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How green is the steppe?

Agriculture and environment in Central Asia

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Hered by a shepherd on horseback, sheep graze in a summer pasture dotted with flowers (Kazakhstan, Almaty region, Raiymbek district, June 2012).

Photo: C. Ferret

How green is the steppe?

Agriculture and environment in Central Asia

A steppe is a biogeographic formation made up of vast grassy plains and characterized by low relief and an arid continental climate. Made up of grasses and a few rare woody plants, it differs from grasslands in that its vegetation cover is of lower density and lower height. Steppes are found in North and South America and southern Africa, however the largest in the world covers much of central Eurasia, hence the name, which derives from the Russian word *step'*.¹

This Eurasian steppe forms a broad and almost continuous belt from the north of the Black Sea to the Far East, interrupted only by a few mountain ranges, and is bordered to the north by the wooded steppe that follows the taiga along a north-south axis, and to the south by the semi-desert steppe that merges into full desert. The flatness and bareness of the landscape of this steppe considerably extend how far across it one can see. It has often been compared to the ocean,² due to its vastness, its horizontal and landmark-free landscape, the hazardous nature of its environment, its unpredictable weather, or because of the way the wind blows the grasses like waves. The openness of this treeless biotope is linked not only to low rainfall, but also to the presence of many herbivores, both wild and domestic, that maintain the herbaceous layer through grazing.

The exploitation of the Eurasian steppe has therefore been dominated by nomadic pastoralism, at least since the first millennium BCE. In Central Asia, archaeologists have identified a major, however porous, division from the Bronze Age between the world of the northern steppe where nomadic herders

1. In this issue, transliteration of Cyrillic follows ISO 9:1995 in French articles, including Kazakh terms (with the exception of common words and names written in French transcription), and the Library of Congress's ALA-LC system in English articles.

2. Isenberg (2014, 148) refers to them as "seas of grass," drawing on a common image, present for example in Potocki (1991, 90) and Simond (1898, 4), where the word steppe is masculine. See also Moon (2013, 62).

ranged, and that of the oases world to the south, where irrigated agriculture was practiced (Luneau 2013).

This two-pole system, which has been in place for a long time, has undergone radical upheavals since the twentieth century. During Soviet times, productivist voluntarism turned Central Asia into a great region of transformation with almost colonial features. These included the collectivization of livestock husbandry in the *kolkhozes* (collective farms) and *sovkhozes* (state farms), which dealt a fatal blow to nomadic pastoralism and led to a terrible famine in Kazakhstan from 1929 to 1932, the imposition of wheat monoculture over 20 million hectares in the north of the same country during the “Virgin Lands” campaign initiated in 1954, and the unchecked development of irrigation in the dry steppes and valleys in the south during the “conquest of the Hungry Steppe.” The environmental consequences of these upheavals have gone down in history as major disasters, exacerbated by the collapse of Central Asian agriculture following the break-up of the Soviet Union and the economic and social disaster of the 1990s.

The post-Soviet period that began in 1991 ended in the 2000s with the dawn of a new era: agriculture reestablished itself, some branches faster than others. The key indicators were on the rise: areas, yields, and livestock populations. For wheat, export was the driving force behind this growth, propelled by soaring prices of grain on international markets after 2005. Governments became involved in the sector once more, supporting exports, providing credits and direct subsidies for grain producers, and implementing a reorganization of livestock farming and land reforms.

Today, agricultural activity remains of vital importance in Central Asia, which in its narrow delimitation, corresponds to the five Central Asian republics of the USSR—Kazakhstan, Turkmenistan, Uzbekistan, Kyrgyzstan, and Tajikistan. The percentage of the population living in rural areas remains high for these countries, accounting for almost half of the total population in Kazakhstan and Turkmenistan, more than 60 percent in Uzbekistan and Kyrgyzstan and almost three quarters in Tajikistan. Almost one fifth of the labor force is employed in agriculture in Kazakhstan and Turkmenistan, with this figure standing at one third in Uzbekistan and Kyrgyzstan, and two thirds in Tajikistan. However, the share of agriculture in generating wealth has significantly decreased: it now accounts for less than 5 percent of GDP in Kazakhstan (compared to a quarter in 1992), and 11 percent in Turkmenistan, countries whose economies are primarily based on oil and natural gas exports. In Kyrgyzstan and Uzbekistan, it has fallen to less than a fifth, but is still a quarter in Tajikistan.³ As in many parts of the world, the gap between the importance of the sector in the national economy and its demographic weight is considerable in these five countries.

