Impact Factor:					
	ISRA (India) = 6.317	SIS (USA) = 0.912	ICV (Poland) = 6.630
	ISI (Dubai, UAE) = 1.582	РИНЦ (Russia) = 3.939	PIF (India) = 1.940
	GIF (Australia) = 0.564	ESJI (KZ) = 8.771	IBI (India) = 4.260
	JIF = 1.500	SJIF (Morocco) = 7.184	OAJI (USA) = 0.350

SOI: 1.1/TAS DOI: 10.15863/TAS

International Scientific Journal

Theoretical & Applied Science

p-ISSN: 2308-4944 (print) **e-ISSN:** 2409-0085 (online)

Year: 2023 **Issue:** 11 **Volume:** 127

Published: 05.11.2023 **http://T-Science.org**

Issue Article

Shushanik Armenovna Magtesyan
Institute of Service Sector and Entrepreneurship (branch) DSTU
bachelor

Karina Sergeevna Kopaeva
Institute of Service Sector and Entrepreneurship (branch) DSTU
bachelor

Artur Aleksandrovich Blagorodov
Institute of Service Sector and Entrepreneurship (branch) DSTU
master's degree

Vladimir Timofeevich Prokhorov
Institute of Service Sector and Entrepreneurship (branch) DSTU
Doctor of Technical Sciences, Professor
Shakhty, Russia

Galina Yurievna Volkova
LLC TsPOSN «Ortomoda»
Doctor of Economics, Professor
Moscow, Russia

THE RELATIONSHIP AND DISTINCTIVE FEATURES OF ZATOS AND ONPS IN THE ARCTIC ZONE

Abstract: *The article reflects the result of a detailed analysis of all Arctic settlements in Russia with a population of more than 500 people. taking into account not only standard statistical parameters, but also specially collected data on the location of medical and educational organizations, logistics infrastructure (including the largest civilian warehouses of fuels and lubricants), proximity to licensed areas for mining, etc. The research work carried out is the basis for identifying closed administrative territorial formations (CATOs) and support settlements (SUP) of the Russian Arctic. The detail of the analysis allows us to form a flexible system of criteria for support settlements in the field of external and internal security, as centers of socio-cultural support for the population of the Arctic, centers of service and administrative support for the implementation of resource projects, innovative, information and personnel support for the development of the Arctic, as well as placement points unique enterprises and organizations.A closed administrative-territorial entity (CATE) is an administrative-territorial entity created in order to ensure the safe functioning of organizations located on its territory that carry out the development, production, storage and disposal of weapons of mass destruction, processing of radioactive and other highly dangerous man-made materials, military and other facilities for which, in order to ensure the defense of the country and the security of the state, a special regime for the safe operation and protection of state secrets is established, including special living conditions for citizens. The entire territory of a closed administrative-territorial entity is the territory of a municipal entity with the status of an urban district, and a supporting settlement is a settlement located outside the boundaries of urban agglomerations, on the basis of which the accelerated development of infrastructure is carried out, ensuring the implementation of guarantees in the field of education, the availability of medical care, services in the sphere of culture and the implementation of other needs of the population of the territory of one or more municipalities.*

***Key words**: competitiveness, demand, quality, accessibility, innovation, digital technology, economic policy, industrial policy, union of federal, regional and municipal branches of government; profitability, profit, financial stability, stability, purchasing power.*

***Language**: English*

Citation: Magtesyan, Sh. A., Kopaeva, K. S., Blagorodov, A. A., Prokhorov, V. T., & Volkova, G. Yu. (2023). The relationship and distinctive features of ZATOs and ONPs in the Arctic zone. *ISJ Theoretical & Applied Science, 11 (127)*, 56-66.

Soi: http://s-o-i.org/1.1/TAS-11-127-10 ***Doi***: https://dx.doi.org/10.15863/TAS.2023.11.127.10

***Scopus ASCC**: 2000.*

Introduction

UDC 337.63:332.43.

A striking example is the weak interaction between the Norilsk industrial region and Igarka. Historically, Igarka was one of the bases for the development of Taimyr (in particular, in the field of providing air communications, vocational education for the peoples of the Far North, and wooden housing construction). However, at present, the development of these cities occurs almost completely in isolation (with the exception of ensuring the operation of power lines, and also, from 2021, providing Internet communications). In many areas, Igarka is artificially "tied" to Krasnoyarsk, and in some cases (providing medical care to women in labor) transportation by plane to Krasnoyarsk 1300 km looks simply blatantly illogical (it is about 200 km to Norilsk, and the capacity to receive Igarka patients is in Norilsk is). At the same time, at the everyday level, connections between Igarka and Norilsk are maintained: privately, residents of Igarka go (in the summer, during the navigation period) to Norilsk for medical care (bypassing existing schemes for the provision of medical services), to sell wild plants, etc.; In Norilsk (Kayerkan), a kind of "diaspora" of former Igarans lives, ensuring the stability of ties (the opportunity to spend the night, etc.).

Establishing connections between Norilsk and Igarka could in the future be mutually beneficial in the following areas (the choice of areas is preliminary, detailed assessments are needed), namely:

production of natural milk for the Norilsk dairy plant on the basis of the Igarsky state farm (currently in a state of crisis, although milk production is still maintained);

restoration of vegetable production in Igarka and supplies to the markets of Norilsk and Dudinka (advantage over imported ones - in freshness, with a loss in price);

provision by medical institutionsNorilsk complex medical services for residents of Igarka instead of Krasnoyarsk (the advantage for Igarka is the reduction of time for transporting patients, the advantage for Norilsk is the expansion of funding by attracting additional patients).

