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¹Turgumbayev A.A. *, ²Levykin S.V., ³Kazachkov G.V., ⁴Yakovlev I.G.
¹Makhambet Utemisov West Kazakhstan university, Uralsk, Kazakhstan
^{2,3,4}Institute of Steppe Ural Branch of the Russian Academy of Sciences,
Orenburg, Russia

*Corresponding-author: ahan.turgumbayev@wku.edu.kz

E-mail: ahan.turgumbayev@wku.edu.kz, stepevedy@yandex.ru, russo-
turisto01@mail.ru

ANALYSIS OF MODERN PROBLEMS AND PROSPECTS FOR CROSS- BOUNDARY COOPERATION OF THE RF AND RK IN THE FIELD OF ENVIRONMENTAL MANAGEMENT AND ENVIRONMENTAL SAFETY ON THE EXAMPLE OF THE TRANS VOLGA-URAL STEPPE REGION

Annotation. The objective prerequisites and grounds for the development of transboundary Kazakh-Russian cooperation on the conservation and restoration of steppes in the post-Virgin Land area within the Trans-Volga-Ural region are considered. The areas in which the development of cooperation is fundamental for the future fate of the naturally unified post-virgin space are noted. Examples of the implementation of projects supported by global international funds show the main achievements on the Russian and Kazakh sides. Current problems and prospects for cooperation are noted.

Keywords: Kazakh-Russian cooperation; cross-border cooperation; post-virgin space; steppe restoration; secondary steppes.

Introduction

About two and a half centuries of joint development of Kazakhstan and Russia (with varying degrees of cooperation, unification, alliance, etc.) could not but give commonality to the fate of the eastern sector of the steppes of Northern Eurasia. Waves of development with different priorities periodically rolled over these steppe lands, on the one hand contributing to the socio-economic development of this difficult region in terms of nature, on the other hand involuntarily creating a number of geo-ecological problems and generating challenges to steppe land use. It is these areas that are romanticized and covered by the problems of developing virgin lands with Eurasian specificity, in fact, it is a very close analog of the conquest of the Wild West and the Dust Bowl of the United States, no less popular in history and culture.

We have established that the common essence of all global virgin campaigns ever conducted in the steppes and prairies of the Holarctic was competition and rapid change of natural and nomadic steppe titularity to agricultural titularity by the type of organized campaign and with the support of the state [1]. The largest such campaign was the Soviet virgin lands campaign of the 1950s; the agrarian and landscape changes caused



by it were so radical that they give grounds to consider the territory of the steppes of the Volga region, Southern Urals, Western Siberia and Kazakhstan covered by this campaign as a specific geographical space, which we call virgin lands. This space has been considered by us in dynamics over the decades, a number of features, regularities, factors and contrasts of this space have been revealed [2-9]. In Soviet times, within the unified virgin space, no fundamental difference in the structure of agrolandscapes, centralized organization of agriculture, its priorities and problems was revealed.

Methods

Materials of own long-term field research, literary and stock materials, state documents of the Republic of Kazakhstan and the Russian Federation were used. The systematic approach, methods of field geographic research, remote sensing methods, expert assessments and logical generalizations were applied.

Results and discussion

In the early 1990s, two fundamental innovations appeared in the virgin area. First, the state border of the independent states: Kazakhstan and Russia, actually ran along the entire virgin area. Second, the unified space was divided between the Russian Federation, which received about 16 million hectares of virgin areas (about 40%), and the Republic of Kazakhstan, which received about 25 million hectares (about 60%). Thirdly, both countries started deep economic transformations in agriculture with their own specifics in each country. The structural evolution of the virgin lands was influenced by the nature of land reforms: in the Russian Federation, the reform had a more pronounced social orientation, due to which the right to land was equally distributed among all rural residents; in Kazakhstan, long-term land leasing was spread. In both countries, the reforms were aimed at disbanding large state virgin agricultural enterprises, on the basis of which the entire virgin area was organized [10].

