Self-Sufficient Urban Socio-Economic Space

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Abstract—The article defines the self-sufficient urban socio-economic space (SSUSES) and reveals its essence as a succession of phenomena, conditions, package of measures to achieve a certain result. The main target of SSUSES is the citizens’ high life quality, achieved by: increasing incomes; improving health; raising the educational level; creating conditions conducive to the growth of people's self-respect; the formation of sufficient social, political, economic and institutional subsystems. This research identifies strategic and current benchmarks for ensuring SSUSES and defines criteria for achieving them; highlights a number of system methodology principles of the SSUSES and also defines an urban space as a multi-level structure of interacting elements combined into several level subsystems to achieve shared objectives. The implementation of a systematic approach in the SSUSES methodology is reduced to the study of urban education on the possibility of developing emergent and synergistic qualities, identifying the diverse links and mechanisms that ensure these qualities in a dynamic urban system. The system approach implementation’s essence is described using the structure of SSUSES indicators, the totality of which is implemented in three stages and the corresponding strategy selection model. The process of implementing the mechanism, providing socio-economic potential increase, ensuring the possibility of urban self-development, is associated with an effective distribution of powers and responsibilities between republican and municipal authorities. Article demonstrates that the process of providing SSUSES is associated with the optimization of a multi-level structure of interacting elements combined into several-level subsystems to achieve shared objectives.

Keywords—city, methodology, principles, cause-and-effect relationships, self-sufficiency, system, socio-economic space, strategy, stratification, functional integrity

I. INTRODUCTION

Self-sufficient urban socio-economic space (Self-sufficient urban socio-economic space, SSUSES) is a dynamic system that combines the reproduction processes caused by the public territorial division of labor, and recreational resources, which together provide for the livelihoods of the population.

SSUSES can be described as a consistent change of phenomena, conditions, package of measures to achieve a certain result, reflecting the essence of the socio-economic urban development.

One of the main goals of the city’s socio-economic development is to improve the quality of life of citizens [1, 2]. The process of ensuring SSUSES should include: increasing income and improving the health of citizens; raising the educational level; creating conditions conducive to the growth of people's self-respect; the formation of sufficient social, political, economic and institutional subsystems [3].

The following vectors should be marked as strategic and current benchmarks for providing SSUSES. For strategic – forecasting and planning the city’s socio-economic development; city budgeting and budget approval and administration; main state policy directions in the field of trade, public catering, consumer services, small business and labor protection; planning the foreign economic relations development; formation of the investment attractiveness of the city; the formation and implementation of innovation and investment policies in the industrial complex, business areas; policy implementation in the field of municipal support for entrepreneurship and small business; the creation of an effective competitive environment, the domestic market development based on the support of domestic and local producers and the trade infrastructure formation; creating conditions for increasing entrepreneurial activity in trade, catering and personal services; ensuring food security of the city, etc.

For current – coordination of activities to reduce administrative barriers in the provision of municipal services, the municipal functions performance; conduct unified tariff policy, measures to improve the organizational and legal mechanism for regulating tariffs; formation of a holistic concept of municipal enterprises, institutions and organizations, the shares of the authorized capital in which belong to the municipality of the city management; coordination of the activities on the city’s structural units administration in the development and implementation of municipal programs;
representation of the municipality interests in economic societies; control over the effectiveness budget and extrabudgetary funds use; control in the procurement of goods, works, services for municipal needs; monitoring and analysis of financial and economic activities of municipal unitary enterprises and business entities, the shares of the which authorized capital belong to the municipal entity; provide the consumer market with high-quality goods and services that meet the demand of the population; creation and implementation of a system of trade and consumer services for socially unprotected segments of the population.

As a criterion for assessing the SSUSES benchmarks achievement, it is appropriate to use the common indicators measuring the level of goods production and consumption and the growth of this level per capita — gross and real municipal product, as well as their growth rates. To assess the dynamics of development, it is advisable to use indicators that estimate the city’s economic growth rate: the growth rate of per capita income, labor productivity, structural transformation of production and society. The impact on economic growth is an essential issue for SSUSES.

