas, Naryan-Mar, Amderma, Vuktyl, Syktyvkar, Ukhta, Pechora, Usinsk, Inta, Vorkuta)	In 1990, there were 11 airports with passenger connections of more than 20 thousand people/year. There has traditionally been a developed network of local air lines most of which were shut down in the 1990s. Only for the 1990–2006 period, only 6 out of 23 air links remained. The air contacts of the European North with the Kola air cluster were completely lost. If, in 1990, 44% of all air passengers moved within the cluster and 25% – to Moscow, and then, in 2006, the capital accounted for 61% of the total flow and intra-cluster – for 25%.
* The latest official statistics in Rosstat on the development of civil aviation in Russia are presented only for 2006. According to: Tarkhov S.A. <i>Changing the connectivity of the Russian space (the case of air passenger traffic)</i> . Moscow; Smolensk: Oikumena, 2015, p. 154.	

Russia's zoning was carried out and three air clusters were identified that somehow connect the economic centers of the European North [29]. In the post-Soviet period, there were very negative processes in their functioning which consisted primarily in a decrease of passenger traffic (for example, the overall decline in traffic on the Murmansk–St. Petersburg airline was almost 90%), and the closure of a significant part of the RN airports (out of 23 air links with the passenger traffic of more than 20 thousand people per year, there are only 6 people left on the territory of the RN cluster, *Tab. 6*), increasing hypercentrism in the functioning of the aviation network (the role of Moscow and St. Petersburg as receiving points of the passenger traffic has increased), a significant weakening, and often complete elimination of

a number of intra-regional and interregional air routes.

Similar extremely negative processes are observed in the functioning of inland water transport in the Russian North, where, in the early 1990s, there was actually a collapse in the volume of traffic which has not been overcome to date<sup>10</sup>.

For the Russian North, road and rail transport play a significant role in terms of ensuring its space integration. At the same time, there are a number of “bottlenecks” in their development which consist in the limited capacity of highways (primarily in the direction of seaports in the region [30]) and the existing configuration of routes that lead to additional financial, time, and other costs for overcoming the economic space.

<sup>10</sup> For example, if, in 1990, 21.1 million tons of goods were transported into the Arkhangelsk Oblast by inland waterway, then, in 1995, the turnover of goods dropped to 2.7 million tons; The Komi Republic – from 10.3 to 0.7 million tons; Karelia – from 11 to 2.2 million tons. Later, this negative trend only continued. Some revival of cargo turnover has been observed in the past few years, but, in principle, it does not change the existing picture. Source: *Transport in Russia*. Rosstat.

Table 7. Transport connectivity of the main economic centers of the Russian North

City	road*	rail
Vologda	0.79	0.78
Cherepovets	0.77	0.75
Syktvykar	0.68	0.59
Murmansk	0.67	0.63
Petrozavodsk	0.66	0.58
Arkhangelsk (with Severodvinsk)	0.60	0.67
<i>Average number</i>	<i>0.70</i>	<i>0.67</i>

Source: own complication.  
\* - sorted in terms of transport connectivity by road.

To assess the space transport connectivity, we use the tools justified in publications [31; 32; 33]. It allows evaluating transport connectivity in terms of the optimal configuration of routes and population of the main economic centers, connected by these routes<sup>11</sup>:

$$TC_i = \sum_{j=1, j \neq i}^n \frac{KP_{ij}}{\Phi P_{ij}} \times \frac{p_j}{\sum_{k=1, k \neq i}^n p_k}, \quad (1)$$

where:  $TC_i$  – transport connectivity of the  $i$ -th center;

$KP_{ij}$  – length of the shortest technically possible route between the  $i$ -th and  $j$ -th economic centers;

$\Phi P_{ij}$  – actual distance between  $i$ -th and  $j$ -th centers;

$p$  – population of the economic center;

$n$  – number of the territory’s analyzed economic centers;

$k$  – serial number of the economic center (from 1 to  $n$ ).

The transport connectivity coefficient can take values from 0 to 1. The results of testing this methodological tool are presented in *Table 7*. It should be noted that the largest economic centers of the REN have higher transport connectivity by road (0.70) than by rail (0.67).

Vologda and Cherepovets have the highest road connectivity with other RN centers, while

Arkhangelsk and Severodvinsk have the worst connectivity. On the roads, the most “bottlenecks” are the section “Arkhangelsk–Murmansk”, “Arkhangelsk–Petrozavodsk”. Vologda and Cherepovets also have the highest connectivity with other towns of the RN by rail, while Petrozavodsk has the lowest connectivity. The problem areas are “Petrozavodsk–Arkhangelsk” and “Petrozavodsk–Syktvykar”. As follows from the presented calculations, the problem of increasing transport connectivity of the RN sub-regions (Karelo-Kola and Dvino-Pechora) is one of the key conditions for ensuring the integration of the region’s space.