In the beginning, these changes did not cause a fundamental difference in the virgin space on both sides of the border: the inertia of the Soviet period, transparency of borders, large enterprises and, most importantly, on both sides of the border almost synchronously in the late 1990s there was a significant reduction in sown areas as a consequence of radical reforms. Without causing a fundamental difference on both sides of the border, these changes, by their radicality, actually reborn the virgin space into a new, post-target space, the specific characteristic of which was the processes of mass self-restoration of steppe ecosystems on the deposits, the study of which allowed to reveal a high self-restoration potential and the properties of aggressive infiltrators in the titular steppe species.

In general, the anthropogenic load on the steppe agro-landscapes of this area has significantly decreased, and trends of sustainable restoration of natural complexes have been noted. Nevertheless, the geo-ecological problems that emerged in Soviet times have been preserved and have changed into a new quality:

- 1) Flow regulation and water use of transboundary rivers, primarily the Ural River. Ural;
- 2) Insufficient coverage of steppes by the system of territorial nature protection;
- 3) The problem of restoration of steppe ecosystems to ecological fullness with reintroduction of wild steppe ungulates.
- 4) The problem of wetland conservation on migratory routes of migratory birds;



5) The problem of providing conditions for saiga migration.

While the saiga population in Kazakhstan and Russia remained at its historical maximum in the virgin area, in the post- virgin area saigas were on the verge of extinction until Kazakhstan took energetic measures to save them.

Since the XXI century, due to the specifics of reforms, landscape differences of the post-Celtic space in Russia and Kazakhstan began to appear on different sides of the border. The sequence of processes of sharp reduction of cultivated areas, self-restoration of steppes and plowing of secondary steppes on fallow lands turned out to be common, but in Kazakhstan each process had a larger scale character. At the same time, it should be noted that in the Russian part of the postcelestial space bioclimatic potential for grain farming decreases towards the border, but remains relatively high, while in the Kazakh part the best lands gravitate towards the border and bioclimatic potential decreases with distance from it up to physical unsuitability. Perhaps that is why the regularity of gravitation of the main areas of steppe self-restoration to the border was not revealed (although some areas of such gravitation were found), but we managed to reveal a curious phenomenon in the dynamics of territories on different sides of any borders, including state borders, which we describe as structural oscillation.

From the standpoint of steppe science, the essence of such oscillation is a single or multiple exchange of development trends between the territories adjacent to the border line from different sides. The exchanged tendencies are tendencies to development and dominance of either steppe titularity in the form of rapid self-recovery of steppe ecosystems, or fields in the form of mass plowing of fallow lands and secondary steppes.

The most large-scale example of oscillation was the Eurasian steppe area itself with the border along the Volga River. In 1934-1954, the western sector of steppes was the most plowed, where virgin placustrine steppes were preserved in horse farms and reserves. At the same time, horse farms occupied rather large areas and were the main habitat of the titular steppe biota. The eastern sector was relatively little affected by plowing, and steppe massifs were preserved on GZF, distant pastures, and virgin lands. The virgin megaproject made an exchange: after its completion, on the contrary, the placers of the eastern sector were more plowed than those of the western sector, and in general, steppe landscapes after the virgin project suffered more than in the western sector [11]. A new and more tragic for steppes exchange of states on different sides of the Volga occurred after the liquidation of horse farms and plowing of their territory. Again, and already finally, the western sector of the steppes was the most transformed.

A new example of oscillation is developing in Alexandrovo-Gai (RF) and Kaztalovsky (RK) districts along the state border and the Maly Uzen River. At the beginning of the development of the postcelestial space, the districts were close in specialization and intensity of steppe land use, but in recent years the Alexandrovo-Gai district as a result of the implementation of the relevant project has become a leader in meat cattle breeding with a corresponding increase in the number of livestock. Kaztalovsky district has become a leader in saiga resources as a result of strict saiga protection. Saiga has begun to migrate periodically, including to Alexandrovo-Gai district. The transboundary Volga-Ural saiga population has now exceeded 800,000 animals [11], several times higher than its late Soviet peak.



