

# How water resources management can support climate-resilient development in Kazakhstan



## ABOUT THIS BRIEF

Water is a ‘climate connector’ – impacts of climate change on water will flow through all sectors of the economy and across national borders. This brief explains why integrated approaches to water management are essential for climate-resilient development, how Kazakhstan has laid a solid foundation in that sense, and what needs to change if Kazakhstan is to meet its commitments under the Paris Agreement and achieve the Sustainable Development Goals (SDGs).

SDG target 6.5, on integrated water resources management (IWRM), can make that climate connection. This brief looks at all four dimensions of IWRM, namely the enabling environment, institutions, management instruments, and financing.

## RECOMMENDATIONS

### Key stakeholder(s)

Department of Climate Policy and Green Technology (Ministry of Ecology, Geology, and Natural Resources (MEGNR))

+

Other key ministries and agencies, including the Ministry of Agriculture, and the subnational governments of eight river basins

### Recommendation

Although climate change and water resources management are regularly referred to in key government documents, links are rarely drawn between them. Climate change is still identified mainly as an energy and emissions issue, and there remains a disconnect between the technocratic approach to water resources management and opportunities to build climate resilience.

- 1 Government bodies working on climate change, agriculture, energy, and other climate-relevant sectors need to coordinate to ensure policy coherence around water resources management and climate resilience. The current process to develop a National Adaptation Plan (NAP) is an ideal opportunity to formally articulate the links between water and climate change.

Efforts to drive institutional alignment between environmental, agricultural, and water resources ministries in order to better manage the impacts of climate change are constrained by a lack of financial resources.

- 2 Tap into ample existing opportunities for Kazakhstan to expand the water-related scope of its applications to climate funders (including the Green Climate Fund, The Adaptation Fund, and the Global Environmental Facility).

## RECOMMENDATIONS CONTINUED...

Key stakeholder(s)	Recommendation
	<p>It is unclear how climate information developed by the public sector and civil society is used to inform water-related policy development and implementation.</p> <p><b>3</b> Clarify how climate information developed by the various public sector and NGO bodies is used to inform water-related policy development and implementation.</p>
<p>As above + River basin management authorities + Neighbouring states + Transboundary commissions and agencies</p>	<p>Kazakhstan is dependent on upstream countries for almost 50% of its water. There is a high potential for water-related conflict between countries in Central Asia in the future unless efforts to ensure effective and equitable transboundary water resources management are maintained and further built upon. Other countries in Central Asia may feel the impacts of climate change more, and be less able to deal with them, than Kazakhstan.</p> <p><b>4</b> Formalise transboundary arrangements with neighbouring countries. These arrangements should include dispute and conflict mediation processes for working through disagreements.</p> <p><b>5</b> Climate information and associated analysis should be incorporated into protocols for adaptive management, where water allocations between countries are dynamically adjusted according to the changing climate.</p>
<p>Committee of Statistics (Ministry of National Economy)</p>	<p>A set of inter-agency working groups have been established under the Committee of Statistics to coordinate data collection and progress monitoring around the implementation of the SDGs, however their outputs are not publicly available.</p> <p><b>6</b> Increase the transparency of these working groups so that the extent of water-related impacts of climate change can be more broadly understood.</p>

## THE CHALLENGE

Kazakhstan is already starting to see the water-related effects of climate change and will see more of these effects in the coming decades.



Climate projections suggest the Central Asian region will face future temperature increases of 2–4°C by 2050 (higher than the global average).

While the total water resources in Kazakhstan may be large, water availability across geographies and economic sectors is likely to become more variable and unpredictable under conditions of climate change.



With more than 90% of the total water supply in Central Asia used for irrigation, the most obvious potential climate impacts relate to agriculture, with implications for food security and economic development.

Projected increases in evapotranspiration will negatively impact agricultural yields for various crops, particularly wheat, and contribute to ongoing soil degradation.



Major flood events will also increase in both frequency and magnitude, primarily as a result of glacier melt leading to increased streamflow. Flooding drives soil erosion and impacts infrastructure, including disrupting energy provision, with impacts for economic development.

Glacial loss will also reduce the flow of mountain rivers by the 2050s, affecting water availability for irrigation (particularly in the summer months).



