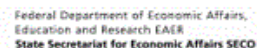
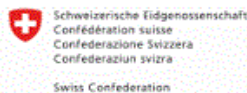


Central Asia:

Towards Water-Secure Sustainable Economies



Central Asia – a dynamic region with increasing water challenges

Central Asia is a dynamic and geographically diverse region achieving steady economic growth. Although increasingly globalized and more regionally integrated, national priorities (economic development; food and energy security; safe and reliable water services) still drive development decisions.

In the face of increased resource pressures and a changing climate, continued economic growth, human well-being and regional stability requires more sustainable management of the region's water resources.

This brochure outlines the major water security challenges of Central Asia, and presents an agenda for national and regional action.

The Central Asia Water and Energy Program, managed by the World Bank on behalf of donors, is supporting this agenda for action.

For more information visit www.worldbank.org/cawep



Towards water secure, sustainable economies in Central Asia

- Contrary to common perception, Central Asia is not water scarce. A large water endowment has enabled extensive irrigation and high levels of water use.
- Until recently, scant attention was paid to water use efficiency, and the economic productivity of water remains very low.
- Most people in Central Asia have access to at least basic drinking water and sanitation services. However, drinking water supplies are often not safely managed, especially in Tajikistan and rural Kyrgyzstan, and even in urban areas sewerage coverage is very incomplete. Service delivery is generally poor and infrastructure is old and poorly maintained.
- Population growth, urbanization and economic growth will continue, driving up food and energy demands, and increasing the pressure on the finite water resources.
- The climate in the region is changing rapidly. Warming is driving water demands higher, and the reliability of water supply is declining.
- With the right mix of policy and institutional reforms, and targeted investments, Central Asia can improve water security and continue strong economic growth.
- Key national-level actions include (i) investing in improved water and sanitation for social stability and human capital development, and (ii) overhauling water resources governance and irrigation management for increased economic productivity of water.
- Investing in climate change adaptation, nationally and regionally, can build economic and social resilience. This should include continued sustainable hydropower development together with intra- and inter-regional electricity trade.

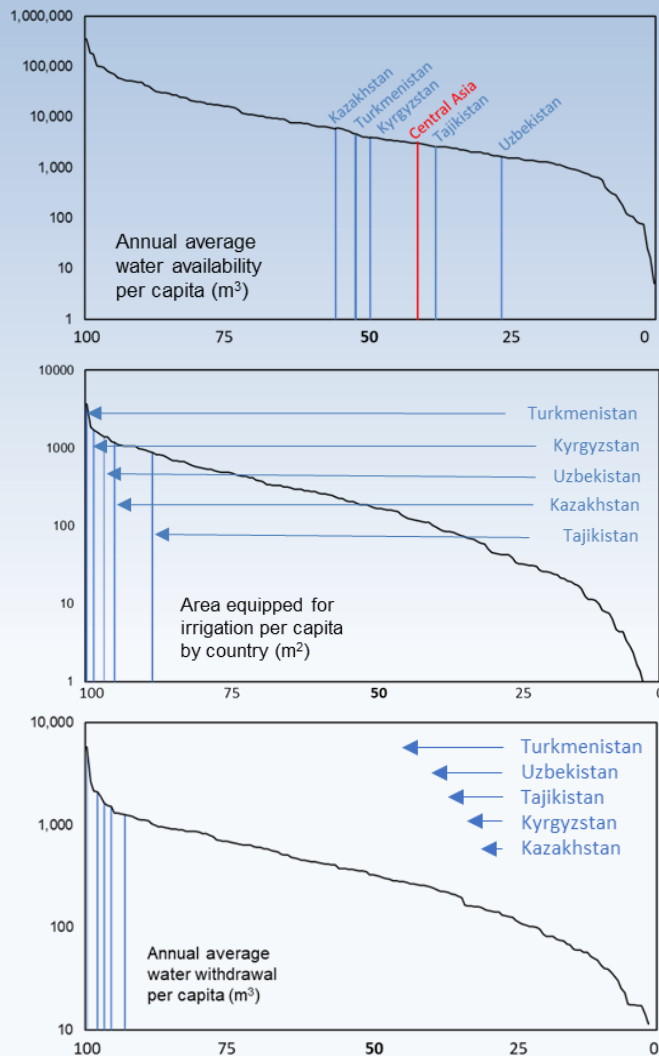


Central Asia is not a water-scarce region

More than half the mean annual runoff in the Aral Sea basin is generated in Tajikistan and almost one-quarter in Kyrgyzstan. Relative water availability, however, depends on resource sharing and population sizes. Kazakhstan, Kyrgyz Republic and Turkmenistan have more water per capita than half the countries in the world. Tajikistan and Uzbekistan have less water per capita but are far from water scarce.

