

Sustainable Habitat as the Main Factor of Urbanization Development: 19th-20th Centuries

Zrównoważone środowisko jako główny czynnik urbanizacji w XIX i XX w.

Azizov Aghasalim

*Associate Professor, Department of Basics of Architecture, Faculty of Architecture, Azerbaijan University of Architecture and Construction
A.Sultanova, 11, AZE-1073, Baku, Azerbaijan
E-mail: aytenka78@yahoo.com*

Abstract

The goals set in this article are to reveal the state of urbanized systems resulting from accelerated globalization, to analyze the facts of deteriorating environmental conditions and depletion of natural resources and tendencies of formation of residential territories with the condition for the organization of sustainable habitat.

Moreover, for the first time, discusses the development of residential and industrial zones in terms of the formation of the urban planning framework of the residential and industrial environment. The novelty of the problems considered in the article consists of the differentiated approach to the policy of forming a sustainable habitat based on the town planning framework. The characteristics, directions and design of urban planning frameworks in the architectural and planning structure of various cities, as well as regions consider. The result of the study was a thorough analysis of the master plans of the of various European and American cities, including Azerbaijan.

Key words: urbanized systems, residential and industrial zones, sustainable habitat, spatial structure, design of town-planning frameworks

Streszczenie

Ponadto po raz pierwszy przeanalizowano rozwój stref mieszkalnych i przemysłowych pod kątem kształtowania się ram planowania urbanistycznego środowisk mieszkaniowego i przemysłowego. Oryginalność pracy zawiera się w zróżnicowanym podejściu do polityki formowania zrównoważonego siedliska w oparciu o ramy planowania miasta. Uwzględniono cechy, kierunki i projektowanie ram planowania urbanistycznego w strukturze architektonicznej i planistycznej różnych miast, a także regionów. Rezultatem badania była dogłębna analiza głównych planów wybranych europejskich i amerykańskich miast, w tym Azerbejdżanu.

Słowa kluczowe: systemy zurbanizowane, strefy mieszkalne i przemysłowe, zrównoważone siedliska, struktura przestrzenna, projektowanie ram urbanizacyjnych

Introduction

As early as the 1990s, the challenges and principles of sustainable human settlements were articulated in the outcome document of the United Nations Conference on Environment and Development (Rio de Janeiro, Brazil, 1992), Agenda 21 (Lola, 2005).

The article considers the issues of town-planning and social infrastructure of residential and production environment in terms of the sustainable habitat. The in-

terpretation of priorities in planning sustainable development of residential zone as well as analyzed the researches of global cities development problems, the characteristics of life quality of population and the characteristics of the most demanded facilities of social infrastructure. The researcher systemized the indicators of social infrastructure that is significant for the sustainable urban development, largely ensuring the good quality of the urban environment, secure and favorable living conditions. The results of

the research can be used as a methodological basis for studying problems of sustainable development of global cities, good quality of urban environment (Dadasheva, 2005).

The contemporary urban studies debate intends the city as a complex system that interacts with other cities creating a complex global network. At the same time, the city is subject to continuous and rapid changes that generate instability conditions and make it fragile (Esopi, 2018).

The aim and main directions of sustainable habitat development are:

- the principle of solidarity and subsidiarity, which defines the mutual assistance of States in the formation of sustainable habitat;
- the principle of humanization of the living environment, aimed at the preservation and development of national circumstances, originality of architecture and urban planning;
- the principle of balanced social, economic and environmental development, aimed at ensuring the stability of the functioning of the living environment (Huseynov, Kakhramanova, 2003);
- the principle of sufficiency, which determines the transition from excessive consumption of natural and other types of resources to sufficient consumption;
- the principle of sovereignty and democracy, which defines the right of every people to choose its own path of development, while taking into account the common interests and development goals adopted by the world community (Azizov, 2014);
- the principle of security, which determines the right of every person to live in a safe and healthy living environment;
- the principle of differentiated development, considering the real diversity of preconditions and limitations of the development of territories and settlements, inevitable differences in the pace and direction of their transformation (Azizov, 2015) (Figure 1).

The objective of the study on sustainable habitat development is to improve the living conditions of the present generation without compromising the needs of future generations through the integrated development of urban and rural settlements, public service systems, industrial, transport and engineering infrastructure, recreation areas and health improvement, rational use of resources, preservation and revival of historical and cultural potential (Budagov, 2007).

Methodology

The Sustainable Urban Land Use Policy is a critical component of sustainable land use in China, aiming to improve the urban land use efficiency, increase land output, protect the land ecological environment and realize the sustainable utilization of urban land resources. As part of the strategy for sustainable ur-

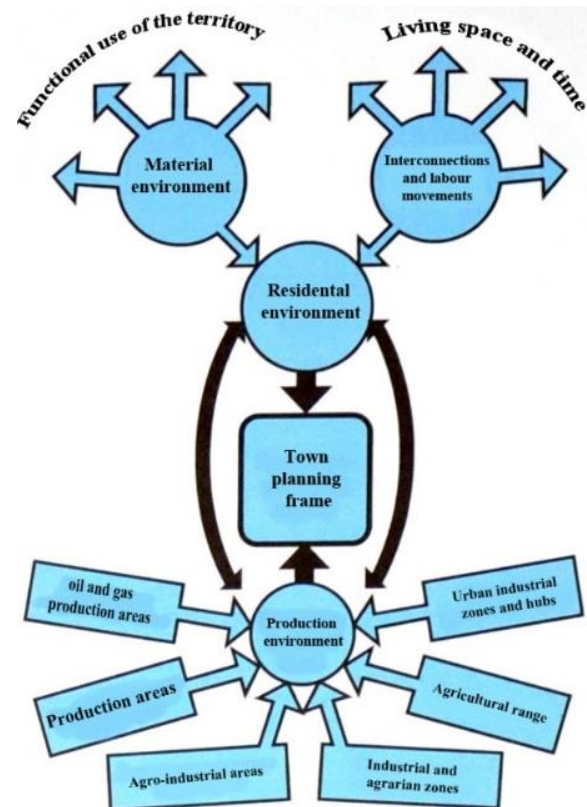


Figure 1. Conceptual model of a town-planning framework and its spatial elements

banization, the Sustainable Urban Land Use Policy has been implemented in some cities for years (Lu, 2018). The following criteria are taken as the criterion basis for the study: fulfilling the spectrum of the main functions of the urban planning framework: saving (territorial, production, labor, energy) resources, attitude to the residential, industrial and natural environment, developmental ability, sustainability.

