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**Innovative development
of cities: theoretical aspects**

In the modern world, human resources development, and effective territorial organization of economy are closely connected with the cities. The cities where human development success are concentrated are influencing not only the settlements near those cities, but also social and economic condition of whole region and country. It is very important for researchers to study in detail, on the one hand, the role of cities in territorial development, on the other hand, the life safety of the natural and technological systems and patterns of economic development. Thus, given article deals with the theoretical issues of ensuring innovative development of urban areas. We made analysis of theoretical conclusions of scientists such as J. Boudeville, N.D. Kondratiev, M. Porter, etc., who studied issues of spatial development of urban areas. The possibility of applying the theoretical concepts related to city geography for cities in Kazakhstan was considered.

Key words: city, issues of innovative development, urban policy, clusters, technology park, sustainable development.

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**Қалалардың инновациялық
дамуы: теориялық аспектілер**

Қазіргі дүниеде адами ресурстардың дамуы мен экономиканы аумақтық тиімді ұйымдастыру мәселелері қалалармен тығыз байланысты. Адамзат дамуының аса маңызды жетістіктері шоғырланып отырған қалалар өзінің маңында қалыптасқан елді мекендер шоғырының ғана емес, аймақтың, елдің әлеуметтік, экономикалық жағдайына үлкен ықпал етіп отыр. Зерттеушілер үшін бір жағынан қалалардың аумақтық дамудағы ролі, екінші жағынан осынау аса күрделі табиғи-техногендік жүйенің тіршілік қауіпсіздігі мен экономикалық даму заңдылықтарын жете зерттеу аса маңызды болып табылады. Сол себепті, бұл мақалада урбандалған аумақтардың инновациялық дамуын қамтамасыз етудің теориялық мәселелері зерттелді. Ол бойынша урбандалған аумақтардың кеңістік даму мәселелерімен айналысқан Ж. Будвиль, Н.Д. Кондратьев, М. Портер және т.б. ғалымдардың теориялық тұжырымдарына талдау жасалды. Қалалар географиясына қатысты теориялық тұжырымдарды Қазақстан қалалары жағдайында қолданудың мүмкіншіліктері қарастырылады.

Түйін сөздер: қала, инновациялық даму мәселелері, қалалық саясат, кластер, технопарк, тұрақты даму.

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**Инновационное развитие
городов: теоретические
аспекты**

В современном мире развитие человеческих ресурсов и эффективная территориальная организация экономики тесно связаны с городами. Города, где сосредоточены достижения человеческого развития, влияют не только на населенные пункты вблизи этих городов, но и социально-экономическое состояние всего региона и страны. Очень важно для исследователей изучить, с одной стороны, роль городов в территориальном развитии, с другой стороны, безопасность жизнедеятельности природных и технологических систем и закономерности экономического развития. Таким образом, в данной статье рассматриваются теоретические вопросы по обеспечению инновационного развития городских территорий. Мы сделали анализ теоретических выводов ученых, таких как Ж. Будвиль, Н.Д. Кондратьев, М. Портер и т.д., изучавших вопросы пространственного развития городских территорий. Рассмотрена возможность применения теоретических концепций, связанных с городской географией для городов Казахстана.

Ключевые слова: город, проблемы инновационного развития, городская политика, кластер, технологический парк, устойчивое развитие.

INNOVATIVE DEVELOPMENT OF CITIES: THEORETICAL ASPECTS

Introduction

Today, cities around the world are seen as the engines for sustainable economic growth. But the playing field for cities is changing dramatically. Fundamental changes such as climate change, technological advances, increasing societal demands, shifting power from national to local levels and the consequences of the 2008 and today's financial crisis are changing the playing field of cities worldwide. While many cities in emerging and advanced economies continue to thrive, it is uncertain whether such growth can be sustained overtime. This is particularly the case as urban development objectives shift from pure wealth creation towards more complex and demanding well-being objectives. How to sustain a city's growth over time without endangering its foundations (such as economic diversity, people and the environment) is now one of the most relevant urban development challenges. Even when much has to do with external-to-the-city macroeconomic and political developments, cities are not just passive receivers of their external contexts – they can also shape their own development.

The role of innovation is undeniable in contemporary economic development pressed by globalization and structural changes, additionally escalated by fluctuant distortions. That is why innovation with its impact on productivity growth and competitive performance of economies is gaining so much attention in today's world of politics and economy. As a result, innovations are found in the centre of interest of policy makers at different managerial and spatial (administration) levels including integrated regional approach, such as presented by European Union (EU) or Organization for Economic Co-operation and Development (OECD).

Material and methods

Fundamental research of the Ministry of Education and Science of the Republic of Kazakhstan on the theme "Development of conceptual basis for effective models of sustainable development of monotowns in Kazakhstan" (a case study of Tekeli and Zhezkazgan cities) was taken as a basis

for given article. Information collected during the research of innovative development of mono-functional and multi-functional domestic and foreign cities were used for preparation of the article. For preparation of the article, theoretical information were systematized and analyzed, geographical ideas were concluded, and foreign literatures were used.

