The role of international infrastructure projects in sustainable social and economic development of the border areas (the case of Russia and Mongolia)

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Abstract. During the existence of the USSR, Mongolia was in the sphere of political and economic interests of Russia. On the one hand, the decrease of economic relations between Russia and Mongolia, and, on the other hand, the geographical proximity of Russia and China have made it necessary to search for new partners and sources of investment in mining, processing industry, energy and transport, service and tourism. The growing interest of foreign countries in Mongolia and presence of their representatives there undoubtedly speaks of the growing political and economic competition in the region. In the face of the current global geopolitical situation, growth of China's influence in Mongolia's economy and infrastructure projects being carried out within the framework of the New Silk Road Concept, the role of border regions and cross-border interaction is growing. One way to increase the presence of other countries is by attracting investment or directly participating in the construction of new infrastructure facilities. The need to find ways of rational territorial organization of economic activities, using the potential of border areas, strengthening the infrastructure cooperation between the two countries determine the urgency of further research. A large amount of accumulated information on this subject of research and developed research methods, singled out comparable indicators of social and economic development of the regions of Russia and Mongolia allow for a qualitative, comprehensive study.

1. Introduction
Currently, the creation of several economic corridors from China to Russia through the territory of Mongolia is announced in three main areas: the Western Corridor, the Central Corridor, the Eastern Corridor. Each area includes several infrastructure projects.

The creation of economic corridors involves the creation of not only transport and logistics corridors, but also the implementation of other projects of economic and humanitarian cooperation: the development of the mining sector, trade, tourism, cooperation in the field of electric power and other infrastructure projects.

2. Models and Methods
To assess the priority areas of economic cooperation and the preparedness of the territory for the implementation of projects, the mineral resource base, as well as the energy complex of Mongolia and the Russian regions bordering on Mongolia, were investigated.
3. Results and Discussion
The map shows the existing international, bilateral border crossing points, large mineral deposits, electricity generating enterprises, existing and planned power lines.

![Map showing resource base of international economic corridors in Mongolia.](image)

**I. Western Road Corridor (Route AN-4 Asian Highway Network):** Novosibirsk - Barnaul - Gorno-Altaiisk - Tashanta / Ulan-Baishint - Khovd - Yaran / Takeshken - Urumchi - Kashin;

**II. West Railway Corridor:** Kuragino - Kyzyl - Tsagan-Tolgoi - Artszur - Khovd - Takeshken - Hami - Urumchi;

**III. Northern Railway Corridor:** Kuragino (Krasnoyarsk Territory) - Kyzyl - Tsagan-Tolgoi - Arts Sury - Ovot - Erdenet - Ulbanbaatar - Zamyn - Uud - Erlian - Beijing - Tianjin;

**IV. Central railway and road corridor (Route AN-3):** Ulan-Ude - Naushki - Sukhbaatar - Ulbanbaatar - Zamyn Uud - Erlian - Beijing - Tianjin;

**V. Eastern Railway Corridor:** Borzya-Solovyovsk-Erentsav-Choibalsan-Bichigt-Shilingol-Chifeng-Jinzhou;

**VI. East Road Corridor:** Borzia-Solovyovsk-Erentsav-Choibalsan-Bichigt-Shilin-gol-Chifeng-Chaoyang;

**VII. The Tumangan transport corridor:** Choibalsan - Sumber - Arshana - Ulankhoto - Changchun - Zarubino;

**VIII. Railway transport corridor Primorye-1:** Choibalsan - Sumber - Arshana - Manchuria - Qiqihar - Harbin - Suifenhe - Vladivostok – Nakhodka.

1.1. Planned power lines 500 kV;
1.2. Planned power lines 220 kV;
1.3. Power lines 500 kV;
1.4. Power line 220 kV;
1.5. Power line 110 kV;
2.1. Hydroelectric power station;
2.2. TPP;
3.1. Gold;
3.2. Silver;
3.3. Copper;
3.4. Polymetals;
3.5. Mercury;
3.6. Tungsten;
3.7. Molybdenum;
3.8. Coal;
3.9. Uranus;
3.10. Polymetals;
3.11. Mercury;
3.12. Tungsten;
3.13. Fluorite;
3.14. Phosphorite;
3.15. Asbestos;
3.16. Planned transport corridors;
3.17. Border crossing points.