The metric and configuration of the framework are studied jointly, as two sides of one process, which is most characteristic of urban planning as a whole (Hassanov, Karimli, 2003).

Architecture and urbanism, faithful to their social commitment, can make valuable proposals from their respective disciplines. Among these proposals, public space remains valid as classic urban resource of integration between different groups. Moreover, the new intergenerational architecture promotes programmatic fusion and social interaction (Garcia-Domenech, 2018).

The object of study was the regions of Azerbaijan, where, with the participation of the author, Regional patterns of settlement, environmental management and territorial organization of productive forces – the Regional Settlement Scheme (RSR) were implemented (Hassanov, 2012). The main sources of information were materials of official statistics, survey data, geographical maps, draft master plans for cities – supporting centers of regions of the republic, integrated transport schemes, schemes for engineering

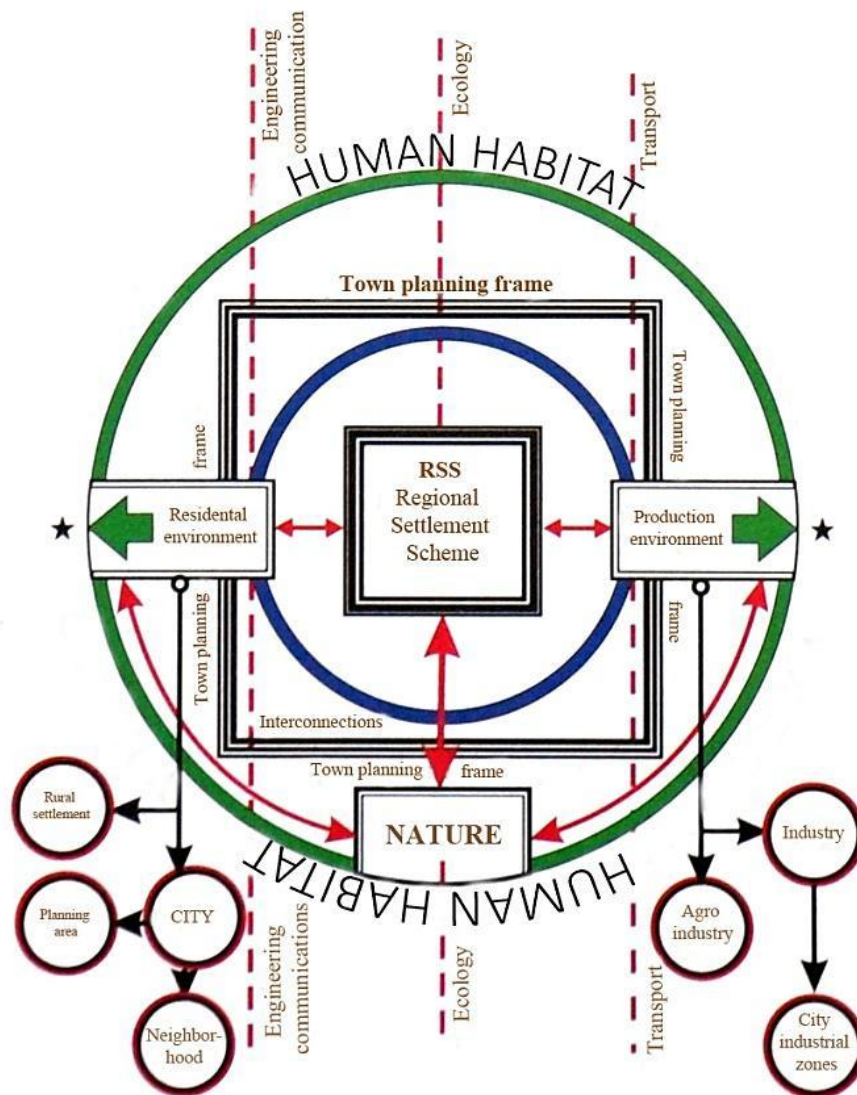


Figure 2. Hypothetical model of the environment within developing the Regional Scheme of Resettlement (RSR)

and communication infrastructures. It is paid a great attention to the problem of sustainable development in modern society. The development of the economy is impossible without the usage of innovative projects in all areas of life. The process of urbanization poses new challenges, so the implementation of innovative projects aimed at sustainable development of cities takes on special significance. The objectives of the current study are definition of the consistency of the *United Nations Sustainable Development Goals* and ways to achieve the goals (Evseeva, et al., 2017) (Figure 2).

A holistic understanding of the region in general with the system of settlement, dialectical interconnections of the core (frame element) levels, developed on the town planning material, but having a general scientific sense, turned out to be interrelated with the main provisions of the system approach (Bakirova, 2005). This helped the author, along with the study of individual specific tasks, to link together all the results obtained (in relation to goals, object-

tives, criteria, tools, conclusions and recommendations) at the final stage of the study (Eldarli, 2004). Urbanism is a challenging topic in the world, which has resulted in several land-use and transportation issues in urban environments. To address these issues, urban planners follow integrated planning approaches that are more compatible with sustainable development objectives (Motieyan, 2018).

Attempts for implementing sustainable urbanization have been reported and documented around the world. These efforts have led to a vast number of exemplary sustainable urbanization practices, classified as best practices. Best practices contain valuable information in the form of experiences and learning from them represents an opportunity to replicate successful practices in other cities (Ochoa et al., 2018). The Industrial Revolution in the late 19th-20th centuries was the cause and impetus for the improvement and development of capitalism in many countries of the world, which caused rapid and intensive growth of cities accompanied by the sealing of buildings.

During this period, in the residential areas as a result of the spontaneous development there were certain problems – the chaotic distribution of residential and habitable areas in the city and the production facilities that pollute the environment (Kolodin, 2004). It could not be changed the spontaneity of urban development and the issuance of a number of legislative and regulatory acts (reconstruction of the center of Paris according to the plan of Osman J. in 1853-1896).

