

Innovative Approaches to Ecosystem Restoration: Kazakhstan's Syr Darya Control and Northern Aral Sea Phase I Project

BACKGROUND

Until the 1960s, the Aral Sea was the world's fourth-largest lake. Shared by five Central Asian countries—Kazakhstan, Uzbekistan, Turkmenistan, Tajikistan, and the Kyrgyz Republic—the Aral Sea basin supported a vibrant economy, with many people relying on fishing and agriculture for their livelihoods. However, decades of poorly designed and implemented industrial and agricultural development significantly transformed the Aral Sea. Most notable was the diversion of large quantities of water for irrigation from the Amu Darya and Syr Darya rivers that feed the Aral Sea. Between 1960 and 2004, the Aral Sea's surface area shrank almost 70 percent and its level dropped almost 20 meters. In 1990, as the waters receded, the Aral Sea split into the Northern Aral Sea within the territory of Kazakhstan and the larger South Aral Sea shared by Kazakhstan and Uzbekistan.

The desiccation of the Aral Sea resulted in serious economic, social, and environmental degradation. Fresh fish production virtually disappeared, salinity and pollution levels rose dramatically, dust and salt storms occurred often, and there were measurable changes in the local climate. Drinking water supplies became polluted and human health problems increased sharply. Tens of thousands of jobs were lost in the fishing, agricultural, and service sectors.

PROJECT DESCRIPTION

The Syr Darya Control and North Aral Sea Phase I Project currently underway is the first phase of

the rehabilitation of the Syr Darya River and was identified under the Aral Sea Basin Program approved by the heads of the five Central Asian States in 1994. The objectives of the project are: to sustain and increase agriculture (including livestock) and fish production in the Syr Darya basin in Kazakhstan; and to maintain the Northern Aral Sea and enhance ecological/environmental conditions for improved human health and conservation of biodiversity. The project's components include: building water infrastructure to rehabilitate the Northern Aral Sea; improving the hydraulic control of the Syr Darya River; rehabilitating the Chardara Dam; restoring aquatic resources and promoting fisheries development; and building institutional capacity.

To maintain the integrity of the Northern Aral Sea, the 13 km Kok-Aral Dike was constructed to separate the Northern Aral Sea from the South Aral Sea. Completion was in August 2005. To increase the flow capacity of the Syr Darya River, several additional hydraulic structures were constructed on the river and existing hydraulic structures and the Chardara Dam were rehabilitated.

PROJECT OUTCOMES

The Phase 1 Project has already shown impressive results:

- *Rise in water level.* Once a fraction of its original size, the Northern Aral Sea filled up rapidly to only a few meters short of viability just months after the Kok-Aral Dike was erected—considerably ahead of the project schedule. In 2006, 2007, and 2008, the North Aral Sea's full sup-

KAZAKHSTAN AT A GLANCE

Population: 15.3 million – 58% urban, 42% rural;
1.1% annual growth rate
Surface area: 2,724,900 km²
Life expectancy: 66.2 years
GNI per capita: US\$ 3,870

Human Development Index Ranking:
73 out of 177 countries

% below the basic needs poverty line: 15.4 (2002)

MORE INFORMATION

Kazakhstan Syr Darya Control and Northern Aral Sea Phase-I Project. Project Appraisal Document. World Bank, 2001.

"Saving the Corner of the Aral Sea." ECA Region Website. World Bank, 2005.

Kazakhstan Second Irrigation and Drainage Improvement Project. Project Information Document. World Bank, 2008.



ply capacity was attained. The water surface area is now 50 percent greater than it was at its lowest level.

- *Reduced salinity levels.* The increased inflow of freshwater halved salinity levels in the North Aral Sea to less than 10 gr/ltr by 2007.
- *Increased fish production.* Between 2004 and 2007 there was a forty-fold increase in fish harvest from 50 tons to about 2,000 tons. Several types of freshwater fish returned to the Aral Sea. Four fish processing plants were opened, and in 2008 fish was exported for the first time in many years. Fish hatcheries are expected to release 15 million fingerlings into the Northern Aral Sea in 2008, including the reintroduction of sturgeon.
- *Restored ecosystem.* The increased water level benefits the micro-climate, improving air, soil, water quality, and biodiversity. Before the construction of the Kok-Aral Dike, the final rains of the season would fall in March; during the last two years there were rains into April, May, and June that resulted in more grass for livestock, cooler summers, a reduction in dust storms, and the return of waterfowl.
- *Improved irrigation water supply.* Enhanced water resource management in the Syr Darya basin has allowed the delivery of irrigation water in the appropriate volumes at the appropriate time to the large irrigated areas in South Kazakhstan and the Kyzylorda region and has stimulated agricultural production. When irrigated areas have been rehabilitated and modernized with the assistance of the Bank-funded Second Irrigation and Drainage Improvement Project, further increases in production are expected.
- *Health improvements.* The shoreline of the expanded North Aral Sea, that until recently was 100 km away from the former port of Aralsk, is now only 25 km away. As a result, new supply systems bring better-quality water to Aralsk and nearby villages, improving the health of the population.

LESSONS LEARNED

Lessons from this and related water projects in Kazakhstan include:

- Rigorous economic and environmental criteria should be applied during project planning; project scope and design should account for the difficulty in coordinating among key government agencies.
- Technical assistance should be provided in a timely manner; a major emphasis on procurement, financial management and construction quality control should be maintained.
- Local institutions must be involved in project design and preparation, as ownership at both the national and local levels is essential for achieving results.
- Agreement among the participating parties on broad regional principles of the Aral Sea Basin Program is important; to be effective, however, discrete yet coordinated national investment projects are proving pivotal to the success of larger regional or multi-country plans.

SCALING UP

The successful restoration efforts initiated by Phase I provide a catalyst for the second phase currently under development, and planned for approval in 2009. Phase II will continue the efforts to improve water resources management in the Kazakh part of the Syr Darya River basin. Based on the results obtained during Phase I, Phase II should provide further improvements in irrigation water supply for agriculture, revitalization of the fisheries industry, enhanced public health, and ecosystem recovery in the Aral Sea.

RELEVANT PROJECTS

Syr Darya Control and Northern Aral Sea Phase I Project

Project ID: P046045
 Timeline: 2002–2008
 Credit Amount: US\$ 64.5 million

Syr Darya Control and Northern Aral Sea Phase II Project

Project ID: P093825
 Under preparation



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