The problem is the lack of transport connections: attempts in the last decade to launch flights to Igarka failed for economic reasons. It seems that flights by themselves cannot in a short time initiate a sufficient number of interactions that would bring flights to the payback mode. It is almost obvious that such flights should receive additional financial support at least for the first time - just as start-up entrepreneurs receive support (in other words, a kind of "transport incubator" should be launched: the long existence of the flight will allow the establishment of business relationships, which, in turn, queue will provide demand for maintaining the route). In addition, it is advisable to combine the launch of a flight with organizational changes, and, in particular, with changes in the medical care system.

Today the Russian urban Arcticthus presents an extremely contrasting picture. On the one hand, there are dozens of cases of depopulation of villages and urban areas - it is not surprising that the subject of research for many Russian scientists is increasingly the problems of "compression", the general inefficiency of Arctic cities, and in the applied sphere one hears the head-on question of whether cities are needed at all in the Arctic. But there is another Arctic - the Arctic of rapidly growing cities, mainly in oil and gas producing regions, and they are characterized by the exact opposite set of problems: the high cost of housing, which creates significant problems in attracting scarce specialists, overloaded social infrastructure - against the backdrop of investments in improvement that are exceptional for Russia. The quality of the urban environment of small "oil and gas" cities would be the envy of residents of many even regional centers in central Russia. However, a retrospective analysis clearly shows that the prosperity of modern oil and gas cities may turn out to be temporary - akin to the prosperity that Igarka, Dikson, Vorkuta and other cities of the Far North experienced in the past. It is obvious that the most prosperous cities of the Russian Arctic are in the boom stage of the frontier cycle (the boom & bust cycle), which has been well studied using foreign materials. A scenario for a successful exit from the resource cycle was proposed by Alaskan economist Lee Huskey - according to his "Jack London hypothesis". Its essence is that a young city during a period of frontier boom can accumulate a critical volume and diversity of economy, which will allow, as the main resource is depleted, to continue the life of the city at the next, post-raw materials stage. That is, the city, according to Husky, must move from the frontier

development scenario to the “normal” one. However, the question of the very possibility of a “normal” scenario for city development in the Arctic is open - here it is necessary to answer the question: which of the niches possible for cities in the urban network are, in principle, open in the Arctic.

The spectrum of roles of Arctic cities in the settlement system: an audittheoretical schemes

Let us consider the theoretical possibilities for Arctic cities to play different roles in the Russell system.nia. There are obviously no major hub cities (alpha cities) in the Arctic: all existing cities are smaller. For the growth of Arctic cities to the level of global ones, what is lacking, first of all, is a sufficient volume of regional markets as supporting structures of the innovative economy: in fact, the entire population of the global Arctic (just over 5 million people) is two to three times less than the population of a “normal” global city - and it is size, as already mentioned, that provides the economic opportunity for diversity necessary for innovative development (the connection between size and diversity is deeply developed in the works of M. Fujita). The second factor is, of course, the poor transport connectivity of the Arctic as a whole. True, Anchorage in Alaska is one of the world's largest air cargo ports (cargo traffic between East Asia, Canada and the USA passes through it), but this is clearly not enough to form a global city in the full sense of the term. Regional capitals—second-order hub cities—are already possible in the Arctic. However, there are some peculiarities here too. In the Russian Arctic, Arkhangelsk, which historically has been the focus of development of a vast territory of the Russian North, most closely meets the criteria for a hub city. The region has a pronounced cultural specificity, completely focused on the regional center, which, in turn, has a strong (for a Russian regional center) system of “knowledge” infrastructure - universities, scientific institutions. The current level of income in this case is not indicative: we are talking about the structure of the regional economy, and here Arkhangelsk is an unconditional, classic regional hub city. The situation in the Murmansk region is somewhat more complicated: the economy of Murmansk has historically been focused on servicing activities related to the sea (navy and merchant fleet, fishing, etc.), while the economy of the Murmansk region is largely associated with mining; It is no coincidence that a kind of competition has developed within the region between scientific institutes in Murmansk and Apatity. However, Murmansk is a nodal center not only and not so much of its own region, but of the Russian Arctic basin as a whole, and here the problem of conceptual understanding of the Arctic as a network region arises. Historically, the Arctic (especially Western European) has similarities with other network regions such as the Hanseatic League and the Mediterranean, and in this regard, the metaphor “Arctic Mediterranean” proposed by A. N. Pilyasov is completely justified. But it is worth paying attention to the fact that network regions, which are a network of interconnected equal nodes (connected “everyone with everyone”), are based on the extraordinary permeability of space. Several centuries ago, when the northern land was an almost insurmountable barrier, navigation (combined with movement along rivers and portages) actually connected the vast Arctic territories of Western Eurasia, and also allowed penetration to Mangazeya and further to Taimyr. Cultural contacts along the sea were so close that they led to a strong interweaving of the cultures of the Norwegians and the Pomors, as a result of which even the hybrid pidgin language “Russenorsk” arose. Yes, compared to the impenetrable spaces of the taiga, the Arctic was extra permeable, and one could quite justifiably talk about the existence of a network region.

Modern science of regional development workThis is true, in fact, with multidimensional space: if the range of a physical distance prevents the development of close connections between, say, a pair of cities, then there may be factors that, on the contrary, contribute to the development of such connections, that is, they seem to compensate for the range of physical distances. To designate such factors that “correct” physical space, the term “proximity” is used; distinguish social, organizational, institutional types of proximity, ensuring close interactions over long distances, thanks, respectively, to social connections, belonging to the same corporate structure, common norms and rules, as well as common areas of activity (cognitive proximity, implying common problems and methods for solving them).