The beginning of the 20th century was marked by the emergence of new town-planning theories that advanced theories about new systems of settlement and progressive directions, such as de-urbanism (associated with the 19th century with the idea of a garden city) and urbanism (Le Corbusier projects) (Lola, 2005).

From the beginning of 20s of 19th century in Europe the design and construction of working settlements of residential complexes of *cheap dwellings* for the middle class of workers got spread. In this direction of urban planning the progressive ideas of planning of inhabited places were produced: planning and functional chart of residential complex in whole, optimal orientation of buildings and structures, installation of green and recreation areas, playgrounds for children, design and planned construction of public buildings and consumer service enterprises. Further development of these urban concepts is observed after the 2nd World War, in 1939-1945. Significant urban planning projects are being developed: the restoration and reconstruction of Le Havre (architect Perret A.), the plan for the reconstruction and development of Greater London Plan (architect Abercrombie L.) (Huseynov, 2010).

The project involved the construction of 8 satellite cities to curb the growth of London's population. The small size and slow pace did not correspond to the scale of natural growth of the city population and was not accompanied by restriction of urban boundaries. Nevertheless, modern urban development trends are reflected in the developing countries of Asia and Latin America (Chandigarh, India, architect Le Corbusier and Brasilia-Brazil, architect Costa, L.).

A new direction in urbanistic of the 20-30s, territorial planning or regional planning arose as a progressive direction in the regulation of regional territories and spaces.

Abercrombie, A. and Johnson, T. in 1921-1922 developed a project for the planning of a coal region in Doncaster, England.

The new crisis of urban development of Western countries has caused the rapid growth of motor transport along with the natural rise of cities. In this regard, in search of solutions to problems, to create new theories of so called *dynamic urban development*, the authors who saw the causes of the crisis in the fact that the planning structure of cities is static

and does not take into account the dynamics of rapid growth of populated areas (Iakovleva, 2002).

In 1950-1960s the Greek architect Doxiadis C. put forward Ekistics theory in which he and his followers justify spontaneous and unlimited growth of cities in the form of continuous linear city strips stretching along transport corridors and ways throughout the world. As an example, the associates of this territory consider the colossal agglomeration of settling on the east coast of the USA and in the area of Great Lakes a positive way of future human settlement (Huseynov et al., 2003).

The search for new modern urban theories continued, so the Japanese architect Tange K. in 1960 put forward the theory of metabolism, and European architects put forward the theory of mobile construction and spatial (three-dimensional) development of cities (Architects Alber E. and Friedman I.).

During this period various theoretical proposals were put forward by architects-town planners, such as rejection of the traditional spreading of settlements on the surface of the earth with the transfer of urban development by creating artificial tiers over the old settlements in space, the erection of the growing buildings of the tree-like architecture, as well as the cities above the sea bays floating in the ocean, etc.

Transformations of residential areas of non-urban spaces and working margins of cities: Moscow, Leningrad, Baku, Kharkiv, etc. began since 1920. Transformations of residential areas of urban spaces and working margins of cities: Moscow, Leningrad, Baku, Kharkiv and others had begun since 1920. Development of urban planning during this period was accompanied by the emergence of new theories on urbanism. For example, the architect Ladovsky N. in the late 1920s proposed and developed a progressive new concept of the so-called developing city in the form of parabola with developing on its axis public centers, which consistently skirted the residential, industrial and green zones. In 1930, the architect Milutin N. put forward the idea of parallel development of industrial and residential areas of the city, which he called flow-functional scheme, which was used in the construction of a tractor plant in Kharkiv, Ukraine. In 1935 architects Semionov V., and Chernyshov S. have developed the master Plan of Reconstruction of Moscow, Russia.

New developments of master plans for Leningrad, Kharkov, Baku, Gorky, Novosibirsk, Chelyabinsk, etc. were launched in the period 1930-1935 (Figure 3).

Formation of the production environment

It is well-known that the town-forming base and the most important part of the city are industrial areas where most of the population works. The working conditions of the population depend largely on the planning and development of these areas. In the

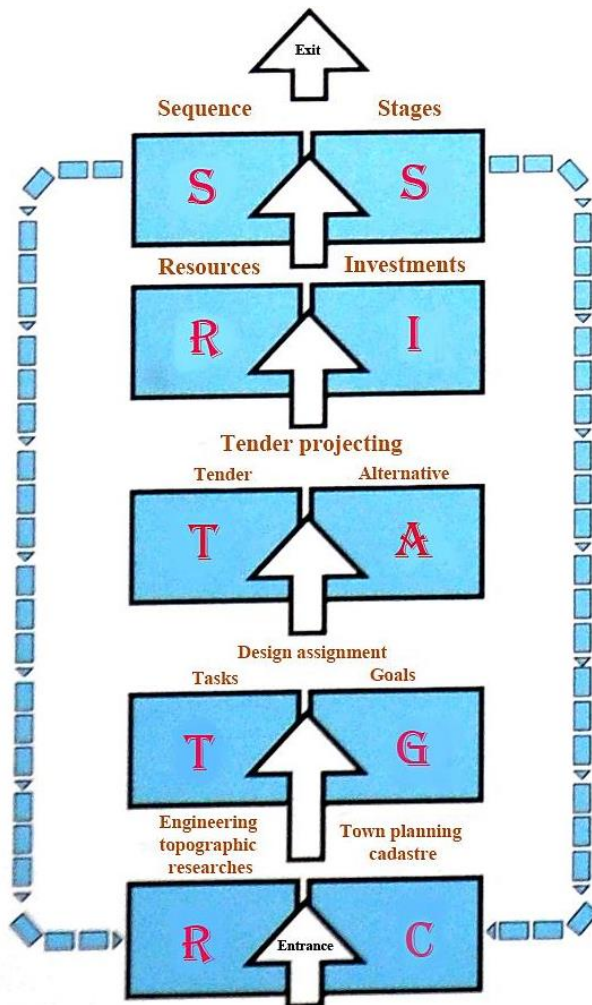


Figure 3. Block diagram of program-targeted management of the planning structure of the city

formation of a production environment, such as an industrial hub, the possibility of joint use by several enterprises of access railway lines and marshalling yards, as well as networks of engineering equipment and infrastructure are considered. As a result, this cooperation provides technical, architectural planning and economic advantages and is carried out on the basis of projects of planning and building of industrial districts and knots (Lysenko, 2004).

