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## Climate Change, Desertification, and Water Stress in Kalmykia

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### Abstract

In Russia as a whole, climate change has led to higher temperatures, permafrost thawing, human health impacts due to extreme heat, and higher incidence of forest fires and other natural disasters, among other country-wide consequences. Warming associated with a changing climate is best viewed as a risk multiplier that will exacerbate existing environmental stresses in locally nuanced ways. The most significant impacts of climate change in the Republic of Kalmykia, located in Russia's southwest, are distinct from those visible nationally and include desertification and increased pressure on an already low-quality water supply.

### A Changing Climate in Russia's Southwest

Kalmykia is a small ethnic republic in Russia's southwest. More than 80 percent of the republic's territory is semi-desert or desert. The desert areas are characterized in places by sand dunes and sparse vegetation. In between can be found herds of sheep and cattle, though these herds' numbers have been in decline since the collapse of the Soviet planned economy. The republic's soil is saline, the product of historical deposits from the Caspian Sea and a shallow water table. The intertwined issues of desertification and water stress in Kalmykia have been exacerbated in recent years by global warming, which causes more frequent thawing in the wintertime and higher summertime temperatures. This, in turn, has been destabilizing the republic's fragile ecosystem, adversely affecting pastoralist practices and increasing the evaporation of limited surface water. As elsewhere in Russia and globally, climate change is in Kalmykia a risk multiplier that compounds existing environmental issues and presents challenges for local communities, which must evolve and adapt to such change. Kalmykia's climate—which is continental, with long, warm, dry summers and harsh winters—has warmed in recent decades, in turn exacerbating anthropogenic changes that have resulted from development and societal practices initiated during the Soviet period and continued since 1991.

### Desertification during the Soviet Period and Thereafter

Traditionally nomads, Kalmyks were forced to abandon this practice in the 1920s and adopt collective farming, characterized by intensive mechanized exploitation of the soil and mandated change to the types of livestock kept. Kalmyks historically pastured animals that were well

adapted to the ecosystem, including cows, camels, and horses, as well as a locally adapted breed of fat-rumped sheep.<sup>1</sup> Under the Soviets, the percentage of cattle as a share of total livestock declined, while non-Kalmyk fine-fleece sheep were introduced and increased in number; the latter's sharp hooves damaged the steppe's soil during grazing (Ochir-Goryaeva et al 2020). As elsewhere in the USSR, this environmental impact was of less importance to Moscow than economic gains, and Kalmykia became one of the leading fine-fleece wool producers in the USSR. The republic's east, known as "Black Lands" (*Russ.* Chernye Zemli) on account of not being covered with snow in the wintertime, served as pastureland not only for Kalmykia-registered livestock, but also for those from neighboring regions—including Stavropol, Dagestan, Astrakhan, and Rostov—up until the 1970s. The increase in animal numbers—by 1985 there were 3.4 million head of sheep in the republic—led to overgrazing and soil erosion, particularly in the Black Lands, where nearly half of the total head of sheep were located.

Zonn (1995), writing soon after the breakup of the USSR, noted a general disregard for the ecological consequences of development and negative impacts resulting from the Soviet Union's centrally planned economy.<sup>2</sup> He reiterated the United Nations Environmental Program's conclusion that the republic had "experienced severe desertification" (Zonn 1995, p. 348) and identified negative effects associated with desertification, including wind erosion and soil salinization (Elie 2015). As a result of these and other factors, in 2020 desertification in Kalmykia affected four times the land area that it had in 1984, increasing from 750,000 to three million hectares, or nearly half of the republic's total area of 7.6 million hectares (Yuferev et al 2023).

1 In 1913, the numbers of animals pastured on Kalmyk lands were as follows: one million sheep, 300,000 cattle, 200,000 horses, and 20,000 camels (Zonn 1995).

2 The Kalmyks' deportation between 1943 and 1957 for supposed collaboration with the Nazis also had a negative impact on soil quality: "The Russian population that remained during the intervening period damaged pasture condition" (Zonn 1995, p. 352).

Babenko (2021) evocatively describes the results of desertification in the republic: “an encroaching sea of sand...overtaking farmers’ camps, swallowing their animals’ food supplies.” As a farmer described his and his family’s prospects, echoing the group’s 1943 deportation to Siberia, “nature itself is forcing us to leave.” The results of desertification are manifold and include the outmigration of Kalmyks from rural areas to cities in the republic and beyond. In Moscow, where an estimated 20,000 to 40,000 Kalmyks live today, Kalmyk migrants note the challenges of development and lack of economic opportunity in the rural areas of Kalmykia, which have been adversely affected by desertification and the foreclosure of pastoralist livelihoods (Holland and Churyumova 2023).

