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# Problems of socio-economic development of the Karelian Arctic and ways to overcome them, taking into account spatial and economic features and the legal status of the region

**A Volkov**

Institute of Economics, Karelian Research Centre, Russian Academy of Sciences,  
Petrozavodsk, Russia

kov8vol@gmail.com

**Abstract.** The economic and legal regime of the Russian Arctic is currently in its nascent stage of development. The Arctic has acquired the status of a special object of government control. However, not only new management tools are being formed to enhance the socio-economic development of the region, the borders of the management object themselves are changing - new territories are being included in the Arctic zone. Thus, the formation of the economic and legal regime of the Arctic zone and the incorporation of new territories into its spatial and economic structure not only go hand in hand, but are also of an interdependent nature. In addition, the historically established system of resettlement and distribution of productive forces and the resource potential of the territory should be considered and analyzed based on the new circumstances, strategic development goals and tasks of the spatial organization of the economy of the Arctic zone region. The purpose of this article is to identify urgent problems of the socio-economic development of the municipalities of the Republic of Karelia included in the Arctic zone of Russia, and to develop directions for overcoming them within the strategic priorities for the development of the Arctic zone of the Russian Federation. To achieve this goal, we analyzed the current stage in the formation of the economic and legal regime of the Russian Arctic, examined the features of the socio-economic development of the Karelian Arctic and the spatial organization of the economy, identified areas for improving the spatial organization of the economy of the region in the context of integration into existing projects for the development of the Arctic zone of the Russian Federation and its legal regime. The conclusion was made about the need to expand the Karelian Arctic in order to form an economic space that determines the complex development of the territory. An alternative is the integration of the Karelian Arctic into the emerging support zones of neighboring regions.

## 1. Introduction

Currently, the question of the most effective mechanisms for implementing the strategic interests of the Russian Federation in the Arctic remains a debating point among researchers and managers. Such interests in accordance with the "Fundamentals of State Policy of the Russian Federation in the Arctic for the period until 2020 and for the future perspective" include:

- the use of the Arctic zone of the Russian Federation as a strategic resource base of the Russian Federation, providing solutions to the problems of socio-economic development of the country;
- preservation of the Arctic as a zone of peace and cooperation;



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- saving the unique ecological systems of the Arctic;
- the use of the Northern Sea Route as a means of unified national transport communication of the Russian Federation in the Arctic.

According to the existing program documents, the key component of the emerging economic and legal regime for the development of the Russian Arctic is the format of "supporting development zones". According to the concept established in the Program "Socio-Economic Development of the Arctic Zone of the Russian Federation until 2025" (updated and adopted by Decree of the Government of the Russian Federation of August 31, 2017 No. 1064), the "development support zone" is a "comprehensive project for the socio-economic development of the Arctic zone aimed at achieving strategic interests and ensuring national security in the Arctic, providing for a simultaneous interconnected use of functioning instruments of the territorial and industry development and mechanisms for implementing investment projects, including those on the principles of public-private and municipal-private partnerships". However, the adoption of this format for the strategic development of the region involves the development of a set of management and economic-legal mechanisms for implementing priority projects assigned to each support zone. At the first stage of the Program implementation, eight support zones were allocated: the Arkhangelsk, Kola, Nenets, Taimyr-Turukhansk, Yamalo-Nenets, Vorkuta, Chukotka and North Yakutia zones. With the expansion of the Arctic zone and the inclusion of three municipalities of the Republic of Karelia into it (in accordance with Decree of the President of the Russian Federation of June 27, 2017 No. 287 "On Amendments to Decree of the President of the Russian Federation of May 2, 2014 No. 296 "On the Territorial Territories of the Arctic zones of the Russian Federation""), the question arose of spreading the format of "support zones" to the included territories. A number of researchers refer to the project of the Karelian support zone as the current economic and legal format for the development of the Arctic Karelia [1], while in speeches of officials more often there are proposals on the integration of the included territories into the existing support zone project of one of the neighboring regions (Kola or Arkhangelsk support zones).

Significant scientific groundwork in the development of theoretical and applied aspects of the application of the mechanism of the support zones of Arctic development has been formed in recent years. V. Fauzer and T. Lytkina have carried out a comprehensive analysis of current demographic trends, existing prerequisites and prospects for the formation of new systems of resettlement, dynamics and accumulation of labor resources on the scale of the Russian and world Arctic [2]. The authors have also developed a methodology for determining support settlements in the support zones of the development of the Arctic, based on the concept of demographic gravitation [3].

