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ATTRACTION OF THE SEA



THE INFLUENCE OF THE SEA ON THE ECONOMIC DEVELOPMENT AND SETTLEMENT STRUCTURE IN THE BALTIC SEA REGION

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Earliest studies into the influence of the sea on the economy and settlement structure date back to the mid-19th century. They became common in the 20th century. Researchers have come to a general understanding that a coastal position has a beneficial effect on the development of regions. Such areas have a denser population and develop more rapidly than inland regions. At the same time, the effect of environmental, socioeconomic, demographic, and political factors is often stronger than the influence of the sea. Thus, an inland position can be more beneficial than a coastal one. Both trends are observed in the Baltic Sea macro-region. However, the 'gravitational force' of the sea varies from place to place. This article focuses on the most significant differences between territories and countries. These differences reflect the uneven influence of the proximity of the Baltic Sea on the development of population and national economies. Qualitative differences between meso-regions are measured using a combination of theoretical and empirical typologies. A combined economic, statistical, and cartographic analysis helps to identify a special type of meso-regions — coastal development corridors, which make an important contribution to the economic development and consolidation of the Baltic macro-region. In transnational macro-regions, such typological differences must be taken into account in strategic and spatial planning at the intergovernmental level.

Key words: coastalisation, Baltic Sea, macro-region, typology of regions, coastal development corridors

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Introduction

The overall positive effect of a coastal position on the economy and settlement structure can be taken as proven. However, proximity to the sea is only one of many



settlement factors and it is not always the definitive one. The socioeconomic and economic-demographic differences between Russia's coastal regions are very significant. Thus, the effect of the facilitating coastal factor is often outweighed by other natural and socioeconomic ones — primarily, the geo-economic position. In certain cases, availability of raw materials plays a crucial role. Differences in population replacement rate can also affect the picture. Proximity to national and international economically successful regions contributes to a territory's development, while remoteness from them hinders it. In the countries and regions that do not enjoy the benefits of strong and multiple international economic ties, and whose economies serve the national market, inland regions gain a considerable advantage.

Regional development forecasts and coherent regional policies require a typology of regions accommodating the effect of a coastal position. Such a typology must take into account the dynamics of current economic processes and changes in the settlement structure. Translated to the international level, such studies take on added significance for the Baltics region, which boasts intergovernmental bodies established to coordinate spatial development. The Council of the Baltic Sea State (CBSS) has launched the *Vision and Strategies around the Baltic Sea Region* (VASAB). Another important initiative is the *INTERREG, the Baltic Sea Region 2014—2020* trans-boundary cooperation project. Special measures are taken to coordinate the Strategy for the Socioeconomic Development of the Northwestern Federal District until 2020. The EU Strategy for the Baltic Sea region has been revised. This article focuses on certain spatial effects of a coastal position on the economic development of the Baltic transnational region.

The current state of knowledge

Coastalisation studies in international research

Research on the effect of a coastal position on the concentration of economy and population dates back to the mid-19th century. Most Western studies carried out in the context of human geography focus on the Mediterranean region. Analyses of urbanisation rates and population change suggest that the effect of coastalisation has been increasing since the mid-20th century [30, 36; 38; 40; 46; 47; 56; et cetera]. According to [41], the coastalisation phenomenon led to a 1.8-fold increase in the population of the coastal cities of Southern Europe in 1950—2000. The 'coast rush' is often addressed in national-level studies. In Greece [49] and Portugal [32], cities grow at the expense of the urbanisation of coastal suburban peripheries. The concentration of population, economic activities, and infrastructure is observed in the coastal zones of Lebanon [42] and Spain [56], including the autonomous community of Catalonia [50]. A skew towards coastal territories is observed in Ireland [37]. Coastalisation-related distortions in the socioeconomic space are characteristic of India [54], China [51], the US [39], and other countries across the world.