It bears mentioning that the master plans of cities and projects of planning of extra-urban and suburban zones are developed simultaneously.

An analysis of the urban development of many cities has shown that progressive and modern techniques and principles of planning and building are widely carried out in the construction of new cities in areas free from site development. At the same time, modern urban planning requirements for old or existing cities are taken into account and work is being done to improve the architectural and planning organization through reconstruction, which envisages the improvement of the residential environment by improving insolation and ventilation of buildings, reducing building density, expanding old streets and punching new roads and streets, and building transport tunnels,

pedestrian crossings. Issues of preservation of historical and artistic appearance and organic combination of new buildings with architectural monuments should be addressed in the period of reconstruction of cities with rich architectural population (Bakirova, 2005).

At the same time, the reconstruction solves the issues of improving the comfort of residential and public buildings and expanding the network of enterprises of trade, cultural and domestic and medical services of the population.

The analysis of the town-planning situation in several countries, accompanied by achievements of science and technology, dynamic development of productive forces, caused rapid growth of urban population (Hassanova-Faradjeva et al., 2007).

It is known that the working environment is the main town-forming factor of the residential environment, therefore the location, size and further growth of cities depend on the allocation and development of existing and construction of new industrial enterprises, power plants and other elements of the production environment. Master plans of cities and other settlements are formed on the basis of projects of district planning and regional schemes of resettlement and determine the location, size of the town-forming objects. Therefore, the parameters, profile and dimensions of the production environment elements are revealed. Consequently, it can be stated that the rational formation of new industrial zones is the main task of regional resettlement schemes. It should be noted that in cities with a population of over 1 million, for the comfort and convenience of movement of the population, it is necessary to construct large transport facilities, modern engineering communications systems, taking into account the neutralization of the concentration of transport and industry, which significantly impairs the sanitary and hygienic condition of residential areas (Dadasheva, 2005).

It should be noted that in the regulation of the territorial size of cities, the paradigm of the optimal size of a city is crucial, which determines such a population and such planning and development, which combines the positive characteristics of large (network of cultural and community services) and small (proximity to nature and place of work, cleanliness of the air basin) of the elements of settlement and in which the formation and construction of the city requires a relatively smaller amount of material and technical resources. Research and analysis of the practice of regulation of medium and small cities in the systems of resettlement of many countries within optimally specified sizes showed that this concept belongs to the group of functionally interconnected cities and settlements of residential environment. It is noteworthy that the optimal size of a city or other settlement is not a constant and depends on the development of the working environment.

An analysis of world practice in the formation of resettlement elements (cities, towns, etc.) showed that

the development of a master plan should go hand in hand with the development of a regional planning project, the center of which is the projected city (Figure 4).

At the same time it should be noted that the concentration of production (industrial) objects in certain areas leads not only to anthropogenic situations, but also to inconveniences in the pendulum movements of workers (to work, home). For example, in the cities of Tokyo and Yokohama (Japan), where the concentration of industry has extremely increased to accommodate workers in new enterprises, dormitory towns are being built. As a result, the time spent on travel to and from the place of work decreased.

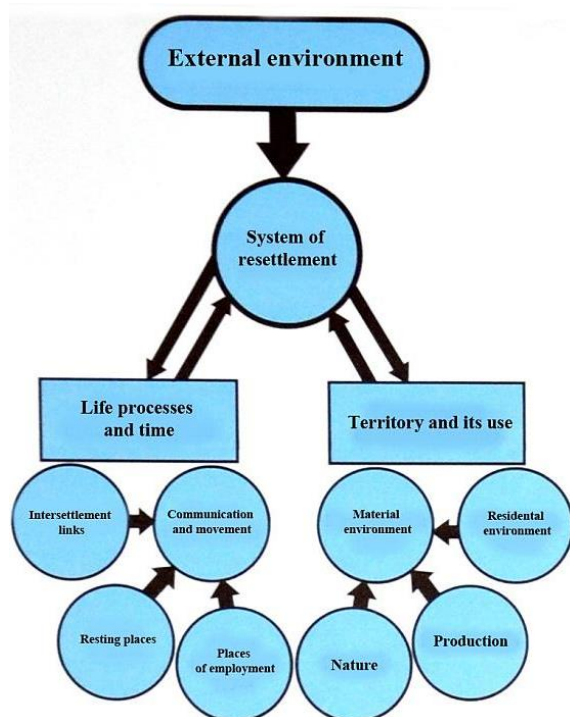


Figure 4. Model *System of resettlement*

The rapid growth of motorization around the world has made many suburban areas available daily, contributing to the dynamic growth of cities.

In resettlement systems, the quality of planning and development of residential environment (cities, groups of inhabited places) are determined by the network and speed of traffic. Distance and length of the path from the place of residence to the place of work or recreation depends on the placement of objects of production environment, which should be reflected in the correct reciprocal placement of production and residential areas (Hassanova, 2003). In the large and big cities of Western Europe and the USA at the beginning of the 20th century, transportation problems that arose as a result of the spontaneous development of transport and the chaotic development of populated places in settlement systems were not considered. Subsequently, the dynamic motorization became the cause of violation of the norm and rules

of urban development. It is necessary to take into account, that modern types of transport and normative requirements are not compatible with historically established transport infrastructure of cities. The alternative is the laying of new and reconstruction of old streets, construction of urban clearways, special expressways, isolating traffic from pedestrians.

The study of the state of town planning decisions on the formation of the residential and industrial environment of the regions and cities of Western Europe and the USA showed that the development of the architectural and planning organization and long-term forecasts of the development of both individual cities and regions as a whole, taking into account the achievements of social and scientific and technical progress.

Problems of sustainable habitats were discussed at the UN Conference on Environment and Development, held in Rio de Janeiro in 1992, where it was shown that in a world with constant environmental degradation, a healthy society and the economy can no longer be considered. It is impossible to solve the problems of economic development, safe for the environment. Meeting the needs of the present without compromising the ability of future generations to meet their needs Agenda 21, adopted and endorsed by representatives of the Governments of the World, numerous international and non-governmental organizations. At the same time, the Conference noted that the environment and socio-economic development can no longer be considered in isolation, the economy and the resettlement environment are not possible with environmental degradation.

