

## Artículo de investigación

## Modern transformations of russian economic space and development of social infrastructure

СОВРЕМЕННЫЕ ТРАНСФОРМАЦИИ ЭКОНОМИЧЕСКОГО ПРОСТРАНСТВА  
 РОССИИ И РАЗВИТИЕ СОЦИАЛЬНОЙ ИНФРАСТРУКТУРЫ

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### Abstract

The article highlights modern emphases of Russian and foreign research studies on social infrastructure. Trends of changes in the content of the "social infrastructure" concept in Russian realities are considered. Taking into account global post-industrial trends, as well as peculiarities of spatial development of Russia and its regions, the need to transform the content of "social infrastructure" concept is substantiated. The analysis of macro-regional space saturation of the Far East by components of social infrastructure is carried out, their parameters are specified. The urgency of problems considered is determined by the necessity of saturation and consolidation of Russian regional space. Thus, social infrastructure is considered from the standpoint of Russian spatial development as a component of space configuration (saturation and consolidation). The purpose of this article is to highlight relevant attributes of modern social infrastructure from national perspectives of

### Аннотация

В статье освещены современные акценты российских и зарубежных исследований социальной инфраструктуры. Рассмотрены тенденции изменения содержания понятия «социальная инфраструктура» в российских реалиях. С учетом глобальных постиндустриальных тенденций, а также особенностей пространственного развития России и ее регионов обоснована необходимость трансформации содержания понятия «социальная инфраструктура». Проведен анализ макрорегиональной пространственной насыщенности Дальнего Востока компонентами социальной инфраструктуры, уточнены их параметры. Актуальность рассматриваемых проблем определяется необходимостью насыщения и консолидации российского регионального пространства. Таким образом, социальная инфраструктура рассматривается с точки зрения пространственного развития России

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human potential preservation and human capital accumulation, as well as to determine indicators and parameters of social infrastructure state of priority macro-region, the Far East. It is proposed to include in concept of social infrastructure functionally significant and thus relevant to the current stage of national development in the post-industrial period components: human potential preservation and human capital accumulation with an emphasis on consistency. The authors propose classification of social infrastructure according to functional bio-socio-humanitarian criterion. The algorithm of complementarity is formed: indicators of each function correspond to specific statistics. This approach is appropriate for use in order to manage development (saturation) of regional (macro-regional) space, especially the Russian Far East.

**Keywords:** Social infrastructure, regional space, classification, differentiation, Far Eastern macro-region, national security.

как компонента конфигурации пространства (насыщения и консолидации).

Целью данной статьи является выделение актуальных атрибутов современной социальной инфраструктуры с национальных позиций сохранения человеческого потенциала и накопления человеческого капитала, а также определение индикаторов и параметров состояния социальной инфраструктуры приоритетного макрорегиона Дальнего Востока.

Предлагается включить в концепцию социальной инфраструктуры функционально значимые и, следовательно, соответствующие текущему этапу национального развития в постиндустриальный период компоненты: сохранение человеческого потенциала и накопление человеческого капитала с акцентом на последовательность. Авторами предложена классификация социальной инфраструктуры по функциональному биосоциально-гуманитарному критерию. Формируется алгоритм взаимодополняемости: показатели каждой функции соответствуют конкретной статистике. Такой подход целесообразно использовать для управления развитием (насыщением) регионального (макрорегионального) пространства, особенно российского Дальнего Востока.

**Ключевые слова:** социальная инфраструктура, региональное пространство, классификация, дифференциация, дальневосточный макрорегион, национальная безопасность.

## Introduction

Russian spatial development in the present period (the end of the second decade of the 21<sup>st</sup> century) obviously relies on two spatial structures: cities (as reference points) and infrastructure as an element, connecting these reference points of space, and also considered as a component of its saturation and consolidation (Makar, 2018).

In modern economic studies on regional differentiation and specialization, authors, comparing Russian macro-regions (federal districts) on infrastructure provision, distinguish its following types: transport, communication, financial, and social (Kryukov, 2018, p.14). National researchers traditionally put forward transport infrastructure in the first place.

Obviously, it is explained by features of economic-geographical and physical-geographical position of Russia, its spatial development. This approach has developed, as they say, historically. However, in the post-industrial era of social development, as well as taking into account the humanization of scientific knowledge, it is important to note the importance of *social infrastructure*, to focus on its essential features, as well as to point out new trends in its development.

