



Toward Climate Resilient Economic Development in Kazakhstan



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List of Abbreviations

ERI	Economic Research Institute
GDP	Gross domestic product
GHG	Greenhouse gas
GIZ	Deutsche Gesellschaft für internationale Zusammenarbeit GmbH
JSC	Joint-Stock Company
LEDS	Low-Emission Development Strategy
MEGNR	Ministry of Ecology, Geology and Natural Resources
MIID	Ministry of Industry and Infrastructural Development
MNE	Ministry of National Economy
MoA	Ministry of Agriculture
MoF	Ministry of Finance
PO	President’s Office
UNFCCC	United Nations Framework Convention on Climate Change



Executive Summary

Kazakhstan has made efforts to enhance national policies and plans for climate change mitigation; however, measures for adaptation have not yet been emphasized in policy and legislation, with gaps existing in adaptive capacity and the lack of an enabling environment to develop appropriate adaptation measures. To meet the challenges arising from climate change impacts on Kazakhstan's economy, a process for adaptation to climate change needs to be formalized and institutionalized. It must clearly outline how decisions are made and provide direction on roles and responsibilities for relevant actors and line ministries to create an enabling environment to mainstream adaptation into all sectors.

This country brief aims to underscore the importance of economic considerations in building the case for climate adaptation and assessing the most suitable set of adaptation options to support climate-resilient economic development. To realize this potential, the brief identifies five strategic entry points for consideration to initiate the integration of climate adaptation to enable climate-resilient economic development.

- › **Establish a high-level political mandate from Kazakhstan's government:** A clear mandate and vision for a national adaptation process, including expectations and outputs, will help to direct the mainstreaming agenda, foster leadership, and ensure stakeholder participation.
 - › **Operationalize adaptation mainstreaming into sectoral development planning in Kazakhstan:** A strategy is needed that elaborates on specific goals and objectives and defines a road map for sectoral adaptation integration to be followed by line ministries, including a set of specific, sequential steps and activities and respective responsibilities.
 - › **Initiate strategic engagement with the Ministry of National Economy on climate change:** Establish a dedicated committee or working group to share and update information on the economic consequences of climate change, including the risks posed by its mounting impacts on the economy (through macroeconomic modelling), as well as, increasingly, the opportunities offered by climate action.
 - › **Analyze, assess, and develop adaptation options at Kazakhstan's sectoral level:** Conduct sectoral climate risk analyses, as well as vulnerability and risk assessments, to provide the evidence and knowledge decision-makers need to trigger policy responses and drive the integration of adaptation.
 - › **Integrate adaptation into Kazakhstan's budgeting process:** Dedicate financing from the central budget for ministries to pay for operating costs, training, and assessments and to implement adaptation measures.
- All five entry points inform and mutually support each other but are also dependent on the conditions within which the entry points operate. To drive adaptation planning within the Government of Kazakhstan, the identified entry points need to be supported by enabling factors:
- › **Awareness and motivation:** All key actors and stakeholders within the Government of Kazakhstan must be made aware of the need to adapt and be



adequately incentivized to integrate climate adaptation into development-planning processes with their ministries.

- › **Information sharing and communication:** Kazakhstan's adaptation planning and macroeconomic modelling efforts need to be grounded in the best available information about current and projected climate risks.

- › **Capacity Development:** Ongoing capacity development in defining climate adaptation and understanding its link with economic development is essential for all key actors to enable their meaningful engagement with and commitment to adaptation planning.

1. INTRODUCTION

Kazakhstan has positioned itself as a regional leader in terms of implementing climate change mitigation measures while also being the second-largest recipient of climate-related development finance in Central Asia (Atteridge et al., 2022). The country set ambitious goals to transform into a green economy by 2050, and to help meet these targets, Kazakhstan adopted national energy-efficiency requirements in 2012 and launched a greenhouse gas (GHG) emissions trading system in 2013. In 2016, Kazakhstan ratified the Paris Agreement and pledged to reduce GHG emissions by 15%–25% by 2030 compared to 1990 levels (United Nations Framework Committee on Climate Change, 2016).

Consistent efforts have been made to enhance national policies and plans for climate change mitigation; however, measures for adaptation have not yet been emphasized in policy and legislation, with gaps existing in adaptive capacity and the lack of an enabling environment to develop appropriate adaptation measures (Deng & Chen, 2017; Fay et al., 2010). This includes limited climate change awareness and knowledge, continuous institutional changes,

and shifting responsibilities, as well as a paucity of available resources for economic development (World Bank Group, 2015). Additionally, the country's struggles in setting out a strategic direction for climate change adaptation can also be explained by their consistent prioritization of issues that they deem more pressing (e.g., economic and political stability) (Poberezhskaya & Bychkova, 2021).

Strategy Kazakhstan 2050 embraces sustainable development and aims to advance the green economy discourse, pointing to investment opportunities and technological advancement ([Government of Kazakhstan, 2014](#)). The same logic must be applied to climate change adaptation actions. Economic development and climate adaptation can mutually reinforce each other. With a strategic approach that mainstreams adaptation considerations into economic development, economic losses can be avoided and new economic opportunities and benefits realized. For example, positive impacts on the economy may include the development and commercialization of new goods and services (e.g., drip irrigation, drought-resistant crop varieties, climate



information) that minimize the negative effects of climate change. Adaptation measures can help to save lives, avoid or minimize asset losses and the costs of reconstruction, reduce climate risks, increase productivity, and generate new jobs and wealth (Dekens & Hammill, 2021).