The Central Asian water endowment has enabled extensive irrigation development across the region. Turkmenistan has the greatest area equipped for irrigation per capita in the world – ten times the global average. All Central Asian countries, except Tajikistan, are in the top decile of countries for irrigated area per capita.

As a result, all Central Asian countries are in the top decile for average annual water withdrawals per capita. Withdrawals across the region are around five times the global average.

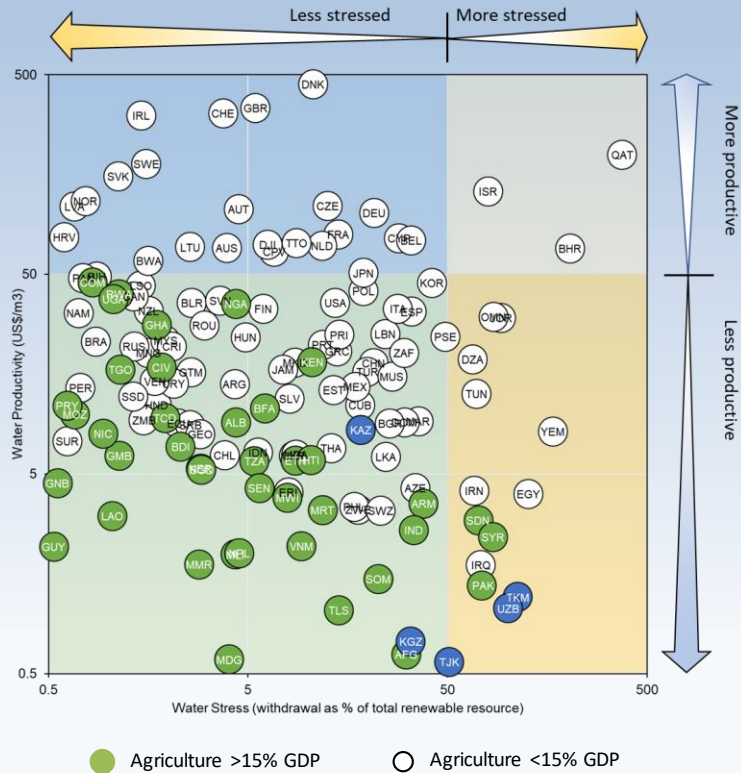


The economic performance of water in Central Asia is very low

In spite of extensive irrigation, the predominance of low-value, water-thirsty crops, and low water use efficiency, means the economic contribution from water is very low.

In Tajikistan and Uzbekistan, agriculture contributes more than 15 percent of GDP; in Kazakhstan, Kyrgyz Republic and Turkmenistan agriculture contributes less than 15 percent of GDP,

All Central Asian economies (blue) are performing far below their water potential and relative levels of water withdrawal – an indicator of system stress – are high, and in some cases unsustainably high.



Water supply and sanitation services in Central Asia are inadequate

Across Central Asian countries, 74–95 percent of people access at least basic drinking water services and over 95 percent access at least basic sanitation services. However, many lack access to safely managed drinking water, especially in Tajikistan and rural Kyrgyzstan. Sanitation in rural areas is predominantly simple latrines without septic systems, and even in urban areas sewerage is very incomplete. Service delivery is generally poor and most infrastructure is old and poorly maintained. The sector has struggled to keep pace with the growing population and is not financially sustainable.