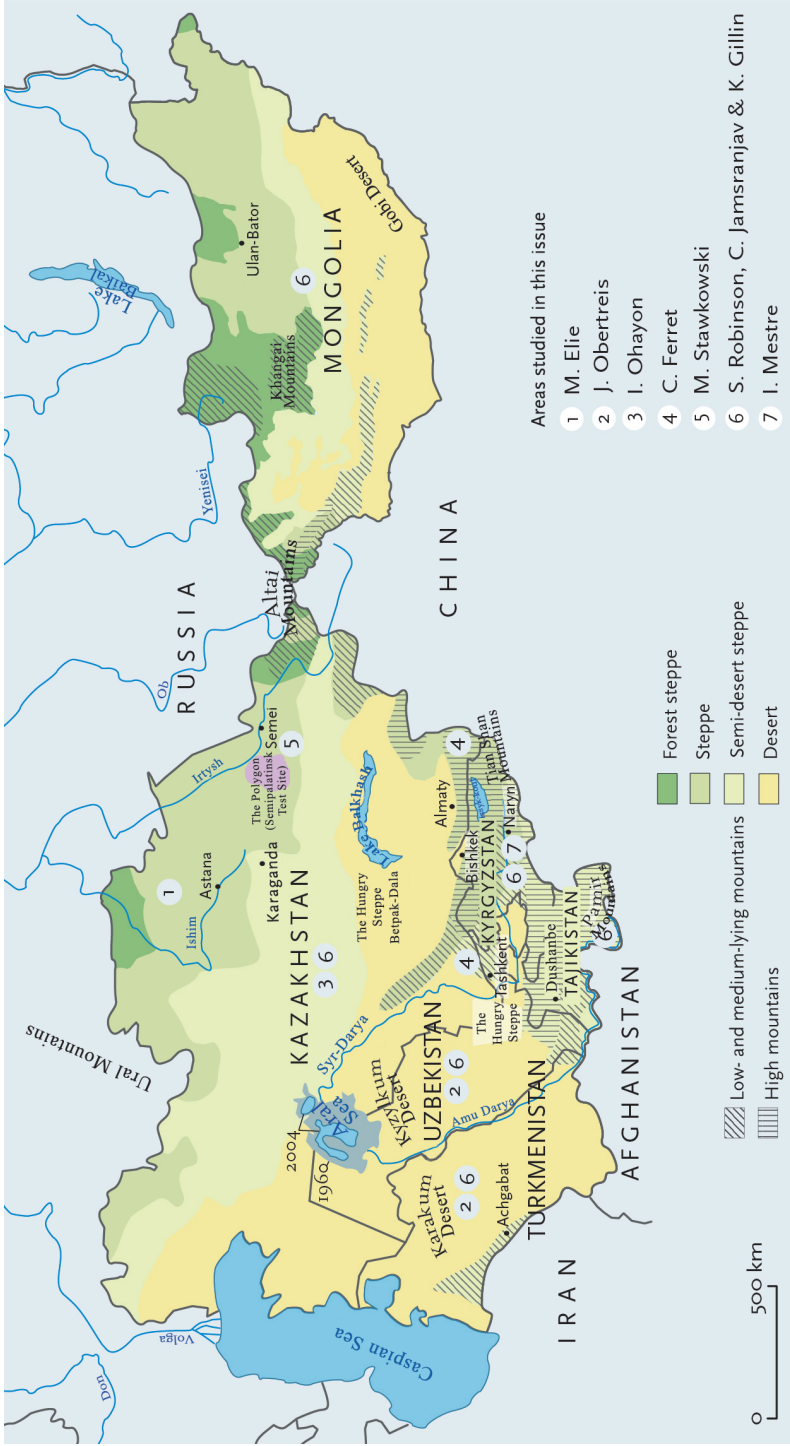
3. World Development Indicators, <https://data.worldbank.org> (SP.RUR.TOTL.ZS ; SL.AGR.EMPL.ZS ; NV.AGR.TOTL.ZS).