S. Lipina and A. Cherepovitsyn have developed the conceptual foundations of applying the cluster approach to the development of mineral and raw material resources of the Arctic zone of Russia, they have substantiated approaches to the formation of mineral and raw material centers, and based on them, of innovative technological clusters as starting points for the spatial organization of the regional economy of the Arctic zone. The authors developed a list of promising mineral resource centers in the Arctic zone of the Russian Federation, as well as formulated the basic principles of the integrated development of the territory based on their innovative development [4].

A. Tsukerman has analyzed the challenges and limitations of the innovative development of the Arctic regions of Russia. He has presented the classification of challenges, including macroeconomic, raw material, socio-demographic, financial, infrastructural, technological, legal, human resource, information, integration and transport challenges. All these challenges remain relevant during the formation of the special economic and legal regime of the Arctic zone of the Russian Federation, the mechanisms for overcoming or leveling them should be taken into account in the legal field and management practice [5].

The features of the socio-economic development, resource potential and environmental and economic aspects of the functioning of the national economy of the Republic of Karelia in general and the Arctic Karelia in particular have been studied in detail by P. Druzhinin [6], G. Kozureva [7], G. Shkiperova [8].

## 2. Material and Methods

As part of the analysis of existing socio-economic trends in the development of the Arctic Karelia, the study used statistical data from Rosstat (the Federal State Statistic Service), Kareliastat (a regional division of Rosstat), official publications of regional and federal authorities, as well as legal acts of the federal and regional levels. The program documents of the federal government in the field of strategic priorities and socio-economic development of the Arctic zone of the Russian Federation, and the development and application of the management mechanism of the supporting development zones were considered separately. In addition, the study used the author's proposals in the "Rationalization for the inclusion of the Kalevala national municipal district, Segezha municipal district and the Kostomuksha city district of the Republic of Karelia into the Arctic zone of the Russian Federation" and the regional section of the new developing "Strategy for the development of the Arctic zone of the Russian Federation and ensuring national security for the period until 2035" previously sent to the Ministry of Economic Development and Industry of the Republic of Karelia along with the practice of other specialists from the Institute of Economics of the Karelian Research Center of the Russian Academy of Sciences.

During the study, the author applied the following scientific methods: institutional analysis, analysis of statistical data, the dialectical method.

## 3. Results and Discussion

### 3.1. *The formation of the economic and legal regime of the Russian Arctic and the mechanism of support zones of development.*

One of the main strategic formats for the socio-economic development of the Arctic today is the project of support zones of development. It was based on the provisions of the State Program of the Russian Federation "Social and Economic Development of the Arctic Zone of the Russian Federation until 2020", approved by Decree of the Government of the Russian Federation of April 21, 2014 No. 366. This program was the main mechanism for the implementation of the "Strategy for the Development of the Arctic Zone of the Russian Federation and ensuring national security for the period until 2020", approved by the President of the Russian Federation on February 8, 2013. Decree of the Government of the Russian Federation of August 31, 2017 No. 1064 approved a new version of this state program. The list of its subprograms, the main tasks, target indicators and tools for their achievement, the composition of the responsible ministries and other executors have been updated, the implementation period of the state program has been extended to 2025. One of the most important conceptual components of the "Social and Economic Development of the Arctic Zone of the Russian Federation until 2025" program is subprogram 1 - "Formation of support zones of development and ensuring their functioning, creating conditions for accelerated socio-economic development of the Arctic zone of the Russian Federation".

The goals of its implementation are:

- the development of real sectors of the economy of the Arctic zone of the Russian Federation;
- the creation of conditions for improving the quality of life and security of the population in the territory of the Arctic zone of the Russian Federation;
- the creation of an integrated system of information support for national interests and socio-economic development of the Arctic zone of the Russian Federation.