But such positive co-benefits do not happen automatically. To ensure that economic development and climate adaptation efforts are mutually reinforcing, it is necessary to identify adaptation measures that are effective and have positive impacts on economic development or make potential trade-offs more manageable and predictable to enable decision-makers to adopt win-win options.

This country brief aims to underscore the importance of economic considerations in building the case for climate adaptation and assessing the most suitable set of adaptation options to support climate-resilient economic development. It further seeks to identify and describe strategic entry points for the integration of adaptation into Kazakhstan's current institutional arrangement and national planning processes. The last section describes important enablers (i.e., the conditions within which the entry points operate) to effectively support climate-resilient development. The country brief targets national policy-makers involved in national adaptation and economic development-planning processes.

2. KAZAKHSTAN'S CLIMATE POLICY ENVIRONMENT

In 2019, the Government of Kazakhstan established the Ministry of Ecology, Geology and Natural Resources (MEGNR), which consolidated state functions related to environmental protection, waste management, natural resources management, geological exploration, and mineral resources replacement (Republic of Kazakhstan, 2019). Within the MEGNR, the Department of Climate Policy and Green Technologies oversees the implementation of the United Nations Framework Convention on Climate Change (UNFCCC) and coordinates the development and implementation of national climate change policies, including work related to adaptation.

A subordinate institution of the MEGNR, JSC Zhasyl Damu, is the operator of the national Emission Trading System. Zhasyl Damu is also responsible for supporting national

policy processes for climate action and provides policy advice and expert services, such as economic and sectoral modelling for mitigation and adaptation planning to stakeholders at national and international levels. The main source of climate data is Kazhydromet, the hydrometeorological service of Kazakhstan. Kazhydromet develops long-term climate projections based on data from global climate models. These data are used for reporting to the UNFCCC. However, it is still unclear which Kazakh institution is responsible for systematically assessing climate risks and vulnerabilities (Bierkandt et al., 2019).

The overall long-term development planning is led by the Ministry of National Economy (MNE), which is also responsible for coordinating the implementation of Sustainable Development Goals. The MNE



has a subordinate institution, the JSC Economic Research Institute (ERI), a think tank for economic modelling and advice. The ERI has the knowledge and capacity for the macroeconomic modelling of climate change impacts and adaptation measures.

The Government of Kazakhstan has developed several long-term strategies governing its environmental protection efforts and future sustainable development plans. These include the Strategy Kazakhstan 2050, the Concept for the Transition to a Green Economy, the Low-Emission Development Strategy (LEDS) of Kazakhstan, and the reformed Kazakhstan Environmental Code. While the Concept for the Transition to

a Green Economy and Kazakhstan’s LEDS mention climate change as a potential risk, the Environmental Code and updated LEDS are the only high-level national policies that also point to actions to reduce climate risks. Recently, the Government of Kazakhstan initiated the process to develop an Adaptation Roadmap as part of their updated nationally determined contribution that seeks to provide sector-specific guidance and actions for the greater integration of climate change adaptation (United Nations Development Programme, not published). Table 1 provides an overview of the integration of climate change adaptation into national strategies, policies, and plans in Kazakhstan.

Table 1. Overview of climate change adaptation integration into national strategies and plans

Policies	Absent	Climate change mentioned as potential risk	Possible actions for reducing risk identified	Targets identified for specific adaptation measures	Funding allocated to support implementation
Strategy Kazakhstan 2050 ¹	✓				
Concept for the Transition of the Republic of Kazakhstan to a “Green Economy” ²		✓			
Kazakhstan Environmental Code ³		✓	✓		
Intended Nationally Determined Contribution ⁴	✓				
Low-emission development strategy (LEDS) of Kazakhstan (under elaboration in 2022)		✓	✓		

There are multiple challenges facing Kazakhstan in terms of achieving a holistic adaptation planning process in its effort to move toward climate-resilient development:

- › The current institutional structure does not support holistic programmatic and strategic planning that considers climate risks and vulnerabilities. The MEGNR

¹ <https://kazakhstan2050.com/2050-address>

² https://greenkaz.org/images/for_news/pdf/npa/koncepciya-po-perehodu.pdf

³ https://wecoop.eu/wp-content/uploads/2021/04/2021-KZ-ENV-Code_full-text_en.pdf

⁴ https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Kazakhstan%20First/INDC%20Kz_eng.pdf



and its predecessors lack “sufficient powers to ensure mandatory integration of climate change issues in state programs and strategies” (Ministry of Energy of the Republic of Kazakhstan, United Nations Development Programme, & Global Environment Facility, 2017, p. 163).

- › The government’s focus seems to be mainly on emission reduction and energy efficiency, without considering the long-term impacts of climate change on energy-related infrastructures (Poberezhskaya & Danilova, 2021).
- › Kazakhstan’s hydrometeorological monitoring, early warning, and emergency response systems are inadequate in the current context of climate risks and vulnerabilities.

Insufficient qualifications of personnel at Kazhydromet and low levels of climate change awareness among practitioners in different sectors add to a lack of capacity to provide modelling on extreme-events projections and material damages due to these events (Ministry of Energy of the Republic of Kazakhstan, United Nations Development Programme, & Global Environment Facility, 2017, p. 164).