Kazakhstan's geography means that it is part of a number of major transboundary river basins (the Aral-Syrdarya, Balkash-Alakol, Irtysh and Ural-Caspian), increasing the political complexity of, and requirement for, effective water resources management.



Thirteen percent of the population lives under drought hazard, with severe water shortages occurring in 2012 and 2014. Population growth is projected to lead to higher demand for both water and food crops.



Decreasing streamflow reduces the country's hydropower potential, which could result in further dependency on fossil fuels (as of 2017, hydropower accounts for around 13% of Kazakhstan's electricity production).

Higher temperatures with increased evaporation will lead to reduced reservoir capacity, further reducing the hydropower potential.



## The interconnected nature of these challenges

As with the water–energy–food nexus, climate resilience and sustainable development are interconnected. The diagram maps the relationships between some of the key climate challenges facing Kazakhstan, showing why coordinated, integrated, and cross-sectoral responses are required to adapt to the impacts of climate change.

At the centre of the diagram is water resource availability/predictability, which is impacted by climate change (as shown by the words written on the arrows between the variables). The complex relationship between climate change and water availability/predictability is not shown here for reasons of space. The word ‘alters’ is used to describe the fact that climate change can affect water resources via multiple vectors, including via changes in temperature and precipitation, and impact on availability in multiple ways, including via seasonality, changing frequency and intensity of rainfall events, and fluctuating water quality.

In order to facilitate the accurate reading of this diagram, the following description will describe two causal chains. The relationship between water resource availability/predictability and agricultural water deficit is inverse: an increase in water availability/predictability will generally reduce the agricultural water deficit (defined as the gap between the demand for agricultural water, expressed in the diagram as agricultural water requirements, and the water available for agriculture). The impacts of climate change in Kazakhstan are expected to mostly alter water resource availability/predictability in negative ways, which will then increase the agricultural water deficit. An increasing deficit will reduce the total agricultural output, with associated decrease in both food security and economic development.

Climate change is also driving glacial melt, via an increase in average temperatures. This increased glacial melt is increasing flooding, which is reducing the state of build infrastructure and therefore impacting on economic development. Flooding also increases the quantity of soil erosion in the country, which further reduces the total agricultural output. The remainder of the diagram can be read in the same way.

## ENABLING ENVIRONMENT

### What do key policy statements say about integration of water, climate, and other Sustainable Development Goal agendas?

#### THE NEED FOR COORDINATION

Kazakhstan’s policy statements recognise integrated water resources management principles and climate change in diverse ways. While many recognise one or the other, few explicitly refer to the relationship between climate change, water resources, and key Sustainable Development Goal (SDG) sectors, such as agriculture. This is exemplified by Kazakhstan’s Nationally Determined Contribution (NDC) not referring once to water, and the absence of a National Adaptation Plan (NAP). This suggests a need for better coordination between climate and water-related actors in the development of these documents and policies.

Water features prominently in the domestic political discourse and in key development plans in Kazakhstan. Beyond outlining the importance of water for agriculture, however, few statements recognise the link between water resources and the current and projected impacts of climate change or identify key actions that should be taken at the basin or transboundary level to mitigate climate variability.

Kazakhstan’s key development plans include the Strategy for Development of the Republic of Kazakhstan (2030) and the Kazakhstan Strategy (2050). Neither strategy explicitly mentions climate change and its implications (see **Recommendation 1**). The 2050 Strategy views water resources from the economic development perspective, with the emphasis on maximising water extraction. A single reference is made to Kazakhstan’s transboundary river basins and to ‘serious issues’ in the use of these

transboundary water resources. Regional and international cooperation in transboundary water management was also recognised within Kazakhstan’s Voluntary Review of SDG progress.