## Literature Review

In national economic studies of the previous seven years (since 2013), social infrastructure was considered multifaceted: as a factor of life

quality development of population (Antonyuk and Bulikeeva, 2014), as a component of regional economy (Smirnova, 2014), as an opportunity to solve social problems in a market economy from the standpoint of economic theory (Ulyanova, 2014), from the standpoint of budget investment of social infrastructure main branches (Boger, 2014), as well as identification of priority areas of development/financing in the region (Medvedeva, 2014; Tkhorikov et al., 2018). Attention is also paid to sustainable development of social infrastructure in rural and urban areas (Zabelina, 2014; Azieva, 2014; Sapozhnikova, and Kuzneczova, 2014), theoretical aspects of social infrastructure importance in economic space (Borodatova, 2013), state priorities in social infrastructure financing (Medvedeva, 2014, Boretskij, 2014).

The number of foreign scientific articles on this subject in the same period (2013-2019) annually increased. Among the presented works there is interest in forecasting the demand for infrastructure due to its destruction by natural disasters (modeling of drinking water network) (Guidotti, et al., 2019), guidelines for sustainable development of cities (urban ecological ecosystems) (Zhang et al., 2019), waste management (Zhang and Zhao, 2019), creation of intellectual infrastructure for a smart city (Vakali et al., 2013), investments in broadband (Van Der Wee, and Beltrán, 2015), mobile networks (Kibilda et al., 2015), prosthetics of vital organs - limbs (Marino et al., 2015). Practical work in recent years is related to sustainability of cities, society as a whole, individual communities (for example, people with disabilities). Theoretical studies are quite rare, and here we note those that emphasize the important role of digital communication infrastructure in reducing the cost of trade and knowledge accumulation (Carlsson, et al., 2013; Aleksandrova and Yarasheva, 2016).

In the last three years, there has been a decline in interest in the researches of Russian social infrastructure. Scientific publications considering it in the context of Russian spatial development concern mainly questions of rural territories development. The authors consider it relevant to review social infrastructure statistical indicators of subnational - regional space from functional positions - human potential preservation and human capital accumulation. Elements that are currently being considered in the context of social infrastructure have begun to emerge in the process of territorial settlement and development (Repnikova et al., 2019). For the harsh natural conditions of Russia (North Zone), it was, first of all, historically represented by

permanent dwellings – settlements, surrounded by a fence (wall) to protect against wind, animals, enemies, as well as temporary shelters for resource sources development – wintering, borrowing, etc.

The modern national *concept* of social infrastructure originates from the Soviet period of social development. During this period, it was, firstly, formed as an antipode to production infrastructure. Secondly, together with the latter, it has come to be seen as a factor of location and regional development. Thirdly, its role was defined as a condition for ensuring daily life of population.

In the late Soviet and post-Soviet, as well as in modern Russian period of science and practice development (1977-2018), social infrastructure was defined with different accents and shades, obviously associated with "demands of time»:

- 1) As *living conditions* - in addition to terms of material production service;
- 2) As "*material elements* that ensure conditions of human life in society – production, political and spiritual spheres, in family, in everyday life" (Dobrenkov and Slepnev, 1994, p. 66);
- 3) As "*a set of industries* such as science, education, health, trade, catering, consumer services, housing and communal services, transport, communications, etc." (Dobrenkov and Slepnev, 1994, p. 66);
- 4) As *a group of industries* that ensure process of material goods/services reproduction and normal living conditions of population - housing construction and operation and socio-cultural facilities, retail trade, public catering, health, education, etc." (Abalkin, 1999, p. 259);
- 5) As *a complex of industries* united by labor force reproduction (health care, education, retail trade, passenger transport, housing and communal services, leisure activities, catering, household services, etc.) (Kushlin and Volgin, 2000; Pinkovetskaia, et al., 2019);
- 6) As *a combination* of existing *structures, buildings, networks and systems* necessary to ensure daily life (Golubchik, et al., 2015, p. 263).

The concept of social infrastructure is often used in conjunction with, and is sometimes confused and identified with the concept of "social

sphere". Social sphere is understood, according to economic dictionary as "a set of industries, organizations, directly related and determining the way and standard of people living, their well-being, consumption" (Borisov, 1999, p. 695). It includes the sphere of services - education, culture, health care, social security, physical culture, catering, public services, passenger transport, communications (Rajzberg et al., 1996, p. 318). In economic literature of the Soviet period the concept of social infrastructure was identical to the concept of "nonproductive sphere" (Shepotko et al., 1983). In response to clarification "social infrastructure" definition, we should note that the concept of "infrastructure" focuses on real objects that ensure life of both individual and society. The actual concept of "life quality" is based on indicators of social infrastructure level development/functioning (Medvedeva, 2014, p. 20].

## Methods

The author's hypothesis is the allocation from the national point of view of preserving human potential and human capital accumulation the actual attributes of a modern social infrastructure, defining the key indicators state of the social infrastructure priority of the macro-region. The practical implementation of this idea involves the use of methods of comparative and economic-statistical analysis, as well as the following steps:

- Selection of contemporary emphases in Russian and international studies of social infrastructure;
- Consideration of trends in the content of the concept of "social infrastructure" in the Russian realities;
- Empirical analysis of the saturation of the macro-regional space with the components of social infrastructure, specification of their parameters.