Among the main tasks are:

- increasing the investment activity in the Arctic zone of the Russian Federation;
- ensuring the implementation of projects for the economic development of the Arctic territories, as well as the continental shelf of the Russian Federation in the Arctic
- ensuring the implementation of projects for the development of the transport, energy and other infrastructures necessary for the formation and functioning of the support zones of development of the Arctic zone of the Russian Federation;

The implementation of these program strategies, in addition to the allocation of regional support zones noted above, takes shape in the implementation of a number of investment projects that has

already begun, as well as in the formation of the main features of the economic and legal regime of the Russian Arctic, outlined in a speech by Alexander Krutikov, Deputy Head of the Ministry for the Development of the Russian Far East, held on December 5, 2019 at the IX International Forum "The Arctic: the Present and the Future." From this speech, we can highlight the following theses based on the draft of the new Strategy for the Development of the Arctic zone until 2035.

A special economic regime will be introduced in the entire Arctic zone of the Russian Federation in 2020. Its main components will be the tax preferences (for example, reduction of the MET rate for gas production for LNG and gas chemistry is planned down to 0% for the first 12 years of industrial production, the same for oil extraction in the new oil provinces in the north of Krasnoyarsk Krai, Yakutia and Chukotka), the possibility of concessional lending to investment projects, state financing of the infrastructure support of the ASEZs. A distinctive feature of the new economic and legal regime will be the freedom of entities within the Arctic zone of the Russian Federation in establishing a tax burden in terms of regional and local taxes, up to the determination of a zero rate.

In general, the project of the Support Zones of Development in the Arctic is focused on three main areas of regional economic development, which are mutually dependent: the development of fuel and energy and mineral and raw material complexes and the development of the transport infrastructure, primarily the Northern Sea Route (NSR). These areas have gained momentum since the adoption of the Arctic Zone Development Strategy in 2013. In pursuance of the initiative of the Government of the Russian Federation on the creation of a unified infrastructure operator for the NSR, the State Atomic Energy Corporation "Rosatom" was vested with relevant powers in the field of development and functioning of the Northern Sea Route and adjacent territories.

### *3.2. The Karelian Arctic in the Arctic Zone of the Russian Federation and the world.*

The term "Karelian Arctic" came into scientific use after the inclusion of three municipal regions of the Republic of Karelia into the land territories of the Arctic zone of the Russian Federation (in accordance with Decree of the President of the Russian Federation of June 27, 2017 No. 287). The included territories were represented by the Belomorsky, Loukhsky and Kemsky municipal regions of the Republic of Karelia. Thus, they became part of a special object of state regulation, in which the Russian Arctic took shape by 2014 [9]. This special status of the Arctic territories is reinforced by the activation of economic processes and the establishment of a special economic and legal regime for the Arctic, aimed at expanding the innovative component of the development of regions. This attracts an increased interest of scientists to the development of problematics related to this object.

Geographically, the Karelian Arctic covers an area of 43,378 km<sup>2</sup>. Of these, 12,797 km<sup>2</sup> falls on Belomorsky district, 22,552 km<sup>2</sup> on Louhsky district, 8,029 km<sup>2</sup> on Kemsky district. The Karelian Arctic region borders on the non-Arctic municipalities of the Republic of Karelia in the south (Segezha municipal region) and the south-west (Kalevala and Muezersky municipal regions), the White Sea in the east, Finland in the west and Murmansk region as the Arctic region in the north. The cohesion of the economic space is supported by the transport framework of the territory, which includes a public highway of federal importance (P-21 "Kola" highway); a network of roads of regional and inter-municipal significance, as well as local significance; a seaport in Belomorsk; the section of the Oktyabrskaya Railway, crossing the Arctic Karelia from south to north (Tunguda station 733 - CP 1,093 km), as well as sections "Belomorsk-Obozerskaya" (Belomorsk-Malenga 128), "Loukhi-Pyaozero" (Loukhi-Pyaozero 103). The latter is used only for the carriage of goods and has not been in operation since the liquidation of OAO Piaozerzsky Lespromkhoz on April 28, 2017. The total length of the public road network of regional and inter-municipal significance of the Karelian Arctic as of January 1, 2020 according to the Department of Automobile Roads of the Republic of Karelia is 1,048 km 670 meters, of which hard-surface roads are 667 km 833 meters, unsurfaced roads are 380 km 837 meters. The total density of roads of regional and inter-municipal significance in the Karelian Arctic is 24.1 km per 1,000 km<sup>2</sup>; the density of hard-surface roads is 15.4 km per 1,000 km<sup>2</sup>. In three municipal districts included in the Karelian Arctic, the provision of road infrastructure of regional and inter-municipal significance is:

- in Belomorsky district - 373 km 690 meters of automobile roads, of which hard-surfaced roads - 168 km 654 meters, unsurfaced roads - 205 km 36 meters. The total density of roads is 29.2 km per 1,000 km<sup>2</sup> of territory, the density of hard-surfaced roads is 13.2 km per 1,000 km<sup>2</sup> of territory.
- in Loukhsky district - 479 km 828 meters of automobile roads, of which hard-surfaced roads - 387 km 618 meters, unsurfaced roads - 92 km 210 meters. The total density of roads is 21.3 km per 1,000 km<sup>2</sup> of territory, the density of hard-surfaced roads is 17.2 km per 1000 km<sup>2</sup> of territory.
- in Kemsky district - 195 km 152 meters of automobile roads, of which hard-surfaced roads - 111 km 561 meters, unsurfaced roads - 83 km 591 meters. The total density of roads is 24.3 km per 1,000 km<sup>2</sup> of territory, the density of hard-surfaced roads is 13.9 km per 1,000 km<sup>2</sup> of territory.

For comparison, the density of hard-surfaced public roads in other regions of the Arctic zone of Russia is: in the Murmansk region - 23 km per 1,000 km<sup>2</sup> of territory, Nenets Autonomous Okrug - 1.5 km per 1,000 km<sup>2</sup> of territory, Yamalo-Nenets Autonomous Okrug - 3.1 km per 1,000 km<sup>2</sup> of territory, Chukotka Autonomous Okrug - 1.2 km per 1,000 km<sup>2</sup> of territory.

Settlements and the distribution of the population in the Arctic Karelia correspond to the focal-dispersed nature of settlement common for the Arctic zone. Some differences may be due to historically prevailing types of economic activity in these territories (logging, fishing), with the relatively weak development of mineral and raw material production common in the rest of the Arctic.

The population of the Arctic Karelia as of January 1, 2018 was 42,799 people, having decreased by 9% from the indicator of January 1, 2014 - 47,030 people (the decrease in absolute terms amounted to 4231 people). As of January 1, 2018, the population of the Arctic zone of the Russian Federation amounted to 2,406.4 thousand people, the population of the World Arctic amounted to 5437.2 thousand people, according to our estimates. Thus, as of January 1, 2018, the population of the Arctic Karelia amounted to 1.78% of the population of the Russian Arctic and 0.78% of the population of the World Arctic.

The calculation of the GRP of the Karelian Arctic poses a certain difficulty due to the peculiarity of the statistical accounting methodology. The estimated data are given in the work of V. Fauzer [2] and refer to the year 2017. According to them, the GRP of the Arctic Karelia amounted to \$303 million; the GRP per capita amounted to \$6898. Taking this value, we can say that the GRP per capita observed by us in the Arctic Karelia is characterized by the lowest value not only in the Russian Arctic, but also in the World Arctic. In addition, the northern territories of the Republic of Karelia are the only region of the Arctic, the GRP per capita of which is below the world average.

This phenomenon is quite simply explained by the absence in the territory of these three municipalities of large-scale industrial production, transport hubs and military facilities, usual for the Arctic zone with its focal nature of development [10]. In addition, the territories under consideration are characterized by the same extremely low population density. There is no large-scale mining in the territory as well.

The mineral potential of the Arctic Karelia is formed by deposits and displays of metalloids (molybdenum, copper, gold, silver, rare earths, platinum group metals, uranium) and non-metallic minerals (granite, gabbrodiabase, sand, gravel, gravel-sand material, granite gneiss, there are occurrences of kyanite (disten), amphibolite, pyroxenite, quartz porphyry, belomorite, quartz, microcline, muscovite, mica raw material, garnet and gem stones). At the same time, 43 deposits of non-metallic minerals were registered on the territory of the Belomorsky district, 8 of them are under development: Kopakovskoye (gabbrodiabase, granite), Zapadno-Sosnovetskoye (granite), Letnerechenskoye (sand), Okunevarakskoye (gneiss granite, granite), Ramrucheskoye (amphibolite, gabbrodiabase, pyroxenite), etc. In total, at the beginning of 2018, 28 licenses were issued in the territory of the district, of which 13 were for the purpose of geological exploration, 9 licenses for extraction, 6 licenses for combined purposes.