But what are the environmental consequences of this recent resurgence? While the decrease in livestock has provided respite from pastoral degradation, irrigators and grain farmers pose a significant risk to ecosystems, through the cultivation of abandoned land in the north and the increased use of pesticides and synthetic fertilizers in irrigated land in the south. Many environmental scientists are encouraging a return to mobile pastoralism, which is considered to be best adapted to the environment and the most sustainable way of using the steppes (Gintzburger 1996; Gintzburger et al. 2006; Kreutzmann 2013, 6). However, other experts say that pastoralism causes desertification and thus call for it to be strictly limited. It is therefore difficult to determine whether livestock should be seen as the gardener or the gravedigger of the steppe.

This issue of *Études rurales* is part of the French-German research programme “Contemporary environmental history of the Soviet Union and the successor states, 1970-2000. Ecological globalization and regional dynamics,”⁴ which aims to study socio-environmental transformations in the dissolving Soviet Union and in ex-Soviet countries. The contributions gathered here examine the possible effects—or lack of effects—of environmental awareness in agro-pastoral exploitation of the Central Asian steppes, from the point of view of its multiple stakeholders: political authorities, experts, kolkhoz and sovkhoz managers and workers, private farmers, salaried herders, or members of NGOs.

Drawing together several disciplinary fields: history (articles by Marc Elie, Julia Obertreis, Isabelle Ohayon), ethnology (Carole Ferret, Magdalena Stawkowski), ecology (Sarah Robinson et al.), and geography (Irène Mestre), this issue reconstructs and analyzes a historical period spanning about sixty years, from the 1950s to the present day. This timeframe offers us a better understanding of the break of 1991, and, by contextualizing the links between agriculture and the environment, allows this question to be addressed in all its complexity. The three main forms of agriculture studied are: irrigated cotton cultivation (Obertreis), cereal cultivation (Elie) and pastoral animal husbandry (Ferret, Ohayon, Mestre, Robinson, Stawkowski). Most of the articles look at a country: the majority, Kazakhstan (Elie, Ohayon), sometimes by investigating local communities (Ferret, Stawkowski), or Kyrgyzstan (Mestre). Julia Obertreis compares the cases of Uzbekistan and Turkmenistan, while Sarah Robinson and her co-authors review the five Central Asian republics along with Mongolia (see map). Depending on the areas and the topics studied, what tends to stand out above all is the persistence of Soviet practices or, conversely, their discontinuation.

4. Funded by the French National Research Agency and the Deutsche Forschungsgemeinschaft (2014-2018). More information available at: <http://www.agence-nationale-recherche.fr/Project-ANR-13-FRAL-0003>.



Map of natural areas in Central Asia with the location of the areas studied in this issue

Map: C. Ferret

Two major interlinking issues are discussed in this issue: first, the perception of environmental changes and the extent of ecological mobilization, and second, the evolution of conceptions of nature as they are expressed in agrarian practices.

The Soviet environmental turning point

An environmental turning point in the Soviet Union of 1960-1970 has recently been identified, which ran parallel to the “ecological revolution” taking place at that time in Western Europe and North America (Coumel and Elie 2013; Elie 2015; Obertreis this issue). Numerous environmental controversies in the USSR came about because of tensions between the intelligentsia and the government. From 1958, scientific and cultural figures took up the cause of protecting Lake Baikal, both in the media and through bureaucratic channels. While they did not manage to get rid of the pulp mill that was polluting the lakeshores, they did succeed in preventing a hydroelectric development project from going ahead, which would have involved widening the mouth of the lake’s only effluent, the Angara River (Weiner 1999; Mandrillon 2012; Breyfogle 2015). This mobilization served as a model for other environmental causes during the 1960s. In this vein, the Kazakh intelligentsia opposed the building of a dam above Alma-Ata in a fragile mountainous region. The project was delayed for several years, until the Kazakh prime minister at the time, Dinmukhamed Kunaev, managed to force the construction through two huge explosions (Elie 2013).

In spite of the semi-failures of these mobilizations in the 1960s, the following decade saw a decisive progression of environmental topics, which began to take root in university programs and in public discourse. Scholars who were well integrated in the system protested against the hegemony of the Ministry of Melioration and Water Management. They pointed out that since the 1960s hydrologists had been racing forward to the point of irrationality.⁵ The most extravagant of these projects, Sibaral, was supposed to save the Aral Sea from desiccation by diverting waters of the far northern and Siberian rivers using channels dug by nuclear weapons. It was met with tenacious opposition in scientific and cultural circles, causing Mikhail Gorbachev to put an end to it in August 1986 (Micklin 2011).

