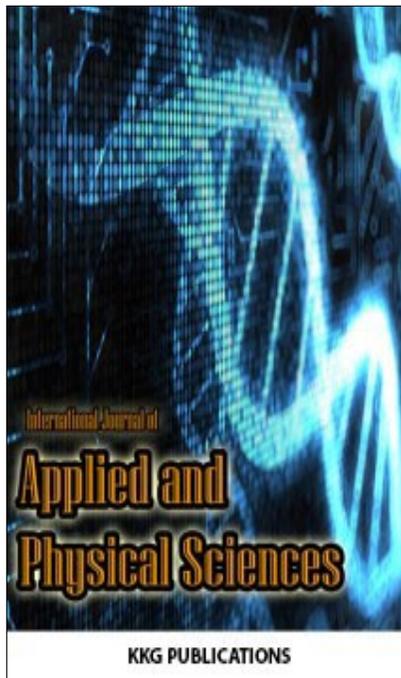


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# GEOGRAPHICAL ASPECTS OF ORGANIZING NATURAL RESOURCE MANAGEMENT STRUCTURE IN KAZAKHSTANI SECTION OF A NEW ECONOMIC ZONE OF THE SILK ROAD

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**Abstract.** The project of a new economic zone of the Silk Road is more important for China in comparison with the Great Silk Road in the past epoch. This initiative should be rightly regarded as a “focus” of foreign policy of China in the forthcoming years, which covers a significant part of Eurasia. Kazakhstan is a key country of the new economic zone of the Silk Road and its territory will be subjected to the respective loads on natural and economic system, which will result in the need for the development of a mechanism of protection against negative influence of anthropogenic factors. In another scenario, the Chinese side will consider the Kazakhstani section of the Silk Road only as a transit zone, which does not meet the expectations of the Kazakhstani side and will require the development of cost-effective options of calculations for sustainable socio-economic development. At various stages of implementation of the new economic zone of the Silk Road project, the main objective is to preserve the terrain- ecological sustainability of the Silk Road zone in the areas of intensive technogenic and agricultural impacts on terrains. In view of these circumstances, in respect of the new economic zone of the Silk Road development, the policy of Kazakhstan should distinguish in a specific, flexible approach that foresees the implementation of the principle of gradual accession of Kazakhstan into global technological chains with maximal efficient natural resource use.

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## INTRODUCTION

Establishment and organization of a balanced environmental management and sustainable development of natural economic system of New Economic Zone of the Silk Road (NEZSR) require an integrated geographical approach and effective techniques of research, monitoring and control of spatial and temporal parameters of natural and economic subsystems. The history of the Great Silk Road covers two millenniums and it is hard to overestimate its role in the destiny of the people of Eurasia. Evaluation of the future world economy requires special researches using systemic-structural approaches on the vast territory of Central Asia, Russia and Europe. The exceptional importance of the Silk Road lies not only in strengthening of economic integration, but also in its role in reformatting of the main components of the world economy, taking into account geopolitical situation, including geo-economics, sub-regional and regional development. Chinese scientists consider that new economic zone of the Silk Road is more important for China than the Great Silk Road in the past epoch. It is difficult to disagree. Implementation of this initiative will be the “focus” of the foreign policy of China in the forthcoming years. It is confirmed that this huge project in Eurasia will be included in

“The 13th Five -Year Plan” that is to be adopted in China in 2016 [1].

## LITERATURE REVIEW

Implementation of the projects in the frame of Kazakhstan program “Nurly Zhol” is aimed, first of all, at ensuring infrastructural basis for economic growth. The new economic policy “Nurly Zhol” will serve as the engine of growth of our economy in the forthcoming years. It is planned to create 200 thousand job places only due to road construction, which will provide employment and income growth. The implementation of “Nurly Zhol” project will produce a multiplier effect on other sectors of economy, in particular, production of cement, metal, machinery, bitumen, equipment and related services. [2]. One of the central priorities for the Republic of Kazakhstan (RK) is creation of an extensive transport network of motorway, railway and air routes.