On the territory of the Kemsky region, 14 non-metallic mineral deposits were registered, 4 of them are under development: the 6th kilometer (amphibolite), Avnepoprozhskeye (gabbrodiabase), K-900 A km (sand, gravel-sand material), Komsomolsky (sand, gravel-sand material). In total, at the beginning of 2018, 15 licenses were issued in the territory of the district, of which 9 licenses were for geological exploration, 4 licenses for extraction purposes, 2 licenses for combined purposes.

111 non-metal deposits were registered on the territory of the Loukhsky District, 13 of them are under development: the 20th km (sand, gravel-sand material), the 57th km (gravel, gravel-sand material), Blinkovye Varakki (quartz, microcline, microcline pegmatite), Boyarskaya (gravel, sand), Vershinnoye (granite), Dalnee (gabbrodiabase), Kalguvara (granite), etc. In total, 23 licenses were issued in the region at the beginning of 2018, of which 7 were issued for geological exploration, for extraction purposes - 8 licenses, combined purposes - 8 licenses [11].

### *3.3. Prerequisites for the formation of innovative development models in the conditions of the Karelian Arctic.*

The most rationalized way of expanding the innovative component of the development of the regions of the Arctic zone under the existing conditions is the formation of innovative industrial clusters on the basis of mineral and raw material centers and logistics hubs [4]. In particular, in the Arctic Karelia there are certain prospects for the development of the extractive sector, which traditionally plays a key role in the development of the economy of the entire Arctic zone of the Russian Federation.

Muscovite extraction, which had practically ceased in the Karelia-Kola region by 1995 due to a drop in demand from manufacturers of electronics and electrical technology, nevertheless, seems economically attractive in the present conditions. According to V. Shchiptsov's, the residual reserves of mica as of 01.01.2001 amounted to about 70 thousand tons, and the industrial reserves of small-sized muscovite – to 115 thousand tons. [12]. In addition, it is the small-sized muscovite, enclosed mainly in mine dumps, that is of economic interest, as a raw material for the production of fireproof dopes, high-end paints used in the automotive and aviation industries, building materials, specialized electrical insulation, etc. Furthermore, the use of technogenic deposits can reduce the accumulated environmental damage in mining areas. In particular, experts note the prospects of the East Khizovaara deposit, which is located in favorable mining and geological (practically zero overburden, good ore preparation characteristics, the possibility of complex use due to the afterproduct - pure quartz) and geographic and economic (general economic development of the territory, transport accessibility, energy provision, proximity to settlements) conditions [13].

The Lobash deposit (copper, molybdenum) is estimated to be large; its reserves are big enough for the long-term functioning of a mining and processing enterprise with an open form of development. In view of the demand for rhenium in the domestic industry and given the fact that rhenium and molybdenum are contained in molybdenite ore and are mined in the same technological and production process, as V. Ivashenko notes [14], relevant is also an exploration of the Paavaara deposit, located 32 km from the Lobash deposit.

The development of complex deposits in the Tikshozero zone (copper, nickel, gold, palladium and platinum) also presents a certain prospect.

Deposits of quartz located in the Arctic Karelia (with the prospect of enriching highly pure quartz used in the manufacture of fiber-optic communication lines) and kyanite deposits at the Mezhozhernoye deposit and Khizovaara ore field (used in the production of refractory products) are in need of additional exploration and geological study.

Mayskoye and Lobash-1 gold deposits have been prospected and their reserves have been approved by the State Committee for Reserves (GKZ) [15].

The considerable potential for the production of structural stones and high-strength crushed stone from gabbro-diabase and granite in the Arctic Karelia deserves special attention. These materials will be in demand in the implementation of large-scale infrastructure and investment projects in the Arctic zone according to the Program "Social and Economic Development of the Arctic Zone of the Russian

Federation until 2025" (updated and adopted by Decree of the Government of the Russian Federation of August 31, 2017 No. 1064).

Several enterprises are already operating in the region that extract structural stones and produce high-quality crushed stone from gabbro-diabase and granite (in particular, OOO Belomorsky Karyer at the Ramrucheskoye, Kopakovskoye and Zapadno-Sosnovetskoye deposits). However, these enterprises face significant difficulties in transporting their products to consumers, which necessitates the formation of logistics centers serving advantageous innovative industrial clusters of mineral and raw material specialization.