Within the climate domain, Kazakhstan’s NDC includes no reference to water. The lack of reference suggests that, despite being central to Kazakhstan’s economic and agricultural development plans, the relationship between water resources management and climate change is either not well enough understood or is not seen as a priority with regards to Kazakhstan’s commitments and requirements under the Paris Agreement. The country has committed to increase the share of non-fossil fuel in the primary energy mix, however much of this is likely to be new nuclear and solar energy, with plans around expansion of hydroelectricity currently unclear. As of late 2020, no NAP exists for Kazakhstan. The initial steps towards developing a NAP are underway and should encourage links between water and climate change to be considered and formally articulated in policy documents. A key set of policy documents which go into detail on both water-related climate impacts and IWRM principles are the country’s National Communications to the United Nations Framework Convention on Climate Change (UNFCCC). Water resources management is identified as a key strategic challenge for the country in the third to the sixth National Communications. The lack of coordination between water-related line ministries and departments has been recognised in these earlier National Communications (see **Recommendation 1**). The seventh National Communication notes the key role of IWRM to climate change adaptation. One noteworthy reference to water in the seventh National Communication relates to the potential need to access water from river systems outside Kazakhstan’s borders by the middle of the century if climate and water usage forecasts are accurate (see **Recommendations 4 and 5**).

References to climate change are scarce in the institutional domain for water. Kazakhstan’s Water Code (adopted in 1993, updated in 2003 and 2013) is the only legal framework explicitly focused on water resources management and it contains no references to climate change. The Environmental Code of the Republic of Kazakhstan (2007) contains extensive references to water resources, including recognising the importance of basin-level water resources management and also various references to climate change. These are separate, however, and with no links drawn between climate variability and water resources management Kazakhstan’s recently approved IWRM Action Plan will service as the basis for the development of a new state water management programme until 2030. The implementation of this plan provides more of an enabling environment for water-related climate adaptation measures (see **Recommendation 1**).

## POLICY STATEMENTS

SECTOR	KEY POLICY STATEMENTS (INCLUDING LAWS, STRATEGIES, AND PLANS)
<b>Cross-sectoral</b>	<ul style="list-style-type: none"> <li>Strategy for the Development of the Republic of Kazakhstan (2030)</li> <li>Kazakhstan Strategy (2050)</li> </ul>
<b>Climate change</b>	<ul style="list-style-type: none"> <li>Nationally Determined Contribution</li> <li>Third to sixth National Communications (2013)</li> <li>Seventh National Communication (2017)</li> <li>Concept for Kazakhstan’s Transition to Green Economy (2013)</li> </ul>
<b>Water</b>	<ul style="list-style-type: none"> <li>Water Code (1993, updated in 2003 and 2013)</li> <li>Environmental Code of the Republic of Kazakhstan (2007)</li> </ul>
<b>Transboundary</b>	<ul style="list-style-type: none"> <li>Intergovernmental agreement on the Chu and Talas Rivers (2002)</li> </ul>
<b>Disaster risk management</b>	<ul style="list-style-type: none"> <li>Plan for preparation of the Republic of Kazakhstan to natural emergency situations (in preparation)</li> <li>National Situation Analysis of security from natural and human induced disasters (in preparation)</li> </ul>

Various transboundary legal frameworks exist to ensure the equitable distribution of water between Kazakhstan and its neighbours. Key frameworks include the Intergovernmental Agreement on the Chu and Talas Rivers (2002) – which sets offtake limits for Kyrgyzstan and Kazakhstan in these basins – and the draft Strategic Action Plan (SAP) for these basins, which should improve basin-level coordination and the integration of climate change adaptation into infrastructure policy and planning (see **Recommendations 4 and 5**). The SAP oversees the Chu-Talas Rivers Commission, a joint body set up in 2006 with support from the UN Economic Commission for Europe (UNECE). The lack of reference to climate change in key water policy documents, and vice versa, suggests an ongoing lack of integration, which prevents holistic management of the impacts of climate change on water-related sectors such as agriculture.

# INSTITUTIONS

Are Kazakhstan's institutions ready to manage the impacts of climate change on water resources and on other water-related sectors in an integrated way?

## KAZAKHSTAN'S INSTITUTIONAL ARCHITECTURE

Given the prominence of water in Kazakh politics and society, Kazakhstan has a strong track record of recognising the need for basin-level and transboundary water resources management, however, there remain gaps between the bodies considering the water-related climate impacts, those coordinating agricultural development, and those managing water resources. Capacity and political challenges remain in aligning these bodies. It is unclear to what extent the new Ministry of Ecology, Geology and Natural Resources (which will now be responsible for climate change-related activities) will be mandated or able to do this, and whether soft political power will remain with Ministry of Agriculture and Ministry of Energy.