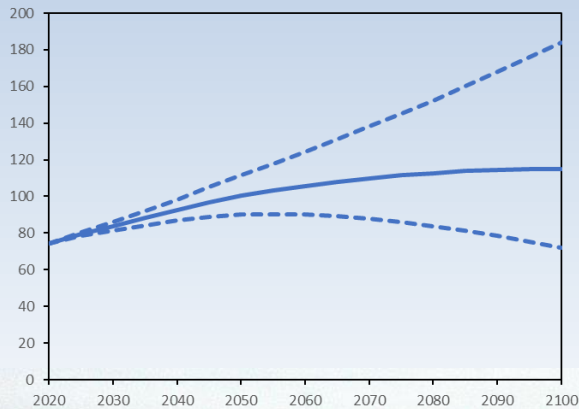
Improved water supply and sanitation services, especially in rural areas, are key to human capital development, as contaminated water and poor sanitation/hygiene in early childhood can cause cognitive and physical stunting. Poor water and sanitation services can undermine trust in government and increase social tension.



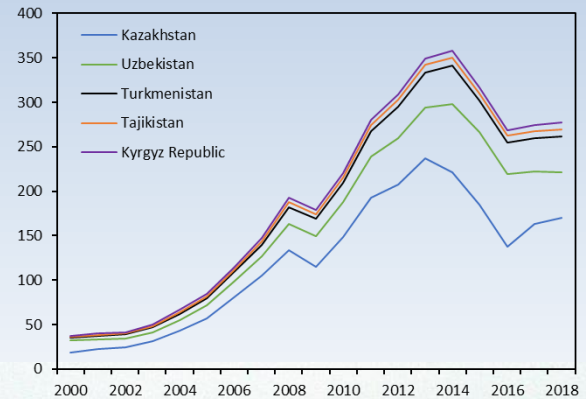
Continued rapid change is expected across Central Asia

Population growth, urbanization and economic growth are expected to continue, driving up food and energy demands, and increasing the pressure on the finite water resources.

Population projections (millions)



Cumulative GDP Growth US\$B

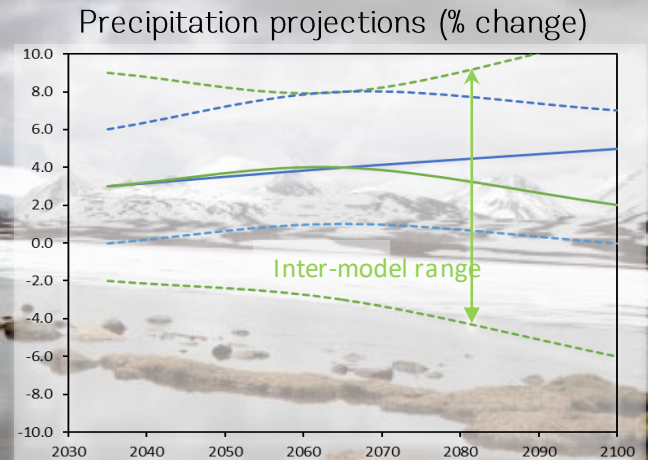
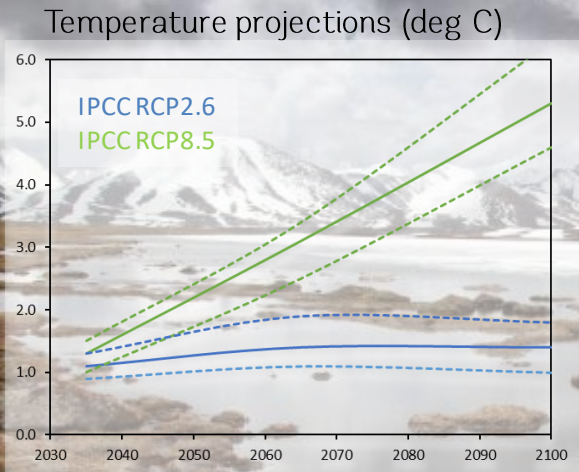


The regional population is expected to grow from the current 80 million to between 90 and 110 million by 2050. Longer-term projections are very uncertain, ranging from a doubling of the current population by 2100 to a small reduction.

Economies in the region have grown rapidly since 2000, especially in Kazakhstan and Uzbekistan. Both, however, have had exhibited recent downturns. Average annual growth since 2000 range from around 4 percent in Kyrgyz Republic to over 8 percent in Turkmenistan.