The specificity of the modern Arctic is that its development requires solving a number of very specific problems. This is ensuring health and working ability in extreme conditions, improvement and functioning of the urban economy of polar cities, construction in areas where permafrost occurs, etc. Common to the Russian Arctic is the problem of ensuring navigation along the Northern Sea Route. Paradoxically, it is the commonality of problems - despite poor transport accessibility - that unites Arctic settlements into a single network, and it is no coincidence that this commonality is institutionalized through a number of official organizations: the Arctic Council and the Northern Forum, the UArctic network university, the association of mayors of winter cities, regional structures like the Barents Council region, etc. - perhaps there is hardly another region of the world where such close attention is paid to strengthening intermunicipal and international relations. From a theoretical point of view, this is natural. Due to poor transport connectivity and harsh conditions in the Arctic (with rare exceptions), there is no possibility of building normal regions - however, a “stretched” network region is being built, in which

the interaction of remote cities is enhanced due to cognitive and gradually organizational proximity. This proximity is based on a commonality of problems: the modern Arctic network region is being formed around the arrangement of life in conditions of Arctic specifics. This is precisely the niche of competitiveness of Arctic cities: for them, among the few areas of activity, competitiveness in the field of uniqueness, the ability to satisfy the narrow, but very specific needs of Arctic consumers in their own and other Arctic cities turns out to be open. It is the ability to satisfy the specific needs of local consumers (thanks to local knowledge) that is one of the foundations of competitiveness and, in general, the viability of Arctic and northern cities. One of the striking examples is the preservation of the machine-building plant in Magadan in the conditions of the collapse of many domestic mechanical engineering enterprises: its products (washing devices) are focused on the characteristics of the gold sands of specific Kolyma deposits.

The existence (albeit in a weakly expressed form) of an Arctic network "extended" region (due to cognitive, "problematic" proximity) has a direct consequence for solving the problem of support settlements in the Arctic zone of the Russian Federation. It means that the development of the Arctic as a whole is influenced by those settlements that are involved in the network exchange of innovative, information products, as well as other products aimed at meeting the specific demand of Arctic consumers. What is important here is the focus on specificity, and not on production volumes, since competition is built precisely on the advantage of uniqueness (and even monopoly). At the same time, the very principle of functioning of a network region means that the role of a city or town in the economy of such a region is not directly related to size: a small settlement can be quite viable in such a system if it is a monopoly, a unique producer of uncontested products.

The size of this niche should not be overestimated, however, in conditions of a very narrowed range of species, it is more economicalical activities, which in principle can be effective in the Arctic conditions, this area should be given the closest attention.

Note: different systems of urban interrelations can overlap and mutually penetrate each other, just as global cities are simultaneously included in global and their own regional networks.ty (New York is a business center both on a global scale and in the northeastern macro-region of the United States) - and the Arctic "extended" region forms connections that are additional to the classic regional ones, at least in relation to the Murmansk and Arkhangelsk regions.

Further analysis shows another system of interconnections between settlements emerging in the Arctic, and again atypical. We are talking about interaction in the North-South system. This topic is one of the most developed in domestic science and practice in connection with the study of areas of new development. In the applied sphere, at the end of the Soviet period, an idea was formed of a hierarchy of so-called development bases from rear (outside the Far North) to outpost ones. It is to the system of hierarchy of development bases that a number of later proposals for identifying the supporting cities of the Arctic and the Far North go back. It is interesting that even then development bases were understood paradoxically in a post-industrial context - as "spatio-temporal concentration of development services"; this definition was given in the late 1970s by A. A. Sysoev, a representative of the Kosmachev school of research into pioneer development of the territory.

In terms of different types of systems of inter-city economic interactions defined above, the system of development bases can be interpreted as another "extended" region, but this time not a network, but a hub: as a rule, Arctic cities are "tied" to a certain rear base (as this called in Soviet times). The existence of such "extended" regions is clearly manifested in the field of migration. Here, there are migration flows of extraordinary strength, inexplicable from the point of view of ordinary migration factors, between the northern regions of the country and some southern ones: between the Murmansk, Arkhangelsk regions and St. Petersburg, between the Komi Republic and the Kirov region, between the Yamal-Nenets Autonomous Okrug and the south of the Tyumen region, the Kurgan region and some others. Powerful migration (as well as economic) ties over such large distances would not be possible if it were not for additional fuel and additional factors of proximity. Initially, these connections were formed largely in the conditions of the frontier, that is, super-profits due to the rapid commissioning of large volumes of natural resources and the concomitant development of the Northern Sea Route. Like the "archipelago" of cities of the nuclear project, a system of long-distance connections between the North and the South, between rear and outpost bases, was formed in the space of the country, and the functioning of connections over long distances could not be carried out without additional replenishment of resources due to frontier conditions for resource development or additional funding for the development of the North due to the strategic aspects of this process. Research shows that in modern conditions (after a significant weakening during the economic crisis of the 1990s), such long-distance connections continue to be maintained through already established networks of fraternities, and often organizational structures (branches in the North of southern universities, real estate agencies, etc.) etc. simplify contacts between North and South).

What do such connections provide for the development of Arctic cities? Dov and what do the

Arctic cities themselves provide to these connections? In essence, Arctic cities make up for the lack of large cities in the Arctic itself through long-distance connections with "rear bases". From the rear bases they receive the very driving forces of innovative development that large cities provide to their regions: these are the products of research centers for the development of new technologies and new equipment, this is personnel training, this is, finally, access to the sphere of culture and art, which is inaccessible in small towns (theaters, advanced galleries, etc.).