In the case of the USSR, as in capitalist countries, the environmental turning point was marked by the internationalization and transnationalization

5. Opposition to the Ministry of Melioration and Water Management began in the mid-1960s. In a letter to the Gosplan, six scientists led by Viktor Kovda attacked it head-on and painted an alarming picture of irrigation policy and its catastrophic consequences for the environment. Archives of the Russian Academy of Sciences (ARAN), collection 2081, inventory 1, file 21 (1965).



Herded by a shepherd on horseback, sheep graze on radioactive waste dump near a former uranium processing facility in Kara-Balta (Kyrgyzstan, Chui region, Zhaiyl district, February 2009).

Photo: C. Ferret

of ecological issues. Through UNESCO and the United Nations Environment Programme, Soviet scholars such as the physician and mathematician Nikita Moiseyev, soil scientist Viktor Kovda and climate scientist Mikhail Budyko, took the “biosphere” concept inherited from Vladimir Vernadsky and made it a key concept of ecological globalization, while other Soviet researchers drew attention to desertification, acid rain, nuclear winter, and global warming (Mahrane 2012; Elie 2015; Oldfield 2016; Rindzevičiūtė 2016).

Was this international activity just Cold War posturing, official “greenwashing” using ecology to continue the East-West competition (Brain 2014)? No, a real transformation of the technocracy was occurring in the 1970s. Scientists made up the main group that the government relied on in its great transformative enterprises, and now influential scientists and intellectuals were fighting against mammoth projects, highlighting the detrimental effects they would have on the environment and drawing on international expertise to do so (Obertreis this issue; Breyfogle 2015; Elie 2017).

It was not until censorship regulations were relaxed under Gorbachev that a large ecological movement could emerge. Protests left ministerial cabinets and laboratories and took to the streets and to the media (Gestwa 2003; Coumel and Elie 2013). This movement saw a brief zenith in 1989 when the elections to the first free parliament since the stillborn Constituent Assembly

in 1918 brought to the fore the most diverse ecological causes put forward by “informals”—scientists, writers, and journalists (Sigman 2013). The politicization of the movement was to be short-lived, since after the collapse of the USSR, although ministers of the environment appeared in Russia and in other countries of the former USSR, no green party managed to have a lasting influence on the political debate (Henry 2010).

Ecological disasters and mobilization in Central Asia

During the Perestroika period (1985–1991), a number of the Soviet republics (Armenia, the Baltic countries, Ukraine, and Belarus) were centers of ecological contestation, and this contributed to articulating a national cause and opposition to Moscow (Dawson 1996; Schwartz 2006; Doose forthcoming). In the case of Central Asia, this mobilization is less well known. In February 1989 in Semipalatinsk, the poet and deputy Olžas Sulejmenov founded the Nevada-Semipalatinsk anti-nuclear movement, supported by inhabitants frustrated by the health problems caused by radiation emitted over forty years of nuclear weapons testing. A petition calling for the closure of the site collected two million signatures. While it is mainly thanks to the development of international agreements on test bans that the last test there was carried out in October 1989, the movement made a decisive contribution to the positioning of independent Kazakhstan as a country that has completely renounced both civil and military nuclear energy.⁶ In 1988 the inhabitants of Ust-Kamenogorsk mobilized against the poisoning of the air, water and soils caused by metallurgical factories. An open-air basin containing 100,000 tonnes of radioactive waste had been installed in the center of the city in 1949, which had aggravated the sanitation disaster and concerns. The protests culminated in a large rally in 1990 following an accidental beryllium leak.⁷

Added to this pollution from the military-industrial complex were the ecological disasters brought on by large-scale transformations in agriculture. The devastation caused by cotton monoculture was patently clear for stakeholders at all levels, as Julia Obertreis details in her article: the fishermen of the villages lining the shores of the Aral Sea had seen it retreating beyond the horizon; Uzbek experts had been sounding the alarm in the pages of specialized journals since the beginning of the 1970s; and government actors knew how to manipulate the disaster to draw the attention of international organizations, despite keeping the agricultural system that caused it.