II. METODOLOGY

The SSUSES problem solution is determined by the general trend of Russian socio-economic system modernization. While forming the SSUSES methodology, it is necessary to take into the consideration a number of system concepts:

- consideration of all the system elements of the as united body;
- system properties do not mean the sum its elements characteristics. This postulates the possibility that the system has special properties that some elements may not have;
- maximum system efficiency. It is theoretically proved that there is always a system value function – in the form of the dependence of its effectiveness on the conditions of construction and operation. In addition, this function is limited, and therefore it is possible and necessary to search for its maximum;
- external relations should necessarily be taken into the consideration, the analyzed system is needed to be viewed as the part (subsystem) of a more general system;
- the possibility of dividing this system into parts, subsystems.

Based on the above concepts, it is possible to formulate the urban system definition as a multi-level construction of interacting elements combined into several subsystem levels to achieve shared objectives – improving the city socio-economic development efficiency, and as a result, SSUSES.

The urban socio-economic system should be considered as a functional and at the same time developing set of deeply integrated economic and social subsystems [4]. Under certain conditions, the subsystems themselves can be considered as a system, and the system under study – as an element of a more complex system.

The implementation of a systematic approach in the SSUSES methodology is reduced to the territorial entity examination on the developing its emergent and synergistic qualities possibility, to identification of the diverse links and mechanisms that ensure these qualities in a dynamic system. The essence of the systematic approach implementation to the SSUSES ensuring process can be described using the structure of indicators:

\[ SSUSES = f(P_1, P_2, ..., P_{20}, T) \]

where \( P_1 \) – is economics and business; \( P_2 \) – small and medium business; \( P_3 \) – investments and industry; \( P_4 \) – state and municipal services; \( P_5 \) – finance; \( P_6 \) – housing and utilities infrastructure and energy; \( P_7 \) – transport and communication; \( P_8 \) – land resources, real estate, property; \( P_9 \) – architecture, construction; \( P_{10} \) – social politics; \( P_{11} \) – Internet, information policy, media and public relations; \( P_{12} \) – culture and tourism; \( P_{13} \) – physical Culture and sport; \( P_{14} \) – youth policy; \( P_{15} \) – international and regional relations; \( P_{16} \) – education; \( P_{17} \) – consumer market: trade and personal services; \( P_{18} \) – municipal control; \( P_{19} \) – civil registry offices; \( P_{20} \) – security; \( T \) – time interval (month, quarter, year).

This is not unique and final indicators structure. In practice, various additions or simplifications, in accordance with the capabilities of the researcher, which at the same time do not significantly change the essence of SSUSES, can be used.

The SSUSES provisioning process can be implemented in three stages:

1. Statement, which includes the following steps:
   - substantive statement of the problem - the definition of the task, its formulation. The objects that relate to the problem being solved, as well as the situation that needs to be realized as a result of its solution are determined;
   - system analysis stage, in the result the object is rendered as a system. Complex objects are divided into parts (elements), the relationships of these elements, their properties, quantitative and qualitative values of properties, quantitative and logical relations between them, expressed in the form of equations, inequalities are determined;
   - system problem’s synthesis stage (mathematical formulation) where the construction of a mathematical model of the object and the definition of methods (algorithms) for obtaining the solution of the problem are being made. At this stage, it may prove to be the previous system analysis led to such a set of elements, properties and relations, for which there is no acceptable method for solving the problem, as a result one has to go back to the system analysis stage.

2. Developing programmes for addressing the problem;

3. Implementing the model and obtaining results. In the socio-economic city development analyzing, the necessary to find an adequate model occurs, i.e. application of the simulation method. The need to use the modeling method is determined by
the fact that many objects of the urban socio-economic system (or problems relating to these objects) are directly impossible to explore, or this study requires a lot of time and money.

Nowadays, there is an objective need to implement a systems approach in the SSUSES methodology, which allows taking into account all the available information.

The SSUSES methodology essence is to reduce the negative consequences of federal and regional authorities’ incompetent decisions in pursuing an effective development policy. The development the SSUSES methodology should be made according the fact that the development of each urban subsystem occurs in the context of a constant change in the socio-economic city space [5]. Approaches to the development of the SSUSES methodology should match the following strategy selection models.