Arctic university cities reliablyare the forges of personnel for the Arctic zone of the Russian Federation. In particular, more than 90% (of the total number of employed) graduates of the Murmansk Arctic State University, the Murmansk branch of the Russian Academy of Economy and State University, the Northern (Arctic) Federal University in Arkhangelsk and its branch in Severodvinsk, the Institute of Management in Arkhangelsk, and the Noyabrsk Institute of Oil find work in the Arctic and gas; 100% of graduates of the Apatity branch of the Murmansk State Technical University are employed. Mostly, employment takes place in the region of study, although some universities train several dozen people not only for their own, but also for other regions of the Arctic: Murmansk State Technical University - with a degree in navigation (mainly for the Arkhangelsk region), Northern (Arctic) Federal university - for the Komi Republic, Murmansk region, Nenets Autonomous Okrug, etc. In general, Arctic universities are at least two thousand graduates employed in the Arctic zone of the Russian Federation annually.

For comparison: all Tyumen universities give for Arktiki - mainly Yamalo-Nenets Autonomous Okrug - approximately 800 people, which is less than what the Northern (Arctic) Federal University trains alone.

In turn, Arctic settlementsstep by consumersgoods and services of their hub cities (from food to high-tech services).

It is this type of connection (nodal city - regional periphery) that allows us to say that between SeIt is the regions that are formed by faith and the South. However, these regions are special because they are literally stretched over distances for which, under normal conditions, intra-regional connections are usually no longer effective. In addition, Arctic cities have a special function: they not only serve as consumers of goods and services from their "rear bases," but also act as conductors of their influence further into areas of new resource development (which in modern conditions is increasingly carried out on a rotational basis). Arctic cities here are distribution centers for the supply of food and household goods, equipment and fuel, and gathering points for rotational crews. Here, "intermediate" points in the higher education system are often created - branches whose students complete their studies at base universities to the south. Intermediate links in the chains of providing fundamental services are also formed here (for example, fundamental geological research is concentrated in scientific organizations in the main settlement zone, while expedition bases, granaries, etc. are concentrated in the Arctic). The role of distribution centers (outpost bases) distinguishes Arctic cities from "ordinary" peripheral hub cities of lower orders. The latter are more characterized by production functions, as well as the provision of goods and services to the immediate periphery (which, in turn, forms a sales market for them). In Arctic cities, due to specific conditions, there are almost no production functions (with rare exceptions), so the importance of transport, logistics, distribution functions increases radically - this is the first thing. Northern cities almost do not receive flows of daily (pendulum) migration from the immediate periphery, as is typical for ordinary cities, but they themselves often turn out to be a hotbed of rotational migration to neighboring (or remote) mining areas, in other words, peculiar "agglomerations inside out" - and this is their second difference. Third, the level of connectivity of such cities with their regional center is still very weak. Figuratively speaking, instead of a regular minibus or train, you have to travel to a hub city by plane with a corresponding increase in travel costs, which forces you to transfer to northern cities some of the functions that would normally be available in a regional center (for example, in northern base cities it is usually presents a wider range of household services than in cities of the same size in the main settlement zone).

In some cases, northern base cities can be considered not only as intermediate points betweenbetween the rear base and resource development areas, but also as "island cities" - a completely special type of city, apparently represented only in sparsely populated areas of the world and partly described in the concept of remoteness, which is gaining popularity abroad. Located in remote, transport-isolated areas, they are no longer so much conductors of city services as their sole suppliers for a territory with a radius of thousands or more kilometers. In other words, where, under favorable conditions, a full-fledged region could have developed, in fact there is one city, which is practically an unalternative center for the provision of many types of services, and it is this unalternativeness that serves as the basis for its viability in Arctic conditions.

It is obvious that maintaining the internal diversity of economic activities in suchinsulator cities require extraordinary costs (among domestic scientists, the Soviet economist Yu. V. Yaremenko paid attention to this aspect), therefore, as a rule, they are formed in frontier regions (that is, areas of excess income), which is fraught with weakening of functions in conditions of depletion of the corresponding deposits. And if, for example, Norilsk

is capable of providing a fairly wide range of services (from scientific research to providing access to modern leisure infrastructure such as specialized cafes, a water park, sports facilities, etc.), then remote island villages, as a rule, provide only vital a set of services: emergency medical care, secondary (sometimes specialized secondary) education, simple banking services, government services, internal security, road and energy services, communications, bread baking. As in the case of the existence of a networked Arctic region, the development of such settlements would be economically ineffective if not for the factor of their uniqueness in the conditions of sparsely populated areas, where, despite their small population, there is nevertheless a demand for these services from indigenous people.

Such “cities of captivity” are often carried out in Arktickfunctions that in the main settlement zone would be performed by much larger settlements. Thus, a city of 30 thousand in the so-called Moscow region could be simply a residential area, almost devoid of services (the shortage of which would be compensated for by other accessible settlements), but in the Arctic it is absolutely no alternative center in terms of providing, for example, medical care ; Likewise, a city of 100,000 people in the Arctic, in captivity, performs almost metropolitan functions.

Таблица 3. Трансформация функций арктических городов и направления выявления их влияния на экономику Арктики как потенциальных опорных населенных пунктов

Универсальные типы городов	Функции	Система информационных и экономических взаимодействий, в рамках которых реализуются городские функции	Типы городов в условиях Арктики	Функции	Системы взаимодействий	Возможные критерии
1	2	3	4	5	6	7
Глобальные города	Генерация инноваций (и соответствующей институциональной системы) как основы мирового технологического развития	Макрорегионы и сеть глобальных городов	–	–	–	–
Города – партнеры сетевых регионов	Генерация инноваций (и соответствующей институциональной системы) как основы мирового технологического развития	Сетевые регионы (как исключение – растянутые сетевые регионы)	Города – партнеры Арктического сетевого региона	Генерация инноваций (и соответствующей институциональной системы) как основы мирового технологического развития	Арктический сетевой регион	Уровень взаимодействия с другими городами Арктики (в том числе уровень транспортной доступности); уровень развития специфических арктических компетенций

Picture 1.