### The challenges of integrating climate change into planning and implementation of policy in agriculture and other key sectors

Firstly, legacy issues related to the centralised water resources management structures of the Soviet Union have left the country with challenges around both ageing and inefficient water infrastructure and a lack of institutional capacity to effectively manage water resources. Although overall responsibility for water governance sits centrally, implementation of the Water Code has been devolved to subnational governments of the eight river basins (including the four major transboundary basins). These bodies are responsible for water allocation, permissions, infrastructural development and permitting.

Secondly, there remains a lack of mainstreaming of climate change considerations into key public institutions. Traditionally, barriers to integrated thinking on water and climate have been driven by political short-termism, long-term development plans focusing primarily on maximising water extraction rather than integrated management, and a lack of capacity within government to align ministerial objectives around water. A longstanding disconnect between the institutions managing water resources and those working on climate change and environmental issues, and other relevant ministries such as energy, will potentially be resolved through the recent creation and ongoing capacitation of a new environmental ministry, the Ministry of Ecology, Geology and Natural Resources (MEGNR) (see institutional diagram). Although MEGNR has a clearer remit for integrating water and climate issues, it remains unclear as to whether it will be as influential as the existing Ministry of Agriculture.

Kazakhstan has previously had a State Programme/Committee on Water Resources, which included some elements of IWRM. This was abolished in 2014, with priorities integrated into the national agrarian programme, overseen by the Ministry of Agriculture, under the Committee on Water Resources, which holds responsibility for adaptation of water resources and hydrotechnical infrastructure to climate change within the agriculture sector. This is the exception, as most public institutions in related sectors do not have specific departments dedicated to climate change, which is generally perceived as beyond their remit.

In terms of disaster risk reduction (DRR), a joint project between the Government of Kazakhstan and United Nations Development Programme (UNDP) is developing a 'Plan for preparation of the Republic of Kazakhstan to natural emergency situations' and a 'National Situation Analysis of security from natural and human induced disasters', which factor in climate change-induced natural disasters. The Ministry for Emergency Situations is working with the Central Asia Centre for Emergency Situations and Disaster Risk Reduction to implement the principles of the Sendai Framework for DRR (which includes a focus on climate change preparedness around water-related impacts). This centre was officially inaugurated in Kazakhstan in 2016 with the objective of improving regional cooperation in the DRR domain (see **Recommendation 4**).

Kazakhstan's downstream position results in its heavy reliance on water resources originating in neighbouring upstream countries. This reality underpins Kazakhstan's regional leadership role in transboundary river basin management. As a consequence of geography and history, Kazakhstan continues to share common governance structures with other former Soviet states (specifically Russia, Kyrgyzstan and Uzbekistan). Several transboundary