The first strategy is to preserve the labor division system, prevailing in previous decades, focusing federal and regional programs and centralized funding sources.

The second strategy is the producers’ refocusing to municipal markets and investments. Municipal authorities and entrepreneurs’ benefit from this strategy is that it achieves absolute autonomous independence in the resources allocation.

The third strategy is to increase the efficiency of enterprises and the entire city’s economic complex, as an indispensable condition for their viability in a market economy. It is achievable due to the radical reconstruction and modernization of production, the introduction of the latest scientific and technological progress achievements, advanced resource-saving technologies, intellectual breakthrough in all areas of activity, the use of new business forms and entrepreneurship potential.

When developing the SSUSES methodology, it is necessary to take into account the influence of globalization, which accompanies the development of global enterprises competition processes, the direct and indirect investments inflow, which objectively violates the economic equilibrium. In these conditions, the advantage of SSUSES is determined by the strategy for the development of high technologies, innovative entrepreneurship, and municipal, regional, and federal economic policies. There is a need to ensure the formation of city socio-economic characteristics’ development in the process of a post-industrial society of the future, which is defined as the information society of knowledge.

Municipal economic policies should be implemented primarily in the form of targeted funding of specific projects in accordance with the city’s resulted development priorities [6, 7]. The SSUSES essence is determined by its goal - the creation of an effective mechanism capable to increase the socio-economic potential and providing the possibility of city’s self-development.

Following objectives need to be met in order to fulfil this commitment:

1) to provide conditions for effective city’ socio-economic development;

2) to achieve a high level of municipal producers economic efficiency;

3) to create conditions for the optimal combination of state regulation methods, taking into account the business entities potential capabilities;

4) to create conditions for a favorable investment climate and innovative entrepreneurship;

5) to create an innovation and investment city development system in order to provide conditions for the innovation and investment activities revitalization, the integrated resources use; information, resource-saving, environmentally friendly technologies introduction;

6) to develop an intermunicipal communications system;

7) to improve the economy and life-support systems efficiency;

8) to organize highest economically active population employment;

9) to provide conditions for the human potential development, capable of effectively carrying out activities in the conditions of the new economy;

10) to create conditions for strengthening its own economic base in municipalities that have potential internal reserves for self-development;

11) to increase in-house income;

12) to create conditions for the local government formation and development;

13) to legally support the small business development;

14) to provide targeted social protection for the disabled and support for the disadvantaged.

To meet the objectives described above, stabilization and consolidation of positive growth trends, overcoming imbalances, further development of market mechanisms, deepening structural changes, creating a favorable investment climate, and training highly qualified personnel are needed.

Russian municipalities must overcome the high cost and economy inefficiency through qualitative enterprises and industries reforming policy, balancing the financial system, resource conservation, introducing new technologies, developing existing capacities and actively supporting small businesses.

It is necessary to implement a number of activities targeting significant social sphere transformation (education, health care, the pension system, housing and communal services), technical re-equipment, technological reconstruction and efficient city’s production capacities use. It is necessary to create an effective system (municipal) of city finances and city debt management, to improve the system of intermunicipal relations.

Solving these tasks requires improving the management structure on the basis of an effective functions and responsibilities distribution, delimiting powers and competencies between republican and local authorities, ensuring the execution of laws, reforming public service. It is
necessary to form an effective city management system [8] (by the municipality) to ensure SSUSES. The management system should include measures to coordinate actions at the regional and municipal levels.

The SSUSES methodology implementation should take place in multiple phases:

- at the first phase, city problems analysis is carried out, it should reveal systemic disparity, causes of imbalances and reproduction, the establishment of links and interdependencies between problems, factors affecting which these problems can be resolved;

- at the second phase, goals and possible strategies are formulated. Based on the urban problems analysis, a set of goals for the city development and the elaboration of the maximum number of areas in which it is possible to achieve the set goals are made. The analysis of the resource base, economic levers, structural changes, economic and other incentives and their possible combination, and consistency in the use to achieve the goals are carried out.