Another oscillation probably develops in the border strip of Pervomaisky district of Orenburg region, along the Chagan river between two protrusions of the Russian territory: the western one isolated by the river and the border is a fallow and secondary forested steppe with abundant streptot on the area of more than 10 thousand ha, the eastern one comparable in area was similar to the western one, but after the arrival of agricultural holding maximally plowed.

Fundamental and applied results obtained during the complex study of agrolandscape dynamics on both sides of the Russian-Kazakhstan (post-target) border were used in the processes of development of interstate transboundary cooperation between Kazakhstan and Russia, primarily for the development of joint documents on joint conservation and restoration of landscape-biological diversity of steppes and qualitative solution of the above-mentioned problems.

Kazakhstan and Russia, as the largest steppe powers in the world, which inherited the virgin lands of Eurasia, are responsible for the future fate of the steppes. It is on their territory that the self-restoring secondary steppes of the XXI century are concentrated, the outstanding landscape and biological diversity of the Eurasian steppes is represented, including the restored population of saiga antelope in Kazakhstan and a semi-wild population of Przewalski's horse reintroduced in Russia. The future fate of the virgin lands on both sides of the state border requires comprehensive development of cooperation between Russia and Kazakhstan in the areas of:

- 1) territorial protection of steppes (as transboundary natural systems),
- 2) innovative forms of prairie conservation,
- 3) promoting genetic exchange and supporting migration routes of rare and economically valuable steppe species,
- 4) neonomadism,
- 5) modern soil and resource-saving technologies of steppe farming,
- 6) promotion of steppe meat products and ecologically friendly farming to world markets,
- 7) prairie fire control,
- 8) control of populations of agricultural pests, including locusts.

The fundamental documents for the development of bilateral Russian-Kazakhstani cooperation, including in the field of environmental protection, are:

Declaration between the Russian Federation and the Republic of Kazakhstan on eternal friendship and alliance oriented to the XXI century, dated July 6, 1998.

Agreement between the Government of the Russian Federation and the Government of the Republic of Kazakhstan on cooperation in the field of environmental protection dated December 22, 2004.

Agreement between the Government of the Russian Federation and the Government of the Republic of Kazakhstan on interregional and cross-border cooperation, dated September 7, 2010.

We consider the following strategic state plans to be prerequisites for the success of further cooperation on the study, conservation and restoration of steppe ecosystems:

- Strategy of socio-economic development of the Russian Federation with low greenhouse gas emissions until 2050" (approved by the Russian Government Order No. 3052-r of 29.10.2021);



- Strategy for achieving carbon neutrality of the Republic of Kazakhstan until 2060 (approved by the Decree of the President of the Republic of Kazakhstan from 2.02.2023 № 121);
- Climate Doctrine of the Russian Federation. (approved by Presidential Decree No. 812 of 26.10.2023);
- Strategic Development Plan of the Republic of Kazakhstan until 2025 (approved by the Decree of the President of the Republic of Kazakhstan dated 15.02.2018 № 636);
- Saiga Conservation Strategy for the Russian Federation (approved by MNRE RF Order No. 30-r of 11.08.2021);
- provisions of the UN-Kazakhstan Framework for Cooperation for Sustainable Development for 2021-2025.

Separately, we note the Law on Pastures in the Republic of Kazakhstan (No. 47-VI ZRC of 20.02.2017), which regulates in detail the use of this type of land, and the rationing of maximum permissible load on pastures by the Ministry of Agriculture of Kazakhstan [13]. In the Russian Federation, the development and adoption of a similar law and regulations remains relevant, especially in the border steppe regions.