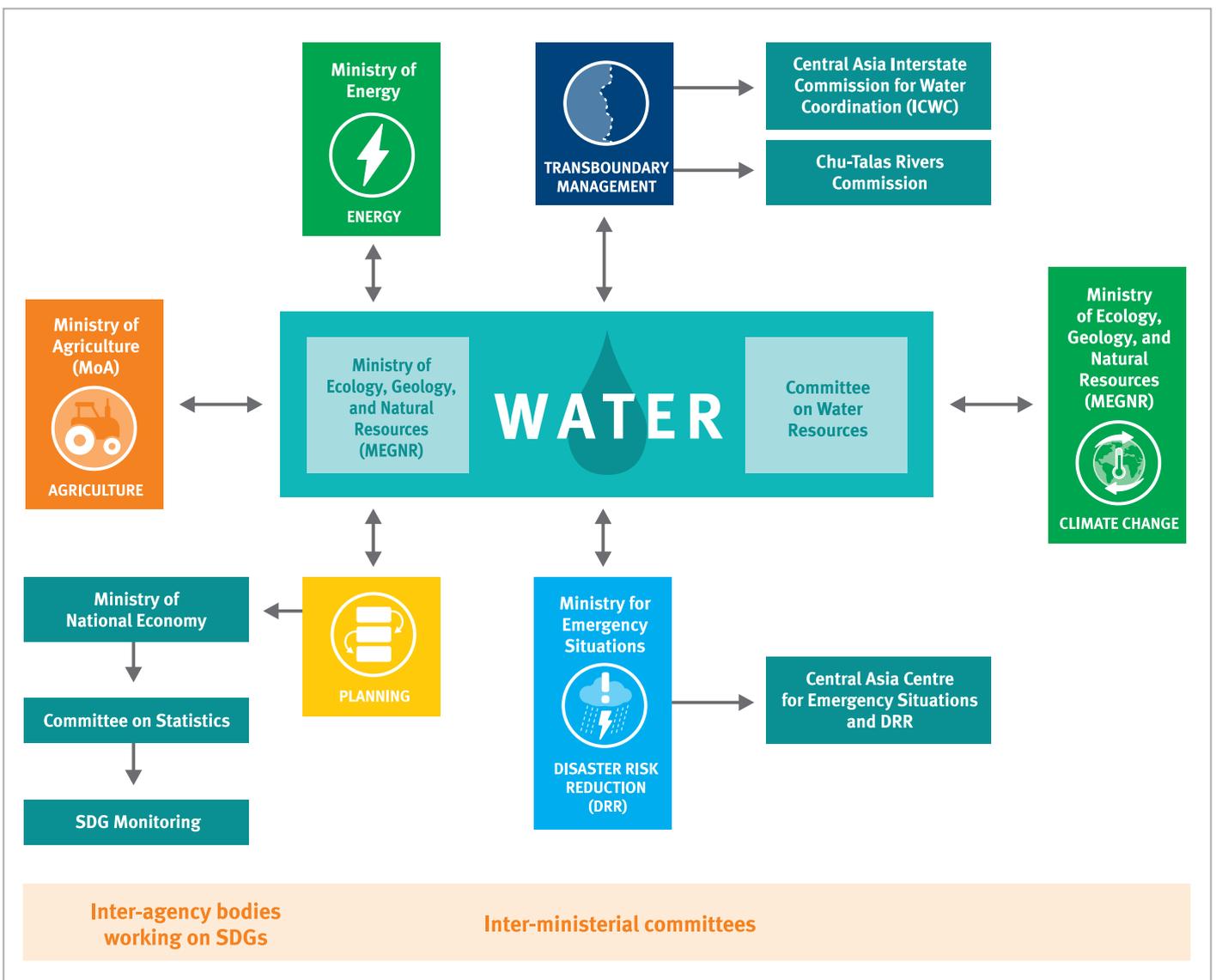
commissions have been formalised, including the Central Asia Interstate Commission for Water Coordination (ICWC), established in 1992, and the Chu-Talas Rivers Commission (established in 2006 with the support of UNECE). The combination of in-common governance structures, formally constituted commissions, informal dialogues, and multiple ongoing collaborative projects has provided the basis for transboundary water-focused meetings like the one co-hosted in July 2018 by the Ministry of Agriculture and the International Water Assessment Centre (IWAC) (see below).

The implementation of the SDGs is monitored via a number of inter-agency bodies under the Committee on Statistics within the Ministry of National Economy. The Committee on Statistics acts as the main government body responsible for collecting, processing, and disseminating data on the SDGs (see **Recommendation 1 and 6**).

**COUNTRIES INVOLVED IN THE 2018 TRANSBOUNDARY WATER MEETING, CO-HOSTED BY MOA AND IWAC:**

Afghanistan	Mongolia
China	Russia
Iran	Tajikistan
Kazakhstan	Turkmenistan
Kyrgyzstan	Uzbekistan

**KAZAKHSTAN'S INSTITUTIONS**



# MANAGEMENT INSTRUMENTS

Are management decisions in water and other Sustainable Development Goals being guided by evidence on climate change?

## INFORMATION MANAGEMENT

A number of public sector bodies exist in Kazakhstan for modelling water resources and climate change, however, it is unclear to what extent the climate information they produce is used in day-to-day planning and management in agriculture and other key water-related sectors. There also remains a lack of clarity on the degree of coordination between internationally facing bodies (such as those assessing progress towards SDG implementation) and climate science and water management bodies (such as Kazhydromet). Improved coordination between these bodies could lead to better understanding and use of climate information and facilitate easier reporting on SDG progress.