**Figure 1.** Resource base of international economic corridors in Mongolia.
The territorial organization and spatial differentiation in the placement of electrogenerating capacities is revealed. Such features as isolation of power systems from each other (there is no high power transmission lines between the western, central and eastern power systems), low density of high-capacity electrical networks, remoteness from the main sources of electricity generation and high length of networks are revealed.

The study of the mineral resource base of the studied territory, including the analysis of data on the diversity of mineral resources, the study of reserves, the presence of large deposits, indicates a high potential for the development of the mining sector and the possibility of creating cross-border technological chains for the extraction and processing of mineral raw materials in the area of planned international transport corridors.

The main indicator characterizing the activities of border crossing points is the number of border crossings through this point (Figures 2-5). The dynamics of crossing the state border of Mongolia in the period 2012-2017 for the main checkpoints at the borders with Russia and China was considered.

![Figure 2. The number of state border crossings through checkpoints in the direction of Mongolia-Russia, people.](image1)

![Figure 3. The number of state border crossings through checkpoints in the direction of Russia–Mongolia, people.](image2)

The largest number of crossings of the Russian-Mongolian border was observed at the international automobile checkpoint Kyakhta-Altan-Bulag and the international railway checkpoint Naushki-Sukhe-Bator, located on the territory of the Kyakhta district of the Republic of Buryatia. It should be noted that until 2017, there was an increase in the number of crossings of the state border between Kyakhta and Altan-Bulag, Tashanta-Tsagaanuur and Khandagaty-Borshoo crossings, associated with the introduction of a visa-free regime between Russia and Mongolia (Figures 2-3).
Despite the growth in the number of persons crossing the Russian-Mongolian border, the same indicator on the Mongolian-Chinese border at the Zamyn-Uud-Erenhotu border crossing is 2.3 times higher than this indicator on the Mongolian-Russian border. It should be noted that in 2017 this figure reached 1 million people per year (Figures 4-5).

The findings on spatial differentiation in infrastructure development were also based on the results of study cross-border infrastructure density: density of roads, railways (Engel coefficient), number of airports, density of electrical networks, density of border crossing points per conditional 100 km of the state border, number of post offices. On the basis of particular indicators, the integral indicator was calculated using the formula:

\[ I_{ij} = \frac{\text{l}_{ij}}{\max(\text{l}_{ij})}; \]

where \( I_{ij} \) – partial indicator of infrastructure density of \( i \)-type (\( i = 1 \) - for auto-road, etc.) for \( j \)-th administrative division (aimak, district).

Prospective development of infrastructure cooperation will be aimed at strengthening the contact and improving the barrier functions of borders. Measures to solve these two multidirectional tasks require the search for effective mechanisms. In particular, due to the increase in throughput and speed of customs clearance, provision of access roads and the development of civilized ways of cross-border interaction, increasing the logistics capabilities of facilities. The implementation of measures will expand the economic effect of the introduction of a visa-free regime for all regions bordering with Mongolia.
One of the promising areas in cross-border cooperation between Russia and Mongolia is the joint development of mineral deposits. The implementation of projects for direct transport, the possible construction of a gas pipeline between Russia and China through Mongolia will create the necessary energy and infrastructure conditions for the participation of Siberian regions in the development of raw material resources of Mongolia. In this case, the work of the effective operation of the cross-border infrastructure will be aimed at improving the contact functions of the borders.

China’s active participation in Mongolia’s infrastructure projects indicates not only growing competition in the region, but also the need to accelerate work on improving the contact functions of the Russian-Mongolian border, actively integrating into international logistics corridors and using the growing transit capabilities of Russia and Mongolia. Some lines of passage of the supposed economic corridors of the “One Belt” concept, including the projects “Economic Zone of the Great Silk Road” and “Sea Silk Road of the XXI Century” coincide with the Russian-Mongolian cross-border territory, which creates prerequisites for further strengthening trilateral cooperation China-Mongolia-Russia.

In this sense, against the background of the expected multiple increase in trade and economic ties, the strengthening of partnership interactions, the high economic and geopolitical role of the border areas of the three countries increases. The implementation of large-scale projects can give impetus for solving existing ethnocultural, socio-economic, environmental problems, etc.

4. Conclusion

Therefore, cooperation between the two countries in the field of military and border security, in the field of environmental protection and emergency management remains important. Current tasks include: combating international terrorism and organized crime (organized cattle-breeding groups, smuggling), fighting emergency situations (forest fire, steppe fires, transboundary pollutant transport, floods, epidemics, epizootic), environmental monitoring, rational use of water and other resources, organization of corridors of seasonal migration of animals.
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