At the regional level, cooperation between the Orenburg Region of the Russian Federation and the Aktobe and West Kazakhstan Regions of the Republic of Kazakhstan is developing in the very center of the post-Celtic space. For example, there is an agreement between the Government of the Orenburg region of the Russian Federation and the Akimat of the West Kazakhstan region of the Republic of Kazakhstan on trade and economic, scientific and technical, cultural and humanitarian cooperation dated 28.05.2012. The Forum of Interregional Cooperation between Russia and Kazakhstan is regularly held, the 19th one was held on November 9, 2023; the International Economic Forum "Orenburg Region - the Heart of Eurasia" is regularly held, the 9th one was held in November 2019; the International Youth Forum "Eurasia Global" is regularly held, the last one was held in August 2023.

The specialized Institute of Steppe of the Ural Branch of the Russian Academy of Sciences in Orenburg, the Russian Geographical Society, including its Nature Protection Commission, the Kazakhstan Geographical Society, and university science in major cities of the post-ceiling space are engaged in research of the post-ceiling space.

The high urgency and acuteness of the problems of preservation and restoration of steppes in the postcelinic space attracted major international sponsors of nature conservation, which supported the research of Russian and Kazakh scientists aimed at identifying areas and massifs of steppes, development of the system of protected areas, including transboundary ones, and restoration of wild steppe ungulates. Large-scale international conservation projects have been implemented in the post-Celtic border areas, including those aimed at developing transboundary cooperation between Russia and Kazakhstan:

UNDP/MPR/GEF project "Improvement of PA management system and mechanisms in the steppe biome of Russia" 2010-2016. Orenburg region is one of the four pilot regions (from Russia);

UNDP/Government of Kazakhstan/GEF project "Conservation and Sustainable Management of Steppe Ecosystems" 2011-2016 (by Kazakhstan);



UNECE project "Study of transboundary rivers of Kazakhstan: Ural and Kigach Rivers" 2016-2017 (international with the involvement of experts from Kazakhstan and Russia).

The success was facilitated by the fact that the projects were implemented almost simultaneously on both sides of the border, which allowed for coordinated research and joint development of final documents. The projects identified preserved areas of virgin steppe ecosystems and nuclei of secondary steppe restoration in the Orenburg region of the Russian Federation and neighboring regions of the Republic of Kazakhstan. It was proposed to organize border and transboundary steppe protected areas on the most valuable ones. In the border areas of the Orenburg region the Nikolskaya steppe (202 ha, Sol-Iletsky district) and Akzharskaya steppe (14.7 thousand ha, Yasnensky district) were put on cadastral registration as natural monuments. It is impossible not to mention a unique specific feature of the creation of border protected areas in the Orenburg region - the realization of the principle of "steppe green conversion". The territories of the disbanded objects of the Ministry of Defense of the Russian Federation were introduced into the nature protection turnover: the above-mentioned Akzharskaya steppe and Orlovskaya steppe (16.5 thousand hectares, Belyaevsky district), on the basis of which in 2014 the 5th specialized area of the State Nature Protection Zone "Orenburgsky" "Preural steppe" for the reintroduction of Przewalski's horse was promptly created. With the support of the Russian and Kazakh steppe projects of the GEF, a number of the most promising arrays were selected for the creation of transboundary steppe PAs [14].

1. Chibendino-Troitsko-Khobdinsky for the conservation and restoration of zonal steppes on chestnut soils and calcareous steppes of the Urals, preservation of habitats of streptet, bustard, saiga (about 270 thousand ha). The array is located in the Troitskiy outcrop of Sol-Iletskiy district of Orenburg region and in the adjacent territories of Chingirlaus district of WKO and Khobdinskiy district of Aktobe region [14].

2. Aituarsko-Ebitinsky for preservation of zonal plakorny, uvalist and low-altitude steppes of the Southern Urals on southern chernozems (about 100 thousand ha). The array is located on the territory of Kuvandyksky (including the area of 6.7 thousand ha of the Aituar Steppe State Nature Reserve "Orenburgsky") and Gaisky districts of the Orenburg region of the Russian Federation and Kargalinsky district of the Aktobe region of the Republic of Kazakhstan (84 thousand ha in the Aktobe region, mainly the territory of the State Nature Reserve of local purpose "Ebita"). In the development of the Aytuario-Ebita massif in 2018. The Government of the Orenburg region established a border state nature reserve of regional significance "Guberlinskie Gory" (107 thousand hectares). From the RK side, the status of the "Ebita" nature reserve was strengthened [14].