Regardless of the level of economic development, the result of demographic imbalances between inland (continental) and coastal regions is that most modern metropolises are located within, or in the vicinity of, coastal zones [48; 53]. According to different estimates, 70—85% of world cities with a population of over 10 m people, including the capitals of Bangladesh, Brazil, India, Nigeria, and Japan, are situated within a 100 km coastal zone [33; 44; 45; 52]. With that, [55] point to the fact that the unprecedented development of coastal zones are exposed to rapid spatial expansion.

Coastalisation studies in Russia

In Russia, the effect of the sea on the economy and settlement structure has been studied since the second half of the 20th century. However, the authoritative work titled *Civilisation and the Great Historical Rivers* by the famous Russian researcher Lev Mechnikov came out as early as 1889. As the author had immigrated to Switzerland, the book was first published in French in Paris [43]. It was first translated into Russian in 1898 [17]. Mechnikov emphasised the role of seas in the history of humanity and attempted to prove that river civilisations are replaced by marine, and later, oceanic ones.

In the USSR, research into the effect of the sea on geography, economy, and settlement structure started in the mid-1960s when maritime-based economy evolved. Soviet international trade reached an unprecedented level due to fast-growing trade with developed and developing countries. Maritime transport was playing an increasingly important role. The Soviet Union's international trade exceeded the 1950 level threefold in 1960, sevenfold in 1970, 13-fold in 1980, and 16-fold in 1986 in constant prices. The fishing catches, which were below 2 m tonnes in 1950, reached 10 m tonnes in 1975 [19]. The Black and Baltic Sea coasts started to develop as resorts. The growing role of maritime economy led to a rapid increase in the population of coastal zones. This necessitated setting a research framework for the development of coastal territories and relevant spatial planning. National economic geography of the World Ocean evolved into an established science and studies into the effect of the sea on the development of coastal territories became one of its major areas.

A significant contribution to the theoretical framework for comprehensive geographical studies of coastal zones in national economy was made in the 1970—1980s by S. B. Lavrov, V. V. Pokshishevsky, S. S. Salnikov, P. Ya. Baklanov, V. S. Bondarenko, V. A. Dergachev, B. S. Zalogin, V. I. Lymarev, S. B. Slevich, and others [4; 6; 9; 11; 14; 16; 20; 21; 23; 29]. In the 1990s, the number of publications on the economic geography of the World Ocean reduced significantly. However, studies focusing on the sea/land contact zone became more common in the 2000s. The number of publications grew to provide a deeper insight into the problems of coastal territory zoning. Researchers analysed the ways to benefit from a coastal geographical position in terms of strategic and spatial planning. In the post-Soviet period, a significant contribution to the research on the effect the sea exerts on the economy and settlement structure, was made by A. P. Alkhimenko, I. S. Arzamastsev, P. Ya. Baklanov, L. A. Bezrukov, G. G. Gogoberidze, S. M. Govorushko, N. V. Gontar, A. G. Druzhinin, V. V. Ivchenko, S. S. Lachininskii, A. S. Milhaylov, S. A. Sukhinin, G. M. Fedorov, and others [1; 2; 5; 7; 10; 12; 15; 18; 24; 27].

Differences in the effect of the sea on the development of Baltic countries and regions

Since the times of Vikings, the Baltic Sea has connected peoples living along its coasts and contributed to the establishment of coastal cities as regional centres of trade. However, the sea has not had the same effect on different parts of the Baltic macro-region. Moreover, coastal territories differ significantly in their level of development. The sea naturally affects the location of large city agglomerations, which grew in the vicinity of seaports. Some of them are capital cities (Copenhagen, Stockholm, Helsinki, Riga, and Tallinn) or were capitals in the past (Saint Petersburg). Of importance are climate conditions, which account for a northward decline in the population density, regardless of the proximity to the sea. In Germany, Poland, and Lithuania, inland territories have a higher population density than coastal ones do (fig. 1). Another regular pattern is a rather sparse population of the EU states bordering the former USSR and current Russian border.