Nevertheless, the newly updated Environmental Code provides a legal framework and process for adaptation planning, presenting an important opportunity to enhance efforts toward mainstreaming climate adaptation and moving Kazakhstan’s economy onto a climate-resilient path.

3. MACROECONOMIC MODELLING AND CLIMATE CHANGE ADAPTATION

The risks to the Kazakh economy from climate change are real and imminent (Grossmann et al., 2022). However, climate change should not simply be seen as causing unfavourable conditions for development. Climate adaptation is a development priority and an economic imperative. The Government of Kazakhstan acknowledges this through its Strategy 2050, which frames climate change as having economic benefits (e.g., increasing energy efficiency and foreign investments) and potential economic losses. Extending this kind of thinking to climate change adaptation and finding the “comparative advantage” can serve climate-resilient economic development. Many adaptation measures protect the economy

from climate risks: they are feasible and cost-effective and therefore constitute good economic development practice.

Linking adaptation with macroeconomic modelling (economic models in combination with scenario analysis), in particular, can help countries to prepare an effective national response to climate risks. Macroeconomic modelling enables policy- and decision-makers to assess the economy-wide impacts of climate change on various sectors, to build the case for adaptation, and shows the economic rationale for investments in specific adaptation measures from an economy-wide perspective based on sectoral cost-benefit analysis.



Adding the perspective of the whole economy and constructing and testing models force economists and policy-makers to exchange their views on how the economy works and identify the most effective adaptation options. It provides planners with additional insights by quantifying the indirect, induced,⁵ and total socio-economic impacts of both climate hazards and adaptation measures⁶ (GIZ, 2021).

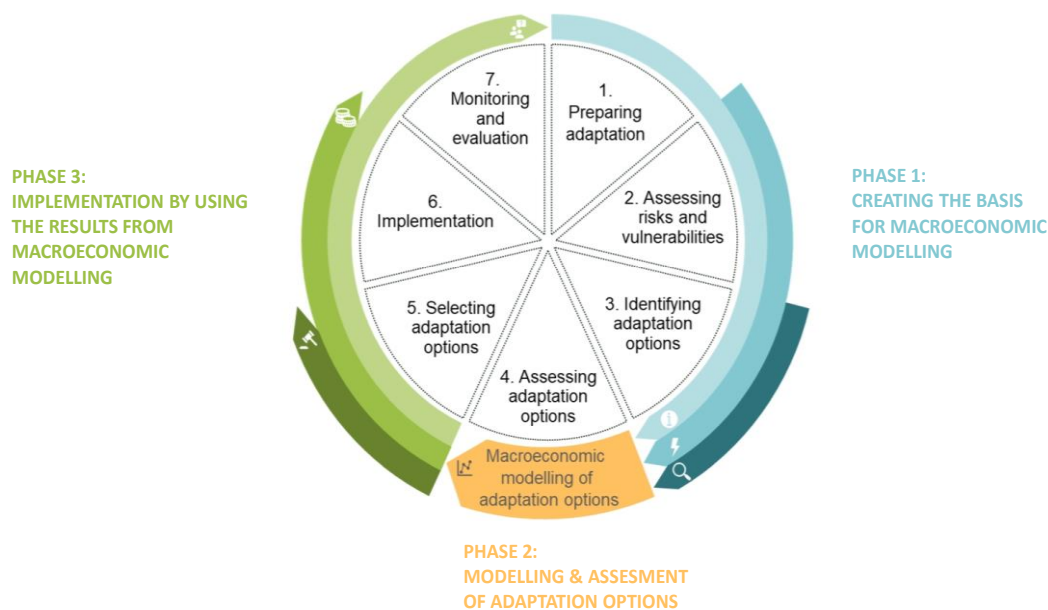
Figure 1 illustrates how macroeconomic modelling supports adaptation planning. The framework employs an iterative seven-step adaptation planning cycle that involves preparing for adaptation, assessing vulnerabilities, identifying adaptation options (Steps 1–3), assessing and selecting

adaptation options (Step 4), followed by implementation and monitoring and evaluation (Step 5–7). The macroeconomic modelling activities are applied along the seven steps of the adaptation planning cycle and can be organized into three phases:

- (1) Creating the basis for macroeconomic modelling
- (2) Modelling & assessment of adaptation options
- (3) Implementation (using the results from macroeconomic modelling).

Table 2 outlines each phase and relevant economic modelling activities supporting the steps along the adaptation planning cycle (GIZ, 2021).

Figure 1. Macroeconomic modelling activities supporting adaptation planning



Source: GIZ 2021

⁵ For specific definitions of direct effects, indirect effects, and induced effects, please see Assessing Green Jobs Potential in Developing Countries by the International Labour Office.

⁶ Aiming at bridging this link, the Global Programme “Policy Advice for Climate Resilient Economic Development” on behalf of the German Federal Ministry for the Environment, Nature Conservation, Nuclear Protection and Consumer Protection provides a country-specific macroeconomic model (e3.kz) that allows the examination of how climate change impacts the economy and its sectors, includes the costs and benefits of adaptation options from an economy-wide perspective, and can help us decide what types of adaptation should be pursued, and in which sectors, depending on existing damage data.