3. Lake-steppe array for conservation and restoration of zonal and solonetz sod-grass steppes of Trans-Urals on chestnut soils, resources of marmot, roe deer, reed boar, saiga, streptet, conservation and restoration of wetlands and waterfowl (283 thousand ha, including 167 thousand ha in Svetlinsky district of Orenburg region of the Russian Federation, 116 thousand ha in Aitekebiy district of Aktobe region of the Republic of Kazakhstan). Aschisai steppe (7.2 thousand ha) and Svetlinsky biological reserve (8.4 thousand ha) were considered as potential nuclei. Large hunting investments were made in the territory of the Orenburg part of the Ozernosteppe massif, and a system of



hunting farms was organized, covering more than 90% of the territory of the district. Arable land has been halved, the main sown areas have biotechnical purpose and are concentrated along meridional flyways of geese. The marmot has again become a mass species and mastered practically all types of lands, including fallow lands. A unique population of Siberian roe deer with high trophy qualities is formed. From the perspective of steppe science, this form of hunting management can be considered as a form of diversification of steppe land use and a new form of steppe protected areas [14].

The Institute of Steppe of the Ural Branch of the Russian Academy of Sciences has justified the site of the Orenburg State Nature Reserve "Pre-Ural Steppe" in the Belyaevsky district of the Orenburg region, 40 km from the state border. This area, found by Orenburg steppe scientists back in the 1990s, was officially established in 2015 with the support of the Russian GEF Steppe Project, at the same time the Przewalski Horse Reintroduction Center was organized on its basis. To date, a number of imports of purebred Przewalski's horses from Europe have been made, the population has reached 100, and the population is already becoming a donor for the Przewalski's horse reintroduction project in the Khakassky Reserve. Reintroduction of Przewalski's horse to the border areas of the Republic of Kazakhstan from the Orenburg Reintroduction Center is quite possible in the future [14].

The GEF Kazakhstan Steppe Project was implemented according to three interrelated components: strengthening the system of protected areas with the most representative sites on an area of at least 500,000 hectares; developing mechanisms to ensure the conservation and restoration of steppe and semi-desert landscapes in the process of their rational use; and improving the institutional framework for steppe land use, including the use of resources of restored species. The project indicators were to increase the area of steppe protected areas by 2.3 times and the saiga population at least twice as much. Large-scale restoration of saiga populations was one of the key priorities of the Kazakhstan project and was subsequently implemented in Kazakhstan [14].

In 2012-2013, the Bokeyorda State Nature Reserve (343,000 ha) and the Aschiozek State Nature Reserve (315,000 ha) were designed in the border Kaztalovsky district of WKO (RK) and established in 2022. This has been one of the leading factors in the growth of the Volga-Ural saiga population, which has increased sixfold in the last few years and is now approaching one million saigas [12,15]. The growing Volga-Ural population has become the steppe miracle of Eurasia in the 21st century; it has exceeded the late Soviet maximum many times over and has begun to make seasonal migrations to the bordering Astrakhan, Volgograd, Saratov and Orenburg regions of the Russian Federation for calving and moulting.

The growth of the Volga-Urals saiga population, which has become transboundary and reached a population of one million, is an outstanding contribution of Kazakhstan to the restoration of the biosphere, which requires the development of Russian-Kazakh cooperation in steppe conservation, basic science, cross-border communication, tourism, and investment. The fate of the saiga has attracted the attention of the world's authoritative conservation organizations, and the species is becoming a global brand of wildlife conservation. World-class specialists in the Republic of Kazakhstan and the Russian Federation, the Secretariat of the Convention on the Conservation of Migratory Species of Wild Animals, IUCN, Frankfurt



Zoological Society, Oxford University, Saiga Conservation Alliance, Swedish Land Use University (SLU), Royal Society for the Protection of Birds (RSPB) work on saigas. The need to allow, and therefore rationally organize, the regulation of saiga numbers is encouraging, as the CIC Wildlife has traditionally supported the ideals of sustainable hunting and ethical hunting as mechanisms for wildlife conservation and the restoration of game fauna resources [16].