Climate change will have profound consequences

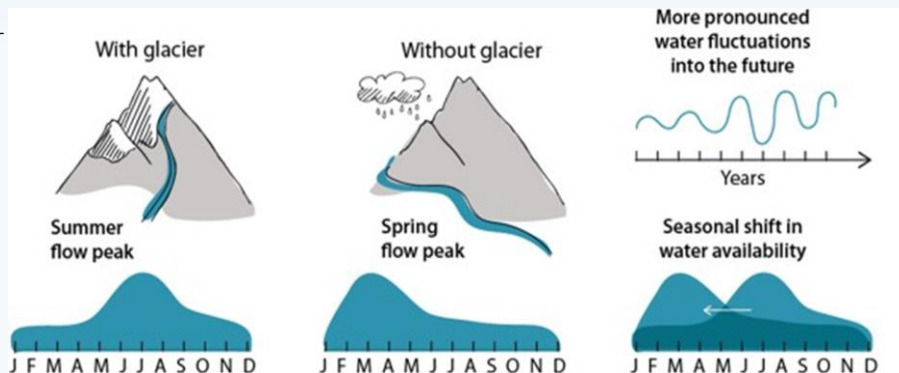
Without proactive action, climate change will have major economic consequences. Strengthening of water governance and improved infrastructure are required to build resilience of irrigation systems, water supply services and agricultural communities.



Warming will exceed global averages. Average annual temperatures could rise by 5–6 °C by 2100.

Future precipitation is very uncertain: it may be higher or lower than in the past.

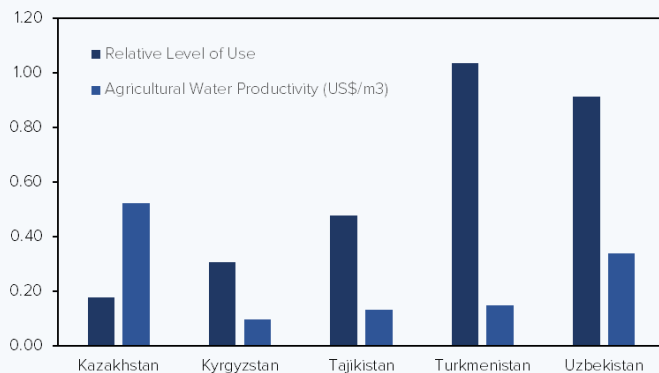
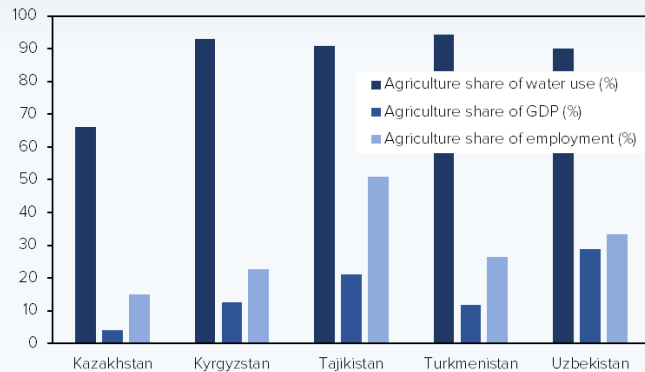
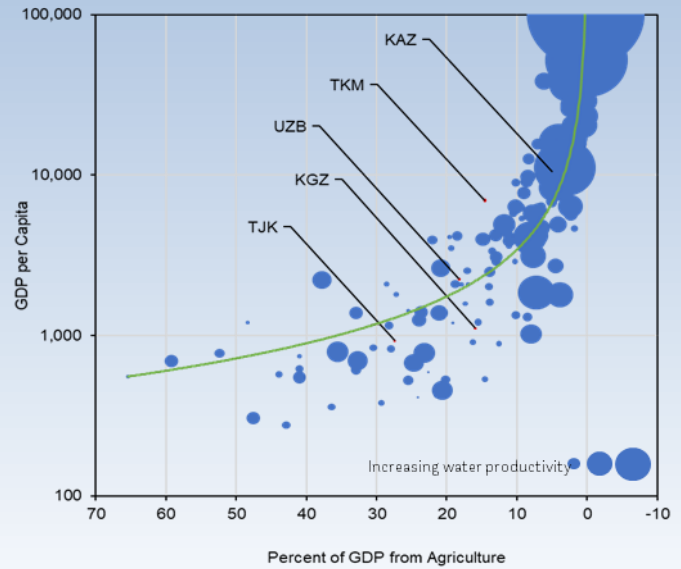
With warming, snow and glacier melt will commence earlier, and seasonal flow peaks will shift from summer to spring. Longer-term changes in flow volumes and timing are uncertain because of uncertain precipitation projections.