Currently, quantitative and qualitative parameters of Chinese economy have reached such proportions that its further development is already possible far beyond the borders of China. (Figure 1).

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The New Economic Zone of the Silk Road (NEZSR) which definitely plays a positive role for international commu-

nity, will greatly serve for China's interests not only in the foreseeable future, but also in the far perspective.



Fig. 1 . Directions of the Silk Road new economic zone routes

At the same time the territory of Kazakhstan is a key country in the new zone of the Silk Road and its arid regions will be subjected to respective load on Natural and Economic System (NES), which will result in the need for developing a mechanism of protection against negative influence of anthropogenic factors. With high probability the NES of Ili-Balkhash area in Almaty region, NES of Zhambyl region, basin of Syrdarya and Ural rivers, territories of South Kazakhstan, Kyzylorda, West Kazakhstan regions, as well as areas of North Kazakhstan, Akmola and Karaganda regions may become the areas with significant terrain-environmental transformation and have impact on sustainability of NES, in particular, their socio-economic and landscape-environmental subsystems.

Technological link of railway lines Zhetegen - Khorgos and Zhezkazgan -Beyneu, highway corridor Western Europe - Western China, Aktau port and FEZ "Khorgos - Eastern Gate" forms an important center for consolidation and distribution of cargo flows on the new Silk Road and provides further integration of Kazakhstan into global transport and trading system. The favorable geographical location and FEZ "Khorgos - Eastern Gate" at the intersection of important routes from China and Southeast Asia to the CIS countries, as well as to Europe, the Persian Gulf and other regions, which create preconditions for the development of multi-modal logistics, organization of

large-scale industrial productions and trade; enable the region to become a promising world-class center of distribution [3].

It is known that Chinese government allocates considerable funds to create the Silk Road Economic corridor. Thus, the project will be financed from the newly established Asian Infrastructure Investment Bank with a registered capital of 50 bln USD and total assets of 100 bln USD, as well as from the Silk Road Fund in amount of 40 bln USD. Firstly, this project is a challenge of countries - participants of the project to the existing geopolitical realities. This can explain the increased interest of political scientists, economists, historians, philosophers to regional geopolitical NEZSR issues. The relevance of these studies is obvious, however, at the same time, it should be noted, that there is a very limited number of activities related to the solution of environmental problems and consequences of NEZSR construction. NEZSR section on the territory of Central Asia, in particular Kazakhstan, is located in the area of dissemination of arid natural systems which is developing on the background of desertification in conditions of low water resources availability.

We should take into account that the most important regional NES are territorially linked with the areas of Trans-boundary Rivers, which complicates the overall environmental and socio-economic situation. Currently, arid natural economic

systems of the RK refer to the systems with insufficiently identified and explored relations. There is a clear need to establish patterns of anthropogenic transformation of NES natural subsystem in the process of their assimilation, mainly in extraction, processing and transportation of hydrocarbons (West Kazakhstan), development of mining and metallurgical industry (East Kazakhstan), chemical industry (Southern Kazakhstan), as well as agricultural production, tourism - recreational activities, etc. Accounting and assessment of anthropogenic changes of Natural-Territorial Complexes (NTC) in the frame of regional NES in the NEZSR zone enable identification of sustainability rate of terrain system with different character, duration and strength of human impact.

## METHODOLOGY

Current situation of natural and economic system development on general background of degraded environmental situation and manifestation of desertification processes cannot be considered as satisfactory. All this requires the development of scientifically justified concept of transition of current economic structure of the Republic of Kazakhstan to environmentally friendly, i.e. green economy, which assumes the solution of the issues of urban development, resettlement of population and reproductive potential of administrative-territorial units and whole NEZSR zone, based on the use of common methodological basis and interaction. At this stage, geo-economic and geo-ecological aspects of the Silk Road development in Kazakhstan are the key factors in addressing socio-economic, environmental, demographic and other issues in the context of spatial development of Kazakhstan. At the same time, account of economic consequences of geopolitical character will allow Kazakhstan to avoid possible negative effects of the Silk Road development. Currently, there are no uniform criteria for assessing the level of regional sustainable development, the degree of disturbance of natural and economic systems. So, the analysis of terrain and ecological situation and evaluation of the development of ecological and demographic processes in the Republic of Kazakhstan showed that depressed centers with low-quality life of population have emerged. Solution of the problems of depressive areas requires the development of fundamentally new assessment criteria that reflect life quality of urban and rural population in NEZSR area [4].