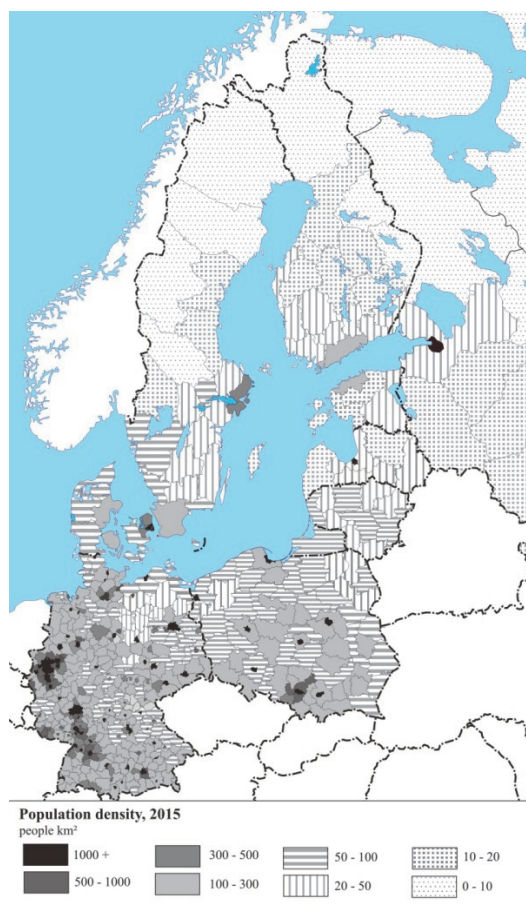


Fig. 1. Population density in the micro-regions of the Baltic Sea countries and the Baltic regions of the Russian Federation, 2015

Compiled by the authors based on [28; 31].

The demographic potential of population is even more illustrative of territory differentiation than population density is. Figure 2 shows territorial differences in the degree of ‘coastalisation’, which makes it possible to divide the Baltic region states into three groups characterised by:

- Pronounced coastalisation (Sweden, Denmark, Finland, Latvia, and Estonia);
- Moderate effect of the sea on the economy and settlement structure (Germany, Poland, and Lithuania);
- Strong differentiation of the territory — some parts do experience coastalisation, others do not (Russia).

