

FACT SHEET – TAJIKISTAN CASE STUDY

Socio-economic context



Agriculture

In the last two decades, agriculture accounted for a quarter of the country's GDP and employed half of its population. Tajikistan's scarce and low-productivity cultivable land is highly dependent on irrigation to offset the unfavorable and volatile weather conditions. {3.2}



Poverty

Among post-Soviet states, which are all low- and lower-middle-income countries, Tajikistan has the lowest GDP per capita and the highest poverty headcount ratio. Being the world's most remittance-dependent country, it is very susceptible to external economic shocks. {3.2}



Food insecurity

For many years, Tajikistan has struggled with severe food deficits and malnutrition among its citizens, in particular among children. Only 12% of its rural population are food secure, 54% are marginally food secure, 28% are moderately insecure, and 5% are severely food insecure {3.2}.

Climate change risks and impacts



Water resources

Tajikistan is known as the "water tower" of Central Asia. Its glaciers in the Pamir Mountains are vital for water availability, agricultural supply, and hydropower generation. From the mid-20th century until the beginning of the 21st century, the country lost 17% of the glacier-covered area and 30% of the glacial mass. {4.2}



Droughts

Tajikistan is expected to see a warming of up to 5.5°C by the end of the century, compared to the 1986–2005 baseline. Agriculture is highly affected, e.g. a severe drought in 2000 destroyed almost all the rainfed wheat crops and 30-50% of irrigated crops, making two-thirds of the population extremely food insecure. {4.2}



Floods

40% of the Tajik population is highly exposed to flood hazard. The economic impact of these hazards is substantial, amounting to an average annual GDP loss of \$100 million. {4.2}



Migration

In recent years, Tajikistan has become the most prominent hotspot for environmental emigration in Central Asia. Low disaster preparedness leads to unmitigated destruction of houses and infrastructure, causing mass displacement of people. {6.2}

Water and irrigation sector



Governance

Tajikistan enabled decentralized and participatory management of water by creating water user associations (WUAs) in local communities from 2011 until now. Members of WUAs receive training in water governance and agricultural extension services.

The establishment of WUAs improved the condition of irrigation infrastructure and incentivized the diversification of crops cultivated. In the first years since WUAs were established, the improved water use efficiency doubled farmers' incomes, benefitting over 200,000 people.

Still, WUAs lack efficiency in keeping users financially accountable and planning schedules and quantities of irrigation. Fees paid by water users are insufficient and poorly collected, which leads to debt accumulation and creates losses in agricultural productivity and inefficient use of water resources. {5.4}

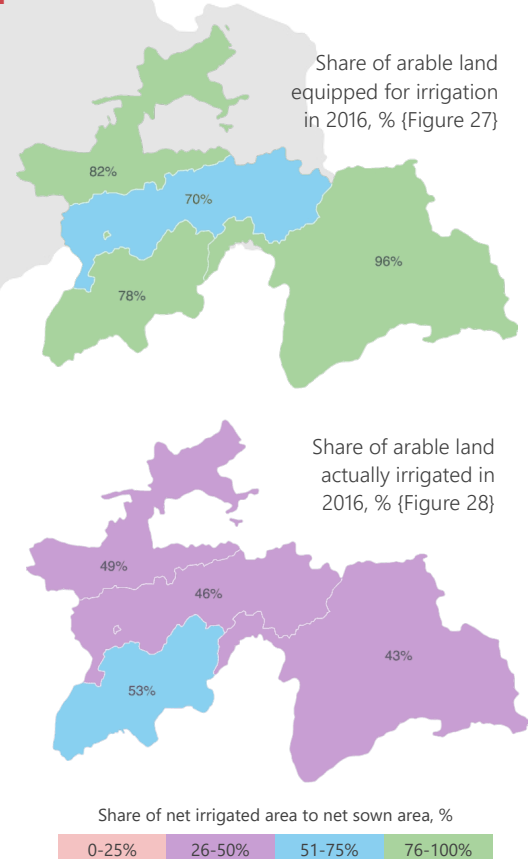


Present state of irrigation

The geographic and climate conditions of Tajikistan make irrigation a vital part of its agricultural productivity. Over 90% of its crop production comes from irrigated land, given that only about 70% of all its arable land is equipped for irrigation.

Water-use efficiency in Tajikistan remains at an extremely low level of 27–46%, due to the outdated monitoring systems and failures to match unstable supply with growing demand for water. There is high variability in the deployment of irrigation infrastructure, as many systems in place fall into disrepair due to poor maintenance or climate hazards. Other reasons are neglect of drainage infrastructure and the use of outdated pumping stations.