## Results

In the course of the study, the following main results were obtained, characterized by scientific novelty. Social infrastructure is considered from the standpoint of spatial development of Russia as a component of the configuration of socio-economic space. The author's interpretation of the term "social infrastructure" is proposed. The concept of social infrastructure is proposed to include functionally significant and relevant for the current stage of national development

components-the preservation of human potential and the accumulation of human capital. The author has developed a classification of social infrastructure functional bio socio humanitarian criteria. The author's algorithm of complementarity is formed: specific statistical indicators correspond to indicators of each function.

## *Classification of social infrastructure components*

Authors believe that in the period of post-industrial development of society and relevance of Russian spatial development strategy, it is advisable to complement the social infrastructure definition as follows. *Social infrastructure is understood as a combination of elements and components of territorial socio-ecological and economic systems, determined as a condition for human potential preservation and human capital accumulation and regional economy reproduction.*

The issues of social infrastructure components differentiation and classification are presented in a number of scientific papers. Thus, indicators of social infrastructure development in the region are combined in the following positions, which are designated as problems: demographic situation, housing, welfare, health, education, involvement in public activities (Smirnova, 2014, p. 88]. Functional structure of the region can include five functions, each of which is a set of social infrastructure elements and is positioned (Medvedeva, 2014) as indicators of sustainable development of the region social infrastructure: housing, food and nutrition, health, environment, personal security, education, culture, democracy and participation, communication, well-being. Social infrastructure is considered as a set of separate infrastructure blocks (infrastructure "education", infrastructure "health care", infrastructure "culture", infrastructure "sport"). In foreign studies other classification forms are considered, for example, socio-technical water infrastructure (Kandiah, et al., 2019).

To clarify and supplement indicators characterizing social infrastructure of the region, it is necessary, in the authors' opinion, to separate infrastructure from social sphere, and then to carry out from bio-socio-humanitarian positions the fundamental division (classification) of infrastructure into "social" and "non-social" (other).

Table 1. Classification of social infrastructure components by functions  
 (bio-socio-humanitarian criterion)

<b>Social infrastructure - function</b>			
<b>for life support (human potential preservation)</b>		<b>for human development as part of socio-economic system (human capital accumulation)</b>	
<b>Needs/ vital</b>	<b>Possible characteristics fulfilling the needs</b>	<b>Needs/ social</b>	<b>Possible characteristics fulfilling the needs</b>
housing	comfortable housing provision	-education	-universities, scientific organizations, computers
food	shops, nature of consumed foods	-cultural traditions and values	-books, media, computers, traveling
water	water availability	-communication (real and virtual)	-clubs, computers, museums -theatres/cinemas, clubs, shops, restaurants/cafes, computers for entertainment and communication, sports facilities, life extension and beauty
clothes	shops, ateliers	-entertainment	
children (reproduction)	marriage rate, fertility, pre-school children organizations		
movement	roads		
treatment - maintenance of working capacity/ life support	medical care – maintenance of vitality functions/ working capacity functions		
rest - recovery of working state	facilities for organized recreation in your region / in another region		
burial	ritual objects: organization of ritual activities, cemeteries, crematorium, columbarium		

Source: compiled by the authors

Systematization of social infrastructure components was carried out by an expert method also from the standpoint of bio-socio-humanitarian positions. Thus, two groups of components are selected:

- 1) Components of life support (human potential preservation)
- 2) Components of development (human capital accumulation).

The first group includes the following elements-indicators of life support: housing, water, food, treatment, recreation, human reproduction, personal safety, ability to move. The second group includes (in expert interpretation) the following indicators: education, cultural traditions and heritage (natural and cultural), communication (real and virtual), entertainment, information.

**Indicators of social infrastructure development in the spatial context**

The authors focused their attention on the features of social infrastructure of **Far Eastern Federal District** (FEFD) macro-region. At present, it is a priority object of public administration from the standpoint of spatial development, which involves space saturation (including territory) with people (Vlasyuk, et al., 2016), infrastructure, activities. We should note status indicators of social infrastructure of the Far Eastern Federal

district region, priority and available for statistical analysis:

- 1) Housing stock
- 2) Housing stock improvement
- 3) Privatized housing
- 4) Total area of residential premises, falling on average per inhabitant
- 5) Share of privatized housing
- 6) Water availability
- 7) Relative share of the housing stock total area, equipped with water supply
- 8) Import of the main types of food products to subjects of the Russian Federation
- 9) Public catering turnover
- 10) Retail trade turnover of trading networks
- 11) Public roads
- 12) Density of paved roads
- 13) Number of hospital beds
- 14) Population per hospital bed
- 15) Children's recreation camps
- 16) Collective accommodation facilities
- 17) Tourist firms
- 18) Share of households with computer and the Internet access
- 19) Public libraries
- 20) Number of organizations engaged in educational activities on educational programs of preschool education
- 21) Number of educational institutions of higher education and scientific organizations
- 22) Number of branches of educational institutions of higher education
- 23) Organizations that carried out research and development
- 24) Organizations leading training of graduate students
- 25) Organizations conducting training for doctoral students
- 26) Number of sports facilities
- 27) Organizations performing innovations, providing increase of ecological safety in the course of goods, works, services production
- 28) Number of personal computers used for educational purposes, state organizations engaged in educational activities for educational programs of primary, basic and secondary education, training programs for skilled workers, employees, training programs for mid-level specialists and higher education programs per 1000 students
- 29) Organizations having a website
- 30) Number of personal computers per 100 employees
- 31) Use of electronic document management in organizations
- 32) Number of connected mobile devices per 1000 people.

Table 2. Social infrastructure development indicators and corresponding official statistics by regions of the Russian Federation

Indicators	Functions	Infrastructure subtype	Absolute figures	Relative indicators – territory / population saturation with social infrastructure
housing	personal safety / protection from natural environment	housing	-housing -housing stock improvement -privatized housing	-total area of residential premises, falling on average per inhabitant -share of privatized housing

water	life-support	environmental	-average annual river flow -use of fresh water	-water availability per inhabitant -relative share of housing stock total area equipped with water supply
food	life-support	food/ environmental	-import of the main types of food products to subjects of the Russian Federation -retail trade turnover of trading networks -turnover of public catering -innovative organizations	
security (personal and public)	life preservation and continuation	environmental	providing increase of ecological safety in the course of goods, works, services production	
human reproduction	life continuation	medical	-provision of residential premises to citizens -number of families registered as needing accommodation	-relative share of families registered as needing accommodation in the total number of families
ability to move	life-support	transport	-public roads	-relative share of paved roads -density of paved highways
treatment	life preservation and continuation	medical	-number of hospital beds	-population per hospital bed
rest	life continuation	recreational	-number of tourist firms -number of tour packages sold to population -children's recreation camps -collective accommodation facilities	
social interaction/ information/ journeys	communication, education, entertainment -learning	information-communication	-number of tourist firms -number of tour packages sold to population	-number of connected mobile devices per 1000 people -share of households with computer and the Internet access -library fund per 1000 people
education	knowledge	scientific, digital	-number of organizations engaged in educational activities for educational	-number of personal computers used for educational purposes, state organizations engaged in educational

			programs of preschool education -number of higher education and research institutions -number of branches of higher education institutions -organizations that carry out research and development -organizations leading trainings of graduate students -organizations, training doctoral students -number of sports facilities (gyms, swimming pools) -organizations having a web site -use of personal computers and the Internet in households -use of electronic document management in organizations -number of connected mobile devices per 1000 people	activities for educational programs of primary, basic and secondary education, training programs for skilled workers, employees, training programs for mid-level specialists and higher education programs per 1000 students  -share of households with computer and the Internet access -number of personal computers per 100 employees; -use of electronic document flow in organizations (as a percentage of the total number of surveyed organizations of the relevant Russian Federation entity)
sport	entertainment, health, rest	sport		
communication	security, education	information-communication		

Source: compiled by the authors

On the basis of the above positions, 2 blocks of indicators were formed: 1<sup>st</sup>-block of human potential preservation; 2<sup>nd</sup> - block of human capital development.

- 2 Components for obtaining information using computers and computer technology
- 2 Components for sports entertainment.

Within the framework of the 1<sup>st</sup> block 3 sub-blocks and within the framework of the 2<sup>nd</sup> block 5 sub-blocks will be highlighted. Thus, we will analyze, according to table 1 and table 2, 8 sub-blocks as components that are considered as direct or indirect elements of social infrastructure:

1. Main components of life support: housing (reality and needs)
1. Main components of life support: water and food
1. Components for movement, treatment, rest
2. Components for communication, information
2. Components for education
2. Components for science

As a result of 1<sup>st</sup> block indicators analysis it is necessary to note the following: *housing*, according to experts, is a critical indicator for human potential preservation. This is especially evident for regions in harsh natural conditions, which are most of the Far Eastern Federal District regions. The most powerful housing stock is in the Primorsky and Khabarovsk territories. These regions have the most favorable economic and geographical location and relatively favorable natural conditions for life (especially Primorsky Krai).