What is sustainable development of the environment?

The recently adopted UN integrated concept of sustainable development of countries, regions and other places in resettlement systems unites the main problems of preservation and restoration of natural components and ensuring decent living of future generations. The strategy of sustainable development is coherent with the laws of ecology, limited natural resources considering the interests of society. It should be noted that the English term sustainable development translates as supported development and environmentally supportive development (Hassanova, 2003).

The concept of sustainable development adopted by the UN requires all countries to provide residents with the opportunity to realize the needs for a full-fledged habitat and harmonious population and economic progress with the existing productive potential of the biosphere.

It should be noted that sustainable development includes the provision of human needs without depriving the future generation of the opportunity to meet their needs.

At the same time, economic, urban, energy and others must be addressed in sustainable development programmes. Tasks, identity of a way of life with ecological possibilities of regions, certain restrictions in operation of elements of a natural environment and resources connected with ability of terrestrial biosphere cope with consequences of human activity, and also the agreement of growth of elements of the residential environment with the productive potential of the ecosystem.

The study of the world-wide dissemination of concepts of Sustainable society, sustainable development of the environment, sustainable cities showed different approaches of specialists to this problem. Thus, the concept of *sustainable society* is constantly criticized by both sociologists and critics of urban planners, mainly because of the uncertainty of this concept.

Held in Manchester, Global Forum 94, the second after Rio 92 was devoted to the problems of sustainable urban development revealed different approaches to this problem. Different concepts of cities and regions were presented here in the context of the *sustainable development plans*, which addressed the main problems—the maintenance of the environmentally sound relationship between urban areas regions and ecologically natural territories. Special attention was paid to the concept of conservation of urban areas of the *wild nature* – wildlife (Figure 5).

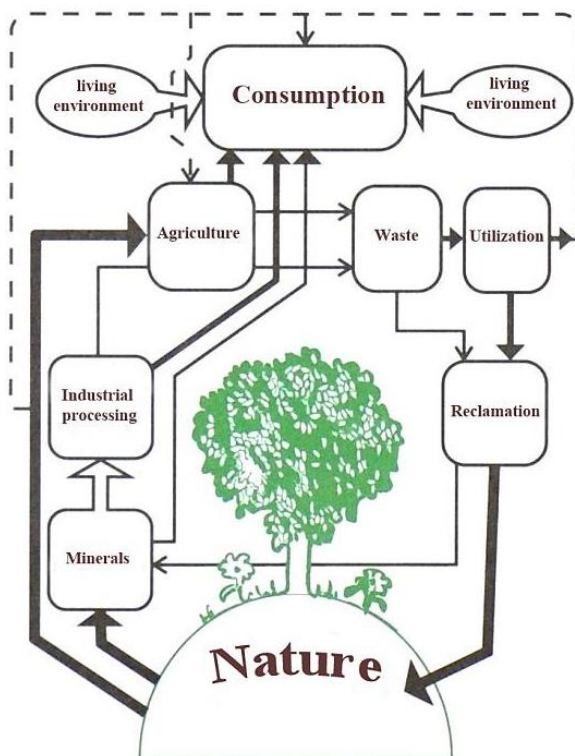


Figure 5. Agrarian Gradokarkas in the Conditions of Agro-Industrial Integration and Combination of Production

As a result of discussions at the forum it was shown that agglomerations uniting the system of cities have

started to implement sustainable development programs, are also of a promising nature, as they allow to see the problem of ensuring sustainable habitat in the complex in all kinds of human activity.

Ensuring sustainable development is one of the most important requirements in the direction of activities and life of society, including environmental education and education of people. This construction of sustainable development programs forms the policy of urban development and other elements of the residential environment, as well as solutions to the problems of the ecological and environmental issues. The formation of programs in the direction of the development of cities and the solution of environmental problems makes it possible to reveal the irrationality, prematureness, non-environmental friendliness of various activities that would not be disclosed in ordinary programs. In modern conditions, the dignity of sustainable development programs is their focus on environmental friendliness of all activities (Global Report, 2009).

Analysis of indicators of urban planning in the world showed that the modern structure of production and consumption does not answer the formulation of a sustainable environment and is one of the main causes of the degradation of nature (State Program on Social and Economic Development of the regions of the Republic of Azerbaijan, 2009-2013).

The analysis showed that the rapid growth of the residential and industrial environment leads to an increase in the load on the ecosystem (air, water, soil) energy and other resources. In this case, the strategy for sustainable development should address a set of problems related to population growth, healthy ecosystems, easy access to and conservation of resources. At the same time, all states need to develop their own demographic program for the livelihood of the population, because creating a sustainable residential environment, one of the main and most important tasks of humanity, given that in 2050 more than half of the world's population will live in cities. However, as shown by the study of trends in urban planning in most cities are now manifested symptoms of environmental crisis.

Accelerated globalization of urbanized systems at the present stage is accompanied by depletion of natural resources, uncontrolled growth of environmental pollution, deterioration of the environmental conditions of the human environment, and therefore the main elements of urban development strategies in the twenty-first century dictate the need to create urban development models that are consistent with the ecosystem and protect it for the needs of present and future generations (Figure 6).

Utopian plans and numerous scientific projects are now associated with the appearance of cities of the future. The chaotic and difficult-to-manage growth of large cities forces specialists to rush from one extreme to another in an attempt to hinder it.

