

# Governing Natural Resources and the Climate Crisis in Central Asia

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On July 8, 2022, a glacier collapsed in the Tian Shan Mountains of Central Asia, causing an avalanche. The Tian Shan are a favorite place for foreign tourists to climb, and if it were not for the camera of a British tourist that witnessed the ensuing avalanche, the loss of the glacier might have gone unnoticed. Instead, we got a firsthand account of what climate change means for Central Asia's ecology and economy.<sup>1</sup>



The Tian Shan are home to the upper reaches of the Syr Darya River, one of two glacier-fed rivers that flow into the Aral Sea – the other being the Amu Darya. As temperatures rise globally, Central Asia's mountain glaciers are retreating and at risk of collapse, creating uncertainty downstream for those communities that depend on the rivers for drinking water, energy, and irrigation for agriculture. Changing patterns of rainfall and increasing frequency of floods in the mountainous regions will have varying effects across farms in Central Asia; small-scale farms in arid zones in Tajikistan, for example, may be more vulnerable to declining crop yields.<sup>2</sup> Droughts in Kazakhstan in May and June 2021 hit the country's production of wheat – its main agricultural export – very hard.<sup>3</sup> Climate change will, accordingly, have broad impacts across the region, ranging from glacial melt to choices over crop cultivation and fossil fuel production.

The Central Asian states are particularly vulnerable to climate change impacts owing to their economic dependence on natural resources. Indeed, natural resource politics have long defined the economies of Central Asia dating back to the Soviet Union, when

Moscow directed the Central Asian countries to produce a range of raw materials to fuel the state socialist economic system. The Central Asian states were large producers of coal, oil, and gas, along with numerous mineral and metal commodities; for example, Kazakhstan was the largest producer of copper in the Soviet Union.<sup>4</sup> Soviet centralized planning required a highly integrated and interdependent system of production in which many of the Central Asian states essentially bartered raw materials in exchange for manufactured goods from the other republics.

While much has been written about the energy-water nexus in Central Asia as well as about Central Asia's abundant oil and gas resources, there is less academic literature concerning climate change impacts in Central Asia despite earlier warnings that climate change would affect Central Asia's water resources and economic livelihoods.<sup>5</sup> Following a summer of record temperatures worldwide and collapsing glaciers – not just in Central Asia, but also in Italy – it is imperative to address how the global climate crisis and the ensuing global energy transition will affect local livelihoods and Central Asia's political economy. On the one hand, melting glaciers and changing rainfall patterns will wreak havoc on Central Asia's agricultural sector, which depends heavily on the rivers fed by the glaciers as well as rainfall; on the other hand, as countries worldwide shift away from fossil fuels, there

may be less demand for Central Asia's oil and gas resources and hence less revenue for government coffers in the oil- and gas-rich states (e.g., Turkmenistan, Kazakhstan, and Uzbekistan). While the war in Ukraine has seen an immediate uptick in demand for fossil fuels, over the long term, it is expected that many importing countries will seek to lessen their dependence on fossil fuels and shift to renewables. Ultimately, the climate crisis may amplify the negative impacts of fossil fuel development, as the oil- and gas-rich countries may lose export markets.<sup>6</sup> Yet, the global demand for clean energy technologies may also provide opportunities for the Central Asian states as suppliers of critical minerals and rare earth elements.

## The Political Economy of the Water-Energy-Agriculture Nexus and Climate Change

Water and energy have long been linked in Central Asia owing to the importance of water for both hydropower and irrigation. During the Soviet period, Moscow created a system of economic interdependence in which the fossil-fuel rich downstream states (e.g., Kazakhstan, Uzbekistan, and Turkmenistan) would provide energy resources to the water-rich upstream states (e.g., Kyrgyzstan, Tajikistan) in return for water for irrigation. Yet, after independence,

this system of mutual interdependence began to fracture as the upstream states sought to harness the upper reaches of the Amu and Syr Darya rivers for hydroelectricity and the downstream states sought to sell fossil fuels to Kyrgyzstan and Tajikistan rather than trade them as they did during the Soviet Union.<sup>7</sup>

Immediately after the Soviet Union's collapse, the international community supported regional efforts ostensibly aimed at restoring the Aral Sea, which had desiccated after decades of mismanagement when water was siphoned off for irrigation for cotton monoculture. International donors sought to ensure that the Central Asian states would sign regional agreements for sharing the rivers of the Aral Sea basin to prevent conflict over water use and to preserve political stability. Rather than addressing the root causes of the ecological disaster, these water sharing agreements reinforced prior institutional arrangements that privileged the agricultural sector and did not address the loss of livelihoods in the fishing communities surrounding the Aral Sea. Moreover, these agreements failed to address the mounting climate crisis that would affect the flow of the rivers given that they are fed by the summer melt of the glaciers.