Analysis of the Far Eastern Federal District housing stock improvement allows us to note important features. In general, less regions in the Far Eastern Federal District are equipped with *water supply* over Russian average. Water supply



of this macro-region is the highest in the country. The lowest values of housing stock water supply is in the following regions: the Republic of Sakha (Yakutia), the Jewish Autonomous region, the Amur region. From positions of provision with *sewerage* – the same regions are outsiders. Heating is worst provided by housing stock of the Jewish Autonomous region (only 62.7%). *Gas equipment* in housing stock is completely absent in the Chukotka Autonomous district, the Magadan region, the Kamchatka territory. In the Jewish Autonomous region and Khabarovsk territory the values are close to the average Russian value. Hot water supply is worst of all - 45.1-57.4% (i.e. below the average Russian indicator) – provided to residents of the Sakhalin region, the Republic of Sakha (Yakutia), the Jewish Autonomous region, Primorsky Krai, the Amur region. The equipment of housing with baths is lower than the average in Russia (69.9%) in the Republic of Sakha (Yakutia), Primorsky Krai, Amur region, the Jewish Autonomous region.

Indicators of privatized housing in the Far Eastern Federal District regions are very small. A relatively significant absolute indicator of such housing is in Primorsky Krai - 3.1 thousand residential premises. In relative terms (the share of the total number of residential premises to be privatized) this value fully corresponds to the average Russian indicator of 81.3%.

Food infrastructure can only be analyzed on the basis of indirect indicators, in particular, on the basis of basic food products import into the Far Eastern Federal District. It should be noted that all regions of the Far Eastern Federal District need to import products. The most significant supply of flour and cereals, vegetable oil characterize Primorsky Krai. Meat and sausages are imported on a large scale to the Khabarovsk territory and the Sakhalin region. In terms of catering, the highest values are characterized by Khabarovsk, Primorsky Krai, the Republic of Sakha (Yakutia), the minimum values (very slightly developed) in the Chukotka Autonomous region, the Jewish Autonomous region.

The upbringing and preservation of children is characterized by existence of children's institutions. The number of preschool organizations in the Far Eastern Federal district is about 5% of their number in Russia. The leaders are Primorsky and Khabarovsk territories, the Republic of Sakha (Yakutia).

The ability to move by residents of the Far Eastern Federal District by car on roads with

modern road surface is difficult. Proportion of such roads in the macro-region is very low. Only in the Sakhalin region this indicator corresponds to the average Russian value of 69.7%. The density of paved roads exceeds the average value in Russia only in Primorsky Krai.

The provision of hospital services (hospital beds) is high – the reverse indicator - population per hospital bed is lower than the average in Russia. Human potential preservation is interpreted through the indicator of residents recreation possibility within macro-region, which is based on the provision of collective accommodation facilities, which is about 6% of the national value. Most opportunities for recreation are in Primorsky Krai - the most climate-friendly region of the Far Eastern Federal District.

As a result of the 2<sup>nd</sup> block indicators analysis, the following should be noted. Libraries are considered as a means of development/knowledge: the Chukotka Autonomous District (AD) is the leader in terms of residents provision with library fund, which is twice higher the average country index. Below it are indicators only of Primorsky Krai and the Amur region.

People communication as a way of human development is based in the discussed macro-region mainly on the Internet and mobile communication. The share of households with a computer and the Internet access is close to the national average (71.4% and 74% respectively). According to the share of personal computers in household, the Chukotka Autonomous District is leading, and according to the Internet access share, the Magadan region takes the first place. Indicators of mobile communication development are slightly lower than the average Russian level. The highest values characterize the Sakhalin region, the lowest value - the Jewish Autonomous region.

Tourism as a method of entertainment and information and knowledge accumulation is not obviously attractive to residents of the Far Eastern Federal District, as can be judged by the number of travel agencies. In the Far Eastern Federal District travel agencies amount less than 5% of the total in Russia. Most of them are in the most densely populated and economically developed regions – Primorsky and Khabarovsk territories. Primorsky Krai stands out by the number of realized tour packages.

As for the infrastructure for *higher* education (the number of educational institutions of higher

education and scientific organizations), which is about 5 %, half falls on the Khabarovsk territory and Yakutia. By the number of branches of higher education educational institutions stands out Primorsky Krai (one third of the total number in the far Eastern Federal District). There is practically no higher education infrastructure in the Jewish Autonomous region and the Chukotka AD.

Development infrastructure (from a scientific point of view) is represented mainly in the Primorsky and Khabarovsk territories - half of all organizations that carried out research and development in the Far Eastern Federal District are concentrated in them. More than half of infrastructure for post-graduate and doctoral training is also concentrated in these regions. There is practically no such infrastructure in most regions of the Far Eastern Federal District.

By provision with personal computers used for educational purposes, the Far Eastern Federal District on average exceeds average Russian figures, the leader is the Chukotka region. About half of the organizations in the FEFD regions have a website. According to the number of personal computers per 100 employees, all regions of the Far Eastern Federal District are at the level of the average country indicator, the same situation (except for the Jewish Autonomous region and the Chukotka AD) characterizes electronic document flow.

