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## **Policy Brief: Improving sustainable development in the Syr Darya River Basin through a transboundary nexus approach**



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Physical resources of the Syr Darya River Basin play a key role in the economic and social development of each of the basin's riparian countries.

Extending over an area of 410,000 km<sup>2</sup> in the heart of Central Asia, the basin provides fertile agricultural land and water resources in a largely semi-arid region. These resources support activities that are crucial for local economies, such as hydropower generation and irrigated agriculture. Strategically located, the basin also hosts transport routes for oil, coal and natural gas reserves — some of the world's largest — originating from the Caspian Sea.

Achieving sustainable development in the basin will require effective coordination in strategic decision-making and planned use of resources.

Such an approach reflects a global situation in which sectors are becoming more and more interdependent. Indeed, the many Sustainable Development Goals put forward in the 2030 Agenda for Sustainable Development, adopted by the United Nations Member States, touch upon different sectors (e.g. water and sanitation, sustainable energy and food production, ecosystem conservation): but they are also interlinked. Understanding these links can lead to synergetic actions that can expand benefits or, at the very least, help in reducing negative impacts.

While there are various types of linkages between countries and sectors in the basin, most of them relate to water.

The Syr Darya River Basin's water resources are vital for hydropower generation in upstream countries, and also for agricultural production in upstream and downstream countries. There is, however, a clear trade-off: demand for energy in upstream countries peaks during winter, while irrigated agriculture requires greater volumes of water in summer. Water-quality issues, driven by

untreated wastewater discharges and unsustainable agricultural practices, are also relevant in terms of their impacts on human health and the environment.

The negative impacts of these demands and dependencies could be reduced.

Not only through improved efficiency of resource use, but also through better planning on the supply side — particularly in the energy and agriculture sectors. For the energy sector, this

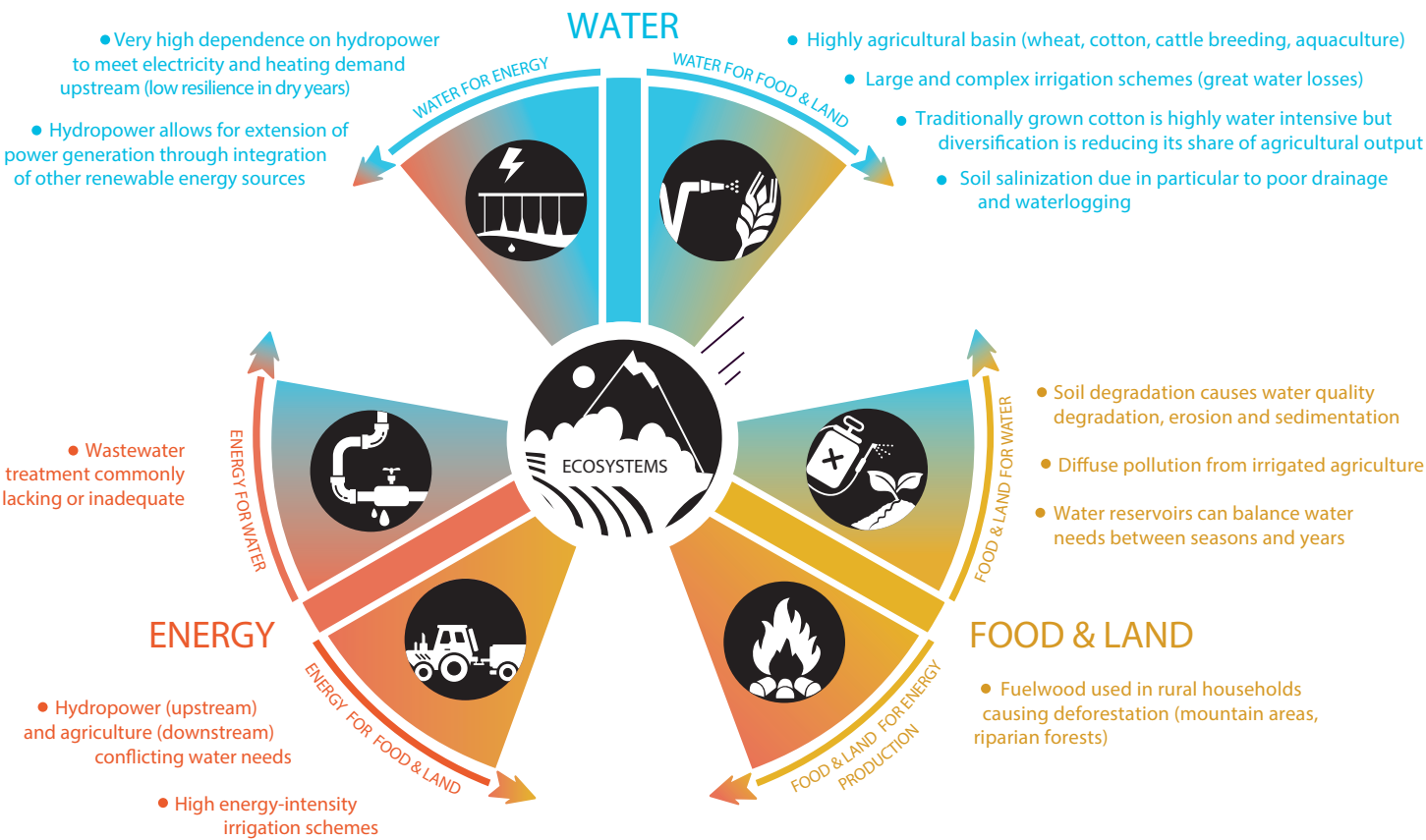
means diversifying the mix of energy sources, as well as restoring the functioning of the regional power system and revitalizing the power trading in the region. The water sector, meanwhile, needs to further the ongoing transformation of agriculture through improved water-use efficiency, crop switching, land reform and other practices. These actions can help to relieve hydropower use and development pressures throughout the basin, while at the same time encouraging rational water use, thereby allowing the progressive restoration of vital ecosystems.