Strong economic growth requires structural change and water reallocation

Strong economic growth will require structural transformation of economies, supported by reallocation of some irrigation water to industry and service sectors.

Structural transformation that reduces the relative share in agriculture typically raises overall water productivity (bubble size).



Agriculture will continue to dominate overall water use, and agriculture will remain an important employment sector especially in rural Tajikistan, where over half the workforce is in agriculture.

But excessive water withdrawals in some countries, and very low water productivity, mean that improving the economic performance of irrigation is crucial.

Future directions – business-as-usual or reform and better management

Business-as-usual

Population growth is driving increased demands for food, water and energy. Increasing temperatures are also driving up water demands and bringing multiple other stresses.

With business-as-usual, low water productivity will undermine food security and economic growth. Poor water service delivery will be an increasing drag on human capital development and may undermine social stability. Transboundary tensions will grow as the regional climate changes, and environmental quality will continue to decline.



Future directions – business-as-usual or reform and better management

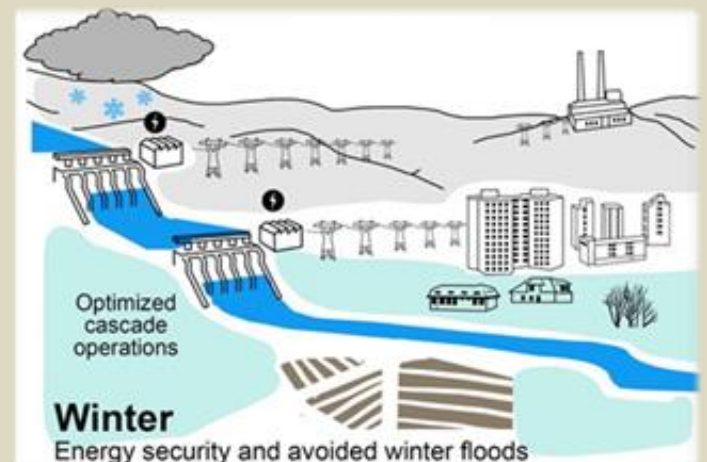
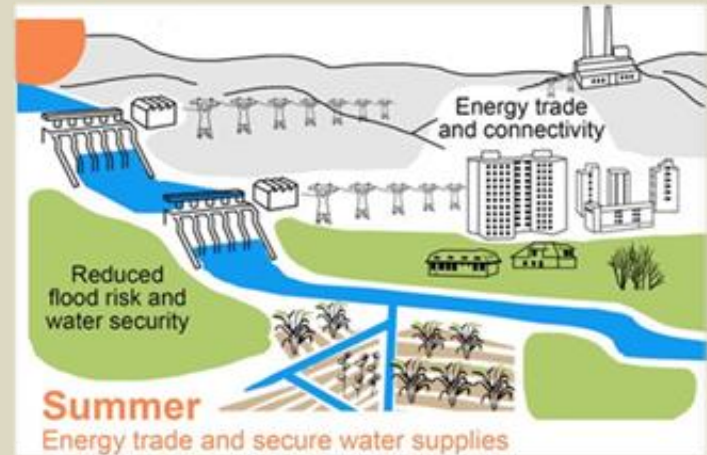
Sector reforms, investment and improved management

With the right mix of national policies (including changes in water allocation and risk sharing), institutional reform, and infrastructure investment (especially irrigation modernization), Central Asian countries can improve water security and achieve continued strong economic growth in the face of climate change.

Reforms are required in both water supply & sanitation and irrigation. Strengthening of the legislative frameworks and institutions for water resource governance should underpin these reforms.