Table 2. A 7-Step approach how macroeconomic modelling supports adaptation

Phase	How macroeconomic modelling activities support adaptation planning
Phase 1: Creating the basis for macroeconomic modelling	<p>Step 1: By integrating an economic view in cooperation with economic experts, climate change adaptation can be communicated as a way to 1) generate economic benefits and 2) avoid or minimize asset losses and the costs of reconstruction, reducing climate risks.</p> <p>Step 2: Macroeconomic data and modelling will provide insights into the past and current economic damages due to climate hazards and how these outcomes could intensify under different climate scenarios.</p> <p>Step 3: A set of criteria (e.g., political priority, technical feasibility, cost to maintain, size of investment required, number of beneficiaries supported) is applied to identify a short list of prospective adaptation options for macroeconomic modelling to fully identify the range of benefits, thereby complementing sectoral cost-benefit analyses.</p>
Phase 2: Modelling and assessment of adaptation options	<p>Step 4: Macroeconomic modelling helps to identify the comparative economy-wide effects of pre-selected adaptation options through the comparison of a scenario where a specific climate hazard occurs but no adaptation action is taken, to a scenario where an adaptation measure to mitigate this climate hazard is implemented. This can provide insights into the broader economic effects of specific adaptation options.</p>
Phase 3: Implementation / Using the results from the macroeconomic modelling	<p>Step 5: Macroeconomic modelling results complement sectoral economic and non-economic criteria in the selection and prioritization of adaptation options.</p> <p>Step 6: Budget allocation for adaptation options can be informed by a macroeconomic assessment of measures. Identified economy-wide benefits of adaptation options may also support access to international climate finance for implementation.</p> <p>Step 7: Macroeconomic data can inform the process of data collection for the purposes of monitoring and evaluation of adaptation options and performance.</p>

Enabling climate-resilient development and the design of suitable adaptation measures, informed by macroeconomic modelling, requires adaptation to be integrated into Kazakhstan’s existing institutional arrangements and planning processes. It involves a systematic approach emphasizing the interdependencies between different authorities, clear mandates, communication,

and an understanding of roles and responsibilities to address the negative impacts of climate change on the economy and plan adaptation projects. The following section aims to highlight practical entry points for strengthening adaptation planning efforts supported by macroeconomic modelling within Kazakhstan’s existing planning efforts.



4. KEY ENTRY POINTS

to integrate adaptation planning and macroeconomic modelling into Kazakhstan's institutional arrangements and planning processes

Critical gaps continue to exist within Kazakhstan's institutional arrangements, and planning processes to mainstream adaptation are constrained by limited support for climate science and data and low awareness among government actors. While rules and frameworks have been adopted and legislative actions have been identified on climate change adaptation, institutionalization and formalization of the process remain inadequate. This is further exacerbated by limited transparency in how decisions are made and a lack of direction on roles and responsibilities for relevant actors and line ministries to create an enabling environment to mainstream adaptation into the different sectors.

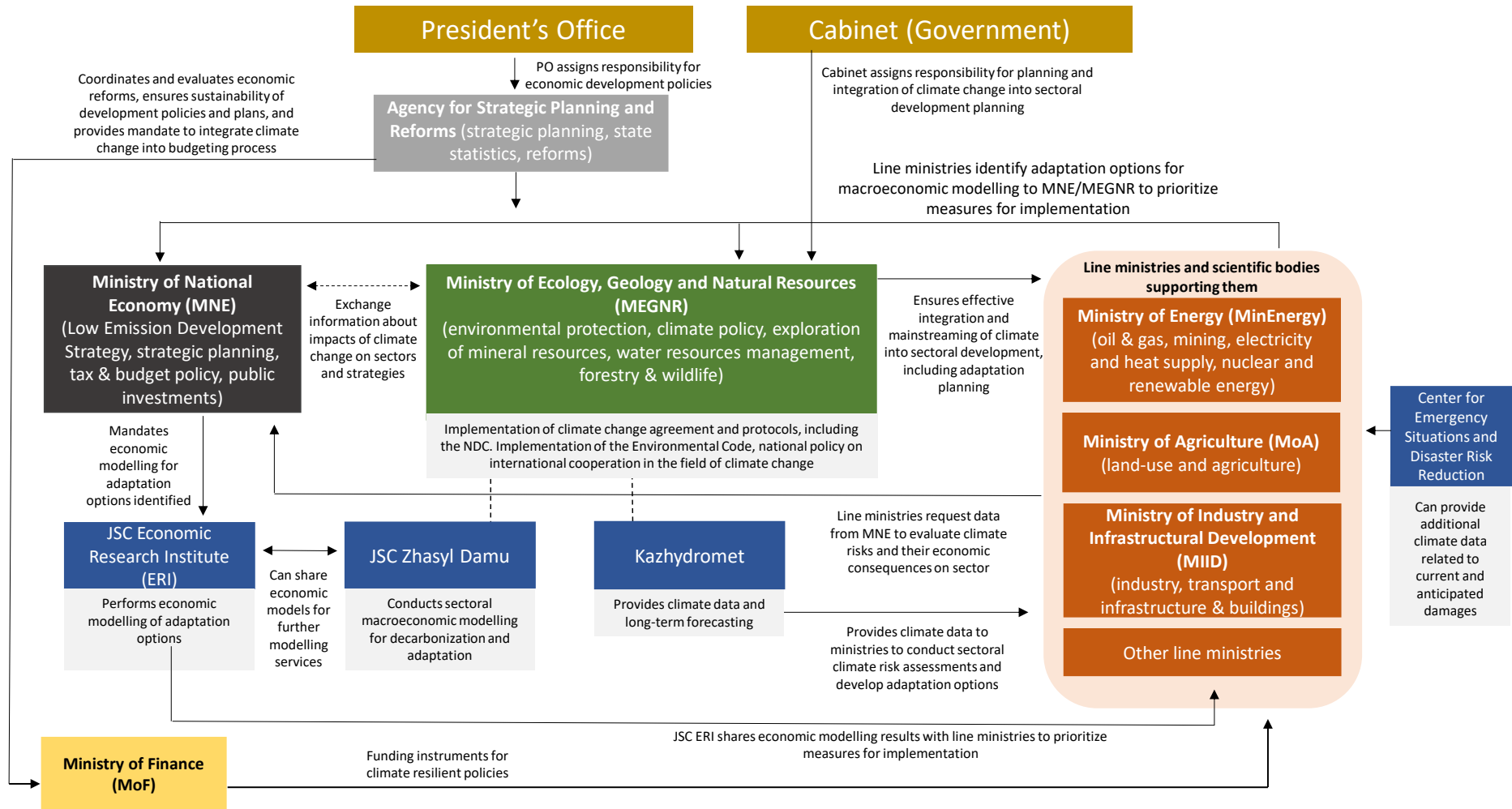
Figure 2 aims to illustrate a proposed institutional arrangement for strengthening and mainstreaming adaptation macroeconomic modelling into Kazakhstan's existing development-planning processes. It identifies strategic entry points (red circles) for how adaptation can be institutionalized and integrated into the development-planning context, including clear roles and responsibilities for key actors. It specifically focuses on creating an enabling environment for adaptation through:

- › Raising awareness of current and future climate change impacts on strategic economic sectors
- › Overcoming existing silos among government ministries and actors in different sectors, including economic

planning, budgeting, and environmental policy-making

- › Utilizing platforms for cross-sectoral coordination on adaptation
- › Producing and sharing relevant climate data and information
- › Strengthening financing to plan, design, and implement adaptation measures.

Figure 2. Proposed entry points for integrating adaptation into Kazakhstan's institutional arrangements and planning processes





Entry point 1: Establish a high-level political mandate from Kazakhstan's government

A high-level political mandate plays an important role in integrating climate adaptation at the national level and across sectors. It usually entails a political mandate for adaptation to be established within a particular ministry. In the case of Kazakhstan, the main players at this entry point include the president's office, the cabinet (government), and the key responsible ministry. While Kazakhstan's national-level Environmental Code provides a directive for climate change adaptation to be carried out, including general requirements and the need for assessing risks and vulnerabilities, it lacks a long-term vision, an enabling environment for mainstreaming adaptation into development planning, and an agency with sufficient powers to ensure the integration of climate change. To drive an adaptation mainstreaming agenda, the cabinet, supported by the president's office, must create a national mandate for adaptation and establish a clear responsibility for the MEGNR to integrate climate change adaptation into key economic sectors and their planning efforts. The mandate will help to establish a clear vision for a national adaptation process including expectations and outputs. It will also help to direct the mainstreaming agenda, foster leadership, and ensure stakeholder participation. Many of the subsequent entry points depend on the country's vision and mandate for adaptation.

Specific actors and activities include the following:

- › Kazakhstan's cabinet creates an ambitious high-level vision and mandate for climate-resilient economic development that sets the stage for integrating adaptation into key economic sectors in Kazakhstan. Climate change adaptation should be communicated as a way to generate economic benefits and a way to avoid or minimize asset losses and the costs of reconstruction, reduce climate risks, increase productivity, and generate new jobs in Kazakhstan.
- › The cabinet clearly identifies and designates the ministry that will oversee the process and spearhead the mechanisms for coordinating with other parts and levels of government on adaptation at the national level.
- › The cabinet assigns clear roles and responsibilities for all key players at the national level. This entails assigning roles and responsibilities to the MEGNR on coordinating and integrating climate change adaptation, to Kazhydromet on providing climate data and long-term forecasting, as well as to the MNE in their role in assessing the data, economic damages, and opportunities that come with climate change.
- › The high-level national mandate should indicate a role for the Ministry of Finance to allocate national resources and/or plans for raising additional funds (e.g., through the Green Climate Fund) to integrate adaptation across key economic sectors.

Entry point 2: Operationalize adaptation integration into sectoral development planning in Kazakhstan

To start adaptation planning across key economic line ministries (e.g., agriculture, water, infrastructure), the MEGNR, as the assigned lead ministry on climate change, should take the lead on initiating the integration of adaptation within sector



strategies and action plans. For this to happen, the MEGNR may set up a strategic climate change committee made up of focal points representing each ministry. Further, the MEGNR may develop a strategy or framework document, guided by the full engagement of all ministries, that would establish a joint consensus and elaborate on joint and specific goals for all sectors. The strategy would respond directly to elements of the high-level national mandate and develop instructions for line ministries or departments and other stakeholders to follow. It would define a road map for sectoral adaptation integration to be followed by the ministries, including a set of specific, sequential steps and activities and respective responsibilities. Part of this road map is to identify available information on climate change impacts, vulnerability, and adaptation to understand gaps and needs for enabling sectoral adaptation planning and how to engage key stakeholders. The document would help sectoral decision-makers to understand how to conduct risk and vulnerability assessments (the basis for identifying solutions) and incorporate climate change into policy and operational decisions across key economic sectors. Macroeconomic modelling can play a key role in this entry point and should be promoted as an element of a standardized sectoral vulnerability and risk assessment. The document would also set the stage for collaboration between the MEGNR, the MNE, and other line ministries by assigning or establishing a common coordination mechanism.

