Environmental Challenges in Central Asia: Strengthening OSCE Engagement for Regional Sustainability

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Central Asia is grappling with an escalating environmental crisis shaped by the region's Soviet legacy, rapid industrialization, and the mounting effects of climate change. These challenges threaten not only ecological stability but also the economic and social resilience of the region. Issues such as water scarcity, soil degradation, radioactive contamination, and desertification are compounded by weak governance structures, limited public awareness, and constrained civil society engagement. With temperatures rising faster than the global average and vital water resources depleting, the region faces a precarious future that requires urgent and coordinated action.

Central Asia serves as a microcosm of the broader environmental challenges faced across the OSCE region. While the region has unique geographical and historical specificities, the interconnected nature of environmental issues, such as climate change, resource management, and the role of governance,[1] makes this case study relevant for the entire OSCE area. Addressing Central Asia's environmental concerns not only provides critical lessons but also highlights the urgency of coordinated international action across the OSCE region.

The Organization for Security and Cooperation in Europe (OSCE), with its comprehensive approach to security and long-standing presence in the region, is uniquely positioned to address these challenges. By leveraging its second dimension (economic and environmental activities) and fostering cooperation among governments, civil society, and the private sector, the OSCE can play an important role in mitigating environmental risks and promoting sustainable development.

1. Central Asia's Environmental Crisis: Soviet Legacy, Modern Pressures, and Climate Change

***Soviet Legacy and Radioactive Contamination**:* Central Asia continues to grapple with the environmental and health consequences of its Soviet past. The Semipalatinsk Test Site in Kazakhstan, where nearly 500 nuclear tests were conducted, has left 13% of the country contaminated with radionuclides.[2] Uranium mining, which supplied over 30% of the USSR's uranium, resulted in over 1

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billion metric tons of toxic tailings scattered across the region.[3] Poorly managed closures of mines and waste sites have further exposed local populations to radioactive materials and associated health risks.

Industrial Waste and Air Pollution: The mismanagement of industrial waste remains a pressing issue. Hazardous substances from mining operations contaminate vital areas such as the densely populated Ferghana Valley, while coal-dependent energy systems contribute heavily to air pollution. Urban centers like Bishkek and Almaty consistently exceed global air quality standards, driven by emissions from vehicles, coal use, and poorly regulated urban expansion.

Domestic Waste and Recycling Challenges: Most domestic waste goes untreated due to limited recycling infrastructure and illegal dumping practices. Many rural areas lack access to organized waste collection, exacerbating pollution. Recycling of municipal solid waste (MSW) stands at 11.5 percent in Kazakhstan and below 10 percent in Uzbekistan, compared to about 50 percent in the EU.[4] Addressing these interconnected environmental issues requires significant investment, regulatory enforcement, and public awareness.

Water Management and Land Degradation: The region's water management situation, shaped in part by intensive cotton cultivation under the Soviet regime, continues to pose significant challenges for its future. Desertification and soil degradation are primarily driven by human activities and poor water management practices. Overuse of land, insufficient fallow periods, and the overconcentration of livestock in small areas have severely damaged ecosystems and accelerated soil erosion. Adding to these pressures are poorly managed and widely dispersed toxic pesticide stockpiles from the Soviet era, which continue to cause substantial environmental harm.

Beyond the well-known Aral Sea crisis, other critical water bodies, such as Lake Balkhash in Kazakhstan, face threats from unsustainable water extraction, industrial pollution, and China's extensive irrigation practices in Xinjiang. Desertification now affects over 1 million km^2, generating hazardous dust and salt storms that harm crops, vegetation, and human health. Approximately 12 million people in Central Asia reside in regions highly vulnerable to drought, spanning an area of roughly 40 million hectares.[5] These challenges are further compounded by outdated irrigation infrastructure and poor maintenance, leading to widespread salinization and degradation of agricultural land. In Central Asia, at least 20% of the total land area is classified as degraded, compared to just over 10% in most other regions worldwide. This represents approximately 80 million hectares—an area nearly four times the size of Kyrgyzstan. An estimated 18.01 million people in the region are affected by land degradation, accounting for 30.51% of the total reported population.[6]