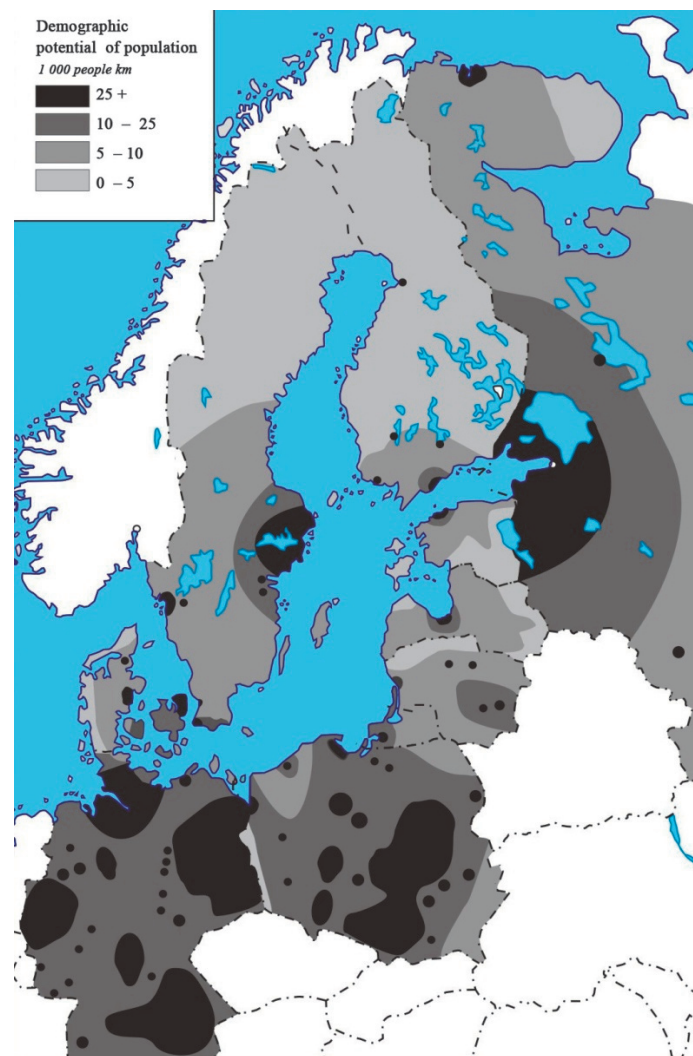


Fig. 2. Demographic potential of population in the Baltic Sea states and the Baltic regions of the Russian Federation

Compiled by the authors.



However, coastalisation increased over time in those countries where inland regions had developed more rapidly than coastal ones. For instance, the average density of population in Germany's five coastal states (Bremen, Hamburg, Lower Saxony, Mecklenburg-West Pomerania, and Schleswig-Holstein) is 176 people/km², whereas it reaches 251 people/km² in inland states. However, population growth rates were higher in all coastal states (approximately 1% per year) than in inland ones (0.3%) in 2011—2017, with the exception of Mecklenburg-West Pomerania. Over the period, the population of Hamburg increased by a third [34]. It can be concluded that Germany's inland states were more developed and densely populated in the past, whereas coastal regions — except for Mecklenburg-Vorpommern, once part of the GDR — are developing more rapidly today.

In Poland, the population density of the coastal Warmian-Masurian, West Pomeranian, and Pomeranian voivodeships is 0.625 that of inland regions. Similarly to German coastal states, these voivodeships showed higher population growth rates than inland ones in 2011—2017. The population was growing at 0.2% a year, whereas it was decreasing by 0.4% a year in inland voivodeships. The Pomeranian voivodeship, whose core is the Tricity — the Gdansk-Gdynia-Sopot agglomeration, saw a 2.1% increase in population. In the two other — less urbanised — coastal voivodeships, the population was declining, but at a slower rate than in inland regions.

Figure 3 shows detailed population dynamics in the micro-regions of the Baltic macro-region. The population of most coastal regions of the Nordic countries, Germany, Estonia, and Russia is growing. However, Germany's inland regions demonstrate higher population growth rates than coastal ones do. Most Poland's coastal regions — except for the Tricity — are losing population.

Figure 4 shows the differences between countries and regions in the effect the sea has on the economy. The cargo per 1,000 population ratio of Polish, German, and Russian seaports is rather low. Those of the Nordic countries and Lithuania outperform them. The busiest ports are those of Latvia, Estonia, and Russia's North-West¹. The third group caters for the trade of Russian regions beyond the country's North-West.

Differences in population dynamics in Russian regions, by sea basins

In Russia, the territorial differences in the effect of the sea on the economy and settlement structure are even more pronounced. The sparsely populated coasts of the seas of the Pacific and Arctic Oceans are very dissimilar to the extensively occupied coasts of the Baltic, Black, Azov, and Caspian Seas.

¹ This article understands Russia's North-West as a territory comprising Saint-Petersburg and the Leningrad, Novgorod, Pskov, and Kaliningrad regions (North-West proper).