As part of the development of an action plan for the implementation of the Saiga Conservation Strategy in the Russian Federation, we have studied the main problems associated with the integration of the growing transboundary Volga-Ural population into the modern agro-landscapes of the border areas of Russia and Kazakhstan, and made a number of proposals. Comprehensive research on transboundary migratory saiga populations continues jointly under a cooperation agreement between the M. Utemisov University of West Kazakhstan (M. Utemisov University) and the University of Kazakhstan (M. Utemisov University). As part of the development of scientific and conservation research on transboundary migratory saiga populations, comprehensive research is continuing jointly within the framework of a cooperation agreement between M. Utemisov West Kazakhstan University (Uralsk, Kazakhstan) and the Institute of Steppe of the Ural RAS (Orenburg, Russia). As part of the development of scientific and conservation transboundary cooperation, a scientific semi-station Aralsor was organized in 2023 on the basis of the unique sor and salt lake Aralsor, located in the core of the core area of the Volga-Ural saiga population. A number of expeditions were carried out on the basis of the semi-station, which allowed us to update information on saiga behavior, ecology, and landscape preferences in the current climatic and anthropogenic conditions of the Russian-Kazakh border area, and to develop a number of proposals for the integration of saigas into modern agro-landscapes.

The studies under the Ural-Kigach project were conducted jointly by national experts of the RK on the Ural River, experts of the Department of Geoecology and the Institute of Steppe of the Ural RAS of the Orenburg Scientific Center of the Ural RAS. The task of the project was to determine the causes of the Ural River water availability decrease with determination of the significance of climatic and anthropogenic factors. To solve this problem, the impact of economic activity on the tributaries of the Ural River was studied, and the dynamics of steppe agro-landscapes and the general ecological state of the Ural River tributaries catchments were assessed. The research was aimed at identifying the dynamics of floodplain ecosystems of small rivers and steppe agro-landscapes, the main agro-ecological risks and problems; to develop proposals for their minimization and elimination.

Based on the results of the studies, a draft Strategy for the Protection and Use of Water Resources in the Ural River Basin was developed. The strategy envisages improvement of water resources supply to the population and economic sectors on the basis of a comprehensive (integrated) approach to water bodies use and protection management, based on objective resource and environmental constraints, taking into account all available surface and groundwater resources, priority of drinking and domestic water supply to the population, openness and involvement of local governments, basin councils, water users associations and other public organizations. It is recognized that coordinated development of economic sectors is necessary on the



basis of taking into account water-resource limitations and permissible environmental load on water bodies. The schemes of integrated use and protection of water bodies of both the Russian Federation and the Republic of Kazakhstan are recognized as the main instrument of integrated water resources use.

It is recognized necessary to improve the tools of state regulation of transboundary water bodies use and protection; to update the Schemes of integrated use and protection of water resources of the Ural River, norms of permissible impact on waters, as well as to modernize the existing rules of reservoirs use taking into account the balance of available resources and users' needs.

Conclusion

The above results of cross-border studies and generalizations allow us to note the following joint achievements, topical problems and prospects for cooperation.

Accomplishments:

1. A solid institutional basis has been created for the development of comprehensive transboundary cooperation, including in the sphere of land use, protection of landscape and biological diversity, and water use.

2. Kazakhstan has been and remains Russia's partner in solving both common cross-border problems and the problems of sustainable development of Civilization.

3. In the context of current global challenges, Russia's cooperation priorities are shifting towards its eastern and southern neighbors.

4. Integrated long-term landscape and water studies have created a fundamental and scientific basis for fruitful cooperation in equitable distribution of transboundary resources and achieving sustainability of transboundary natural and anthropogenic systems.