6. *Meždunarodnoe antiâdernoje dviženie “Nevada – Semipalatinsk”* [International Anti-Nuclear Movement “Nevada – Semipalatinsk”], http://hirosima.scepsis.ru/movement/mov_2.html.

7. See the file on demonstrations kept in the State Archives of the Russian Federation (GARF), collection 5446, inventory 163, file 1357 (1990).

The Virgin Lands campaign under Nikita Khrushchev in northern Kazakhstan had led to an erosive crisis in the 1960s. Marc Elie explains that early on, agronomists had warned of the risk posed by wheat monoculture in these low-precipitation steppe regions, but the solutions adopted were unable to remedy the loss of soil fertility in the long term. The agricultural decline of the 1990s allowed the steppes to regenerate, but climate change is now leading to continentalization and a drier climate in the region.

Isabelle Ohayon, Carole Ferret, and Sarah Robinson all agree in their articles that the condition of pastures has not been a major concern for pastoralists, either during the Soviet period or since. In a similar vein, Magdalena Stawkowski notes that the inhabitants of a village near the Semipalatinsk nuclear testing site are not concerned about radioactive contamination of livestock and crops. Feeling abandoned by the state and consumed by the difficulties of daily life, they can only count on local solidarity within their community, a legacy from a former *kolkhoz*.

It is generally external stakeholders who bring attention to ecological problems, and first and foremost scientists. Desertification due to overgrazing was an important subject of Soviet and international ecological expertise in the years 1980-1990, ever since the 1977 UN conference on the issue in Nairobi. Soviet experts criticized, first internally and then, after Perestroika, publicly, the productivist management of pastures in the USSR and the disregard for the conservation of pastoral ecosystems. It is possible that this alarm has been exaggerated (Robinson et al. 2003). In any case, the livestock crisis has reduced this threat, except in Mongolia. International governmental and non-governmental organizations have made the fight against desertification their focus and have identified Central Asia as a battlefield after the fall of the USSR. In a similar way, the role of international expertise was crucial in the case of the Aral Sea disaster (Jozan 2012).

Spurred on by the debate on the “tragedy of the commons” between Garrett Hardin and Elinor Ostrom, land reforms were considered to be one of the solutions that could encourage more sustainable grazing land use. Sarah Robinson, Chantsallkham Jamsranjav, and Kramer Gillin compare their implementation in six countries, showing that, despite displaying the same environmental concerns, the recommendations differ: while international organizations promote community ownership regimes, governments tend to opt for individual land ownership. Irène Mestre focuses on the case of Kyrgyzstan and the establishment of associations of pasture users—community management institutions at the local level.

Views and actions on nature

Apart from the explicitly ecological movements, the ways in which nature is treated and, in this case, agrarian practices, reflect a profound change in the relationship with the environment. This change has taken place over time and results from the confrontation of different forms of action on nature that vary in their level of intervention. With colonization, Russian and then Soviet models of domination of nature through the development of modern agriculture were imposed on Central Asian peoples who, in their previous practices, demonstrated an ability to take advantage of nature's resources in their variations over space and time, without aspiring to dominate it or control all its hazards. Rather than sharply opposing two models: local and imported, or traditional and modern, by showing that the former has been supplanted by the latter, before ousting it in turn, the contributions in this issue focus on examining in-depth the composition of these different models in agricultural and pastoral techniques.

The USSR is known to have been far more red than green. Various different theoretical, historical, and geographical factors contributed to this. First, despite recent attempts to link Marx's thinking to environmentalism (Foster 2000; Barrillon 2013), his criticism of capitalism focuses on the exploitation of labor linked to relations of production, not on the exploitation of natural resources. Then the Soviet project, in its Stalinist phase and beyond, aimed to transform nature, not preserve it, and this was carried out without regard for the environmental costs. In addition, the Central Asian steppes, in their vastness and low—moreover, nomadic—population, were perceived as vacant territory, “virgin lands” to be occupied and exploited, suitable for all kinds of agricultural, cosmic,⁸ and nuclear experiments. The evocatively titled book *Preobrazhennaia step'* (The Metamorphosed Steppe), praises the transformations of Soviet Kazakhstan, and its evolution over fifty years from a “backward,” “miserable” country, “entirely subject to the whims of a harsh nature,” to a modern republic, with a productive and mechanized agriculture, and this thanks to the achievements of science and culture, where the “rumbling of tractor engines has broken the silence of steppe spaces” of the “millions of hectares long unexploited.” (Mel'nik 1967, 6–14).