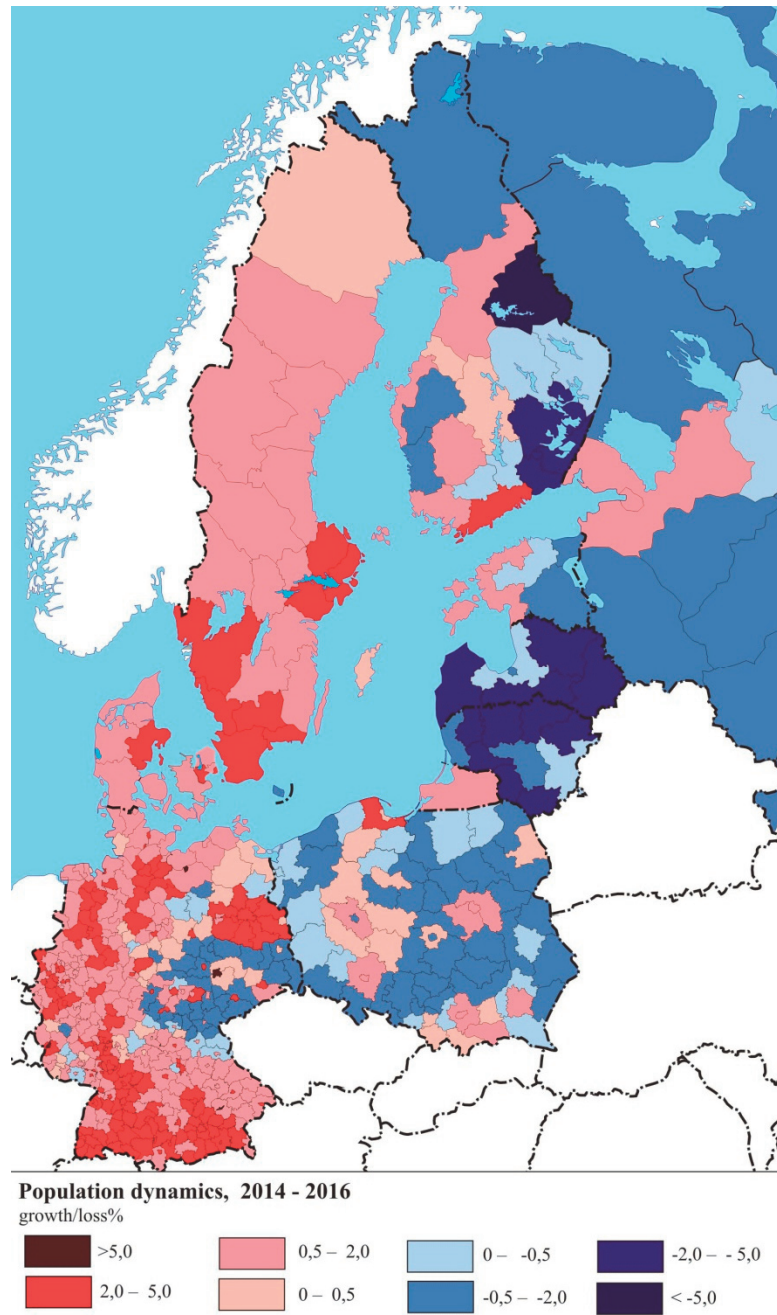


Fig. 3. Population dynamics in the Baltic Sea micro-regions and the Baltic territories of the Russian Federation, 2014—2016

Compiled by the authors based on [28; 31].