5. Transboundary territorial protection of landscape-biological diversity of steppes is developed on the scientific basis built as a result of joint research.

6. A center for the reintroduction of Przewalski's horse has been established in the border region of Belyaevsky, becoming a donor animal with the potential for international donation.

7. The Republic of Kazakhstan has achieved impressive success in restoring saiga populations, especially the transboundary Volga-Ural population.

8. In 2021, the Przewalski's horse was included in the Red Book of the Republic of Kazakhstan, and at the national level it was recognized as a "Dzungarian miracle". The project of reintroduction of the species has been activated, and "Altyn dala", "Altyn-Emel", "Charyn", "Kolsai kolderi", and Naurzum reserve are recognized as promising areas.

Challenges:

1. Due to fluctuations in world grain prices and the implementation of a number of national projects to support grain farming in Russia and Kazakhstan, plowing of fallow lands, including those developed into secondary steppes, and the last areas of virgin lands has intensified.

2. Organization of transboundary steppe protected areas is not completed, there is a great potential for development.



3. The transboundary Volga-Ural saiga population faces a number of agro-ecological problems, especially during spring migrations to the border agricultural areas of the Saratov and Volgograd regions of the Russian Federation.

4. An action plan for the implementation of the Russian Saiga Conservation Strategy is under development.

5. The mass migration of saigas in 2022 and 2023 to the border areas of the Russian Federation showed that while Russia has fundamentally increased criminal penalties against saigas for the extraction and trafficking of derivatives, the institutional framework for the conservation of saiga habitats outside protected areas, especially the maternity fields of migratory populations, is clearly insufficient. As a challenge for migratory transboundary populations, one can single out the actual implementation of the Tselina-2 project on plowing of deposits and the project to increase the export potential of mutton.

Perspectives:

1. The authors have helped to establish the scientific basis and institutional prerequisites for joint actions to adapt migratory saiga populations to modern steppe agro-landscapes in border areas.

2. In the near future, the Altyn-Dala State Nature Reserve (400 thousand hectares) located in the Kostanay region bordering the Russian Federation will become one of the world's largest centers for the restoration of wild steppe ungulates of Eurasia: saiga, kulan, Przewalski's horse after the reintroduction of Przewalski's horse (2025-2026). In the future, Altyn-Dala and the Orenburgsky GPZ will be able to support inter-population exchange of animals.

3. The potential remains for organizing a network of transboundary steppe protected areas along the state border, including innovative forms for the conservation of migratory ungulate populations.

In conclusion, we note that according to the results of our research in recent years, the modern post-target space is confidently transforming into an agro-export space - an analog of virgin land at a new technological and climatic stage with an export orientation in the face of new challenges. We have developed a theory and assessed the potential for the development of this space into a compromise space according to the principle of optimum of agriculture, animal husbandry and revival of the steppe sacred to the peoples of Russia and Kazakhstan. We believe that the border areas of Russia and Kazakhstan are best suited for pilot projects of such development.

Conclusions:

1. In the RK and in the RF at the turn of the millennium, the largest in history fallow pool on the common post-celestial space appeared. The main biospheric function of this unique phenomenon is that hundreds of millions of tons of carbon dioxide were deposited. According to Kazakh and Spanish researchers, Kazakh plowed virgin lands on an area of about 30 million hectares in 30 years (from 1960s to 1980s) emitted about 1 billion tons of carbon dioxide into the atmosphere, and in 20 years (from 1998 to 2018) at least 12 million hectares (according to expert estimates) of deposits on both sides of the border deposited about 250 million tons of carbon dioxide [17, 18, 19, 20].

2. At the beginning of the XXI century joint contribution of Russia and Kazakhstan to the recovery of endangered titular steppe ungulates. In the Russian



Federation, the Przewalski's horse was reintroduced in the border Belyaevsky district of the Orenburg region, and its population exceeded 100 animals. In the Republic of Kazakhstan, by 2020, there was a unique recovery of endangered saiga resources, which exceeded historical maximums.