The phenomenon of island cities forces us to reconsidersighton cities in Arctic mining regions. Cities that, by all indications, should have become “supplier cities” are expanding their functions to the role of island cities - that is, they are becoming uncontested points of medical care, the formation of cultural life, uncontested transfer hubs and trade and distribution bases. This trend paradoxically increases (albeit not much) the viability of particularly remote Arctic cities and towns: being not only strictly production centers (as, however, even decision makers in these cities themselves often think), but also uncontested centers for the provision of services for the surrounding area, they gain the competitive advantage of uniqueness. It can be assumed that this somewhat increases their economic viability in the conditions of colossal Arctic increases in prices associated with impassability, extreme climatic conditions, seasonality of many types of activities, etc. Thus, even a cursory theoretical analysis of the settlement network in the Arctic allows us to identify the main 50 functions of Arctic settlements, determined by their role in the settlement network in specific Arctic conditions (Table 1), and accordingly outline directions along which it would be possible to assess the degree of influence of a settlement on the economic development of the Arctic as a potential supporting settlement of the Russian Arctic. The

following sections will evaluate the validity of this hypothesis regarding the functions of Arctic human settlements.

Main part

Determination of support settlements of the formbased onprovisions of the National Security Strategy of Russia and on the basis of paragraph 43 of the unified action plan for the implementation of the Fundamentals of State Policy of the Russian Federation in the Arctic for the period until 2035 and the Strategy for the Development of the Arctic Zone of the Russian Federation and Ensuring National Security for the Period until 2035 (approved by order of the Government of the Russian Federation dated April 15, 2021 No. 996-r) "Development of a list and mechanisms of state support for the development of settlements in which bodies and organizations performing functions in the field of ensuring national security and (or) functions as a base for the development of geological exploration and mineral resource centers are located , implementation of economic and (or) infrastructure projects in the Arctic."

The definition of national security given in the National Security Strategy of the Russian Federation allows us to specify the expression "bodies and organizations performing functions in the field of ensuring national security are located" as bodies and organizations operating in three main areas of ensuring national security, namely:

*ensuring the security of national information resources of the Russian Federation from external threats, protecting the sovereignty of the Russian Federation, its independence and state integrity (hereinafter referred to as strategic functions);

*ensuring the security of national information protection from internal threats, ensuring the implementation of constitutional rights and freedoms of citizens, civil peace and harmony in the country (hereinafter referred to as functions in the field of ensuring internal security);

*ensuring a decent quality and standard of living, socio-economic development of the country (hereinafter referred to as the functions of ensuring socio-economic development), including the functions of a base for the development of geological exploration and mineral resource centers, the implementation of economic and (or) infrastructure projects. The proposed interpretation of national security means, in particular, that the functions of a base for the development of geological exploration and mineral resource centers, the implementation of economic and (or) infrastructure projects in the Arctic are an integral (and in the Arctic conditions - fundamental) part of the functions of ensuring socio-economic development.

Development criteria and a list of support settlements was carried out taking into account the specifics of the territorial organization of the economy and society in the Arctic, due to the impact of which its general spatial patterns of socio-economic development are violated. The key methodological principle has become a functional one: it is proposed to identify supporting settlements based on the nature of the activities of the enterprises and organizations located in them, taking into account their potential impact on the socio-economic development of the surrounding territory. At the same time, the methodology for determining the list of support settlements in the Russian Arctic is based on the following features of the territorial organization of the economy and society identified earlier, namely:

*first feature- this is the specificity of the local territorial division of labor in areas of new development - the formation of a two-part local economic system, consisting of a settlement (development base) and distributed (usually over a vast area) activities for the primary extraction of natural resources. Although the bulk of industrial products are produced outside the populated area (and often with the involvement of labor employed on a rotational basis), the populated area is an integral part of this system, providing transport, logistics and service services, and, to a large extent, the reproduction of personnel, provision of medical care, etc. However, activities in the field of information and innovative support for mining operations are of particular importance. Services of this kind, provided by enterprises and organizations of the locality (geological work, oil services, etc.), are a key factor in extending the operability of the entire system over time, since they ensure the renewal of resource reserves "in breadth" (new fields) or "in depth" (ensuring the development of hard-to-recover reserves);

*the second feature is the specific role of the settlements of the North in the interregional division of labor in the "North is the main settlement zone" system. Here, populated areas serve as the main "conductor" of development - logistics centers on a trans-regional scale, as well as a base for adapting equipment and technologies developed in key economic centers of the country and the world for the specific conditions of the North and the Arctic;

*the third feature is the network organization of the settlement and economic system, characteristic of the Arctic as a special (network) region. In fact, the system of settlement and economy in the Arctic is a network of relatively weakly connected local centers, while in the main settlement zone of Russia monocentric regions with clearly dominant centers predominate, with which, in turn, all settlements in the region are connected by year-round transport routes (a similar structure - and then adjusted for worse transport connectivity - in the Arctic is represented only in the Murmansk and Arkhangelsk regions; the

Arctic regions of the Republic of Karelia are part of such a system with a center in Petrozavodsk).