In terms of sports facilities availability macro-regional differences are very significant. Thus, the Primorsky territory is the absolute leader in the number of gyms, the Chukotka region is the outsider. Swimming pools are concentrated in three regions – Khabarovsk, Primorsky Krai and Yakutia.

According to the level of information and communication technologies development in Russia (Makar and Nosonov, 2017) 4 types of regions were previously highlighted: 1 – high; 2 – above average; 3 – medium; 4 – low. Regions of the Far East are of type 2, 3 and 4. Above the average level are indicators in the Primorsky and Khabarovsk territories. Regions with average level (3) - general ICT development indicators are 6-12 times lower than in type 1 - Yakutia (Sakha). Regions with the lowest level of ICT development: Chukotka, Kamchatka, Amur, Magadan, Sakhalin regions). That information and communication periphery is characterized by minimum values of all indicators of ICT development (11-23 times lower than in the regions of type 1), which is primarily due to low

level of socio-economic development of these regions and insufficiently formed information component of development (Semin et al., 2017). Thus, on the basis of statistics (2017) of direct and indirect nature (Abalkin, 1999), it is obvious that for the Far Eastern Federal District macro-region space the density of social infrastructure is uneven and insufficient to attract qualified labor personnel here (Yarasheva and Makar, 2019; Zaytseva, et al., 2016).

## Conclusion

Social infrastructure is an attribute of a more general concept of "infrastructure" which is associated with such definitions as "living conditions", "living standards", human capital, human potential.

Social infrastructure is a private set of space elements or components that provide not only vital needs (human potential *preservation*), but also more complex – cultural, intellectual - human capital *accumulation*. Social infrastructure is a condition and indicator of living standards, possibility of realizing not only vital, but also complicated social and intellectual needs of people.

Creation of social infrastructure is a matter of national importance (Boretskij, 2014), as it concerns settlement and retention of territory (i.e. geopolitical aspects, state security). In Soviet times, there was a practice of creating social infrastructure on the "residual" principle. Social infrastructure scientific research is presented in fragments.

Social infrastructure has territorial character. The importance of social infrastructure remains a long-term integrated factor of regional development. It should be considered as an element of regional space framework (Makar, 2013; Migranova, et al., 2014).

Modern theoretical basis of social infrastructure formation is the concept of human capital creation. The author's definition of social infrastructure includes human potential preservation and human capital accumulation components, which are functionally important and relevant for modern stage of national space development in the post-industrial period. In the last years of the current decade, a new subspecies – digital is singled out in the social infrastructure. It is formed by information and communication technologies.

Problematic aspects in interpretation of "social infrastructure" concept and allocation and

classification of its elements are revealed. Classification of social infrastructure is proposed by the authors on the socio-humanitarian functional basis - from the point of view of two functions: life support (for human potential preservation) and development (for human capital accumulation).

The author's algorithm of complementarity of preservation and development indicators is offered: indicators of each function correspond to specific indicators (basic and derivative).

From the point of view of actual national priorities of spatial development, features of the Far Eastern macro-region social infrastructure state, emphasizing the needs of managing its development, are highlighted (Yarasheva and Makar, 2019; Morkovkin, et al., 2016). Incompleteness of indicators, necessary for the analysis, is notable.

The authors see the need and opportunity to continue research on relationship between parameters of social infrastructure state and development and parameters, trends in dynamics of other components of regional socio-economic systems. In particular, social infrastructure is designed to serve the needs of different groups of population - social clusters (Makarov, 2010). In this regard, it is possible to analyze and classify on the basis on needs of groups that have developed in a particular territory at a certain time/period. Specific needs of this time serve as criteria for allocation of infrastructure elements of social importance for each group: age (children, economically active population, elderly people); human health (disabled, able-bodied); urbanization (urban/rural); scale of territory/economy - city/municipality/region/macro-region/country/enterprise).

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#### References

Abalkin, L.I. (ed.). (1999). *Ekonomicheskaya entsiklopediya* (Economic encyclopedia). Moscow: JSC "Publishing house "Economy".

Aleksandrova, O.A., Yarasheva, A.V. (2016). Transformation of investment and savings behavior of high-income groups during the crisis. *Economic and Social Changes: Facts, Trends, Forecast*, 1(43), 122-137.

Antonyuk, V.S., Bulikeeva A.Z. (2014). Socialnaya infrastruktura rassmatrivalas kak faktor razvitiya kachestva zhizni naseleniya (Social infrastructure was considered as a factor of life quality development of population). *Economy and entrepreneurship*, 4, Part 1, 329-333.