Climate Change: Amplifying Risks: Central Asia is among the regions in the world most severely impacted by climate change, experiencing temperature increases above the global average. The average annual temperature is projected to rise by 1.02°C by 2030, 3.1°C by 2050, and 4.7°C by 2085.[7] These shifts are profoundly impacting ecosystems, agriculture, and water resources. For instance, the Caspian Sea is undergoing rapid evaporation due to rising temperatures and could lose up to 25% of its area by the end of the century, threatening biodiversity and ecosystems.[8]

The accelerated retreat of glaciers jeopardizes the water supply of major rivers like the Amu Darya and Syr Darya, which millions rely on for irrigation and drinking water. By century's end, Central Asian glaciers could lose up to 60% of their surface area, leading to eventual water shortages and agricultural challenges.

Natural Disasters and Economic Risks: Climate change also exacerbates the risk of natural disasters, including floods, mudslides, and glacial lake outbursts. Each year, over 3 million people in Central Asia are impacted by natural disasters. With global temperatures projected to rise in the coming decades, accelerated glacier melt is expected to increase the risks of floods and mudslides.[9] Mountainous regions such as the Tien Shan and Pamir ranges, are increasingly vulnerable to rockfalls, avalanches, and debris flows, driven by both seismic activity and rising temperatures. These disasters disrupt trade, damage infrastructure, and cause economic losses estimated at $10 billion annually, affecting around three million people.[10]

As droughts intensify, water resources decline, and natural disasters become more frequent, climate change represents a profound threat to human security and economic stability in Central Asia. Urgent, coordinated action is needed to address these risks and build resilience against the worsening impacts of climate change.

2. Environmental Issues and Human Security: Lessons from Central Asia

Environmental Impacts on Regional Economic Stability: Environmental issues are critically important for the OSCE as they deeply influence the economic development and stability of the region. Environmental challenges and climate change are also intensifying food insecurity. Between 2014 and 2019, the number of people experiencing moderate to severe food insecurity in Central Asia rose by 55%, far exceeding the global average.[11] Factors such as undernutrition, malnutrition, and developmental stunting in children underscore the fragility of food systems.

Key issues like soil salinization, erosion, and flooding significantly compromise agricultural productivity. Climate projections suggest that declining water availability and rising temperatures could reduce agricultural yields by 10–30% by 2050. While roughly 80 per cent of land in Central Asia is used for pastoralism, livestock farming faces mounting risks from pasture degradation and extreme weather, threatening animal health and productivity.[12]

Poverty, Rural Communities, and Unsustainable Practices: Poor and rural populations are disproportionately affected by environmental challenges. This is particularly concerning given that Central Asia is predominantly agrarian, with approximately 60% of the population directly relying on agriculture as their primary source of income. While some farmers may see temporary gains from improved harvests, the long-term impacts of water scarcity, land degradation, and climate change are likely to diminish productivity and incomes. Unsustainable practices, such as overgrazing, deforestation, and excessive resource extraction, exacerbate this cycle of poverty and environmental harm. These actions degrade ecosystems, disrupt agricultural livelihoods, and heighten energy insecurity, posing additional challenges to economic stability in the region.

Water Pollution and Public Health Risks: Water pollution, driven by industrial waste and unsustainable agricultural practices, has worsened public health situation in Central Asia. Many rural communities lack access to clean drinking water, relying instead on contaminated sources. Pollutants such as lead, copper, and uranium, combined with inadequate water treatment infrastructure, have contributed to severe health problems, including gastrointestinal diseases and infections. With population growth – the region's population has tripled over the past 50 years - and increasing water demand, the risk of waterborne diseases is set to rise, placing further strain on public health systems.