For decades, scientists had, however, cautioned that global warming would accelerate glacial melt in places like the Tien Shan Mountains that extend across China, Kazakhstan, and Kyrgyzstan. A 2007



background paper for the UNDP Human Development Report on Climate Change found that 46 glaciers in Central Asia were already shrinking and that from the 1950s to the 1990s the Pamir-Alai glaciers had lost 19 percent of their ice.<sup>8</sup> Recent studies have found that approximately 80 percent of the Tien Shan glaciers are losing mass.<sup>9</sup> Earlier snowmelt coupled with shorter winters is likely to create natural hazards for those living near glaciers and associated infrastructure such as dams and reservoirs.

Overall, less water in Central Asia's rivers will have socioeconomic and political consequences given the importance of agricultural livelihoods, even in the countries that are rich in oil and gas resources. For the regions of Central Asia where livelihoods depend on the agricultural sector, changes in the river runoff will thus affect complex irrigated agricultural systems. For example, in the Fergana Valley, clashes over water resources occurred between communities along the border area between Tajikistan and Kyrgyzstan in 2021. Changing precipitation has decreased the amount of cotton as well as wheat that can be produced, resulting in food shortages in 2017 in Turkmenistan.

## Climate Change and Fossil Fuels

Addressing climate change requires an international commitment to reducing greenhouse gas emissions. For decades, the Central Asian states have sent mixed signals about their commitments to adhere to the UN Framework Convention on Climate Change. While Kazakhstan is a major producer of fossil fuels, the then Ministry of Environment and Water Resources engaged the International Institute for Environment and Development in 2011 to help it map out a path for building a green economy. This followed the launch of the Green Bridge Initiative to build regional collaborations to share lessons regarding green technologies and strategies for decarbonization.<sup>10</sup> At the 2021 UN Conference of the Parties meeting in Glasgow, Kazakhstan underscored its commitment to reaching carbon neutrality by 2060.

Yet, dependence on natural resources continues to constrain efforts to reduce greenhouse gas emissions not just at home, but globally through the production and export of fossil fuels. Kazakhstan remains the largest greenhouse gas emitter in Central Asia. Most of Kazakhstan's emissions are attributed to energy use in the energy industries and transport; decarbonizing Kazakhstan's economy is particularly challenging because it still relies upon aging coal-fired electricity plants for approximately 70 percent of its electricity, in contrast to 37 percent globally.<sup>11</sup> According to the Rocky Mountain Institute, Turkmenistan is listed as having the second dirtiest and climate damaging oil field (South Caspian Basin) after Russia's Astrakhanskoye natural gas field.<sup>12</sup>

Transitioning away from reliance upon the extractive industries remains difficult given the lack of diversification of their economies and dependence on export markets for oil and

gas, which are constrained by pipeline routes. In the decades following the Soviet Union's collapse, Russia was a large purchaser of Turkmen gas, though it was surpassed by China in 2010. With investments in a pipeline to bring gas to China via the China-Central Asia Gas Pipeline, China imported 34 billion cubic meters of gas from Turkmenistan in 2021.<sup>13</sup> In recent years, Turkmenistan has reaffirmed its interest in completing the Turkmenistan-Afghanistan-India-Pakistan (TAPI) pipeline.

Much of China's investments in Turkmenistan's and Kazakhstan's oil and gas sectors are, furthermore, part of China's Belt and Road Initiative (BRI) – or what is referred to as the Silk Road Economic Belt within Central Asia. The China National Petroleum Company (CNPC) has helped to develop the Galkynysh gas field in Turkmenistan. In 2019, the Kazakhstan government published a list of 55 projects with Chinese investments, of which half were in oil and gas projects.<sup>14</sup> As with other BRI investments elsewhere in Asia, revenue generated from these projects will likely need to service the debt from the initial investments.