Azieva, R.Kh. (2014). Ustojchivoe razvitie socialno-ekonomicheskoy infrastruktury selskih territorij (Sustainable development of rural areas socio-economic infrastructure). *Bulletin of economic integration*, 3(72), 71-75.

Boger, T.N. (2014). Socialnaya infrastruktura kak komponent kachestva zhizni i socialno-ekonomicheskogo razvitiya regiona (Social infrastructure as a component of life quality and socio-economic development of region). *Problems of modern science and education*, 8(2), 45-47.

Boretskij, Yu.A. (2014). O kriteriyah prioritnosti gosudarstvennogo finansirovaniya otraslej socialnoj infrastruktury (About criteria for prioritizing public funding of social sectors infrastructure). *Bulletin of Chelyabinsk state University*, 9(338), 57-61.

Borisov, A.B. (1999). *Bolshoj ekonomicheskij slovar* (Big economic dictionary). Moscow: Book world.

Borodatova, L.Yu. (2013). Razvitie socialnoj infrastruktury v ekonomicheskom prostranstve: teoreticheskij aspekt (Development of social infrastructure in the economic space: theoretical aspect). *Modern problems of science and education*, 2, 359.

Carlsson, R., Otto, A., Hall, J.W. (2013). The role of infrastructure in macroeconomic growth theories *Civil Engineering and Environmental Systems*, 30(3-4), 263-273.

Dobrenkov, V.I., Slepencov, I.M. (eds.). (1994). *Socialnoe upravlenie: Slovar* (Social management: Dictionary). Moscow: Moscow state University Publ. house.

Golubchik, M.M., Makar, S.V. Nosonov, A.M., Faybusovich E.L. (2015). *Socialno-ekonomicheskaya geografiya: Uchebnik dlya akademicheskogo bakalavriata* (Socio-economic geography: Textbook for academic bachelor course). Moscow: Yurayt Publishing House.

Guidotti, R., Gardoni, P., Rosenheim, N. (2019). Integration of physical infrastructure and social systems in communities' reliability and resilience analysis. *Reliability Engineering and System Safety*, 185, 476-492.