- › The MEGNR, with full engagement of all sector ministries, initiates the development of a framework or strategy document that outlines goals and objectives, milestones, instructions for line ministries, and terms of collaboration and coordination at the national level.

For example, setting up an inter-sectoral commission on climate change.

- › The MEGNR identifies and compiles national information on ongoing and past adaptation activities (projects, programs, policies, and capacity-building efforts) to assess needs and gaps and provide an indication of the status of the country's enabling environment for adaptation.
- › The MEGNR and the MNE promote an economic-climate change nexus in the framework or strategy and identify the key economic sectors that require more in-depth risk assessments to get a more detailed understanding of the macroeconomic implications of climate change and the capacity of the economy to adapt. Achieving climate-resilient economic development should be included as an overall guiding principle.
- › The MEGNR, in close collaboration with Kazhydromet and JSC Zhasyl Damu, may undertake additional stocktaking of the state of the science on current climate variability and existing vulnerabilities, projected climatic changes, associated impacts, and future vulnerabilities. This would develop a basis for identifying further planning and guide efforts to improve climate science, data needs, and a knowledge base to provide sectoral decision-makers with robust and relevant information on climate change impacts, vulnerability, and adaptation options.

Entry point 3: Initiate strategic engagement with the Ministry of National Economy on climate change

The MNE is responsible for Kazakhstan's Low-Emission Development Strategy,



provides strategic planning, and sets out priorities for tax and budget policy and public investments. Further, the MNE, through its subordinate JSC Economic Research Institute, provides modelling services to assess the climate change impacts on key economic sectors and the economic impacts of adaptation options. Strategic and ongoing engagement between the MNE and the MEGNR on climate change will build support and ensure the exchange of information, clarify modelling requests, and provide evidence to integrate climate change aspects into Kazakhstan's development-planning priorities. The MEGNR may establish a dedicated committee or working group to exchange ideas with MNE staff on sector-specific economic consequences of climate change: both the risks posed by its mounting impacts on the economy (e.g., reduced GDP growth) and, increasingly, the opportunities of climate action (e.g., a green economy), which could unlock investments and create jobs. This can also entail information on utilizing climate-related fiscal tools such as emission trading systems, bonds, and methods of prioritizing low-carbon growth. It is an opportunity for reinforcing the climate change-economy nexus and for determining which options, priorities, and approaches to consider or pursue and who should be involved in advancing climate-resilient economic development in the country.

In this entry point, economic modelling results provide a narrative justification for proposing or revising development strategies, investments, and plans that account for the impacts of climate change on the economy. It can further provide justification for channelling resources for climate-resilient economic development to address the economic (and related fiscal and financial) losses due to climate change and make the case for preventive risk-

management strategies rather than reactive (disaster response) public investments.

Specific actors and activities:

- › The MEGNR may set up a strategic climate-economy nexus working group between the MEGNR, the MNE, the JSC Economic Research Institute, JSC Zhasyl Damu, and Kazhydromet to share the latest information on climate data and potential impacts on key economic sectors and opportunities around linking adaptation and mitigation action.
- › A climate-economy nexus working group may assess capacity and information gaps in undertaking economic modelling (e.g., data, technical capacity) and identify economic sectors that require in-depth economic analyses to get a more detailed understanding of the macroeconomic impacts of climate change and the capacity of the sector to adapt.
- › The JSC Economic Research Institute, JSC Zhasyl Damu, and Kazhydromet work jointly on further refining models and scenarios predicting climate change impacts on the national economy and key sectors.

Entry point 4: Analyze, assess, and develop adaptation options at Kazakhstan's sectoral level

An important step in enabling Kazakhstan's line ministries to identify and integrate adaptation options into their sectoral planning processes is to understand current development efforts most at risk from climate change. In Kazakhstan, each national sectoral ministry is connected to a specific scientific body that supports the ministry analytically. They will play a key role in conducting sectoral climate risk analyses and



vulnerability and risk assessments. These assessments provide the evidence and knowledge decision-makers need to trigger policy responses and drive the mainstreaming of adaptation. Sectoral assessments will also benefit from incorporating specific sections summarizing the economic impacts of climate change and the opportunities offered by climate adaptation for economic growth. Specifically, macroeconomic modelling can provide insights into the broader economic opportunities associated with adaptation compared to a situation with climate change and no adaptation. This is followed by identifying and appraising adaptation options at the sector level to address priority vulnerabilities. An important component of this entry point is to share and make climate information accessible to all relevant sectoral stakeholders. These can focus on the impacts and highlight the need for adaptation action.

