Level of Infrastructure Development as a Determining Factor of Quality of Life

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Abstract—In this article, the authors consider the role of one of the subsystems of infrastructure - the residential real estate sector. The relevance of this topic lies in the plane of the fact that the state and prospects for the development of residential real estate must be viewed through the prism of the economic system, the main element of which is a person. It is a person with his potential that determines and sets the vector of development of the economic system. The state of human potential is determined, inter alia, by the quality of its life, the main criterion of which is housing security. That is, the affordability of housing can be considered one of the significant characteristics of the quality of life. The imbalance in the elements of housing infrastructure and a decrease in their quality can lead to an imbalance in the system and even to its destruction. The article presents an empirical analysis of the state of the housing stock of the Russian Federation. Based on the data obtained, problems were identified and conclusions were drawn on such an indicator as the housing affordability coefficient and recommendations were made on further development of the industry.

Keywords: housing, infrastructure, Industry 4.0, quality of life, systemic concept, technological structure

I. INTRODUCTION

The relevance of the problem under study is due to the fact that, according to some scientists, the Russian economy is a zone of crisis and severe turbulence, its structure is only 18% represented by a high-tech complex, most of which are related to the fourth technological structure. At the same time, they note that Russia has every chance, implementing an innovative development strategy, to make a technological breakthrough on the world market (a number of Russian developments not only correspond to the world level, but even lead in certain areas) [1]. Such a breakthrough and focus on breakthrough directions of the sixth technological mode are impossible without reference to the appropriate infrastructure level of development.

Today, Russia in the world ranking of 137 countries held by the World Economic Forum takes 38th place in the global competitiveness index and 74th in terms of infrastructure quality. Meanwhile, infrastructure determines the structure and level of development of an economic system of any level, acting simultaneously as an intra-system and intersystem environment of these systems [2].

II. RESEARCH METHODS

The development of infrastructure as an indispensable component of any holistic economic system that contributes to the solution of fundamental problems of the economy was considered in the works of such foreign scientists as Rosenstein-Rodan P., 1944; Hirshman A., 1958; Jochimsen R., 1966; Isard W., 1966; Ammer C., 1986; Stein J., 1992; Conrad K., 1994; Fabozzi F.J., 2007; the role of infrastructure in the balanced development of socio-economic systems of different levels is devoted to the works of domestic researchers L. Abalkina, 1968; Nasal S. 1970; Terentyeva V., 1979; Krasovsky V., 1980; Goltsa G., 1981; Feodoritova V., 1985; Fedorova V., 2000; Azriliana A., 2002; Mordovchenkova N., 2002. Mordovchenkova N., 2010, Kuznetsova A. 2013, Oveshnikova, L., 2015.

At the same time, in the above works of domestic and foreign scientists there is no systematic consideration of the problem of infrastructure development, the problems of the interdependence of the level of development of infrastructure sectors and the competitiveness of the national economy are not adequately covered. However, it should be noted that there is no systematic consideration of the problem of balanced infrastructure development in the new economy, which is manifested in the absence of a unitary approach to methodological provisions that reflect the process of infrastructure transformation based on the analysis of multi-structure macro and micro states of its subsystems and objects and algorithms about their active management. In order to eliminate methodological gaps in the theoretical understanding of the problems and directions of the balanced development of the new generation infrastructure, ensuring the transition of the domestic economy to the sixth technological order, the formation of conditions for the reproduction of human capital and its quality of life, we consider it relevant and timely to conduct a study of the problem of the development of the housing sector as a key quality indicator of life.

As the main research methods for the problems of balanced development of infrastructure and its subsystems, including housing in Industry 4.0. both general scientific methods of cognition were used, which make it possible to objectively and comprehensively study the conceptual positions of infrastructure in the digital economy, as well as private experimental techniques, innovative developments, including: systematic and integrated approaches to studying the features of infrastructure implementation, the dialectical method of scientific knowledge, and comparative analytical, situational analysis.

III. RESULTS

The slowdown of the Russian economy observed in recent years is based on problems of a chronic nature, which cannot be overcome with the help of methods and tools proposed by the mainstream economy.