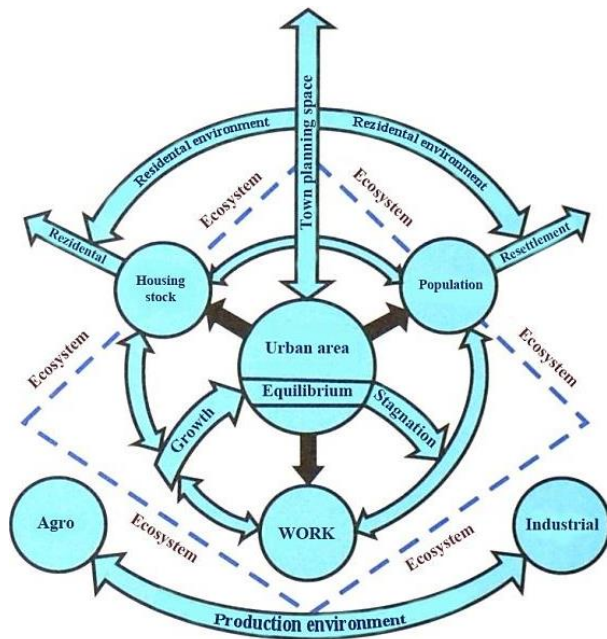


Figure 6. Model of the urbanized territory

The problems of the city are not confined to any country, society or historical epoch. The performance of the city is much more determined by the advantages of its economy and the nature of the relationship between business, housing and population. Apparently, the majority of urbanized areas develop on the same pattern. It is possible to assume that any separate city is small enough and does not influence the external environment. We can therefore consider the city as a living system that interactions with the environment are not of decisive importance.

Urban planning is one of the areas of human activity where forecasting is of paramount importance. This is explained by the fact that life in the city becomes a form of existence of an increasing number of people that huge material values are concentrated in cities, and that as a result of industrial development the urbanization process is accelerating (Talybov, 2007). The specificity of urban planning forecasting is associated with a much longer service life of an object such as a city, the laboriousness of its design and construction, requiring considerable time even in conditions of developed industry, as well as the need to take into account all the life principles of this complex organism. Experiment – the traditional criterion of new developments in relation to the real city is almost impossible, however, comparisons of various options for strategies for managing the development of the city can be done on mathematical simulation models using computer technology. American urban planners have accumulated extensive experience in the development of simulation modelling of the city. On this point, referring inter alia a large number of interesting works in which the authors offer different mathematical models to solve the problems of life of the city, model of the city's subsystems, for example city size model in the city

system, statistical models of the city, game modelling of cities, urban planning and system analysis, model of optimal accommodation of buildings in cities, potentials of the field of resettlement, potentials of the field of contacts in the city (Figure 7).

Territorial placement of residential and industrial environment

In most countries, the system of territorial distribution of the residential and industrial environment is hierarchically structured by applying new methods of forming urban planning space: state-wide strategic planning of territories in order to integrate public sector functions and the formation of new methods of regulating land use and planning new territorial forms, such as regional settlement schemes, compact cities and new urbanism.

In the 20th century, the dynamic urbanization that led to climate change and the scarcity of natural resources, as well as the global recession, led to the question of a return to the planning system. These trends are essential for the formation of territorial structures, i.e. elements of residential and industrial environment.

As urbanization develops, the issue of sustainable development becomes crucial. Planning can play an important role in ensuring a sustainable development environment. Achieving the goal of creating sustainable cities and helping to preserve the climate requires planned changes to give cities the desired shape in terms of territory and space and provide a service delivery system. Research and analysis of urban trends has led to the conclusion that planning allows us to direct the problem of climate change into the mainstream of solving the main issues of the development of the residential and industrial environment of certain regions (Naghiyev, 2011).

The end of the XIX century is characterized by the emergence and spread of a certain innovative trend in urban science and practice, which was called urban modern or modernist planning. In the period after the industrial revolution of the 1850s, the concept of Planning in modern style is used in everyday life in Western Europe.

It should be noted that the planning in the style of *modern* was formed under the influence of two groups of factors – technical and ideological.

Planning efforts to neutralize the external negative effects of industrialization and urbanization were due to the first group of factors.

A characteristic feature of the planning was:

1. Fulfillment of the technical task on development of territorial plans of the locality;
2. Development of master plans, detailed building planning and layout plans;
3. Fulfillment of the technical task in compliance with existing and acting norms and rules describing their human habitat in perfect form.



Figure 7. Town-planning modular

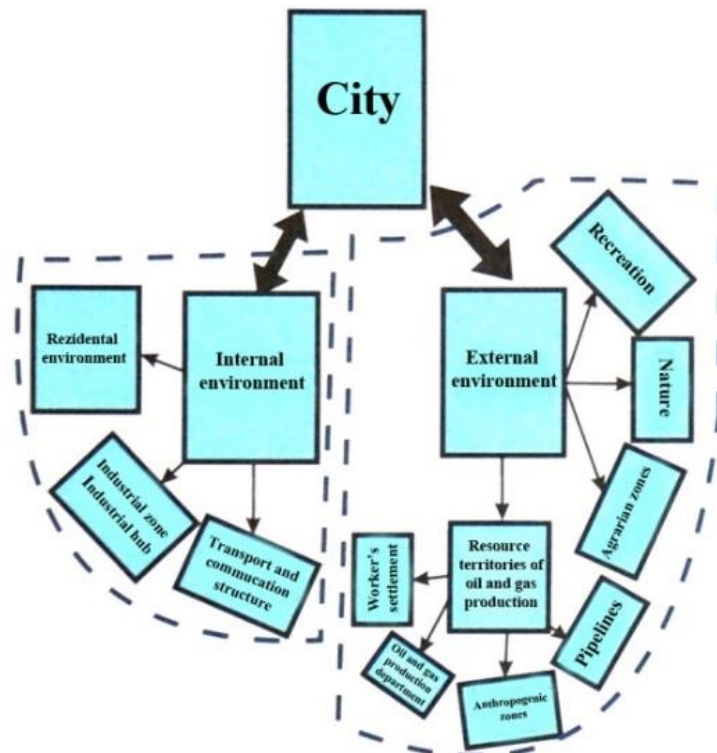


Figure 8. Urban model city environment (concept)

At an early stage of urban planning in the UK, this concept was influenced by the utopian socialism of that era. Nostalgia for the rural image of England revived the idea of recreating village life in cities by building ecologically clean cities, which became the most popular concept of planning of the time Garden City developed by Howard E.

During this period, Wright, F., to address the challenge of rapid industrialization in New York City, proposed the idea of low density building, distribution of residential areas throughout the city with the representation of each family on a small plot of land. Although the spatial forms proposed by the different planning systems were different, the master plans on which they were based had much in common. In conjunction with the system of architectural and planning supervision over the development of the territory, the master plans functioned quite successfully, forming a high-quality and sustainable human environment.