The development of universities, research institutes, technology parks and business incubators may also have a certain perspective in the development of the Arctic Karelia, which is more typical for the northern regions of Sweden, Finland and Norway [6], [16].

In the region under consideration, there are also prerequisites for the creation of a tourist cluster and its integration into the network of existing and upcoming international tourist routes. In particular, now there is a process of formation of the White Sea-Solovets tourist zone (a cluster in perspective). The legal basis of this process is presented by Decree of the President of the Russian Federation of April 6, 2018 No. 145 "On the establishment of the Fund for the Conservation and Development of the Solovetsky Archipelago", which prescribes the creation of the Fund for the Conservation and Development of the Solovetsky Archipelago, as well as the provision of state support to it. According to the text of the Decree, "the Fund provides and (or) finances the construction, reconstruction and overhaul of the communal, engineering, transport and social infrastructure of the Solovetsky Archipelago, as well as the conservation and restoration of cultural heritage sites (historical and cultural monuments) of the peoples of the Russian Federation." At the same time, as amended by subparagraph "b" from March 15, 2019, by Decree of the President of Russia of March 15, 2019 No. 104, this provision is expanded to include a number of Arctic territories of the Republic of Karelia: "The Fund provides for carrying out and (or) financing of works to create communal, engineering, transport and social infrastructures and housing construction on the territory of the Solovetsky archipelago, certain territories of the Republic of Karelia historically associated with the Solovetsky archipelago, reconstruction and overhaul of objects in such infrastructures and housing facilities and conservation and restoration of cultural heritage objects (historical and cultural monuments) of the peoples of the Russian Federation located in these territories."

The development of the fishing industry and aquaculture production has a significant economic potential. The availability of water resources in the Arctic Karelia represented by the White Sea, lakes and rivers with different temperature conditions, chemical composition and formed ecosystems makes it possible to approach the organization of the aquaculture production base with flexibility. Among prospective lines of development, researchers note:

- collection, breeding and processing of various types of algae in the coastal waters of the White Sea, the production of intermediate products and finished products for sale at public catering establishments and as raw materials for the pharmaceutical industry.
- breeding of mussels on an industrial scale, for the organization of which numerous bays on the White Sea coast are well suited. Products of mussel plantations can be used in the food industry, pharmacology. The demand in the world market for this type of raw material is constantly growing [17].
- the creation of new trout farms, including an improved type, using the installation of closed circulation of water, which reduces the load on natural ecosystems.

#### 4. Conclusions

Despite the listed negative socio-economic trends that characterize the development of the Arctic regions of the Republic of Karelia, in general, it is necessary to note the promising aspect of the Karelian Arctic as a raw material base for large-scale infrastructure projects in development in the Arctic zone of the Russian Federation. The richness of the mineral and raw material base, the abundance of water

resources and the recreational attractiveness of the territory form the basis for future innovational clusters.

One of the significant obstacles to the realization of the existing resource and economic potential of the Arctic regions of the Republic of Karelia is the decreasing reproduction of the labor resources and human capital of the region. This circumstance can be partially overcome by attracting labor resources from other regions, as well as using the resource of shift rotation (pendulum migration) [18]. Moreover, the value systems and life attitudes of the population of these territories in the development of their human capital are of great importance. These systems and attitudes, together with the identification of non-formalized in the statistical information characteristics of the region's human capital, are of great research value. It is determined by the importance of this information for the development of a system of economic incentives for the consolidation and subsequent transition to expanded reproduction of human capital in the Arctic Karelia in the management practice. As part of the development of future research tools aimed at supplementing and updating information on the human capital of the region and aspects of its reproduction, we propose the use of sociological methods, in particular, polling. In addition, the studied key indicators reflect the most important aspects of the reproduction of the human capital in the region: the migration attitudes; the possibility of training in the place of residence; the opportunity to receive quality medical care; the opportunity to find a job according to the education and profession; the ability to plan the earnings and investments in one's human capital. The use of these tools will allow us to form an analytical base for informed managerial decision-making in the field of regulating the development of the human capital in the region and creating incentives for its expanded reproduction.

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