The problems are based on a fundamental reason, which, from the authors' point of view, is connected with the lack of an infrastructure environment that meets the requirements of the new economy. The infrastructure environment that meets the requirements of the time is not only the basis for the development of the country's economy, but also a condition for its full membership in the global economic process developing today on the Industry 4.0 platform [3,4].

The basis of a modern view of the problems of the Russian economy that are chronic in nature, and the concept of modernization of its infrastructure, according to the author, should be a systemic paradigm [5]. Reliance on the system concept as the theoretical basis of the study will allow to rethink the view on the content and essence of infrastructure, identify the most acute problems of the functioning and organization of the infrastructure system in Russia, and substantiate aspects of its modernization. The conceptual apparatus and methodology of the new systemic concepts make it possible to consider infrastructure as a complex economic system of an environmental type that interacts with other economic systems and the social system as a whole and acts either as a platform for their innovative development (in the case of its modernization), or as a condition for their degradation (in case of its backwardness) [6].

Infrastructure by representatives of various economic schools, including the domestic economic school, is recognized as a mandatory component of any holistic economic system that contributes to the solution of fundamental problems of the economy (infrastructure is not only a sign of a developed market economy (Stein J., USA), but also the public capital of the economy countries (K. Ammer, USA), which assumes the sustainable development of all sectors, including the social sphere (Konrad K., USA), this is a whole range of conditions that stimulate economic development e specific territory (G.A. Golts, Russia), ensuring economic reproduction (A.N. Azrilian, Russia), the totality and interconnection of the components of social and economic life, ensuring the conditions of society (A.Yu. Moskvin, Russia), determining to a large extent the "quality of life" of the population (VN Fedorov, Russia) [7.8].

The main criterion for the quality of life and well-being of the population in the country is the condition of one of the main infrastructure subsystems - the housing sector. "The housing issue remains one of the most socially significant issues, it requires an immediate solution and constant attention to itself from the state." [9]

To solve the housing problems of citizens, the national project" Housing and Urban Environment "was developed and adopted in 2018, which includes four federal projects:" Mortgage "," Housing "," Formation of a comfortable urban environment "and" Ensuring sustainable reduction of unsuitable for housing stock. " [10] Also, amendments were made to the Federal Law "On participation in shared construction of apartment buildings and other real estate and on amendments to certain legislative acts of the Russian Federation" dated 12.30.2004 (No. 214-FZ) [11]

If we consider the main trends in the development of the housing sector in the period 2005 -2018, then we can distinguish the following indicators:

1) there is a gradual decrease in the average area of an apartment in the primary market starting in 2010: if in 1995 the average area was 62 sq.m, then in 2005 it was already 67 sq.m, but in 2010 it was 63 sq.m, in 2012 the year - 60 sq. m., in 2015 - 55 sq. m, and in 2018 - 49.3 sq. m.

Firstly, this is due to the structure of demand: after the crisis of 2008, the purchasing power of the population decreased. During this period, despite the fact that the mortgage market began to develop actively, it was necessary to offer the target buyer a reduction in the purchase budget and debt burden.

Secondly, the expansion of the target segment at the expense of a group of citizens with lower incomes who can only purchase a small-sized apartment with mortgage funds.

2) the condition of the housing stock. According to the Federal State Statistics Service, at the end of 2017, the housing stock of the Russian Federation is 3,708 million

square meters, of which 90 million square meters, which is 2.5% of the total housing stock, belongs to the categories of emergency and dilapidated housing. [12] The share of the areas provided with all types of landscaping amounted to 67.2% in 2018 .. The annual retirement of the housing stock (dilapidated and dilapidated housing) was low - 0.15-0.2% of the total area of the existing housing stock - and only in 2014-2017 significantly increased (up to 0.3-0.4%), which is still significantly lower than the level characteristic of countries with developed housing markets, where up to 1% of the available housing stock is annually withdrawn.

This reflects the low rate of renovation of existing emergency, dilapidated and morally obsolete housing and reduces the "quality" of the value of the indicator of provision with the total area of housing.

According to the Ministry of Regional Development of Russia, on average, each inhabitant today has about 25.2 m2 of living space. For comparison, in the countries of Eastern Europe - 35 m2, in France - 43, in Germany - 50.