Kazhydromet, a service of the MEGNR, is the official government service for gathering and sharing hydrology, climate, and ecology information. It is unclear to what extent climate change information produced by Kazhydromet is accessed and used by decision-makers. Kazakhstan also has a State Fund for Environmental Information, which publishes the latest global climate science online, which is referenced in the Environmental Code (2007) as the *de facto* data and information service on the environmental impacts of development and vice versa. The service is, however, primarily concerned with pollution, greenhouse gas emissions, waste, and other natural resource reserves, rather than water in the context of climate change.

As described earlier, the Committee on Statistics, under the Ministry of National Economy, is the main government body responsible for collecting, processing, and disseminating data on the SDGs. It is, however, unclear how these bodies engage with the NDC process, which is managed by the Ministry of Energy and supported by UNDP with Global Environment Facility (GEF) funding (see **Recommendation 6**).

# FINANCES

How ready is Kazakhstan to finance water-related climate action?

Existing funding for water-related projects in Kazakhstan is complex to disentangle. There is little data on domestic public and private finance, with most recorded finance appearing to be for hard infrastructure without climate change considerations being taken into account. With regards to climate-related external development finance provided in the form of bilateral and multilateral official development assistance, of the total US\$35 million provided to Kazakhstan over the period 2012–2017, 99% of finance in water-related sectors was for water supply

and large-scale sanitation systems. While these projects included climate components, these were not a central element. The remaining 1% of funding did include a single US\$40,000 project focused on transboundary IWRM in the Ural basin.

With regards to policy-oriented (rather than hard infrastructure) projects, those that have been or are in the process of being funded are focused primarily on transboundary management in the Central Asian

## CLIMATE FUNDING

The majority of financial support for projects focused on improving water resources management and governance capacity (rather than those for hard infrastructure) has been provided internationally through bilateral or multilateral development aid, suggesting that a history of bilateral and multilateral finance hasn't necessarily led to mainstreaming in national budgets for integrated water resources management and transboundary water projects, either as a result of donor dependence or lack of national ownership of internationally financed projects. There remains a need to catalogue such projects and evaluate their impact. The Ministry of Energy has historically been the focal point for various international climate funds (including the Adaptation Fund), which may be the reason for a lack of water-related funding being applied for or financed to date, given that the Ministry of Energy's remit does not overlap neatly with key climate-impacted sectors such as agriculture, nor with entities overseeing water resources.

region (see table below and **Recommendation 4**). These projects include climate actions and could be used as springboards for further transboundary negotiations. There remains a need for an up-to-date national catalogue/database of the various transboundary and IWRM-related projects underway, and evaluations of the projects' impacts and effects are needed in order to guide future policy and interventions pertaining to water-related climate actions, both within Kazakhstan and on a transboundary basis.

## SELECT TRANSBOUNDARY PROJECTS

Project	Funder	Value	Details
Transboundary water resources management in the Irtysh River Basin	French Fund for Global Development	US\$1.15 million	Project ran between 2000 and 2004
Enabling transboundary cooperation and integrated water resources management in the Chu and Talas River Basins	Multiple	± US\$4.75 million	GEF: US\$1 million (with co-funding from government and others)  Began in 2015
Reducing vulnerabilities of populations from glacial lake outburst floods in a changing climate	Adaptation Fund	US\$6.5 million	Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan (UNESCO-managed) Approved in late 2020