The challenges of sustainable environment development

Fundamental problems of sustainable development of the environment, in which three basic elements of human life work-life-rest, always coexist, become relevant for the development of a full-fledged habitat, i.e. structural-medium System *settlement-production* (Figure 8).

Hence, a natural question arises, and how interconnect such territorial and spatial elements of the environment, as production (industry, agrarian sector, engineering and transport infrastructure, etc.) with residential areas (cities, settlements, recreation areas, historical and cultural, natural and ecological and tourist areas).

The analysis of the world urban planning concepts for solving the problems of the interconnected sustainable development of the industrial and residential environment has revealed several different methods of approaching this problem:

- carcass method;
- cluster method;
- planning in Art Nouveau style;
- planning on the basis of urban cadastre;
- development of regional schemes of settlement, environmental management and territorial organization of productive forces (regional settlement scheme) (Sharifov, 2004).

In the global urban practice, the carcass method of planning space and environment was proposed as far back as the 1960s – 1980s.

The initial formulation of the problem and its development on individual issues are reflected in the masterworks of the Central Research Institute of Urban Planning (CRIUP). Regarding the planning structure of the city, the ideas of the framework were formed within the framework of research on the problem Transformation of the environment of large

cities and improvement of their planning structure, which began in 1971 and ended with the publication of monographs of the same name in 1979 under the general guidance of Lavrov V.

The author has written the chapter *Transport-Technical and planning-structural framework of the big cities and interconnected with them groups of inhabited places*. Here, the rationale was given for the need to operate with such a concept as the planning framework of a city, taking into account the growth of the connective content of the planning structure. If earlier in the first plan of research there was a problem of restriction, differentiation of heterogeneous parts of the city, now the task of ensuring its entirety and integration. Gutnov A. (Scientific Research and Design Institute (SRDI) master plan of Moscow) in his doctoral thesis *Structural and functional organization and development of urban planning systems* (1979) justified the ideas of the structural and functional framework of the urban planning system on the example of Moscow. In the Central Research Institute of Urban Development, the General Scheme of Settlement in the USSR was developed (Fomin G., Belousov V., Vladimirov V., Listengurt F., Yusin G., etc.), in which the concept of a settlement framework was used, as well as the transport frame, across the country. In the joint work of Bocharov Y. and Kudryavtsev O., it was noted that *groups of large cities not only characterize the modern stage of urbanization, but also form the framework of the perspective organization of production and development of settlement*.

The prerequisites for the study of such a complex phenomenon as the framework of the planning structure of the largest cities in settlement systems that make this problem solvable serve the capital studies of large agglomeration cities and associated settlement systems carried out by Smolar I. and others, and in individual areas: Ural – Lakhtin V., Siberia – Ogli B., Ukraine – Fomin I., and others, as well as a systematic approach in urban planning, defined in the works of Avdotin L. and others.

In geography, the ideas of the framework go back to Baransky's N. now popular expression: *cities plus a transportation network is the economic framework of a territory*. Lapto G. considers the exoskeleton in relation to the territorial structure of economy, planning and resettlement, shows its outstanding role and importance in concrete conditions. Khorev B. considers the exoskeleton to be the most important component of his theory of a unified settlement system, attaching particular importance to the connection with the territorial organization of society. Bakclanov P. applies the concept of the exoskeleton of the territorial-economic structures to the linear-nodal structures of the industry.

In the Western countries the concept of the skeleton of the planning structure of the largest cities in resettlement systems has its own peculiarities. In the works by Gruz Y. (Czech Republic), dated back to

1960, the original structures of cities with an emphasized frame are presented in a schematic form. Similar developments took place in England, France and other countries. Even more schematic attempts, up to a global scale, were taken by Doxiadis K. (Greece). According to Glazychev V. (Russia), the term *spatial framework of the urban environment* is used in Japan in the architectural and compositional sense associated with the traditions of Japanese architecture.

Concentration in terms of building density was already one of the main themes of the first modern planning doctrine, the Osman Doctrine, which provided for the development of the city center with compact five and six-story buildings. In the period after the 30s, concentration along with the division of functions was also a guiding principle, which was reflected in the doctrine of the International Conferences of Modern Architecture (MKSA), set forth in the Athens Charter, which served as the basis for modern urban planning and was formulated in 1933. The doctrine of the garden city, which prevailed in the period 1900-1930, was based on the concept of decentralization. At the same time on the periphery of cities began to build high-rise buildings (Urban Planning and Construction Code of the Republic of Azerbaijan). In the period after the Second World War, urban planning developed towards the creation of adequate living conditions for the majority of the population through the efficient use of technical resources and skilled labor. The slogans of this period were justice, equality and solidarity, and for the dwellings themselves, this meant modern equipment, a comfortable layout, good lighting and sufficient space. However, in practical planning, these values increasingly faded into the background, giving way to the demands of economic necessity and the efficient use of resources.

The concept of the garden city was further developed in the form of the creation of a *solar system* of independent satellite cities with certain employment opportunities, the planning of which would ensure a healthy and safe living environment. This concept has been implemented in a number of new cities in Western and Eastern Europe. Another powerful direction in the theory of modern urban planning was the model of a multifunctional urban structure consisting of cities with relative levels of self-sufficiency and specializing in the implementation of certain functions. The merits of this direction should include the development of the concept of multifunctional and small-mesh building, the preservation of existing buildings and the creation on the streets of the city of a favorable climate for active communication and cultural recreation of residents.

In transition countries, some of these doctrines, combined with socialist egalitarian ideology, also influenced urban planning. Social policy in the field of urban development was based on the principles of ensuring a balance of opportunities in the field of

housing and production (employment) and equal access for all to the social infrastructure.

Analysis and findings

In the practice of designing master plans for many European cities, there was a concept of balance between the production and residential environment. But often the employment plans of the population were not sufficiently adjusted in the master plans of new cities; project documentation was developed in general terms, sufficient for the initial, conceptual definition of territories required for the construction of cities. For example, for new cities created around London, one place was provided for employment in industry and one in the service sector or in institutions for every four inhabitants. This would mean a small surplus of jobs (the average employment rate in new cities was about 0.42), which exceeds the average employment in the London industry. In Cambernold, the percentage of the employed population was 45-50% by the time the city was completed; It provided 70% about places of application of labor in industry, construction and mines.