Specific actors and activities:

- › The MEGNR, in close collaboration with Kazhydromet, provides climate information to all sectors and their scientific bodies in a way that is useful, understandable, and relevant for planning, including a unified and standardized risk and vulnerability assessment framework. Additional sources of climate information include data provided by Kazakhstan's Center for Emergency Situations and Disaster Risk Reduction.
- › Kazhydromet generates climate information on past, current, and future climate and provides information to relevant sectoral scientific bodies responsible for conducting sectoral risk and vulnerability assessments.
- › The MEGNR, in close collaboration with the MNE, requests that line ministries representing key economic sectors include information on the past and current economic damages of climate hazards to estimate how these could intensify under different climate scenarios.
- › As part of a standardized risks and vulnerability assessment process, relevant scientific staff from key economic sectors (e.g., water, agriculture) request support and data from the MNE and JSC Zhasyl Damu to identify, assess, and evaluate climate risks and their economic consequences on certain sectors of the economy by integrating climate change scenarios into a long-term economic development model.
- › JSC Zhasyl Damu identifies available information and studies related to the economic assessment of climate impacts—in particular, information related to past event hazards (e.g., flooding, drought).
- › Following the identification of adaptation options by line ministries, key economic sectoral ministries identify adaptation options for macroeconomic modelling to prioritize measures for implementation.
- › The JSC Economic Research Institute, supported by Zhasyl Damu, holds ownership of the macroeconomic modelling and assesses adaptation options identified, applying available cost-benefit analyses and other detailed studies to quantify the indirect, induced, and socio-economic impacts (e.g., employment effects, GDP).
- › JSC Zhasyl Damu provides an economic framework for monitoring and evaluation of adaptation measures.



Entry point 5: Integrate adaptation into Kazakhstan's budgeting process

Financing is needed throughout the adaptation planning process, from its initiation to the implementation of prioritized adaptation options. It is important that the Government of Kazakhstan's (the cabinet's) high-level mandate and vision related to climate clearly sets out objectives to inform fiscal planning for adaptation (e.g., defining climate adaptation as a priority for resource allocation). For example, dedicated financing from the central budget may be designated for use by the MEGNR and other line ministries, science authorities, or state agencies. A designated budget line may be allocated to recipients' core budgets (e.g., to pay for operating costs, trainings, and assessments and to engage additional human resources or strengthen crosscutting support structures). The most suitable approach for allocating financing to adaptation planning could be sector-specific medium-term budgets or an annual budgeting process. The Ministry of Finance (MoF) is usually responsible for the budget preparation process, requesting that all spending ministries submit their budget plans in the required form. The sector ministries' proposals are generally based on their sector plans or programs. The budget is then presented to the cabinet and submitted to the parliament for approval. Involving key actors from the MoF responsible for budget allocation in any climate-related coordination mechanisms is crucial to capitalize and carry out targeted efforts to integrate and finance adaptation measures.

Furthermore, macroeconomic modelling can play another key role in this entry point. Often, medium-term budgets are informed by

macroeconomic forecasts. Understanding climate risks and their economic consequences on certain sectors of the economy can be useful information for the MoF's macroeconomic forecasting efforts, enabling the ministry to understand potential fiscal pressures and impacts on future economic growth. Such analyses can inform the government of the value and opportunity costs of climate adaptation investments.

Specific actors and activities:

- › The MEGNR may include the MoF in any climate-related coordination mechanisms to build awareness of the economic impacts of climate change and inform the budget-allocation process for selected adaptation measures and provides information on investments and the returns on public spending.
- › Involve the MoF in validation workshops to review and select assessed adaptation options for subsequent sector strategies and inform budget-planning decisions using economic modelling information.
- › Through climate-related coordination mechanisms, the MoF and other line ministries may determine financing options for prioritized adaptation actions by identifying potential sources of financing and suitable financial instruments, taking into consideration national circumstances, relationships, and capacities.
- › At the resource-allocation stage, the MoF may consider reallocating funding to (or increasing the budget for) more vulnerable sectors and regions and funding adaptation-specific activities, based on risk and vulnerability assessments as well as subsequent macroeconomic analyses.



5. ENABLING FACTORS FOR MAINSTREAMING ADAPTATION IN KAZAKHSTAN

Without an effective and enabling environment, it is difficult to “activate” the entry points, engage ministries and key actors in mainstreaming adaptation planning, and sustain the use and uptake of economic modelling. This section focuses on three key enabling factors that are relevant to drive adaptation planning within the Government of Kazakhstan.

Awareness and motivation: All key actors and stakeholders within the Government of Kazakhstan must be aware of the need to adapt and adequately incentivized to integrate climate adaptation into development-planning processes with their ministries. While scientific, modelling, and technical information (e.g., vulnerability risk assessments) is critical, it is often not sufficient. The MEGNR, as the ministry responsible for the implementation of climate change agreements and protocols, may consider complementing scientific and technical data with a targeted outreach and communication strategy to ensure a basic understanding across government of climate change, its potential risks, and the need for planned adaptation. The MEGNR may also engage deliberately with the MNE and communicate climate-related economic opportunities, including the option of green bonds for climate change projects as well as public-private partnerships for climate-resilient infrastructure, and how the private sector can be incentivized to do so. This should be complemented by economic data and policy outlooks (e.g., reporting on a decline in global fossil fuel demand), and information on the cost of inaction and how investment in adaptation prevents and minimizes economic damages caused by

climate change (including case studies from other countries).