Environmental Disasters and Population Displacement: Environmental degradation has led to significant displacement across Central Asia. In Kazakhstan's Semipalatinsk region, more than 161,000 people were forced to leave between 1980 and 1990 due to the environmental fallout from nuclear testing.[13] In the 1990s and early 2000s, droughts in the Aral Sea region displaced many residents as they sought more viable living conditions. Additionally, natural disasters like floods, landslides, and glacial melt have further driven population movement. By the late 2010s, Tajikistan had 4,800 internally displaced persons, largely as a result of natural disasters in the Rudaky and Fayzobod provinces.[14]

3. Navigating Barriers: Civil Society's Role in Environmental Advocacy in Central Asia

A free and vibrant civil society is essential for addressing environmental challenges. Civil society organizations (CSOs) serve as advocates for sustainability, transparency, and accountability. They raise public awareness, hold governments and corporations accountable for harmful practices, and mobilize communities for collective action. By providing expertise and bridging gaps between policymakers and local populations, CSOs amplify the voices of those most affected by environmental issues.

Top-Down Governance and Barriers to Civil Society Engagement: In Central Asia, environmental challenges are compounded by a centralized, top-down approach to policy-making that stifles civil society engagement and limits government accountability.

After the Soviet Union's dissolution, although most Central Asian countries loosened information restrictions, they later re-imposed limits on media freedom and access to information. Although governments in the region, with the exception of Turkmenistan, have introduced measures to increase the dissemination of environmental information, these efforts remain inconsistent and insufficient.

Restrictive Legislative and Financial Frameworks for CSOs: Since the early 2000s, Central Asian governments have increasingly restricted civil society's operational space. CSOs face substantial legislative and financial constraints, including strict registration laws, bureaucratic hurdles, and expensive compliance requirements. These constraints hinder the ability of CSOs to operate effectively and advocate for environmental issues.

The Rise of GONGOs: Governments in the region have also promoted government-organized non-governmental organizations (GONGOs) to promote official policies and counter criticisms. These

GONGOs enjoy expedited registration and state funding, in stark contrast to independent environmental CSOs that face bureaucratic hurdles and often struggle to secure necessary resources, often making it look like countries in the region have a significant number of registered environmental CSOs, although any are not truly independent. GONGOs dominate funding opportunities and have greater access to decision-making processes within government institutions, sidelining authentic environmental advocacy.

Suppression of Political and Institutional Alternatives: Political authoritarianism and censorship also hamper the development of think tanks and independent institutes, which are essential for shaping effective environmental policy. Additionally, ecological political parties are nearly nonexistent, with Central Asian governments actively suppressing opposition and preventing the emergence of environmental-focused independent political groups. Efforts to create such parties, like the Green party in Kazakhstan, have failed to gain momentum, reflecting the broader suppression of civil society and the stifling of environmental political discourse in the region.

Repression of Environmental Activism: Independent environmental activists face significant repression, especially when addressing sensitive issues like corruption or the environmental impacts of foreign investments. Activists are often subjected to harassment, job loss, and even violence. In some cases, CSOs and their members are labeled as "foreign agents," reflecting tactics used by other authoritarian regimes such as Russia and China.

This hostile environment has pushed many CSOs into self-censorship, focusing on non-political or international issues like biodiversity and climate change that are less likely to provoke state retaliation. However, this limits their ability to critically address local environmental issues and effectively influence government policies.

4. Conclusion and Recommendations

Central Asia's environmental challenges are urgent and multifaceted, affecting not only the ecological health of the region but also its economic and social stability. In this context, the OSCE has a vital role to play, leveraging its unique mandate to foster regional cooperation, empower civil society, and support sustainable development initiatives.

To effectively address these challenges, the OSCE should prioritize enhancing transparency, strengthening the participation of independent civil society, and supporting robust environmental governance across the region. Engaging with both governmental and non-governmental actors, including local communities and private sectors, would be essential in promoting a more sustainable future. OSCE work to foster inclusive and transparent decision-making processes, support civil society organizations, and encourage regional cooperation could mitigate the environmental risks and build resilience across Central Asia. This should be a coordinated response to safeguard the region’s future and ensure the long-term security of its ecosystems and communities.

Recommendations

1. **Strengthen Civil Society's Role in Environmental Advocacy**

    - **The OSCE** should strengthen capacity building for civil society organizations working on environmental issues, similar to its support for human rights organizations. It should also offer training and financial support for local environmental initiatives.