- at the third phase, the possible SSUSES methodology implementation consequences are assessed. Impact assessment implies the identification of the possible reaction of all system elements at a given level to the effects produced. This process should be optimized using comprehensive modeling of the various strategies implementation effects. If the assessment shows that the stated goals are not achievable, it is necessary to clarify the goals set, problems to be solved, change the strategy or change the deadlines for achieving the goals. As a result, only those that meet the objectives of the quality of the consequences are selected from the set of permissible strategies.

- the fourth phase - the optimal strategy selection, a comparative analysis of all the chosen strategies. At this stage, it is necessary to provide several scenarios for the implementation of the strategy, which should be applied depending on the projected changes in both external and internal conditions within certain boundaries. An assessment should be made of

This changes probability and volume and, accordingly, possible adjustments to the strategy should be provided in the process of its implementation, depending on which scenario is actually implemented. It is necessary to identify and assess the reserves that ensure the orders achievement. Possible events should be formulated; their occurrence would mean the need for a complete SSUSES methodology revision.

The adopted strategy should serve as the basis for the development of both long-term and operational solutions for managing the city development. Therefore, the phases implementation timing and the main parameters to be achieved at each stage should be formulated.

III. EVALUATION

The effectiveness of functionally complementary city subsystems interaction can be estimated via the method based on the evaluation of the multiplicative efficiency of separate city subsystem interaction with the entire SSUSES structure (see the formula) (Table 1).

<table>
<thead>
<tr>
<th>SSUSES</th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
<th>P₄</th>
<th>P₅</th>
<th>…</th>
<th>P₂₀</th>
<th>Interaction efficiency</th>
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<tbody>
<tr>
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<td>x₁,3</td>
<td>x₁,4</td>
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<td>1</td>
<td>x₂,3</td>
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<td>E₂₀-2₀</td>
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Evaluation of the functionally complementary city subsystems interaction effectiveness is carried out according to the formula: \( E = \prod_{i=1}^{20} E_{i-20} \), where \( E_{i-20} \) – interaction efficiency. \( i \rightarrow \) of subsystems with the entire SSUSES structure \( E_{i-20} = \sum_{j=1}^{20} x_{i,j} \cdot k_{i,j} \), where \( x_{i,j} \) – interaction efficiency \( i \rightarrow \) of subsystems with \( j \rightarrow \) subsystem; \( k_{i,j} \) – interaction’s weighting factors \( i \rightarrow \) of subsystem with \( j \rightarrow \) subsystem (determined by an expert).

The use of the "express method" is advisable under certain conditions: the studied parameters must be within a certain time interval; and "wide range" of experts availability.

The effectiveness of functionally complementary city subsystems should be assessed according the determined SSUSES structure. The structure of SSUSES should be considered as stratified causal relationships of administrative-territorial units, which are formed by economic entities in the surrounding urban (municipal) space. Three areas can be distinguished:

1) control sphere (reason);
2) controlled sphere (consequence, result);
3) the transition process from the control sphere to the control sphere.

Consequently, it becomes possible to create a management model that will align the goals of the management area (causes) with the management area (effect, result) - to stratify the urban system within a hierarchical structure.

When coordinating multi-level goals between the urban system strata, it becomes possible to organize effective socio-economic development, which leads to the sustainable and effective development of each strata separately [9]. It should be noted that the city is a structured, organized [10], dynamic system. The management of such a system is aimed at solving the problem of ensuring optimal conditions for the processes.
IV. MANAGEMENT

Underway implementing the SSUSES methodology, it is necessary to identify the main directions to assess the effectiveness of the socio-economic city development and the optimization of urban business processes [12]. It should be clarified in which direction, suitable for citizens, SSUSES increases and due to some factors [13, 14].

The process of providing SSUSES can be carried out in accordance with the proposed scheme (Fig. 1). 

![SSUSES provisioning scheme](image)

The "Input" parameters must comply with the SSUSES evaluation criteria structure. Economic, political-administrative, ethnic, socio-cultural, legal, political links should be considered to achieve certain socio-economic indicators of the development of the city (see above).

"Output" is a system effect that will allow using limited resources for SSUSES effectively.