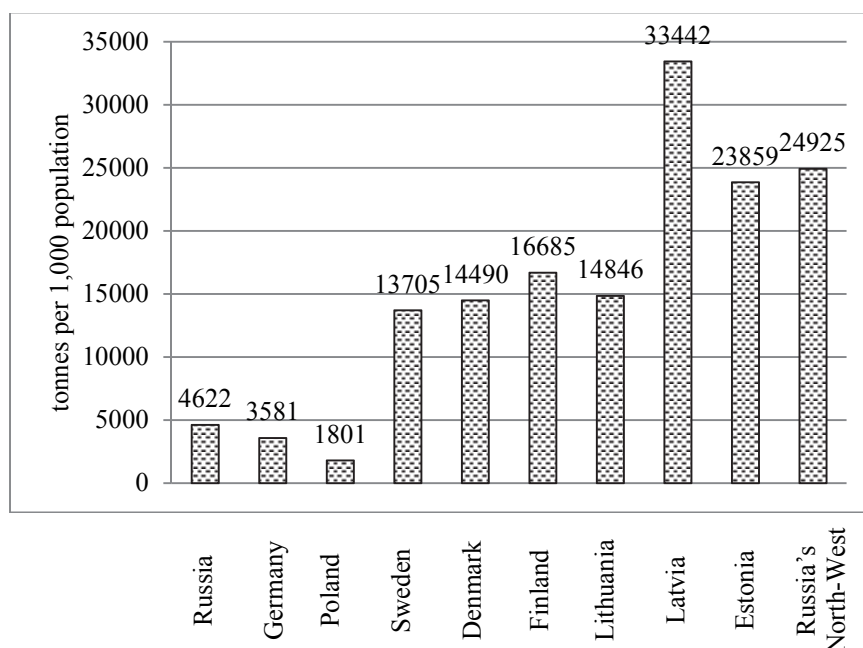


Fig. 4. Cargo handled by seaports per 1,000 population, 2015

Compiled by the authors based on [3; 34].

The population of Russia's coastal zone was growing more rapidly than that of inland regions in the Soviet period. After the collapse of the USSR, the difference between the population growth/decline in coastal and inland regions persisted but reduced significantly. In 1959—1989, population was increasing on the coasts of all the sea basins at a higher rate than in inland regions. Later, in terms of population growth rates, inland regions outperformed the coasts of the Arctic and Far Eastern basin seas.

Overall, in 1959—2016, the specific weight of coastal regions in the total population of Russian Federation increased from 18.2% to 22.8%. This was the case in the regions of the Baltic, Azov-Black Sea, Arctic, and Caspian basins. The proportion of the Far Eastern basin and the European part of the Arctic basin was decreasing. The trend persisted in 2011—2016 (table 1).

Table 1

**Changes in the specific weight of coastal and inland regions
in the population of Russia, 1959—2016**

Region	Year			
	1959	1989	2011	2016
Basins:				
Baltic	4.42	5.12	5.26	5.51
Arctic (Europe)	2.16	2.41	1.89	1.80
Arctic (Asia)	2.35	3.11	3.00	3.01

End of table 1

Region	Year			
	1959	1989	2011	2016
Far Eastern	2.96	3.78	3.02	2.94
Caspian	1.67	2.12	2.94	2.98
Azov-Black Sea	6.80	7.75	8.26	8.33
Total for coastal regions	18.24	21.91	22.50	22.79
Inland regions	81.76	78.09	77.50	77.21
Total	100	100	100	100

Compiled by the authors based on [26].

The proportion of Russia's Baltic regions — Saint Petersburg and the Leningrad and Kaliningrad regions — to the total population increased from 4.4% to 5.5% in 1959—2016.

Coastal regions as development corridors

Significant differences in the factors and characteristics of coastal regional development encouraged G.G. Gogoberidze to construct a comprehensive typology of the World Ocean's coastal regions [7]. These types are qualitatively different in natural and economic characteristics and the rates of socioeconomic and demographic development.

Perhaps, the most effective method is a combination of empirical and theoretical typology techniques. The authors believe that the most appropriate theoretical typology of regions was provided by John Friedmann [35]. Friedmann distinguished between core, upward transition, resource frontier, and downward transition regions. Kaliningrad researchers supplemented this list with international development corridors located between core regions of two or more countries [13].

Empirical data were used in the typology of Russian coastal regions constructed by G.M. Fedorov in 2016. Based on a number of quantitative characteristics, regions are assigned a Friedmann's type or an additional one [27].