It is expected that NEZSR will facilitate rapid development of cities and other settlements in Kazakhstani section of a new economic zone of the Silk Road, and, respectively, the increased consumption of water and electricity in household and industrial purposes, natural gas, petroleum products and other energy sources, which are necessary to maintain sufficient or highly comfortable living conditions. The level of consumption of natural resources will depend on the role of spatial structure of settlement in socio-economic and production-economic field, as well as on the degree of development of infrastructure and technical progress within regional NES in Kazakhstani section of new economic zone of the Silk Road. Kazakhstani section of the Silk Road should be viewed not only as transit area and, in our opinion, it is necessary to develop cost-effective scenarios of development and functioning of NEZSR zone and sustainable status of NES.

The principles of ecological balance of NEZSR natural system which are needed for the life of population and functioning of infrastructure, involve addressing of three main objectives:

- renewable resource exploitation rates should not exceed their regeneration rates;
- non-renewable resources exploitation rates should not exceed the rates of development of sustainable renewable substitutes;
- intensity of emissions of (waste, sewage) pollutions should not exceed the assimilative capacity of the environment.

For the project authors consider that new economic zone of the Silk Road is not only a space, but also the tool of spatial development and management. Most Chinese documents [5] declare common positions of the significance of new economic zone of the Silk Road in transit of goods between Europe and Asia, and highlight the key role of Kazakhstan. However, currently there is no link to specific geographical objects, first of all, large mining, energy and chemical industries of Kazakhstan. The role of the Silk Road in the process of integration of Kazakhstan into global technology links is still unclear. In this case the obstacle is the technological gap which has resulted from the predominance of industries of the III-dand IV-th technological structure.

TABLE 1  
THE SHARE OF TECHNOLOGICAL STRUCTURES IN ECONOMIES OF SOME COUNTRIES (ESTIMATE) [5, 6]

Country	Techno-Structure III	Techno-StructureIV	Techno-StructureV	Techno-StructureV
USA	-	20%	60%	5%
Russia	30%	50%	10%	-
Kazakhstan	65%	34%	1%	

For accession of the Republic of Kazakhstan to global innovative technological chains, Kazakhstan economy needs a qualitative jump in the development of productive forces, formation of new industries, which have improved forms and methods of management, that means that there is a need to transform technological structure. The lag of Kazakhstan in innovative development is also related to the lack of systematic legal and regulatory framework, which regulates the scientific sector. Comparative analysis of scientific and technological activities in Kazakhstan and developed countries has shown that development of national support system and introduction of innovations in the country is at the beginning stage. Kazakhstan is only at the initial stage of economic transition from raw materials to innovative type of development.

In this situation, sustainable development which is determined by resource-saving, energy-efficient, high technology, environmentally and socially - oriented areas, could determine the structure of natural resource management in the Silk Road area. Profound environmental changes that have occurred in natural system of the RK along the Silk Road route, raise a number of new challenges, including the need to develop principles of sharing water and energy resources of transboundary rivers, restoration and preservation of landscape diversity. This position serves as the main factor for determination of the strategy of land use and management, including landscape planning, development of environmental and socio-economic concepts of NES development in the Silk Road area, including natural-protection activity and control over the assumed solution technologies.

At this stage for Kazakhstan and China combination of laws of development of natural and economic components of NES sustainable development in the project area is difficult in terms of bilateral cooperation. In particular, the implementation of NEZSR can fundamentally change China's attitude toward the problems of Ili-Balkhash basin. We are talking about joint search for the ways of preserving the sustainable ecosystem common for Kazakhstan and China. One of the reasons in this case, in our opinion, is not the interdependence but almost complete dependence of Kazakhstan on China, due to the existing natural configuration of the river network.