The process of "Federal regulatory and legal regulation" includes:
1. Regional development issues in the Constitution of the Russian Federation.
2. Federal laws and regulations on regional development.
3. Federal laws and regulations, reflected the regional themes.
4. Regional subjects of fiscal legislation.

The process of "Regional regulatory and legal regulation" covers:
1. Issues of regional development in the Constitution of a separate subject of the Russian Federation.
2. Regional and municipal regulations.
3. Regional and municipal issues of fiscal legislation.

The process of "Municipal regulatory and legal regulation" consists of legal acts aimed at achieving certain socio-economic indicators of the city development (see above).

The "Urban governance" process includes the following procedures: "Analysis and forecast", "Problem statement", "Planning", "Organization" and "Control".

The procedure "Analysis and forecast" of the socio-economic city development includes the collection, processing, classification, systematization and storage of information in order to ensure SSUSES. At the same time, forecasting is considered as the probability of achieving socio-economic city development indicators. If the city is developing steadily, the forecast period may be one third of the period of its prehistory.

Competent "Problem statement" determines the possibility of achieving the goal – SSUSES. Tasks should be defined clearly and intelligibly in indicative form. The tasks setting phase, as a rule, is connected with the preliminary analysis and forecasts for the future. One of the main reasons for low SSUSES is disagreement in the formulation of tasks by federal, regional and municipal authorities to achieve the goal.

"Planning" is the procedure for justifying the decision and allocation of urban resources (material, financial, human, informational, temporary) [15]. The planning stages of effective socio-economic city development should be expressed in specific planned indicators. Account must be taken of the factors influencing the plan quality: the chosen methodology and planning methodologies; on the choice of planning indicators; from the interaction and unity of planning bodies; from the maximum consideration of factors of an objective and subjective nature (rates of economic growth, inflation, living standards and unemployment, ethnic and cultural characteristics, etc.).

"Organization" is a procedure for internal ordering, coherence, interaction of methods and tools, a set of actions leading to the formation and improvement of interrelations of a hierarchical urban structure [16]. The procedure of “Organization” includes three stages: first, the design of activities; secondly, the construction of the structure; thirdly, the construction of the system [17].

The “Control” procedure performs a stabilizing role in the SSUSES provisioning scheme. Continuously monitoring the city’s socio-economic development results, the authorities are able to make management decisions quickly and stabilize the situation in the event of its negative changes.

Consequently, the process of "Urban governance" is understood as the correction of tasks, planning, organization based on the results of the city development vector in order to influence the direction – the desired vector. The vector of a city’s development is understood as a sequence of accepted states, which are considered as some points in the set of dynamic “city” system states.

Under continually changing conditions, the city has to constantly evolve, and this development becomes not only a consequence of natural evolution, but also the result of targeted efforts by federal, regional and municipal authorities. In this connection, the management activities content also changing: it is less directed at administration, and to a greater extent at effective transformation.
The required quality effective socio-economic city development organization is set by the rules (conditions) that the indicators must meet (see the formula), and the verification of their implementation is an assessment of the quality of the “city” system and the ability to provide SSUSES.

Thus, the SSUSES provision in the methodological context serves as a consequence of the functional city integrity. The functional integrity of the city determines the relative autonomy, autonomy of individual urban units (districts, settlements, etc.) within the framework of the hierarchical structure. In a sense, this autonomy is inevitable, as it is inevitable that every object, once it exists, has integral characteristics, some of its own behavior.

Autonomy, integrity, behavioral characteristics of any level in the city hierarchical system cannot be understood by studying the only one level structure. The functions of the level have an inter-level nature, speaking as structural properties of the entire city hierarchical system. At the same time, the city structure should be considered as a result of the functional synthesis of the elements and its strata integral properties.

V. CONCLUSION

During systematic approach application to ensure SSUSES, it is necessary to study the city in general – as the system. In this case, the system criterion can be defined as an integral (structural) set of elements in a functional relationship (functional set), ensuring not only the existence, but also the development of the system. This criterion allows the evaluation and provision of SSUSES focusing on the urban system functionality.

The city system should be considered as a multi-level structure of interacting elements, combined into several-level subsystems to achieve shared objectives - ensuring SSUSES.

References