**Conclusion and suggestions**

It becomes obvious that overcoming the disintegration processes in the Russian economy requires a comprehensive state policy. As V.N. Lazhentsev rightly notes, in relation to the European North, such integration is possible and highly expedient within the framework of a large economic region “North-West”, where a successful combination of economic and federal district regionalization occurs. A prerequisite for the further revival of such a large spatial economic system should be an increase in the role of St. Petersburg and the St. Petersburg city agglomeration as the organizing center of the district [14]. In this case, the RN will be part of a large district that has its own specialization within the division of labor system.

<sup>11</sup> In this paper, when analyzing transport connectivity, the economic centers of the region with a population of more than 100 thsd. people were taken.

Considering the NWFD territories as a large economic area, it should be noted that the preserved cooperative relations between the entities are the objective basis for the development of integration processes. In addition, the existing mainline infrastructure (for example, the Northern and Oktyabrskaya railways, systems of inland waterways of the Meridian direction, etc.) also contributes to this.

As the successful global experience shows, one of the basic conditions for the development of the regions' spatial integration is the awareness of their identity<sup>12</sup>, the search for joint solutions to the living problems. In our opinion, positioning the entities of the European North (and, in a broader sense, the entire NWFD) as an "Outpost" of the Arctic development is a factor in ensuring the identity of these territories and establishing close cooperative ties between them to solve a common strategic task. In this case, we should expect a decrease in the role of competition factors, an increase in the operational component in the territories' interaction and, ultimately, their spatial integration.

"The framework of the state policy of the Russian Federation in the Arctic for the period up to 2035"<sup>13</sup> justifies strategic issues in terms of the infrastructure (expansion of river navigation, construction of railways, expansion of the airport network, development of information and communication infrastructure, etc.), economic (state support for small and medium businesses, development of mineral resource centers, etc.) development of these territories, as well as international cooperation

(strengthening good-neighborly relations with the Arctic States) which, in our opinion, will contribute to the development of integration processes in the economic space of the North and Arctic.

Ensuring the economic space integration of the Northern region requires the transformation of the entire system of strategic management of socio-economic and spatial development. The need to ensure connectivity and form a single economic country's space is enshrined in the main strategic documents at the federal level<sup>14</sup>. However, it is necessary to solve these problems at the district and regional levels. Unfortunately, there is currently no single administrative center which activities are aimed at solving spatial development problems. These powers are distributed among several state authorities (ministries and departments of economic development, transport development, construction, etc.). All of this requires the development of a strategic management system of the region's development, taking into account the spatial integration of its economy. At the initial stage, it is important, in our opinion, to assess the spatial integration level of the economy and identify the main factors and problems (institutional, economic, social, cultural, and other) that limit the development of integration processes.

The analysis of strategies and programs of the RN entities' socio-economic development shows that the spatial development aspect is very limited there, and it is primarily related to the territorial entity's regionalization without analyzing and designing links with the

<sup>12</sup> "Identity" should be understood as the feeling or confidence of belonging to a group or area, or of belonging to that group or area. If this feeling or certainty is related to an area or region, then it refers to spatial or regional identity [34].

<sup>13</sup> "On the fundamentals of the state policy of the Russian Federation for the period up to 2035": Presidential Decree no. 164, dated March 5, 2020.

<sup>14</sup> National Security Strategy of the Russian Federation: Presidential Decree no. 683, dated December 31, 2015; Spatial Development Strategy of the Russian Federation until 2025: Presidential Decree no. 207-p, dated February 13, 2019; Transport Strategy of the Russian Federation in the period up to 2030: Presidential Decree no. 1734-p, dated November, 2008, etc.

economic space of neighboring entities, the district and the country as a whole. In other words, the main forms, methods, and tools for managing spatial integration are not sufficiently integrated and often only formally mentioned; they are declarative or not reflected in these documents at all.

In this regard, an important task at the goal-setting stage is to create guidelines for the development of integration processes in the long run. To do this, we believe that it is necessary to coordinate strategic and program documents for the development of the region and long-term programs for the development of key economic entities as leading economic agents. All of this should form the basis of the regional spatial development strategy.

In turn, the mechanism for implementing the regional development strategy and the spatial development strategy should include tools aimed at integrating space at the intra- and inter-regional levels and coordinating investment plans of economic entities with the goals of territorial development. An important role here is played by the usage of project management technologies in the implementation of PPP and MPP agreements.

At the same time, there is a need to create a mechanism for implementing the development strategy of the Northern region, adapted to the specifics of its economic space. Obviously, the focal nature of productive forces, the sparseness of the Northern region's space leads to the fact that the focus solely on market forces of self-organization and the interests of major economic entities in practice maintain to a mismatch of placing of the regional economy objects and historically developed settlement system; space business and space in the region, and as a consequence of its disintegration. This makes it necessary to increase the direct role of the state as a key agent in the development of the economic space using tools of direct and indirect influence.

The next stages of the research will be devoted to developing methodological tools and assessing the spatial integration level of the Northern region's economy. This will allow assessing the development vector of the integration/disintegration processes in the regional socio-economic system, as well as identifying factors and problems that limit the region's space integration.

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