Creation of innovation and stimulation of innovative development are therefore found in the area of interest of both economic actors located in a city's space and the cities as catalysts of countries' development. Innovative, endogenous development contributes to the effect of local growth experienced by the city itself, its urban region and the elements of city's space including innovative businesses. In the urban, the particular role of innovative development is played by clusters of innovative firms including technology parks as specific innovative spaces concentrating on high-tech firms [1].

The view on innovative city presented hereby is proceeded by presentation of the idea of changing city's image with focus on creative and innovative growth replacing traditional factors of city's growth. In the process of cities' competitive changes, privileged position is attributed to the big cities as diversified urban spaces fulfilling different functions contributing to spatial clustering of innovative firms. City's environment has an impact on the flourishing effect of innovative business growth and clusters stimulation, and acts as an attractive force for location of Foreign Direct Investments (FDI) considered as "innovative tools" for local development. Specific role in an innovative city is played by technology parks whose growth is addressed to technological development and hard innovations' stimulation. They influence growth of the economy of a city and add multiplier effect to a city's economy with additional impulses for positive spatial changes transforming urban socio-economic structure and enhancing modern outlook of an innovative city.

The literature of regional innovation systems is relatively new at the level of policy (though it has been discussed and written about since the early 1990s) [2]. Bengt-Ake Lundvall, one of the first authors to promote thinking about systems of innovation, mentioned regionalization in relation to globalization and referred to regional networks, but did not believe a regional

perspective on innovation could be as useful as national systems, even in respect of such geographically contingent processes as tacit knowledge exchange [3]. He suggested that transnational innovation interactions were likely to gain in importance over national ones, but that regional processes were unlikely to. When this view was being developed, the European Commission was developing and implementing, inter alia, Regional Technology Plans and Regional Innovation Strategies precisely because of the weaknesses of national innovation systems in the European Union (EU) over producing rates of innovation competitive with those of the United States of America [4].

By contrast, Porter showed that the United States' competitive lead in innovation was predicated on the existence of regional and local innovation systems based on clusters [5]. This has been shown to be particularly true in new-economy sectors like biotechnology and information and communication technologies (ICT) in states like Massachusetts and California, or new media in big city districts like Hollywood, Los Angeles and "Silicon Alley" in New York [6].

Results and discussions

Innovation has become a central driver of national, regional and local economic well being and competitiveness and this is why so many places are engaged in the race for global innovation advantage. The growing role of innovation in the economy is treated as a key factor for economic growth. This makes innovative orientation for cities growth both economically useful and desirable.

Development of any city is a multi-goal and multi-criteria process. There may be many differences in development of structure of the city. This difference is not only the result of development level; also it depends on the peculiarities and production structure of the city, geographical location, and production specialization of the city. Development direction of modern cities is various. Some cities are directed towards industrial development, and some cities towards postindustrial development. Innovation is taken as a driver of economy in the development of cities or regions. Theories of economic development in the development of innovative strategy are given in the Table 1.

Table 1 – Methodological ways of innovative development of cities or regions [7]

Theory of economic development, main representatives	Content of innovative development	Applicability in development of innovative strategy
Long Economic Cycles (Kondratiev N.D.)	Moving to a new cycle depends on scientific inventors and inventions. Theory of long economic cycles is a base for innovative development.	It is used for identifying the ways how capital pushes back crisis in the development of innovative structure.
Theory of Innovation Joseph Schumpeter Gerhard Mensch	Innovation is a basis for economic growth. Depression plays a role of generator in emergence of innovation. Economic activity grows in mid-depression period.	The role of innovation in economic growth of the region is determined. This is important in development of innovative policy. Innovative strategies which take into account long-term opportunities will be studied.
Growth Poles Theory Jacques Boudeville	Formation of economic growth poles depends on the concentration of highly innovative and technically advanced industries in geographic space.	Theory is used for development of regional programs, technological parks and technopolises.
Theory of Regional Lifecycles	Regional agglomeration economy accelerates labor productivity, technical development and growth, and plays decisive role in allocation of industries. Economic policy of region must be directed at creation of favorable conditions for innovative stages of less-developed regions.	Formation of favorable conditions in regions depends on the development of technopolises, technology parks, scientific and educational centers etc.
Concept of Technological Paradigms Sergey Glazyev, Dmitriy Lvov	There are new economic opportunities in structural crisis and depression during transition process from one technological level to another one.	Institutional structure is based on technological movements and technical-economic principles (paradigms)
Theory of Clusters Michael Porter	Clusters are the initial point of growth for the domestic market of the state economy. A characteristic of cluster is a direction at innovation.	Cluster direction is used for assesment of competitiveness of a territory (state, region, administrative unit) or a branch; and for development of regional development program.
Concept of National Innovation System Cristopher Freeman, Bengt-Ake Lundvall, Richard Nelson	National Innovation System (NIS) is a set of distinct institutions which jointly and individually contribute to the development and diffusion of new technologies.	The activity of NIS is based on the determination role of the state. The concept of NIS can develop at territorial level.