Taking further the idea of international corridors, the authors distinguish coastal development corridors. Moreover, some regions can combine characteristics of more than one type. For instance, coastal development corridors in the Baltic region comprise all the core regions of the largest Baltic agglomerations. As development corridors, not only do they evolve because of their position between national and international core regions, but they also have close connections with the most developed international regions. This holds true for the coastal development corridors/core regions of Stockholm, Copenhagen, and Helsinki. The Saint Petersburg agglomeration, which benefits from the communications of the Moscow metropolitan area with international core regions, is also a core region, which increases its significance as a coastal development corridor.

The two other Baltic Russian regions, the Leningrad and Kaliningrad ones, are coastal development corridors proper. This type includes several international coastal centres — Poland's Tricity (Gdansk — Gdynia — Sopot) and Szczecin, Sweden's Gothenburg and Malmö, and Finland's Turku.

Russia's Baltic regions have the most beneficial economic and geographical position among all the national coastal regions, since they neighbour the EU, which is the country's principal international trade partner. The EU accounted for 42.8% of Russia's international trade even after the steep reduction in bilateral trade in 2015—2016.

Table 2 presents data on the socioeconomic performance of Russia's Baltic regions, which, in most cases, is above the national average. They differ from many other Russian regions by the extensive occupation of the territory, high manufacturing output per capita, high proportion of international trade in GRP, and a positive net migration rate. Their seaports — especially, those of Saint Petersburg and the Leningrad region — handle large amounts of international cargo.

Table 2

The socioeconomic performance of Russia and its Baltic territories

	Russian Federation	Saint Petersburg	Leningrad region	Kaliningrad region
Population density, people per km ² , as on January 1, 2016	8.5	3733	21	65
Fixed assets per one employee, 1,000 roubles, 2015	2350	2042	3594	1294
GRP per capita, 1,000 roubles, 2014	403	511	402	316
Fixed asset investment per capita, 1,000 roubles, 2015	99	100	112	64
Manufacturing output, 1,000 roubles per capita, 2015	226	379	460	409
2014 GRP, % of the 2005 level (current prices)	327	241	348	374
Proportion of international trade in GRP, 2014	51	76	107	243
Cargo handled by seaports, 2015	676.7	51.1	166.9	12.7
Proportion in the total cargo handled by Russian ports%	100.0	7.6	24.7	1.9
Net migration per 1,000 population, 2015	1.7	4.9	6.8	8.2

Compiled by the authors based on [8; 22; 26].

With the highest GRP per capita among the three regions, Saint Petersburg has a rather low gross product increase rate. The fixed asset investment per capita is at the national average in Saint Petersburg and well above that in the Leningrad region. In the Kaliningrad region, it reaches only two thirds of the national average. Probably, the potential of these regions as coastal development corridors has not been fully exploited yet.

Conclusions

An important factor positively affecting the economy and settlement structure, the coastal position is often shadowed by other factors, primarily, natural ones. Russia's northern and eastern regions with unfavourable climate conditions develop more slowly than inland regions do.

In the Baltic region, there are both countries with a high concentration of population in the coastal zone (the Nordic states, Latvia, and Estonia) and those where coastal regions are occupied less extensively than inland ones are (Germany and Poland). However, coastal territories have been catching up in recent decades. In Russia, coastal regions develop more rapidly than inland ones do. The exceptions are the Arctic and Far Eastern basins.

Of course, both strategic and spatial planning must take into account the specific features of coastal regions. However, a single strategy cannot be applied to all such territories. The greatest potential for accelerated development is associated with coastal development corridors (especially, core regions, such as Saint Petersburg with its significant socioeconomic and innovative potential). Cementing economic ties between the core regions of partner states, they do not only handle and process transit cargoes but also develop goods and services production through absorbing and modifying innovations coming from the regions that they cater for. Such involvement of coastal development regions into international production and innovation networks contributes to the emergence of international cluster hubs. It facilitates the development of the socioeconomic and innovative systems of the Baltic coastal regions and requires further research.

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