At present, the basin's resources are under large and mounting pressures.

The drying up of the Aral Sea and related environmental degradation graphically exposes the dramatic extent of some of those pressures. In addition to water use for irrigation, the basin also experiences pressures from energy development, industrial development, household

consumption and climate change. For those who live in the basin, these pressures are affecting socioeconomic development, energy and food security, and the sustainability and resilience of economic activities, including agriculture. Environmental and social challenges will become increasingly urgent in the future as resource demands will increase in stride with higher living standards.

SYR DARYA BASIN



NEXUS CURRENT STATUS

BASIN TRENDS

|                             |    |
|-----------------------------|----|
| TEMPERATURE                 | ↗↗ |
| PRECIPITATION               | ↗↘ |
| ECOSYSTEM SERVICES          | →  |
| WATER RESOURCE AVAILABILITY | ↘  |
| POPULATION                  | ↗  |
| ECONOMY (medium term)       | ↗  |

NEXUS FUTURE IN THE SYR DARYA BASIN



NATIONAL TRENDS

|   | Kyrgyzstan | Tajikistan | Uzbekistan | Kazakhstan |
|---|------------|------------|------------|------------|
| WATER FOR FOOD & LAND<br>Irrigation needs                                       | ↗          | ↗          | ↘          | ↘          |
| WATER FOR ENERGY<br>Electricity generation needs, cooling                       | ↗↗         | ↗          | →          | ↘          |
| ENERGY FOR WATER<br>Treat, move and store water                                 | ↗          | ↗↗         | ↗↗         | ↗          |
| ENERGY FOR FOOD & LAND<br>Grow, store, process and move food                    | ↗↗         | ↗↗         | ↗          | ↗          |
| FOOD & LAND FOR ENERGY<br>Food-energy competition for water, biofuel production | ↗          | ↘          | →          | →          |
| IMPACT OF FOOD & LAND<br>ON WATER RESOURCE<br>Water pollution, agricultural use | ↗          | ↗          | ↗          | ↗          |



A transboundary nexus approach to assist in enabling cross-sectoral and cross-country interventions is needed to address current challenges in the Syr Darya River Basin.

In the Soviet era, basin resources were, to a significant extent, managed in an integrated way to address both development and production priorities, and which included a compensation mechanism to facilitate the acceptance of centralized planning decisions. Cooperation between countries in the basin has weakened since 1991, however, despite the establishment of agreements and a number of basin governance institutions at the Aral Sea level. Opportunities to achieve cooperative solutions (particularly regarding energy exchanges and water discharges) have been missed, leading the riparians to act independently and without coordination to ensure economic growth and resource security. This has caused transboundary tension and increased the exposure of each country to external shocks.

Nonetheless, transboundary cooperation in the management of basin resources has the potential to generate large economic benefits for countries in the Syr Darya River Basin.

Such benefits might be achieved by: reducing input costs; increasing the value of agricultural production; promoting exports of energy carriers; enhancing the sustainability of economic

The Syr Darya nexus assessment has identified a menu of solutions to address specific inter-sectoral challenges in the basin and to help realise potential benefits.

Such a programme would encompass: (i) energy diversification in upstream countries (including local use development of non-hydro renewable energy sources and some fossil fuel-based generation capacities) to improve energy security, reduce dependency of hydropower in winter, and facilitate crop diversification; (ii) modernisation of energy and water infrastructure to minimise system losses; (iii) introduction of policy packages to increase energy and water efficiency (including pricing reforms, public-awareness campaigns, and the development and coordinated implementation of energy-efficiency policies and standards); (iv) operation of agricultural extension programmes to support crop-shifting and the adoption of sustainable resource management policies; and (v) development of regional markets for energy and agricultural products, while at the same time lowering barriers to trade. The implementation of such measures would also require institutional reforms and capacity development to facilitate basin-wide integrated resources planning at both the national level and the basin level.

The riparian countries are already taking various initiatives that are in line with identified technical and policy-related solutions.

In order to develop coordination necessary for effective and concerted actions, trust needs to be built progressively and high-level political backing needs to be obtained.

It is important to note that currently the countries find themselves in a vicious cycle in which solutions based on self-sufficiency lead to diminished levels of trust and fewer opportunities to advance cooperation. This being the case,

transboundary relations and efforts to instil confidence in cooperation should be — and can be — developed step by step. In order to address the broad range of nexus issues identified, various sectoral and cross-sectoral efforts, as well as harmonization and better overall coordination, are needed. Greater involvement from the energy sector within the basin-wide frameworks of institutional cooperation would improve such opportunities.



The assessment of the Syr Darya River Basin is part of a series of intersectoral (nexus) assessments in transboundary basins using

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