Targeted investments in water infrastructure can support improved and financially sustainable service delivery and increase the efficiency of water use.

Attention to environmental aspects of water management – quality and quantity – are required to ensure the resilience of the resource base in the face of climate change.



Agenda for national and regional actions

National action areas

Action area 1: Invest in water supply and sanitation for social stability and human capital development.



Action area 2: Reform water resources governance and irrigation management for increased water productivity.



National and regional action areas

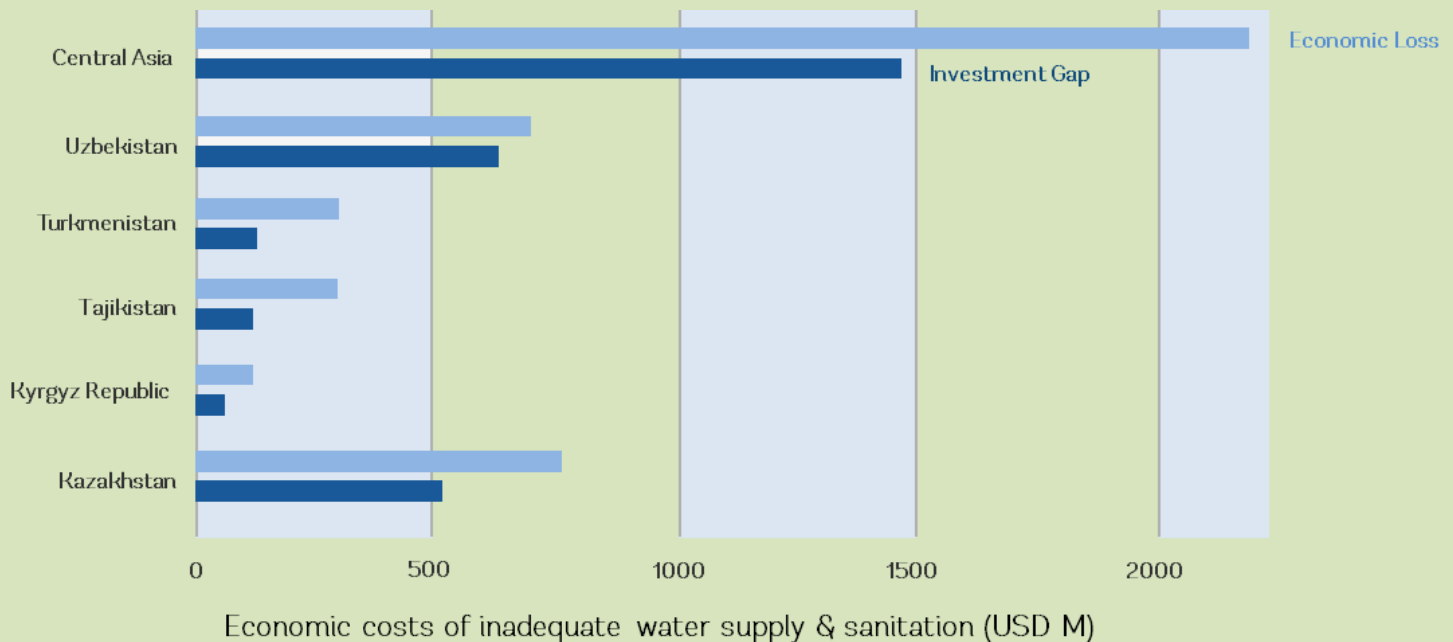
Action areas 3: Invest in adaptation measures to build economic and social resilience to climate change.



Action area 1: Invest in water supply & sanitation for social stability and human capital development

The investment required for universal water supply and sanitation is less than the current economic costs of inadequate water supply and sanitation, for every country in the region. Economic losses stem from health care costs, productivity losses, and premature death.

Improved water and sanitation services build human capital by reducing stunting in children and improving education outcomes. In time, this delivers a stronger and more skilled labor force, including better water professionals.