3. Despite active plowing of fallow lands and secondary steppes, in the post-Celina space in the Republic of Kazakhstan, especially in Western Kazakhstan, and in the Russian Federation, especially in the Orenburg region and Altai Krai, there are still massifs of secondary steppes - nuclei of self-recovery of steppe ecosystems deserving high international evaluation as providers of global ecosystem services, especially carbon storage.

4. In terms of preserving and restoring steppe ecosystems that were most damaged during the virgin campaign, the Republic of Kazakhstan and the Russian Federation have jointly achieved successes of global significance in steppe restoration worthy of high praise from the international conservation community during the course of gaining independence and implementing economic reforms. Great efforts have been made to develop international cooperation in the study, conservation and restoration of steppe ecosystems in Eurasia. At the same time, under the conditions of modern climatic, economic, geopolitical and other challenges, it is necessary to develop and expand international cooperation on steppe issues with the participation of all interested countries, major conservation funds and other organizations.

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**Тургумбаев А.А.*, Левыкин С.В., Казачков Г.В., Яковлев И.Г.
ЕДІЛАЛДЫ-ОРАЛ ДАЛА АЙМАҒЫНЫҢ МЫСАЛЫНДА
ТАБИҒАТТЫ ПАЙДАЛАНУ МЕН ЭКОЛОГИЯЛЫҚ ҚАУІПСІЗДІК
САЛАСЫНДАҒЫ ҚР ЖӘНЕ РФ ТРАНСШЕКАРАЛЫҚ
ЫНТЫМАҚТАСТЫҚТЫҢ ҚАЗІРГІ МӘСЕЛЕЛЕРІ МЕН КЕЛЕШЕГІН
ТАЛДАУ**

Аңдатпа. Еділалды-Орал дала аймағының шегінде тыңнан кейінгі аумақта далаларды сақтау және қалпына келтіру бойынша трансшекаралық Қазақстан-Ресей ынтымақтастығын дамытудың объективті алғышарттары мен негіздері қарастырылды. Табиғи біртұтас тыңнан кейінгі кеңістіктің болашақ тағдыры үшін ынтымақтастықты дамытудың іргелі болып табылатын салалар атап өтіледі. Жаһандық халықаралық қорлар қолдаған жобаларды жүзеге асыру мысалдары ресейлік және қазақстандық тараптың негізгі жетістіктері баяндалады. Ағымдағы мәселелер мен ынтымақтастықтың келешегі атап көрсетіледі.

Кілт сөздер: қазақстандық-ресейлік ынтымақтастық; трансшекаралық ынтымақтастық; тыңнан кейінгі кеңістік; даланы қалпына келтіру; қайта пайдаланған дала.

**Тургумбаев А.А. *, Левыкин С.В., Казачков Г.В., Яковлев И.Г.
АНАЛИЗ СОВРЕМЕННЫХ ПРОБЛЕМ И ПЕРСПЕКТИВЫ
ТРАНСГРАНИЧНОГО СОТРУДНИЧЕСТВА РФ И РК В СФЕРЕ
ПРИРОДОПОЛЬЗОВАНИЯ И ЭКОЛОГИЧЕСКОЙ БЕЗОПАСНОСТИ НА
ПРИМЕРЕ ЗАВОЛЖСКО-УРАЛЬСКОГО СТЕПНОГО РЕГИОНА**

Аннотация. Рассмотрены объективные предпосылки и основания для развития трансграничного казахстанско-российского сотрудничества по сохранению и восстановлению степей на постцелинном пространстве в пределах Заволжско-Уральского региона. Отмечены сферы, развитие сотрудничества в которых принципиально для дальнейшей судьбы единого в природном отношении постцелинного пространства. На примерах реализации проектов поддержанных глобальными международными фондами показаны основные достижения с российской и казахстанской сторон. Отмечены актуальные проблемы и перспективы сотрудничества.

Ключевые слова: казахстанско-российское сотрудничество; трансграничное сотрудничество; постцелинное пространство; восстановление степей; вторичные степи.