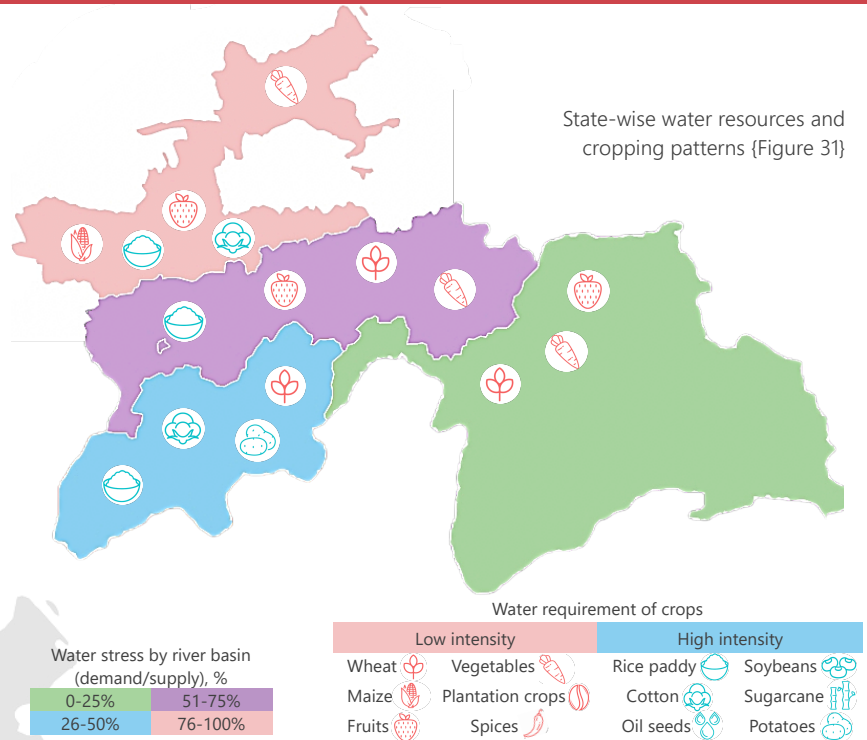
Tajikistan makes very slow progress in transitioning from traditional irrigation methods to modern water-saving technologies, e.g., only about 100 hectares are irrigated through drip irrigation. {5.5}



Irrigation and cropping patterns

Cropping patterns across regions are largely based on the types of terrain and temperature regimes, rather than water resources endowments. Highly water-intensive crops like cotton and rice are mostly grown in the northern province of Sughd, which has the country's highest water stress indicator. Demand for water there already exceeds supply by far, and climatic changes will likely exacerbate this process.

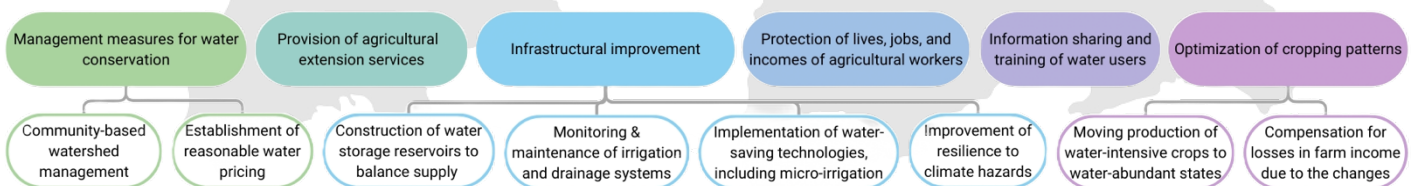
At the same time, Gorno-Badakhshan has the lowest water withdrawal-to-supply ratio and abundant water resources. Yet, the region only grows vegetables, fruits, and wheat, all of which have relatively low water requirements. The only region where cropping patterns are relatively well matched with water supply is the southern province of Khatlon. This region grows mostly water-intensive crops, yet its high water endowment allows it to maintain a moderately low level of water stress. {5.6}



Ways forward for irrigation management

Balancing water supply and demand

The main direction for sustainable irrigation management in Tajikistan is to reconcile water supply and demand across the country's regions. One of the ways is through consolidated efforts of all agencies concerned with water, land, and climate to encourage water conservation and effectively manage the financial performance of the sector. A financially sound and effectively managed irrigation sector can generate the funds required for infrastructural development and improvement of irrigation water delivery services, which is crucial for achieving a better cost-benefit ratio in the irrigation sector. Furthermore, it would allow for the creation of a financially sustainable framework where WUAs would be able to afford rehabilitation of the outdated irrigation and drainage infrastructure, as well as implementation of high-performing irrigation and water-saving technologies that are quite costly. These funds can also be employed for providing agricultural extension services, as well as setting up information sharing and training schemes for water users. {7.1}



Participatory irrigation management

The irrigation sector in Tajikistan would benefit from ensuring access to information on water availability and weather variability to all stakeholders, including local agricultural producers, WUAs, extension service providers, etc. Financial viability of WUAs could be improved through ensuring equity in water allocation and cost sharing among members, introducing penalties for free-riders, and improving the overall financial transparency of WUAs budgeting. Water users should receive extensive training on crop diversification, water and energy use efficiency, and potential risk-sharing strategies. ICT, including mobile platforms, can help create a demand-based model for water delivery, facilitate greater public-private sector collaboration and innovation. {7.2}

Improving disaster preparedness

Given the increasing frequency of extreme climatic events, there is an acute need for Tajikistan to develop early warning systems and improve coordination of disaster response efforts, making local communities active participants in emergency prevention and management processes. Another important pathway is to construct hydropower plants and water reservoirs, which would help the country and Central Asia as a whole to prevent disruptions in irrigation water supply and losses in agricultural productivity. The Interstate Commission for Water Coordination, which oversees transboundary water-related matters in Central Asia, could facilitate the joint financing of such infrastructural projects by Tajikistan and neighboring countries. {7.3}