The network organization of settlement and economy is characterized by specialization of individual nodes of the system with the exchange of goods and services not according to the "regional center - serviced periphery" scheme, but according to a more complex scheme. In particular, in the Russian Arctic, a kind of "division of labor" often develops between administrative centers, transport hubs and main bases serving mineral extraction areas: Yamalo-Nenets Autonomous Okrug, Chukotka Autonomous Okrug, the Arctic part of the Krasnoyarsk Territory and the Republic of Sakha (Yakutia)); in some cases, scientific and innovation centers (Apatity) are also isolated.

This circumstance makes it impossible to identify a small number of multifunctional support settlements: the network system of organizing settlement and economy in the Arctic must be compared with a system of sufficiently numerous support settlements of different functional specializations (Figure 1).

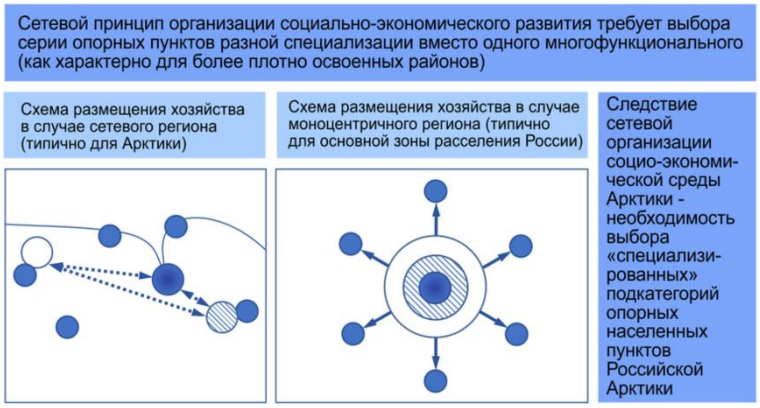

Figure 1. The need to identify specialized intersecting categories of SNP as a consequence of territoriality real organization of the Arctic zone of the Russian Federation

One of Features of the network organization of economy and settlement is a sharp imbalance in the territorial structure of the transport and logistics infrastructure and settlement system. A comparison of these two parameters quite clearly makes it possible to identify settlements that perform the functions of transport and logistics bases for mineral resource centers and other mineral development areas outside settlements.

Spatial "mismatch" of settlement centers (including specific infrastructure for serving the population, in particular food supplies) and centers of transport and logistics services for mining areas brighter Allit manifests itself in the territoryChukotka and Nenets Autonomous Okrug with adjacent areas.

A comparison shows that the bulk of Chukotka's settlement centers are located in the east of the region and in the Chaun-Bilibinsky district, while economic activity is concentrated mainly in the western part of Chukotka, and the supply (judging by the location of fuel and lubricants bases) comes from the west, from the territory of the Republic of Sakha (Yakutia). At the same time, sometimes centers that are extremely small in terms of population play an important role in the transport and logistics support of mining areas; cities located to the south of the territory of the district serve as transport and logistics centers for supplying the Nenets Autonomous Okrug, such as Vorkuta, connected by winter roads to the eastern regions of the Nenets Autonomous Okrug, and Usinsk (central regions of the Nenets Autonomous Okrug). This example shows well, firstly, the interregional significance of many stronghold settlements in the Arctic, even if they are small in population (Usinsk); secondly, according to the above maps, it is obvious that settlements can play the role of a transport and logistics base, which are not stereotypically associated with the logistics functions of servicing remote territories, but only with mining in the immediate vicinity - while Vorkuta turns out to be not only a coal mining center, but also transport "gateway" to the east of the Nenets Autonomous Okrug.

There is a paradox: on the one hand, as already indicatedAlthough higher than the main settlement zone, in the Arctic the functions of administrative management of the region and provision of the extractive industry are often separated in space. On the other hand, on the contrary, cities that are usually considered purely as highly specialized industrial centers (Vorkuta, Novy Urengoy, Noyabrsk, Norilsk, etc.) are in fact also important centers in which enterprises and organizations are concentrated that provide services to the population and economic entities in the surrounding area.

At the same time, the area of provision of such services sometimes extends beyond even the territory of the region in whichlocatedcity: thus, Novy Urengoy serves as a food base for Igarka, Vorkuta for the

eastern regions of the Nenets Autonomous Okrug and even partly the Yamalo-Nenets Autonomous Okrug. It was Vorkuta (which is traditionally associated only with the coal mining industry) that was the base for the construction of the Bovanenkovo - Ukhta gas pipeline (the completion of construction significantly aggravated the economic situation in the city).

Thus, the role of single-industry mining cities in providing logistics services to other areas is usually underestimated. That is why, when developing a methodology for determining reference populationspoints of emphasison their role in the socio-economic development of the surrounding territory, and not only (and not so much) on the activities of the city-forming enterprise.

Let us draw attention to the territorial problem of determining the supporting settlements of the Arctic zone of the Russian Federation: often the functions of the basis for the socio-economic development of the territories of the Russian Arctic are performed by settlements that are not formally included in the boundaries of the Arctic zone of the Russian Federation.

A striking example is Magadan and the Magadan region, which are not formally part of the Russian Arctic, but due to established economic and organizational ties, continue to serve as a base for the development of the Chukotka Autonomous Okrug.

Thus, the Magadan region is now the largest supplier of qualified personnel to Chukotka, as evidenced by the migration index and the absolute number of graduates of Magadan universities employed in Chukotka in recent years (according to the Russian Ministry of Education and Science). The absolute number of such migrants is small - a little more than 30 people per year, but one must understand that this is almost the only flow of qualified personnel to Chukotka: practically no people from other regions of the Russian Federation find employment in the Chukotka Autonomous Okrug. Even from the Khabarovsk and Primorsky territories, the number of university graduates who came to Chukotka is 3–4 times less than from the Magadan region (only 5–10 people). This, by the way, casts doubt on the prospects for organizing a separate Arctic university in Chukotka.

