

## CASE STUDY

# Irrigation Innovation in Tajikistan



Tajikistan is changing the way it uses water to improve food security and increase farm production. *Tajikistan combined irrigation system repairs with agriculture policy reforms to increase food security and farm productivity.*

## Overview

Poor irrigation infrastructure has kept Tajikistan's farm productivity low, contributing to rural poverty in a country heavily dependent on agriculture. Agriculture employs 67% of Tajikistan's people and contributes 20% to gross domestic product.

Along with poor rural-urban connectivity and limited community resilience to climate-induced shocks, poor irrigation has also made the central Asian country vulnerable to food insecurity.

To improve agricultural productivity and food security, Tajikistan needed to put in place structural reforms to increase incentives for farmers and to invest in rural infrastructure that had been destroyed by years of neglect and the five-year civil war that ended in 1997.

## Project snapshot

### Dates

- **December 2004:** Approval
- **August 2011:** Closing

<b>Cost</b>	<ul style="list-style-type: none"> <li>• <b>US\$ 28.67 million:</b> Project Cost</li> <li>• <b>US\$ 23.24 million (SDR 15,146,000):</b> ADB Loan</li> </ul>
<b>Institutions and Stakeholders</b>	<p><b>Executing agency</b></p> <ul style="list-style-type: none"> <li>• Ministry of Water Resources and Land Reclamation, Tajikistan</li> </ul> <p><b>Financing</b></p> <ul style="list-style-type: none"> <li>• <u>Asian Development Bank</u></li> </ul>

## Challenges

Tajikistan's agricultural productivity declined significantly after the country attained its independence from the former Soviet Union in 1991. Throughout the 1990s, irrigated agriculture suffered from the combined effects of loss of traditional markets, deterioration in irrigation and drainage infrastructure, and the socioeconomic impact of the civil war.

Inadequate funding and poor maintenance of irrigation and drainage infrastructure caused rapid deterioration in the capacity of water pumping stations, increased water losses in main canals, low water-use efficiency in the fields, soil salinization, and declining crop yields.

As of 2005, an estimated 16% of formerly irrigated land had been out of production since 1991.

# Solutions



ADB changed the scope of two loans, including the Irrigation Rehabilitation Project, in response to devastating floods that struck the Khatlon Province in 2005. The additional funds were used to rehabilitate embankments along the Pyanj River. Video credit: ADB.

To improve Tajikistan's agricultural productivity, the government, with the help of the Asian Development Bank (ADB), rebuilt and developed irrigation systems in five districts across Tajikistan—Farkhor, Pyanj, Rushan, Asht, and Vahdat—and brought agricultural production back to the pre-1990 level. Civil works started in 2007 and were completed between 2008 and 2011.

The project also rehabilitated the Dehkanobod canal and bank protection structures along the Pyanj river in Hamadoni District following extreme flood damage in June 2005.

The project also built potable drinking-water supply systems in the selected project areas, provided pumps and generators, and financed the construction of wells, reservoirs, pumping stations, pipelines, and distribution networks.

Farmers in the project districts also received trainings on crop rotation, green fertilizer application, crop nutrition, water management, crop intensification, and pest management. Staff of the oversight bodies tasked to manage water use also received training in accounting and budget preparation, processing water and service fee payments, measurement of crop water requirements, and water distribution techniques.

The project also pushed for agricultural policy and market reforms. In 2006, the government agreed to implement pilot-based reforms in the project areas, including, among others, improving farm structures, operations, and management based on market principles; removing production quotas on cotton, a

major crop in Tajikistan; and removing restrictions on the sale of raw cotton between districts.



A man working at a water pump station in the Asht District in Tajikistan. Photo Credit: ADB.

## Numbers and facts

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55,368 Hectares of land improved through irrigation, drainage and/or flood management

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3,848 Households with new or improved water supply

## Results

The project generated unquantifiable benefits from the improved potable drinking water supply systems, including reduced incidence of waterborne diseases owing to improved water quality. In turn, school attendance and labor productivity among beneficiaries improved, while also reducing their health care costs. Women, who traditionally collected water for their households, had become more productive, as they were freed up from their task of collecting water from canals and streams.

Due to improved irrigation infrastructure, the project completion report surmised that the project likely succeeded in improving cropping intensity and household incomes.

## Lessons

**Partial rehabilitation of irrigation systems is less effective than complete rehabilitation**

Significant infrastructure constraints remained as irrigation systems were only partially rehabilitated, limiting the effectiveness and efficiency of the investment. In future, focus should be on full rather than partial rehabilitation of irrigation systems.

**Dispersed rehabilitation not effective**

Infrastructure rehabilitation projects dispersed over a broad geographic area are harder to implement and more costly than more regionally concentrated projects.

**Administration costs can add up**

There is a high project administration burden associated with a large number of civil works and equipment contracts. A centralized system to procure equipment such as pumps and motors and the use of district-wide civil works contracts can limit the number of small contracts needed.

**Improving on-farm agricultural productivity is important for project efficiency and**

## sustainability

Access to irrigation water is not the only constraint on improving crop yields. Higher farm incomes from yield improvements due to productivity gains make it easier to pay water- use fees and sustain the operation and maintenance of irrigation infrastructure.

## Interagency cooperation is needed

The executing agency may not always have the expertise to deliver certain project outputs. Another implementing agency may have more success in delivering certain outputs. Selection of an appropriate implementing agency is critical to the success of certain project outputs.

## Water use levies needed to ensure sustainability

Sufficient funds should be raised through water use tariffs or government contributions to ensure there is funding to finance the operation and management of the infrastructures going forward.



A view of a water pumping station in Tajikistan. Photo Credit: ADB.

## Resources

ADB. 2016. *Asian Development Bank and Tajikistan: Fact Sheet.* Manila.

ADB. 2012. *Project Completion Report: Tajikistan: Irrigation Rehabilitation Project.* Manila.

ADB. 2013. *Project Results/Case Study: Tajikistan Flooding and Disaster Preparedness.* 25 April.

ADB. *Tajikistan: Irrigation Rehabilitation Project.*

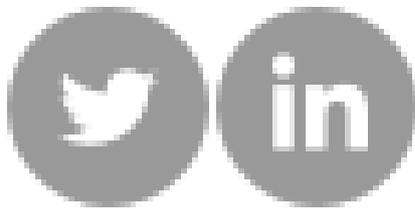
ADB. 2013. *Validation Report: Tajikistan: Irrigation Rehabilitation Project.* Manila.



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Prior to joining ADB in 1998, Akmal Siddiq worked for a United States Agency for International Development-funded project, International Maize and Wheat Improvement Center, and consulted for the World Bank. He is a natural resource economist with extensive experience in sustainable development. He received his master's and doctoral degrees from the University of Arizona and University of Illinois, Urbana-Champaign.



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