Another problem is that water resources of transboundary rivers have already become an essential element in the system of economic relations between two countries and should be addressed in the context of bilateral cooperation. At the same time, theoretical and practical bases for scientific justification of the principles of sharing water and energy resources are underdeveloped both in Kazakhstan and in China, and as a consequence, there is no economic mechanism for sharing of

transboundary rivers. Further economic development of the whole Silk Road and emerging here agglomerations depends on decisions taken on joint use of water resources.

Identification of national types of environmental management in Kazakhstan section of the Silk Road new economic zone needs the development of methodology of evaluation of potential specialization of economic zone areas, which should address the answers to the following questions:

- what branches and productions, and in which form should be developed in the area and attracted to the region in order to achieve strategic goals set by the government;
- if the selected productions are attractive for identified effective specialization branches;
- in which areas should the funds of regional programs be spent in order to increase the attractiveness of the area for the greatest number of potential productions [7].

In evaluating opportunities for regional development and development of this technique, it is recommended to separate two concepts: the concept of actual area specialization, that may be outdated or initially ineffective and justified area specialization, which is formulated with regard to objective factors of regional competitiveness in a certain time period [8].

Unfortunately, currently there is no understanding of the fact that joint use of water and energy resources, as a major integrated issue can be solved only by using concepts of regional cooperation, without which the sustainable development of NES Silk Road is impossible. In our opinion, it would be useful to evaluate new realities of the Silk Road and revise production specialization of the border areas, taking into account specific weight of water-intensive branches and increasing ecological pressure. It is necessary to identify priorities in development of water-saving technologies and establishing of joint ventures (JVs). Currently, considerable number of terrains are subjected to anthropogenic impact and therefore it is needed to extensively use terrain-ecological approaches in developing Silk Road for the development of environmental measures with assessment of the status of NES natural subsystems under technogenic, agricultural, touristic and recreational and other types of impacts.

NES regional sustainable development along the new Silk Road, and ways and preservation of natural resources potential in development of areas in current economic environment is the most important element of social and economic development, and at the same time, serves as a factor of environmental safety assurance of the Republic of Kazakhstan.

## RESULTS

At present stage of economic development of Kazakhstan and implementation of NEZSR project, one of the main

objectives is a complex social - ecological and economic assessment of the development of proposals on reduction of regional disproportions and preservation of terrain - environmental sustainability of the Silk Road zone in the areas of intensive technogenic and agricultural impacts on terrain. Currently in NEZSR project area the decrease of terrain and biological diversity and formation of centers of ecological and demographic pressure have been observed, which increase the need to address the problem of developing a structure of environmental management balanced organization and creation of conditions for transition to sustainable development within specific NES. It creates a paradoxical situation: on the one hand, the development of transport infrastructure, industrial and agricultural objects objectively leads to increase of population employment, reduction of inflation rates, labor resource mobility, diversification of production, increased efficiency and competitiveness, transition to higher technological structures. On the other hand, it causes damage of sustainability of natural and economic systems.

In our view, balanced structure of environmental management in the area of new economic zone of the Silk Road is largely determined by not only transition to new technological structures, but also the structure of electrical power production and consumption. Thus, energy consumption of GDP in Kazakhstan is 1.9, energy consumption of GDP in Belarus- 1.17, while energy consumption of GDP in Japan is only 0.1, that is 19 times lower than Kazakhstan's index. At the same time, the average specific energy consumption index of buildings in Kazakhstan is 270 kWh /m<sup>2</sup>, whereas in Sweden the same figure is only 82 [9]. In Kazakhstan the new law "On Energy Saving" was adopted to reduce energy consumption of GDP by 10% by 2015 and by 25% by 2020.

The energy consumption of GDP in Kazakhstan is 1.5 times higher than energy consumption of GDP in Russia and Belarus. However, reduction rates of this indicator evidence of the effectiveness of energy-saving policy of the State. Despite high energy consumption of GDP, energy consumption in Kazakhstan (per capita) is at comparable level with the developed countries. According to Chinese researchers, in this regard Russia and Central Asian republics will play the important role. And these countries, in addition to transit capacity can also export their natural resources. So, Beijing plans to establish a whole network of oil and gas pipelines from Eastern and Western Siberia, as well as from Kazakhstan, Uzbekistan and Turkmenistan, which will cover part of the needs of Chinese consumers [10].