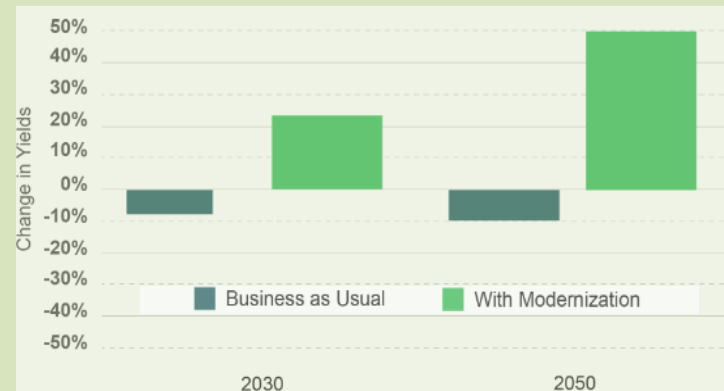


Action area 2: Reform water resources governance and irrigation management for increased water productivity

Changes to water allocation priorities, guided by participatory river basin planning and supported by consistent national policy and water accounting, can improve water security in all sectors. This will help drive growth in the industry and service sectors.

Modernization of irrigation infrastructure and management will improve water use efficiency and productivity. This requires supporting governance reforms at irrigation scheme, river basin and national levels.

Private sector engagement in irrigation can bring innovation and increased productivity.

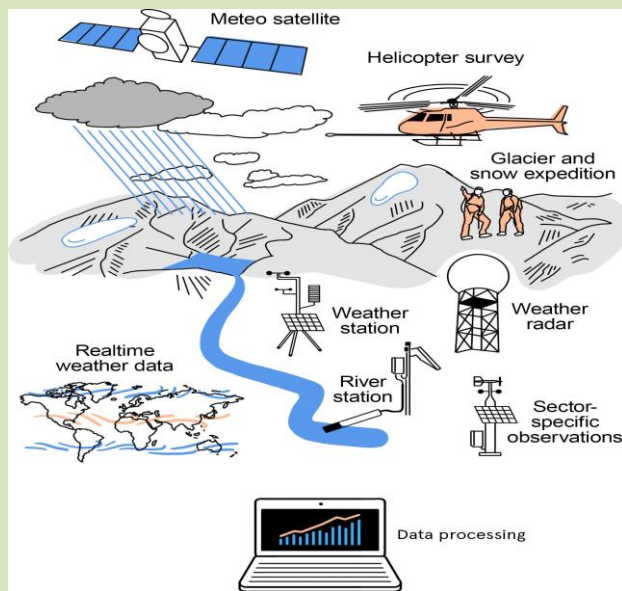


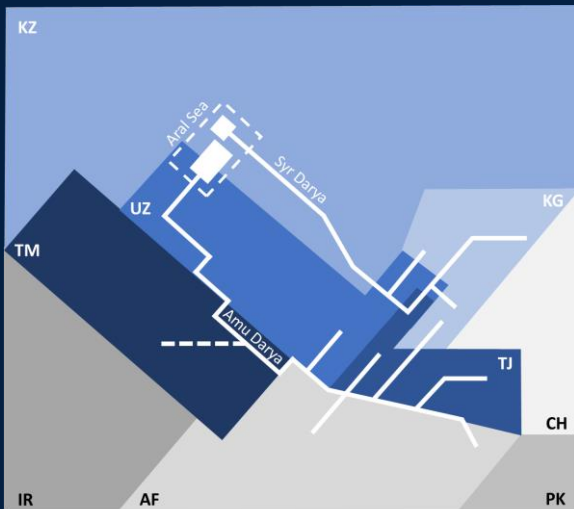
Action area 3: Invest in adaptation measures to build economic and social resilience to climate change

Climate change will have profound consequences for the region. National and regional action is needed to prepare for more variable hydrology (especially more severe droughts), changes in seasonal flow patterns, and temperature-driven water demand increases. This agenda should extend beyond Central Asia into Afghanistan – an important riparian country of the Amu Darya River.

Weather and water information services including short-term and seasonal forecasting should be improved. Initial estimates indicate a return on investment for these improvements of 200–400 percent over seven years.

Reservoir operations should be reviewed to better balance energy security, water supply and flood mitigation. Continued investment in sustainable hydropower (including small scale hydropower), together with increased electricity trade within and beyond the region, will build broader economic resilience to climate change.





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