Critical analysis

In-depth study and analysis of the pre-project situation in the developed Regional settlement Schemes of Azerbaijan revealed different, sometimes contradictory trends in the state of the urban-ecological framework of these regions.

So, the regions in which production areas do not affect the long-term modernization and where there is a development of the residential environment at a low rate, where there are systems of various anthropogenic factors geographical condition and clinical conditions dictated certain requirements for design development. In this regard, the study in the conceptual solution of the Regional Scheme provides different approaches and solutions when working on architectural and planning and environmental conditions specific to each region separately, which could eventually be the main argument for a sustainable habitat. As proof of this, the study developed and implemented in the project work SWOT-analysis of the urban situation in the Guba-Khachmaz region of Azerbaijan, which considers mainly the promising formation of the structure of the regions of the Unified Settlement System (ESR), the analysis of trends in the formation of settlement systems, because the transformation of this system and the prospective content of its structure should be developed on the basis of the ESR.

Empirical data

In the history of world urban planning, there were many areas, approaches, schools on the problem of analyzing and further addressing the issues of spatial

modelling of the urbanized territories of various states. In our case, where the main system-forming spatial element of the development of certain regions of Azerbaijan is the urban framework. The study brought the methods of forming a single urbanized structure with the integration of residential and industrial areas.

According to the author, an optimally formed urban frame is the most important postulate of the results of the temporal-spatial process of the emergence of an urbanized environment and a decisive factor in its future development in the context of a sustainable environment.

These conceptual statements were used in the development of regional settlement Schemes of 6 regions of Azerbaijan with the participation of the author.

It should be noted that the development of this SPEM revealed several specific differences in the planning structure of cities and settlements of these regions:

- Geographical location;
- Relief of the territory;
- Ecological state;
- The geometry of the site;
- Size, rank and population of cities;
- The balance of the territory is the dislocation of the industrial zone in the architectural and planning structure of the city.

It is known that the architectural and aesthetic appearance of the city is naturally associated with its planning structure. The city is more pronounced than in the deep areas outside the frame. It is necessary to talk about the unity of planning and architectural and compositional framework as the main principle of architectural composition of large spaces. In connection with the subsystems of the planning framework there are communication nodes, in which the conditions of human activity are most pronounced and in which it is necessary to create architectural and spatial accents that form the aesthetic environment, forming a system of landmarks and serving as transitional elements from one spatial order (scale) to another. Specific conditions for the formation of regional urban structures find their aesthetic expression in the frame. The latter unites the city and its surroundings.

The results of the conceptual provisions proposed in this article were presented at scientific conferences of Azerbaijan and abroad (Macedonia, India, Italy, Russia, etc.).

Conclusions

Thus, industrial zones, one or more, depending on local conditions, but mainly at the rate of about 100 jobs per hectare were located on the periphery of the city, near shopping centers, railway stations, etc. In the new cities located around London, as they were built, the number of places of employment in industry reached about 25% of the total population,

slightly increasing (21% in 1948, 28% in 1967). In other cities, often located near industrial enterprises or mines, this ratio, on the contrary, decreased from 40% to the time of completion of construction of the city to 22% in 1967, which necessitated providing employment places outside the London district. So, it can be said that, despite some initial difficulties that have arisen, the number of places where labor is used in industry currently corresponds to the plan.

In some new cities, several in the London area, large industrial enterprises play a dominant role (Ford at Basildon, Heveland in Hatfield, and others), which have a decisive influence on the entire life activity of the city. In other cases, one or another area of activity prevails.

The two largest metropolitan areas, Greater London and West Midlands, continued to grow rapidly. The main reason for their growth was that they had many new and expandable enterprises. Especially phenomenal was the growth of the capital. It attracted almost half of all new businesses opened in Britain in 1931-1937. The capital had a special attractive force for industrial and other enterprises, activities were related to serving the needs of the population. All of them received strong development in the capital. A great impetus to the development gave rise to construction in the 30s. For 16 years, Greater London and the surrounding counties have attracted more than a million immigrants from other parts of the country, mainly from areas in depression.

There are many types of enterprises, the location of which does not depend entirely on natural factors, nor on settlement. Even in the last century, the placement of industry did not occur in one way or another automatically. Various valid reasons limited the area of its possible location, and some leading industries could successfully find a place in any of the districts. In general, the development of employment in the industry of new cities takes place in favorable conditions, the number of places of employment for employees in institutions is too small. This is the reason for the emergence of new daily pendulum migrations outside the city.

In accordance with modern requirements, as well as to maximize the preservation of traditional buildings in populated areas, it is proposed to locate promising large industrial facilities and public storage infrastructure on separate sites outside the cities, near major highways for convenient delivery of raw materials and organization of transportation of labor resources. Such an approach meets the requirements of preserving the cultural heritage of cities, improving urban areas while preserving their identity and will allow preserving the territories of settlements mainly for the development of residential buildings, tourism and recreation. These sites can become *Points of economic growth* of local or regional importance, with the condition of ensuring infrastructure improvement, they will become the most attractive objects for investment (Global Report, 2009).

The share of the working environment and the urban population of the economic region is the main demographic indicator. Its dynamics are the results of changes in the urban population in administrative territories (Yefomov, 2006).

One of the main tasks of the regional scheme of settlement, environmental management and territorial organization of the productive forces of the region (regional settlement scheme) is to organize a reasonable balance in terms of architectural, social, industrial, environmental and other proposals for territorial planning, ensuring the development of the region as a whole.

The spatial structure of the regions is formed in the form spatial planning systems based on growth poles, linear (roads, pipelines, etc.) and frame elements (urbanized, natural-ecological, tourist-recreational and infrastructure cores of the framework). The formation of the spatial structure is the materialized expression of the main trends in the socio-economic development of the economic region. The formation of new growth poles will allow new technology parks, agro-towns, transport and logistics complexes, large or small industrial towns to be located in the region, and new projects in the development of the tourism and recreation complex.

In order to be ready for the harsh environmental challenges of the twenty-first century, residential environment need a new planning agenda. Defining this agenda is impossible without first revisiting the core concepts of our work: *sustainability*, *city* and *region* (Bogunovich, 2009).

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