Currently, a branch of the Magadan North-Eastern Integrated Research Institute (SVKNII) is successfully operating in Chukotka. Traditionally, the vast majority of scientific research in various fields (geology and geophysics, ethnology, economics, history, medicine, etc.) on the territory of the Chukotka Autonomous Okrug is carried out by Magadan specialists.

In Magadan, over many decades, a material and information base has also been accumulated for the scientific study of the economic potential of Chukotka (the most significant are geological archives and materials - the most important information base for further research into the resource potential of the Far Eastern Arctic).

The most pressing issue, however, is regarding the completion of the Ust-Srednekanskaya hydroelectric power station, the full capacity of which is designed to provide electricity for the development of the Baimskaya ore zone in the Chukotka Autonomous Okrug. Connecting consumers of the Baimsk ore zone should reduce the tariff for electricity supplied to consumers in the Magadan region, and thereby contribute to the development of the economy and improve the living standards of residents of the region. However, it is currently planned to supply the Baimsk ore zone with electricity through new generation facilities in the north of Chukotka (the construction of the floating nuclear power plant alone is estimated at 190.23 billion rubles), new power lines, shore preparation and other work are also required.

Meanwhile, the supply of the Baimsky mining and processing plant based on the implementation of the socio-economic development of all levels of the Ma energy bridge included in the strategic planning documentsGadan - Chukotka" would, according to existing estimates, be significantly cheaper than the new project. In the future, the construction of a power line at the Baimsky GOK would be the beginning of work to eliminate the isolation of the Chukotka energy system from the Central Energy System of Russia and, in addition, could solve the issues of replacing the retired capacities of the Bilibino NPP and creating an energy reserve. However, the currently implemented supply scheme for the Baimsky GOK essentially ignores the existing development base in the Magadan region and follows the path of forming a new, from scratch power supply scheme from the Northern Sea Route. In addition to direct costs, this undermines the economic sustainability of the “sub-Arctic” Magadan region: the feasibility of such a project from the point of view of the Russian economy as a whole can be questioned.

Since the historical regions of the Far North were formed based on economic bases in the so-called Near North (today, for the most part, these regions are not part of the Russian Arctic), a similar situation can be repeated many times along the southern border of the Russian Arctic.

In this studythis problem was left without consideration, however, in the future it is advisable to identify the entire range of economic and socio-cultural functions of the Russian Arctic in order to identify the range of settlements that actually influence the development of the Arctic.

The analysis convincingly shows that ensuring economic activity in the adjacentterritories (with a radius of up to several hundred kilometers) is one of the most important functions of Arctic settlements within the framework of ensuring national security in the Arctic as a whole.

Supporting functions in the development of the economy of the Arctic zone of the Russian Federation are performed by the following groups of industries concentrated in the Arcticlocal settlements, namely:

*industries aimed at the emergence of newtechnologies,types of activities and/or for the development of new areas of the Russian Arctic - this group of industries can be conditionally called Arctic innovative or Arctic propulsive - this is geological exploration, other specialized scientific research, primarily focused on adapting production processes to the conditions of the Arctic and/or individual territories, fields and so on.;

*industries that provide technical and technological support to already established complexes of extractive industries outside cities (including the production of the main products of mineral resource centers): these are oil services and other services for the extractive industry; production of goods and services to support the work of resource extraction companies outside the urban area: transport support, logistics, banking support, etc.; production and repair of equipment and components; often food supply, etc.;

*managerial and organizational activities to ensure resource extraction activities. The effectiveness of management decisions decreases with increasing distance between the place of decision-making and the place of its application (the so-called institutional distance, the detrimental role of which in the development of the North and the Arctic is shown in the works of Alaskan scientists), therefore it is necessary to locate management structures in cities - development bases (compared to their placement in the main settlement zone of Russia).

Similar security functions are performed byArctic settlements in the social-cultural spheretour services for the entire population of the Russian Arctic (including indigenous minorities, workers hired on a rotational basis, as well as military personnel in the event of their quartering near populated areas). In particular, the role of Arctic settlements is especially great in ensuring the conservation and reproduction of the population in sparsely populated areas of new development and also, obviously, in the sphere of ensuring external and internal security.

It is advisable to base the definition of support settlements in the Russian Arctic on an assessment of the support functions of settlements (Arctic propulsion, service, management, as well as support in the sociocultural sphere, in ensuring internal and external security). In other words, the greater the influence a settlement has on the development of the surrounding territory, the more it can be considered a supporting one.

At the same time, the second specific feature of the role of Arctic settlements in ensuring national security and socio-economic development must be taken into account. In the Arctic, even small settlements can play the role of an organizing center, a development base for the surrounding territory (including mineral resource centers, as well as for areas inhabited by indigenous peoples) on the same scale as larger settlements outside the Arctic usually perform. Therefore, when assessing the degree of influence of Arctic settlements on the development of the surrounding territory, one cannot rely on the size of their population (although many methods for assessing the influence of settlements on the surrounding space are based specifically on population size - these are methods for assessing the potential field, various interpretations of Christaller's concept of "central places" and etc.).

Taking into account these limitations, the fact of the presence of enterprises and organizations of basic types of activity in the settlement (according to the definition adopted above - affecting the development and security not only in the territory of the settlement, but also beyond its borders) can be used as the main methodological method for selecting reference settlements). When developing criteria for support settlements, the following can be clarified: the area of influence of the basic industries of support settlements, the scale of production of goods and services in these industries and other quantitative parameters.