- Kandiah, V.K., Berglund, E.Z., Binder, A.R. (2019). An agent-based modeling approach to project adoption of water reuse and evaluate expansion plans within a sociotechnical water infrastructure system. *Sustainable Cities and Society*, 46,101412.
- Kibilda, J., DI Francesco, P., Malandrino, F., Dasilva, L.A. (2015). Infrastructure and spectrum sharing trade-offs in mobile networks. *Proceedings of the IEEE International Symposium on Dynamic Spectrum Access Networks, DySPAN*, 7343930, 348-357.
- Kryukov, V.A. (2018). Izuchenie ekonomiki Sibiri: preemstvennost i kompleksnost (Study of Siberian economy: continuity and complexity). *Region: Economics and sociology*, 2 (98), 3-32.
- Kushlin, V.I., Volgin, N.A. (eds.). (2000). *Gosudarstvennoe regulirovanie rynochnoj ekonomiki: Uchebnik dlya vuzov (State regulation of market economy: Textbook for universities)*. Moscow: JSC NPO "Economy".
- Makar, S.V. (2013). K razvitiyu teorii organizacii regionalnogo prostranstva (On the development of regional space organization theory). *Economics. Taxes. Law*, 6, 22-27.
- Makar, S.V. (2018). Ustojchivoe prostranstvennoe razvitie: kriterii i indikatory (Sustainable spatial development: criteria and indicators). *Proceedings of the IX Annual scientific Assembly of the Association of Russian geographers and social scientists «Modern trends in spatial development and priorities of social geography»*. Barnaul: Publishing house of Alt. University, 2, 43-46.
- Makar, S.V., Nosonov, A.M. (2017). Otsenka i prostranstvennye zakonomernosti razvitiya innovacionnoj deyatelnosti v regionax Rossii (Evaluation and spatial patterns of innovation development in Russian regions). *Economics. Taxes. Law*, 4, 96-106.
- Makarov, V.L. (2010). *Socialnyj klasterizm. Rossijskij vyzov (Social clustering. Russian challenge)*. Moscow: Business Atlas.
- Marino, M., Pattni, S., Greenberg, M., Ritter S., Mehta K. (2015). Access to prosthetic devices in developing countries: Pathways and challenges. *Proceedings of the 5th IEEE Global Humanitarian Technology Conference, GHTC*, 7343953, 45-51.
- Medvedeva, I.A. (2014). Algoritm vydeleniya prioritnyh napravlenij razvitiya socialnoj infrastruktury regiona (Algorithm of priority directions allocation of regional social infrastructure development). *Bulletin of Moscow University named after S. Yu. Vitte*, 1(7), 19-23.
- Migranov, L.A., Toreyev, V.B., Yarasheva, A.V. (2014). Economic Behavior: Analysis and Prospects. *Economic and Social Changes: Facts, Trends, Forecast*, 1(31), 116-124.
- Morkovkin, D.E., Mamychev, A.Y., Yakovenko, N.V., Komov, I.V., Derevyagina, M.V., Didenko, O.V. (2016). Factors and material conditions for space-intensive economic development of region. *International Review of Management and Marketing*, 6(1), 67-72.
- Pinkovetskaia, I., Arbeláez Campillo, D., Rojas Bahamón, M., Gromova, T., Nikitina, I. (2019). Female entrepreneurship development in the Russian Federation. *Amazonia Investiga*, 8(18), 111-118.
- Rajzberg, B.A., Lozovskij, G.Sh., Starodubceva, E.B. (1996). *Sovremennij ekonomicheskij slovar (Modern economic dictionary)*. Moscow.
- Repnikova, V.M., Bykova, O.N., Skryabin, O.O., Morkovkin, D.E., Novak, L.V. (2019). Strategic aspects of innovative development of entrepreneurial entities in modern conditions. *International Journal of Engineering and Advanced Technology*, 8(4), 32-35.
- Sapozhnikova, T.A., Kuznecova, A.I. (2014). Upravlenie razvitiem socialnoj infrastruktury goroda. *Teoreticheskie aspekty (Management of city social infrastructure development. Theoretical aspects)*. *Bulletin of Moscow University named after S. Yu. Vitte. Part 1: Economics and management*, 2(8), 105-112.
- Semin, I.A. et al. (2017). *Territorialnaya organizaciya tretichnogo sektora ekonomiki: monografiya (Territorial organization of economy tertiary sector: monograph)*. Saransk: Publishing house of Mordovian University.
- Shepotko, L.A., Polonskij, V.Ya., Prokopa, I.V. (1983). *Kapitalnye vlozheniya v social'nyu infrastrukturu sela (Capital investments in the social infrastructure of rural area)*. Moscow: Economics.
- Smirnova, O.A. (2014). *Socialnaya infrastruktura regiona: sushnost, problemy i perspektivy razvitiya (Social infrastructure of the region: essence, problems and prospects of development)*. *Modern science-intensive technologies. Regional application*, 2(38), 87-91.
- Tkhorikov, Boris; Semibratsky, Maksim; Gerasimenko, Olga; Merezko, Anna (2018). Análisis de los enfoques metodológicos para la gestión de proyectos. *Revista Científica del Amazonas*. Vol. 1, Núm 1, 2018, 28-34.
- Ulyanova, O.Yu. (2014). *Strategicheskij obraz razvitiya regionalnoj socialnoj infrastruktury v Rossii (Strategic image of regional social infrastructure development in Russia)*. *Economic analysis: theory and practice*, 5(536), 2-11.
- Vakali, A., Angelis, L., Giatsoglou, M. (2013). Sensors talk and humans sense Towards a reciprocal collective awareness smart city framework. *Proceedings of the IEEE*

International Conference on Communications Workshops, ICC 2013 6649226, 189-193.

Van Der Wee, M., Beltrán, F. (2015). The efficiency and effectiveness of a mixed public-private broadband deployment: The case of New Zealand's ultra fast broadband deployment. Proceedings of the Conference of Telecommunication, Media and Internet Techno-Economics, 7347231.

Vlasyuk, L.I., Kashin, V.K., Makar, S.V. (2016). Indikatory gumanizacii regionalnogo razvitiya: chelovecheskij kapital (Indicators of regional development humanization: human capital. Economics. Taxes. Law, 6, 68-76.

Yarasheva, A.V., Makar, S.V. (2019). Vliyanie demograficheskikh faktorov na trudovoj potencial regionov Dalnego Vostoka (Influence of demographic factors on the labor potential of the Far Easter regions). Economics. Taxes. Law, 2, 85-96.

Zabelina, N.V. (2014). Regionalnye problemy razvitiya socialnoj infrastruktury sela (Regional problems of rural social infrastructure development). Regional economy: theory and practice, 28(355), 30-37.

Zaytseva, I.A., Makar, S.V., Yarasheva, S.V. (2016). Analysis of the need for additional educational services in the textile industry. Izvestiya Vysshikh Uchebnykh Zavedenii, Seriya Teknologiya Tekstilnoi Promyshlennosti, 255-258.

Zhang, X., Song, J., Peng, J., Wu, J. (2019). Landslides-oriented urban disaster resilience assessment—A case study in ShenZhen, China Science of the Total Environment, 661, 95-106.

Zhang, Z., Zhao, L. (2019). Voluntary monitoring of households in waste disposal: An application of the institutional analysis and development framework. Resources, Conservation and Recycling, 45-59.