In view of the interests and specific concerns for the Central Asian Republics, the following points can be highlighted:

- The predominance of unfavorable trends in Central Asian economies. This is the rapid increase in the share of raw materials in export structure at reduction of prices and proportional increase in the share of food and consumer goods in import structure from China;
- China's loan in the form of the scheme "loans in exchange for resources". According to some sources, Kazakhstan over the past 4 years has received from China the loan of \$ 18.5 bln. USD. This circumstance causes certain concern among experts and ordinary people [10].

The emphasis on exploitation of natural resources, in addition to increased negative impact on environment, makes the country's economy, in particular, Kazakhstan section of NEZSR very vulnerable and dependent on the level of prices for raw materials and energy carriers. Analysts' forecasts in this direction in the forthcoming years are not "optimistic" as the decline in prices is expected. In these circumstances, we consider it valid to use the results of geo-ecological zoning of the RK in construction of NEZSR [4], which reveals regional patterns of territorial character of environmental issues, identification of interactions and interdependences between natural, socio-economic, natural-anthropogenic components.

## DISCUSSION AND CONCLUSION

Summarizing the above mentioned, it should be noted that it is needed to develop a balanced structure of environmental management and transition to sustainable development in Kazakhstan section of NEZSR. In current economic conditions, the solution of these objectives is possible only on the basis of the following:

- In-depth and comprehensive analysis and assessment of terrain-ecological conditions and assessment of natural resource potential of natural systems;
- Exploration and assessment of socio-economic conditions of NES sustainable development;
- Development of perspective industrial and agricultural specialization, taking into account objective factors of competitiveness of territory in specific time period;
- Development of mechanism of transition to innovative technological structures, including innovative technologies in the field of agri-industrial complex;
- Reduction of GDP energy consumption indices and specific energy consumption of buildings in Kazakhstan section of new economic zone of the Silk Road.

In view of the existing current economic and geopolitical situation, the project on the Silk Road new economic zone could result in the increased competition between Chinese, Western and Russian companies, which operate in Kazakhstan.

Possibly, competition may generate a situation when directions of socio-economic and environmental development will be formulated taking into account interests of Kazakhstan and NEZSR key partners. For this reason, Kazakhstan policy on NEZSR development should distinguish in specific and flexible

approach that is aimed at implementation of the principle of gradual entry of Kazakhstan into global technological chains with maximum efficiency of natural resources, which is the most important condition of functioning of the Silk Road new economic zone.

## REFERENCES

- [1] “Breath of China,” *Moscow Times*, 2016.
- [2] N. Nazarbayev, “Address of the President of Kazakhstan to people of Kazakhstan, Nurly Zhol - Path to the Future,” 2014.
- [3] R. Meiramov, “On the new Silk Road,” *Vremya News Paper*, 2015.
- [4] *The National Atlas of the Republic of Kazakhstan, Environment and Ecology*. Almaty, Kazakhstan: Institut Geografii Respubliki, 2010.
- [5] Kablov E. (2010). *Sixth technological structure* [Online]. Available: <https://www.nkj.ru/archive/articles/17800/>
- [6] D. Rogozin, “The robot will stand under the gun,” *Moscow Times*, 2013.
- [7] E. V. Danilova. (n. d). *On foreign experience of development of cross-border trade* [Online]. Available: <http://www.rgwto.com>
- [8] A. M. Seterbayeva, “Economic specialization of border branches of the Republic of Kazakhstan in comparison with specialization during the period of Kazakh Soviet Socialist Republic,” Economic Research Institute, 2015.
- [9] [Online]. Available: [www.strategy2050.kz](http://www.strategy2050.kz)
- [10] R. Y. Izimov, “Global energy policy of China and role of Central Asia in it,” *Kazakhstan in the System of New Regional and Geopolitical Transformations in Central Asia*, S. M. Nadirov, Ed.

— This article does not have any appendix. —