Finally, one more caveat needs to be made. There are a few manufacturing enterprises in the Arctic, which, however, are leading in their industry, significantly influencing the development of the industry and the country's economy as a whole. These are, in particular, the enterprises of the MMC "Norilsk Nickel" - the world's largest nickel refining production in Monchegorsk, as well as the production of nickel matte and semi-finished precious metals - in Norilsk, these are the defense enterprises "Sevmash" and "Zvezdochka" in Severodvinsk, the construction Center for the construction of large-capacity marine structures in Murmansk (Belokamenka) and some others. These enterprises do not fit into the concept of a base, but the cities where they are based, of course, should be classified as the core settlements of the Russian Arctic due to the uniqueness of the enterprises located in them and their role in the economy of the country as a whole. The above provisions lead to the following definition of support settlements.

The core settlement of the Arctic zone of the Russian Federation is defined as a settlement located within the Russian Arctic and in which enterprises and organizations, playing significant role in providing in the locality and the surrounding area one or more of the following areas, namely:

*protection of the national interests of the Russian Federation from external threats, protection of the sovereignty of Russiaskaya Federation, its independence and state centerflatness;

*protection of national interests from internal threats, ensuring the implementation of constitutional

rights and freedoms of citizens, civil peace and harmony in the country;

*decent quality and standard of living, socio-economic development of the country (including serving as bases for the development of geological exploration and mineral resource centers, implementation of economic and (or) ininfrastructure projects in the Arctic).

According to this definition, a specific locality in the Russian Arctic can perform functions within the framework of either one, two or three tasks to ensure national security - depending on the type of relevant enterprises and organizations located in it. So, for example, Severomorsk (a closed administrative-territorial entity) performs functions both in the sphere of ensuring the protection of Russia's national interests from external threats (which is due to the status of a ZATO), and in the sphere of ensuring the quality and standard of living (industrial enterprises - for example, a bakery; and also the social sphere, etc.) and internal security (for example, the activities of departments of the Ministry of Internal Affairs).

To formulate proposals regarding the inclusion of Arctic settlements in the list of support centers, 256 settlements were analyzed Russian Arctic - all settlements with a population of at least 500 people (at the beginning of 2021), for which a total of 57 indicators have been collected (in addition to statistical ones, including indicators of the development of the mining industry within a radius of 150 km from the settlement, characteristics of the transport situation, location government, medical organizations, fuel and lubricants warehouses and food depots, etc.). Additionally, in connection with the analysis of transport development, permanent settlements with a smaller population (22 in number) were considered, in which large fuel and lubricants warehouses and/or large transport enterprises are located, as well as a number of rotational camps with large cargo or passenger turnover of airports.

References:

1. Baburin, V. L., & Zemtsov, S. P. (2015). *Evolutioncity systemssettlements and dynamics of natural and socio-economic processes in the Russian Arctic*. Regional studies. T. 50, 2015.
2. Gunko, M. (2020). Cities of the Russian Arctic in a constant cycle of change. *Urban Research and Practice*, 5(1), 7-8.
3. Zamyatina, N. Yu., & Goncharov, R. V. (2020). Arctic urbanization: phenomenon and comparative analysis. *Bulletin of Moscow University*. Episode 5: Geography. — 2020. No. 4. pp. 69-82.
4. PeelSov, A. N. (2019). Cities of the Russian Arctic: comparison by economic indicators. *Bulletin of Moscow University*. Episode 5: Geography. — 2019. No. 4. pp. 64-69.
5. Fuzer, V.V., & Smirnov, A.V. (2018). Russian Arctic: from stockades to urban agglomerations. *ECO*. — 2018. No. 7 (529). pp. 122-130.
6. (1914). *Regions of Russia. Socio-economic indicators 2019.* 02/1/2020. Retrieved from https://gks.ru/bgd/regl/b1914p/Main.htm
7. Zamyatin, N. Yu. (n.d.). *Arctic cities: the will to diversity.* Retrieved from https://goarctic.ru/society/arkticheskie-goroda-volya-k-raznoobraziyu/
8. Zamyatina, N. Yu., & Goncharov, R. V. (2020). Arctic urbanization: phenomenon and comparative analysis. *Bulletin of Moscow University*. Episode 5: Geography. — 2020. No. 4. pp. 69-82.
9. Pilyasov, A. N., & Kibenko, V. A. (2020). Reindeer herders-entrepreneurs: the difficult path to gaining economic independence. *Scientific Bulletin of the Yamalo-Nenets Autonomous Okrug*. — 2020. No. 1 (106). pp. 20-46. DOI 10.261 0/ARCTIC.2020.106.1.003.
10. Pilyasov, A. N. (2016). Development of city centers - outpost bases of the northern frontier. *Bulletin of the North-Eastern Scientific Center of the Far Eastern Branch of the Russian Academy of Sciences*. — 2016. No. 1. pp. 107-18.
11. Fauzer, V. V., Smirnov, A. V., Lytkina, T. S., & Fauzer, G. N. (2019). Economic and social changes: facts, trends, forecast, 2019. T. 12. No. 5. pp. 25-43. DOI: 10.15838/esc.2019.5.65.2.
12. Goncharov, R.V., Dankin, M.A., Zamyatina, N.Yu., & Molodtsova, V.A. (2020). Cathedrals in the desert or support bases? Typology of settlements in the Russian Arctic according to the nature of the relationship with the surrounding territory. *Urban Research and Practice*. 2020, 5(1), pp.33-56. https://doi.org/10.17323/usp51202033-56.