So, innovation is a factor which determines long-term development of a region.

For innovative urban development of the area, it is supposed to create a sustainable system of interaction of three key areas in the city: *science - innovation - urban facilities*. Interaction of facilities of urban environment with each other, using an innovative approach, will allow in the future to create innovative territorial cluster that can determine the role of the city in innovation development system of the whole country, as well as ensure the sustainable development of cities and create favorable living conditions for the population of the city. Basis of clustering territory is a modernization process based on innovation. Structurally, it covers the technical, aesthetic, technological, organizational, managerial and institutional innovations.

Innovative development of urban space is provided by the implementation of projects of three main modules:

The scientific development of urban systems using scientific approaches. It is necessary to develop options for the development system of urban environments. Identifying options for innovative development not only in the areas where new buildings are maintained and constructed, but also in existing urban environments. As well as their modernization and reconstruction, to achieve the most efficient cluster. Attracting scientific strata of the population to the transformation of the city, the promotion of bold ideas and financing.

Innovation is an integral part not only in the formation of new clusters, but also in the modernization of existing urban spaces. The introduction of innovations, development of new approaches, methods, techniques, materials, and application of them. Technology should bring the city to a new level when all facilities in the urban system will work for the convenience of the population.

Urban facilities are an integral part of each urban environment. As we know, it's a set of groups, involving not only the architecture of the city, city parks and construction sites of different sizes, but it is also a small architectural forms, ranging from bridges and stalls, to lamps, benches and park vases. All this variety needs improvement and processing. So, it is necessary to identify the unique style of the city, to link it with the scientific aspect of city life and formed clusters, the merging of urban facilities

in a single system, to avoid fragmentation and to eliminate shortcomings in the operation.

Sustainable innovative development of the city determines its competitive advantage. According to the Russian scientist Tumina T.A., *a sustainable innovative development* is a development model in which a system transforms from one state to another as a result of innovation [8]. So, in order to clarify this statement, four prerequisites peculiar to the world innovative cities are given (Figure 1).

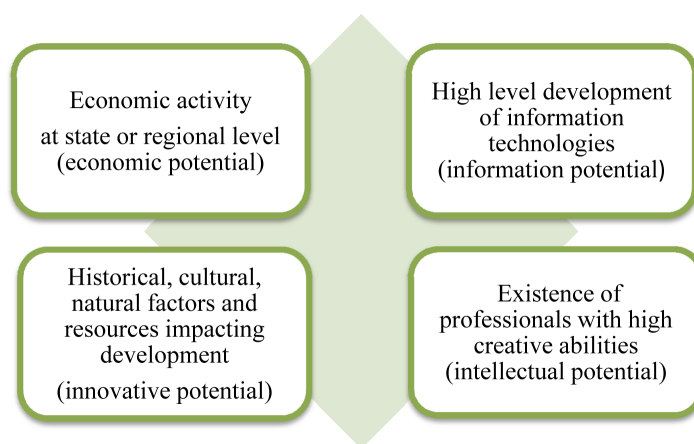


Figure 1 – Potential of innovative development (developed by authors)

Thus, innovative development is not only a process of innovation, but also a process of development of the whole system of factors and conditions necessary for the implementation of the innovation process.

Requirements for urban environment change each year. Today's innovative city, firstly, should be "green" city, in other words it should meet ecological requirements, and be convenient environment for living. Scientists connect "green" future with the concept of "sustainable development" [9]. In this case, transformation into innovative economy based in science and education is a trend of city development.

Conclusions

XXI century is a century of science, information and technology. Therefore, in case of Kazakhstan, it is necessary to create scientific and innovative infrastructure in cities which have a set organizations and enterprises with high-level of scientific-technological potential and support the services of their components (technology parks, national scientific centers, scientific and technological regions etc).

In a global world in which the waves of globalization have forced the introduction of strategies to enhance innovativeness and competitiveness; the role of cities as a regional innovation centers becomes more and more significant. In recent years, there has been increasing concern over the **formation and outcomes** of cities as global innovation centers.

Analysing the world experience, **future development** trend of cities upon space can be summarized as follows:

For the world's cities - further integration into the world economy, the development of extraterritoriality, own global subjecthood and competitiveness, the transition to a culture of active consumption of innovation.

For the regional cities - the formation and development of post-industrial economy, associated significant spatial deformation (movement of production sites, refunctionalization, and development of new territories), the formation of urban agglomerations.

For small towns (monocities) - a transition to industrial development (through the city-forming enterprise, connection to the metropolitan area, etc.), or a hypothetical transition to a postindustrial through the development of the services sector.

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