However, a closer examination of the sources highlights the need for further caution. During the imperial era, the Russian conquest did indeed lead to a reduction in the amount of rangeland in which nomads could move around. However, the so-called “surplus” lands, which were theoretically available for colonization, were the subject of detailed investigations by Russian and local experts, and the opinions of these parties on the need for sedentarization

8. The main Soviet space launch base, which became the Baikonur Cosmodrome, was established in 1956 in the Kyzylorda region.

were not unanimous, with several praising how perfectly nomadic pastoralism was suited to the steppe environment (Martin 2001, 72; Campbell 2011; Ferret 2016).

Various conceptions of nature coexisted during the Soviet period. While rampant prometheism may have had the upper hand in the mammoth “conquest” and “nature transformation” projects, a protection movement existed even in Stalinist times in “little corners of freedom” protected by strict legislation (Weiner 1999), and conservative conceptions of natural resources were able to prevail in some bureaucracies and major flagship projects of the Stalinist decades (Brain 2011). In addition, more “complex” or “integrated” approaches to resource exploitation existed in industrial processes, for example in the extraction of apatite required for fertilizer production (Bruno 2016).

For the second half of the Soviet period, after the death of Stalin, concepts of the “rational use of resources” and “integrated uses of nature” signaled the desire to step away from a confrontation with nature. A rational, economical, and planned management of ecological services would ideally take into account all the complexity of natural processes, in a scientific and technocratic vision of the biosphere. This concept, which was dominant in scientific circles, was elevated to the rank of official doctrine in the 1970s and 1980s. However it was swiftly reduced to a simple slogan that could cover all manner of practices, some of which were very remote from or even opposed to the spirit of the concept: indeed, the Ministry of Melioration and Water Management could even claim to be “rationally exploiting water resources” so as to promote its mad plan to divert the northern and Siberian rivers.

Nevertheless, this “rational use of resources” bears a striking resemblance to the “sustainable development” that has swept through independent Central Asia with the arrival of international organizations. This is how actors often translate “sustainable development” into Russian, as Irène Mestre explains. This is unlikely to be a misunderstanding: it is still a question of finding a balance between exploitation and conservation, with the difference that compatibility with the capitalist system and the quest for economic profitability are at the heart of sustainable development, while rational use accentuates the need for centralized planning. Moreover, this type of translation into practice is not unique to Central Asia, it has been shown in other contexts that “sustainable development” is a very loose framework whose appropriations go as far as subversion or mockery (Villalba 2009).

In the animal husbandry sector in Central Asia, these contradictory tendencies in the conceptions of nature, but especially the catastrophic outcomes of collectivization, have led to the invention of a compromise between extensive breeding and intensive farming, and between nomadic and settled ways of life. This system is defined by Isabelle Ohayon as “intensive pastoralism.” It disassociates the mobility of livestock from that of the population and prevents

the effects of climatic hazards through the development of fodder production, using interventions in both soils and in water resources.

The strong emphasis on production led to the creation of new animal breeds, as well as a focus on a few indicators, such as the proportion of females in the herd or flock and the fertility rate. Carole Ferret shows that the Soviet rationalization of animal husbandry consisted in a strict categorization of livestock and an a priori standardization of its treatment. An examination of current pastoral techniques in a village and on a summer pasture in independent Kazakhstan reveals a relaxation of control over animals, but without a return to multi-purpose animal husbandry or renewed extensiveness.

It would therefore be inaccurate to identify in this the resurgence of the former pastoral system, once the Soviet parenthesis was closed and the shock of decollectivization had passed. The greening of the steppe, still pale, in the end owes little to the ecological movements that encouraged it. Moreover, the recently more visible display of ecological concerns within institutions does not necessarily lead to a cessation of harmful agricultural practices.

The contributions to this two-hundredth edition of *Études rurales* draw attention to a region and to socio-environmental phenomena that are little-known, by placing the current situation in the longer temporal context of upheavals of the Soviet and post-Soviet times. With climate change, likely the aggravating factor that caused the septicemia that killed 200,000 saiga antelopes in May 2015 (Kock et al. 2018), a process is underway whose impact in Central Asia is still poorly understood.

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