### Warming and Water Stress in Kalmykia

Kalmykia’s water supply is generally unreliable. Wasteful irrigation practices and improper canal construction during the Soviet period have compounded the salinization that historically resulted from the inundation of Kalmykia’s land area by the Caspian Sea and the evaporation of surface water (Zonn 1995). The result is a lack of access to potable water, particularly for rural residents. In 2012, those living in rural areas of Kalmykia consumed an average of eight liters of water per day, compared to 300 liters across Russia (Sangadzhiev and Onkaev 2012). Although money was allocated from the federal budget to build water pipelines in Kalmykia—and on August 28, 2015, Kalmykia’s head, Alexei Orlov, reported to Russian President Vladimir Putin on the completion of this federal project in a television broadcast—the pipelines were never in fact completed. In 2019, when Orlov resigned, a criminal case was opened against some members of his government over the embezzlement of 300 million rubles from the federal budget earmarked for this project.

The problem remains acute today, as only 7.4 percent of Kalmykia’s population has access to potable water. People across Kalmykia’s villages purchase water from water trucks, but water scarcity prevents them from improving their economic situation by growing vegetables or keeping animals in their yards. This lack of access to sufficient water also contributes to migration from villages to urban places or out of the republic entirely, among other environmentally related “push” factors spurring outmigration from Russia’s south (Reuveny 2007; Churyumova and Holland 2023). At the republic level, water scarcity is a key factor that constrains the development of the agrarian sector. There are several aquifers across the republic, but their high salinity means they cannot be widely used to address issues of water stress and shortage.

### The Lack of Government Response to Climate Change in Kalmykia

In the years immediately following the breakup of the USSR, Kalmykia’s government declared a state of emergency, maintaining that the republic had become “the first desert in Europe.” The worst-affected areas were in the republic’s east, pushing many families to move westward toward the republic’s capital, Elista—a form of climate-related migration. Under the leadership of Kirisan Ilyumzhinov (in power as Kalmykia’s leader from 1993 to 2010), the republic’s government implemented an anti-desertification program, with some success. Within the framework of a newly launched National Action Program to Combat Desertification, Kalmykia’s government designated the Black Lands, which contained the “first man-made desert in Europe,” as a nature reserve and carried out the large-scale planting of shrubs that are resistant to heat and require little water, whose roots help support the growth of pasture grasses (Ivanov and Perera 1997). The fact that the nature reserve recovered substantial vegetation by 2011 was attributed both to the success of the National Action Program and to the decrease in the number of livestock grazing in the area (Ochir-Goryaeva et al 2020). The situation has deteriorated sharply in the past decade, however, with the result that the level of desertification today is four times what it was in 1984 (Yuferev et al 2022). This setback is largely the product of an increase in livestock numbers due to a state-sponsored program in 2005–2010 to support the agricultural sector. By 2017 the number of cattle in Kalmykia stood at 4.7 million (eighth among Russia’s regions), while that of sheep and goats was 2.5 million (second among Russia’s regions) (Namrueva 2022: 108).

Ilyumzhinov’s successor, Alexei Orlov, tried to maintain high livestock numbers, turning the republic into a “meat belt zone” (*Russ.* myasnoi poyas) while simultaneously working to restore degraded soil within the framework of the federal program “Development of Land Reclamation for Agricultural Purposes in Russia (2014–2020).” The republic was unable to achieve either of these aims; rather, encouraged by the local government to increase their livestock numbers, herders abandoned pasture rotation schemes (*Russ.* pastbishcheborot) and overgrazed, thus exposing the soil to additional anthropogenic stress. Batu Khasikov, who succeeded Orlov in 2019, has presided over a reclamation program since 2020, though it is small in scope; the goal is to plant 7,000 hectares with shrubs to stop further encroachment by the desert.

Khasikov’s government has thus offered only limited plans for combating desertification and has failed to solve the water supply issue (due in part to inadequate funds), mainly leaving it to citizens themselves. This abdication of responsibility raises a question about individuals’ environmental behaviors at the grassroots level. Despite the collapse

of the Soviet system more than three decades ago, people in Kalmykia have retained a vertical type of collectivist mentality, expecting the authorities to solve problems on the ground—including environmental ones. People understand well the precarious ecological situation in the republic and the importance of pro-environmental actions. But what is striking, drawing on research conducted in 2011 by a group of UK-based scholars, is Kalmyks' "inability to conceive of a personal role in improving the environment" (Waylen et al 2012: 1130). What was true a decade ago remains true today: many people blame the local government for inaction and failure to mitigate the negative effects of climate change. The mismatch between pro-environmental attitudes and ambivalent behaviors is arguably related to the lack of a sense of personal agency when it comes to pro-environmental action at the community level.

## Conclusion

Kalmykia is the driest region in the southern part of European Russia, with temperatures reaching about 40

degrees Celsius in the summer. Despite the region not being conducive to large-scale livestock agriculture, both national and republic-level governments have introduced anthropogenic stressors into the ecosystem with the aim of increasing agricultural productivity, resulting in further soil erosion, salinization, shrinking water resources, and the spread of desertification across the republic. Some predictions suggest that owing to climate change and the gradual westward movement of sand, the entire Lower Volga steppe, which covers the whole of Kalmykia, will gradually turn into a desert (Sangadzhiev et al 2020). Despite ongoing and accelerating climate change impacts that affect desertification and water access, the Republic of Kalmykia has developed neither targeted adaptation policies nor quantitative assessments of climate impacts on the regional economy. Region-focused research is critical to understanding the locally specific effects of climate change throughout the territory of the Russian Federation.

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