Whereas prior to the Covid-19 pandemic, despite being the world's largest emitter of CO<sub>2</sub>, China was taking significant steps to reduce its fossil fuel footprint by reducing its reliance on coal-fired power plants and expanding its use of clean energy technologies. Yet, by investing in fossil fuel projects abroad, China's commitment to decarbonization at home is not being replicated abroad with its BRI investments in dirty industries in Central Asia and elsewhere in Asia. In part due to such criticisms, Chinese financial institutions providing BRI finances have committed themselves to the "Green Investment Principles for the Belt and Road."<sup>15</sup> Yet, if these investments are not carried out according to industry best practices with social and environmental safeguards, there will likely be associated environmental and health costs. NGOs have already raised concerns about the lack of transparency regarding the loans as well as the absence of reporting and assessment tools, which has implications for community engagement, oversight, and local implementation of environmental laws.<sup>16</sup>

## Climate Change Opportunities for Critical Minerals

Meeting the Paris commitments of limiting global warming to 1.5°C will demand a reduction in the use of fossil fuels globally, which will be a challenge for the oil- and gas-rich countries in Central Asia, not only because they are large exporters of fossil fuels, but also because they are large consumers. Yet, as of 2021, all five Central Asian states have ratified the Paris Agreement and have submitted their national determined contributions. In light of Russia's invasion of Ukraine, many countries, especially in Europe, are seeking to wean themselves off oil and gas. If the oil and gas-rich Central Asian countries continue to depend on fossil fuels domestically and for export revenue, the ensuing socio-economic impacts could be devastating not just in the short term, but over the long term.

Despite the short-term influx of oil rents from new markets in Asia, over the long term the oil- and gas-rich Central Asian states could be forced to yield to global pressure to decarbonize and risk social discontent if they are unable to diversify their economies. Furthermore, for the Central Asian states that are also at the forefront of climate change impacts, opportunities may emerge to offset the loss of revenue and contribute to a global energy transition through new investments in critical minerals. Indeed, the United States Geological Survey has highlighted the significant deposits of rare earth elements and rare metals located in Central Asia, which are essential for the development of clean energy and transportation. According to Vakulchuk and Overland, the region of Central Asia, moreover, holds important critical minerals, including global manganese ore, chromium, lead, zinc, titanium, aluminum, copper, cobalt, and

molybdenum.<sup>17</sup> Kazakhstan is the second-largest producer of chromium, which is vital for the production of wind turbines.

Like the challenges faced by many oil and gas countries with state-owned enterprises managing their oil and gas revenues, it will be imperative for the states with significant deposits of critical minerals to be transparent about their supply chains and revenue accumulation to benefit society and mitigate conflict. While the Central Asian states have opened their state-owned enterprises to foreign investment, state ownership without any checks on revenue flows to the state can lead to corruption and misuse of revenue that may not benefit the local populations.<sup>18</sup> Thus, as the Central Asian governments develop their critical mineral resources, contractual agreements with foreign investors require transparency and accountability mechanisms as laid out in the Extractive Industries Transparency Initiative (EITI). They must also include provisions for stakeholder engagement and public access to information, especially when it comes to important topics such as environmental and social impacts. Only Kazakhstan, Kyrgyzstan, and Tajikistan are parties to the EITI, with Tajikistan having been suspended temporarily in January 2022 for missing a reporting deadline. EITI requires signatories to commit to disclosing information about how much revenue is received from the extraction of natural resources and how those revenues are used to benefit society. Kazakhstan, Kyrgyzstan, Tajikistan, and Turkmenistan are parties to the 1998 Convention on Access to Information, Public Participation in Decision-making, and Access to Justice in Environmental Matters (i.e., Aarhus Convention). Article 21 of Kazakhstan's Environmental Code also includes provisions for information disclosure and public participation. Yet, most of the governments remain characterized by weak transparency and governance when it comes to the mineral sector.

To date, the absence of disclosing foreign investments and public participation in decision making has led to protests in other sectors, such as potential sales of agricultural land in Kazakhstan to foreigners. One reason public disclosure of contracts matters is that these contracts lay out environmental protections as well as commitments to benefit local communities, including investments in social services and hiring of local staff. While vital for fostering a global energy transition, research will be needed to understand the range of environmental and health effects for local communities caused by mining rare earth elements and critical minerals.

## Conclusion

Turbulence and continuity characterize the natural resource sector in Central Asia. Since the Soviet days, Central Asia has been an exporter of raw materials. While independence has allowed the states to pursue natural resource sovereignty and enjoy the riches of their endowments, not all members of society have benefited. In regions where oil and gas exploration and production occur, communities have seen their environments and health deteriorate. Thus, as the world seeks to move away from fossil fuels, the Central Asian states will face their own reckoning regarding how to mitigate the impacts of global warming while ensuring that government coffers have resources to provide for basic social services and government functions. While a global energy transition might be economically costly for the oil- and gas-rich Central Asian states in the short term, the global transition to clean energy technologies could provide opportunities to diversify their economies and export markets in the long term. This is especially so if best practices are followed, in which industry activities are transparent and provide for stakeholder consultation and public access to information about impacts and benefits.

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## Notes

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Fig. 2: Tian Shan Mountains in Central Asia. (Photo courtesy of Oli Brown, 2008.)