3) Increase in construction volumes. In 2018, 75.7 million m² of housing were commissioned. In 2014 and 2015, Russia introduced record-breaking housing volumes in its entire history: 84.2 and 85.3 million m², respectively, breaking the 1987 RSFSR record (72.8 million m²). By 2024, it is planned to bring the commissioning of new housing to 120 million m² per year.

As a result, the growth in housing construction leads both to an increase in the provision of the total area of housing, and to an increase in the provision of housing, which by 2017 amounted to 449 units per 1000 population, which practically corresponds to the average level of security prevailing in European countries [13] .

4) Lower interest rates on mortgages that have a direct impact on housing affordability. "Affordable housing is housing of a certain quality and size that a family with a certain level of income can acquire at market value." [14].

According to the Central Bank, the weighted average mortgage rate for 2018 was 9.35%, which is 30.43% lower than in 2015 [15].

In 2017, the share of families with the opportunity to purchase housing using their own and borrowed funds amounted to 42.6%. , which is 115.15% more than in 2010. Recall that this indicator of housing affordability is calculated based on the following conditional assumptions: the family consists of 3 people; the total area of the purchased apartment is 54 square meters. m; average price of 1 sq. m of housing - 68.7 thousand. rub.; term and mortgage rate - respectively 186.8 months. and 10.6% per annum; loan amount - 70% of the price of the apartment; the ratio of mortgage payment to monthly family income is 35% .

IV. CONCLUSION

It is important to note that, despite the positive dynamics of such an indicator as housing affordability, in reality not every family corresponds to the calculation parameters used: it consists of 3 people, has an income per family member equal

to the average per capita in Russia. In addition, housing prices in each specific city may differ significantly from the average Russian prices. The absolute size of the family income, as well as the part of it that remains after paying the mortgage loan, is also important from the point of view of the sufficiency of such income to finance other necessary family expenses.

For example, in 2017, the average price in Russia for an apartment with a total area of 54 sq. M. m amounted to 3.7 million square meters. m. Provided that the purchase of such an apartment with a mortgage in the amount of 70% of the price, that is, in the amount of 2.6 million rubles, and the average conditions of mortgage lending in Russia in 2017, the monthly mortgage payment is 28.5 thousand rubles . Assuming that such a payment does not exceed 35% of the family income, the required family income is 81.4 thousand rubles. per month. In this case, for a family of three with such a family income, the average per capita income is estimated at 27.1 thousand rubles. per month (further, if we assume that the distribution of families by income and the distribution of population by per capita income are the same, then this income is higher than 42.6% of families).

With this calculation, it turns out that each month the family has 52.9 thousand rubles. to finance all other necessary expenses: payment for utilities, expenses for food, clothing, education, medicine, leisure, the purchase of other durable goods and current consumption, as well as for savings.

Even with such a conditional example, it is quite clearly seen that after making a monthly installment for a mortgage loan, the residual income of the family is not so large as to speak about the high availability of housing.

One of the components of sustainable economic development of the state is the social component. The successful development of society is directly related to the development of residential real estate [16,17,18].

To improve the situation in the housing sector, it is not enough just to build and implement subsidizing programs to support different categories of citizens; the role of targeted state influence on the state and dynamics of the rental and social housing market is necessary [19]. This practice in real estate is the most important practice used in successful countries [20].

Contribution of the authors to the development of the research topic.

An analysis of the sphere of residential real estate, as a subsystem of infrastructure, made it possible to identify problem areas requiring further research. These include: 1) questions on the provision of accessible methodological approaches for calculating the housing affordability index taking into account each segment of buyers; 2). the problem of selecting indicators for assessing the "housing component" of quality of life.

The practical significance lies in the fact that the study can serve as the basis for improving the methodology for calculating housing security and assessing its level in the activities of legislative and executive authorities.

The scientific news consists in studying the theoretical and methodological issues of housing provision, assessing its condition and developing recommendations for improving the calculation of such an indicator as the housing affordability coefficient. Recommended when calculating the coefficient of housing affordability, housing factor, housing share, housing percentage, percentage, provision with all types of amenities, changes in the mortgage rate, the provision of family housing.

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