## REFERENCES

- Abdullaev, I. and Rakhmatullaev, S. (2015) Transformation of water management in Central Asia: from state-centric, hydraulic mission to socio-political control. *Environmental Earth Sciences*, **73**: 849–861. doi: 10.1007/s12665-013-2879-9
- Abuduwaii, J., Issanova, G., and Saparov, G. (2019) Water Resources in Kazakhstan. *Hydrology and Limnology of Central Asia*. Water Resources Development and Management. Springer, Singapore. [https://doi.org/10.1007/978-981-13-0929-8\\_2](https://doi.org/10.1007/978-981-13-0929-8_2)
- Arnell, N.W., Lowe, J.A., Challinor A.J., and Osborn, T.J. (2019) Global and regional impacts of climate change at different levels of global temperature increase. *Climatic Change*. doi: 10.1007/10584-019-02464-z
- Bekturganov, Z. et al. (2016) Water related health problems in central Asia: A review. *Water*, **8**(6): 1–13. doi: 10.3390/w8060219
- CAWaterInfo. Available at: [http://www.cawater-info.net/water\\_world/kazakhstan\\_e.htm](http://www.cawater-info.net/water_world/kazakhstan_e.htm). Accessed 14 October 2019.
- Climate funds update, updated February 2019. [www.climatefundsupdate.org](http://www.climatefundsupdate.org)
- Global Facility for Disaster Risk Reduction (2019) *Kazakhstan Country Profile*. Accessed 13 November 2019. Retrieved from: <https://www.gfdr.org/en/kazakhstan>
- Global Water Partnership (GWP) (2009) *Water management, water security and climate change adaptation: early impacts and essential responses*. Global Water Partnership TEC Background Paper No. 14. Available at: <https://www.gwp.org/globalassets/global/toolbox/publications/background-papers/14-water-management-water-security-and-climate-change-adaptation.-early-impacts-and-essential-responses-2009-english.pdf>
- Global Water Partnership (GWP) (2016) *Republic of Kazakhstan – Country Report* [online], Report on the regional water partnership. Available at: [http://www.gwp.org/Global/GWP-CACENA\\_Files/en/pdf/kazakhstan.pdf](http://www.gwp.org/Global/GWP-CACENA_Files/en/pdf/kazakhstan.pdf)
- Government of Kazakhstan (2019) *Kazakhstan Strategy 2050*. Available at: <http://kazakhstan2050.com/>
- Hu, Y., Han, Y., and Zhang, Y. (2020) Land desertification and its influencing factors in Kazakhstan. *Journal of Arid Environments*, **180** (April). <https://doi.org/10.1016/j.jaridenv.2020.104203>
- Ministry of Energy of Kazakhstan, UNDP, GEF. (n.d.) *Extreme weather events of Kazakhstan in the context of global climate change*. Available at: [https://new.kazhydromet.kz/upload/pagefiles/nits/%D0%A3%D0%9A%D0%98%D0%9D%D0%98%D0%A6/eng/Climate%20Change\\_09-2017\\_ENG\\_Light.pdf](https://new.kazhydromet.kz/upload/pagefiles/nits/%D0%A3%D0%9A%D0%98%D0%9D%D0%98%D0%A6/eng/Climate%20Change_09-2017_ENG_Light.pdf)
- Ministry of Justice of the Republic of Kazakhstan (n.d.) *Environmental Code of the Republic of Kazakhstan*. Available at: <http://adilet.zan.kz/eng/docs/K070000212>
- Ministry of Justice of the Republic of Kazakhstan (n.d.) *The Water Code of the Republic of Kazakhstan*. Available at: <http://adilet.zan.kz/eng/docs/K030000481>
- Ministry of the National Economy of the Republic of Kazakhstan (Kazhydromet) (2016) Annual digest of monitoring change and climate in Kazakhstan: 2015. *Astana*, 55 pp. (in Russian).
- Myagkov, S. (2006) Climate change impact on the river runoff in Central Asia: risks of water management. In: *Asia Capacity Building Workshop “Earth observation in the service of water management”*, 26–28 September 2006, Bangkok, Thailand.
- OECD DAC External development finance statistics. Accessed 14 October 2019. Available at: <http://www.oecd.org/dac/financing-sustainable-development/development-finance-topics/climate-change.htm>
- Office of the President of the Republic of Kazakhstan (1997) *The strategy for development of the Republic of Kazakhstan*. Available at: [https://www.akorda.kz/en/official\\_documents/strategies\\_and\\_programs](https://www.akorda.kz/en/official_documents/strategies_and_programs)
- Plekhanov, P.A. (2017) Natural hydrological risks and their prevention in Kazakhstan. *Central Asian Journal of Water Research*, **3**(1): 17–23.
- United Nations Development Programme (UNDP) (2014) *Enabling transboundary cooperation and integrated water resources management in the Chu and Talas River Basins*. Project Document. Retrieved from: [https://www.unece.org/fileadmin/DAM/env/water/meetings/Water\\_Convention/2016/PMU/PIMS\\_5167\\_ChuTalas\\_prodoc\\_ENG\\_final\\_25March15.pdf](https://www.unece.org/fileadmin/DAM/env/water/meetings/Water_Convention/2016/PMU/PIMS_5167_ChuTalas_prodoc_ENG_final_25March15.pdf)
- United Nations Development Programme (UNDP) (2018) *National Adaptation Plans in focus: lessons from the Republic of Kazakhstan*. Retrieved from: [https://www.adaptation-undp.org/sites/default/files/resources/kazakhstan\\_nap\\_in\\_focus\\_final\\_online.pdf](https://www.adaptation-undp.org/sites/default/files/resources/kazakhstan_nap_in_focus_final_online.pdf)