    - **Governments** must implement their OSCE commitments to ensure respect for freedom of association and facilitate civil society engagement, including by easing registration requirements, repealing foreign agent style legislation, and opening space for CSO engagement in the policymaking process.

2. **Diversify Civil Society Engagement**

    - International actors, including the OSCE, are often criticized for engaging primarily with well-established CSOs or international NGOs. It is crucial to involve a broader range of organizations, including smaller and less-established local groups that may lack resources or capacity but have valuable local knowledge. Efforts should also extend beyond urban centers to include rural areas where activists are deeply familiar with regional environmental challenges. Moreover, the OSCE should actively engage with CSOs that operate in local or minority languages, ensuring a comprehensive understanding of environmental issues across diverse communities.

3. **Increase International Visibility and Engagement with Environmental CSOs**

    - The OSCE can play an important role in raising the international profile of environmental organizations, particularly those from more authoritarian states where space for civil society is restricted. The OSCE should include more civil society in its second dimension events, raising the international profile of environmental CSOs and activists, including in Central Asia, by providing a platform for CSOs to network and share their work and challenges on the international stage. Giving visibility to small, isolated CSOs also makes it harder for governments to silence them, as international connections can act as a safeguard.

4. **Strengthen Aarhus Centers**

    - Aarhus Centers are vital tools for collecting and disseminating environmental information, yet many face significant challenges or are not as active as they could be. The OSCE should support strengthening these centers by providing logistical support and working with governments to remove bureaucratic or political obstacles. These centers can play a critical role in enhancing public awareness and facilitating access to environmental data.

5. **Strengthen Review of the Implementation of 2nd Dimension Commitments**

- The OSCE should conduct a more comprehensive annual review of states record on implementing their 2nd dimension commitments, closer to the annual review conducted concerning OSCE 3rd dimension commitments, and involve civil society in this effort. By facilitating transparent reviews and accountability mechanisms, the OSCE can ensure that commitments translate into tangible progress, countering tendencies to neglect or backslide.

6. **Support Academic Freedom and Knowledge Development**

- Thinktanks and universities are key to generating knowledge and solutions for environmental issues but face significant limitations in some countries, including a lack of academic freedom, censorship, and government pressure to align with official narratives. The OSCE can support academic independence by fostering collaboration through seminars, information exchanges, and discussions. It also should step up environmental programs within the OSCE Academy in Bishkek. By empowering experts and researchers to go beyond descriptive approaches and address sensitive topics, the OSCE can help generate innovative solutions.

7. **Connect Environmental Advocacy with Anti-Corruption Efforts**

- The OSCE already works on both anti-corruption and environmental issues. Programs linking the two would help address situations where corruption undermines environmental policies. Addressing corruption as a cross-cutting issue is critical to ensuring that foreign cooperation efforts achieve their intended impact.

8. **Promote Public Awareness Campaigns**

- Environmental awareness remains low among much of the population in Central Asia, despite occasional campaigns focused on specific issues such as nuclear pollution or mining-related hazards. The OSCE should partner with media and educational institutions to raise awareness about critical issues like recycling, water conservation, climate change, and actionable solutions. Public education campaigns can help build a broader societal understanding of environmental challenges and foster collective action to address them.

9. **Engage more with the Private Sector**

- The OSCE should deepen its engagement, dialogue, and cooperation with businesses, encouraging them to embrace and expand corporate social responsibility (CSR) initiatives. Companies often serve as legitimate intermediaries between government authorities and civil society, providing a neutral platform for collaboration. Furthermore, businesses possess the resources, expertise, and innovative capacity to contribute significantly to addressing environmental challenges. This can include: promoting sustainable business practices that

align with environmental goals; encouraging investment in green technologies and renewable energy solutions; facilitating knowledge-sharing between businesses, civil society, and policymakers to develop practical and scalable solutions; and advocating for corporate accountability in industries with significant environmental impacts, such as mining, agriculture, and energy.

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