United Nations Economic Commission for Europe (UNECE) (2014) *Approval of project to develop transboundary water cooperation between Kazakhstan and Kyrgyzstan*. Retrieved from: <https://www.unece.org/info/media/news/environment/2014/approval-of-project-to-develop-transboundary-water-cooperation-between-kazakhstan-and-kyrgyzstan/approval-of-project-to-develop-transboundary-water-cooperation-between-kazakhstan-and-kyrgyzstan.html>

United Nations Economic Commission for Europe (UNECE) (2014) *Strengthening cooperation in Adaptation to climate change in transboundary basins of the Chu and Talas rivers*. Brochure, Kazakhstan and Kyrgyzstan. Available at: <https://www.unece.org/environmental-policy/conventions/water/envwaterpublicationspub/brochures-about-the-water-convention/2014/brochure-strengthening-cooperation-in-adaptation-to-climate-change-in-transboundary-basins-of-the-chu-and-talas-rivers-kazakhstan-and-kyrgyzstan/doc.html>

United Nations Economic Commission for Europe (UNECE) (2019) *Transboundary cooperation in Chu and Talas river basin*. Available at: <https://www.unece.org/env/water/centralasia/chutalas.html#c65768>

United Nations Economic Commission for Europe (UNECE) (2019) *Third Environmental Performance Review: Kazakhstan*. Available at: [https://www.unece.org/fileadmin/DAM/env/epr/epr\\_studies/ECE\\_CEP\\_185\\_Eng.pdf](https://www.unece.org/fileadmin/DAM/env/epr/epr_studies/ECE_CEP_185_Eng.pdf)

United Nations Framework Convention on Climate Change.

USAID (2018) *Climate risk profile: Kazakhstan*.

Water security in Central Asia: troubled future or pragmatic partnership? In: *Paper 11, International Conference “The Last Drop?” Water, Security and Sustainable Development in Central Eurasia*, 1–2 December 2006. Institute of Social Studies (ISS), The Hague.

World Bank Open Data (2014) Renewable internal freshwater resources per capita (cubic meters). Available at: [https://data.worldbank.org/indicator/er.h2o.intr.pc?most\\_recent\\_value\\_desc=false](https://data.worldbank.org/indicator/er.h2o.intr.pc?most_recent_value_desc=false). Accessed 27 September 2019.

Zhupankhan, A., Tussupova, K., and Berndtsson, R. (2018) Water in Kazakhstan, a key in Central Asian water management, *Hydrological Sciences Journal*, **63** (5): 752–762. doi: 10.1080/02626667.2018.1447111

## ABOUT THIS PUBLICATION

This Country Brief is one of a series of 15 publications that explores how integrated water resources management at a country level contributes to climate resilience and sustainable development, as well as meeting the commitments under the Paris Agreement and achieving the Sustainable Development Goals (SDGs).

The full synthesis report, *The Untold Story of Water in Climate Adaptation. Part II. 15 Countries Speak*, of the work undertaken in all 15 countries is available at [www.gwp.org](http://www.gwp.org).

- |   |            |    |                   |
|---|------------|----|-------------------|
| 1 | Bangladesh | 9  | Jordan            |
| 2 | Cameroon   | 10 | <b>Kazakhstan</b> |
| 3 | Chile      | 11 | Kenya             |
| 4 | China      | 12 | Mauritania        |
| 5 | Ghana      | 13 | North Macedonia   |
| 6 | Grenada    | 14 | Tunisia           |
| 7 | Guatemala  | 15 | Ukraine           |
| 8 | Indonesia  |    |                   |