Information sharing and communication: Kazakhstan’s adaptation planning and macroeconomic modelling efforts need to be grounded in the best available information about current and projected climate risks. The MEGNR, MNE, and key sectoral stakeholders can only be convinced to integrate climate risks into planning and make necessary amendments if all necessary data and information required for risk and vulnerability assessments are sufficiently supported and shared. The most recent scientific data on Kazakhstan’s historical and projected climate are being provided through the [Climate Adaptation and Mitigation Program for Aral Sea Basin CAMP4ASB](#), financed by the World Bank. The assessment was executed based on data comparison for 1960–1990 and modelled data for 2045–2055 for scenarios RCP4.5 and RCP8.5 and includes presented data on geographic and socio-economic sensitivity. The overall picture of the climate risks facing Kazakhstan is also supported by the findings in the older Seventh National Communication and Third Biennial report of the Republic of Kazakhstan to the UNFCCC. At the sub-national level, a number of climate risk and vulnerability assessments have been completed through donor-funded projects (e.g., the Asian Development Bank Project; the Kazakhstan Irrigation Rehabilitation Sector Project; and the Climate Risk and Vulnerability Assessment Report).

However, quality data and information that is context-specific remains limited but is a key input to ensure that all actors are acting in an



informed manner. Kazhydromet as well as the Center for Emergency Situations and Disaster Risk Reduction play a critical role in fulfilling this gap and facilitating systematic data collection. They must be well equipped to generate and share accessible and sector-specific climate information on past, current, and future climate change with scientific bodies that support the ministries analytically. These could include up-to-date floodplain maps, regional climate data and projections, hydrologic modelling, drought information, and sector-specific data. Information communication must go beyond the sharing of documents. It is often more effective when accompanied by strategic communication tools such as developing “sectoral summary cards” on the impacts of climate change in key sectors and various associated infographics. Further, meetings or workshops can provide opportunities for different sectoral stakeholders, including sub-national authorities, to ask questions, provide feedback, and build a common understanding of the information and the way forward. Robust climate information is also essential for the ongoing refinement and revision of climate-informed economic models.

Capacity development: Ongoing capacity development on understanding climate adaptation and its link with economic development is essential for all key actors to enable their meaningful engagement and commitment in adaptation planning. Actors need to have access to climate science, projections, scenarios, and tools, as well as having a mechanism in place to request tailored and context-specific information from

a scientific body (e.g., Kazhydromet). In the same vein, it is important that a) scientific agencies at the national level are able to conduct risk and vulnerability assessments and b) that line ministries at the national level are able to undertake adaptation planning and develop suitable adaptation measures. At the same time, it is crucial that the knowledge of the method for conducting risk and vulnerability assessments is standardized and embedded in an institution and not lost due to the rotation of staff. For this to take place, financial resources must be made available for scientific agencies and sectoral ministry staff to have access to trainings and capacity-building workshops. These could include conducting a “training of trainers,” offered by international development organizations or regular short-term trainings.

Similarly, quantifying the macroeconomic impacts of climate change and the economic returns on investment in adaptation requires technical capacities and expertise, which may not be readily available in sectoral ministries, or which may be limited. Trainings could focus on modelling methods, data collection, updating models, and initiating modelling requests, as well as train-the-trainer models to build subject-matter experts who can then teach other colleagues. Providing training and capacity-building opportunities, such as through GIZ’s Policy Advice for Climate Resilient Economic Development Programme, to strategic scientific bodies such as the JSC Zhasyl Damu, supported by the JSC Economic Research Institute, should be considered to address this gap.



6. CONCLUSION

To meet the challenges arising from climate change impacts on Kazakhstan's economy, a process for adaptation to climate change needs to be formalized and institutionalized. It must clearly outline how decisions are made and give direction on roles and responsibilities for relevant actors and line ministries to create an enabling environment to mainstream adaptation into sectors.

A significant element in advancing climate-resilient economic development is the consideration of macroeconomic modelling in adaptation planning. It enables policy- and decision-makers to assess the economy-wide and sectoral impacts of climate change, build the business case for adaptation, and provide an economy-wide perspective on specific adaptation measures. These macroeconomic results can be particularly helpful in framing the problem, engaging (new) stakeholders and raising their awareness, and improving communication on the linkages between climate change and economic development. For policy- and decision-makers, these are essential elements in support of advancing climate-resilient economic development in Kazakhstan.

To realize this potential, this country brief identified five strategic entry points for consideration to initiate the integration of climate adaptation supported by macroeconomic modelling.

- › **Establish a high-level political mandate from Kazakhstan's government:** A clear mandate and vision for a national adaptation process including expectations and outputs will help to direct the mainstreaming agenda, foster leadership, and ensure stakeholder participation.
- › **Operationalize adaptation mainstreaming into sectoral development planning in Kazakhstan:** A strategy that elaborates on specific goals and objectives and defines a road map for sectoral adaptation integration to be followed by line ministries, including a set of specific, sequential steps and activities and respective responsibilities.
- › **Initiate strategic engagement with the Ministry of National Economy on climate change:** Establish a dedicated committee or working group to share and update MNE staff on the economic consequences of climate change, including the risks posed by its mounting impacts to the economy (through macroeconomic modelling), as well as, increasingly, the opportunities presented by climate action.
- › **Analyze, assess, and develop adaptation options at Kazakhstan's sectoral level:** Conduct sectoral climate risks analyses and vulnerability and risk assessments to provide the evidence and knowledge decision-makers need to trigger policy responses and drive the integration of adaptation.
- › **Integrate adaptation into Kazakhstan's budgeting process:** Dedicate financing from the central budget for use by the MEGNR and other line ministries to pay for operating costs, trainings, and assessments and implement adaptation measures.

All five entry points inform and mutually support each other but are also dependent on the conditions within which the entry points operate. To drive adaptation planning within the Government of Kazakhstan, the identified entry points need to be supported by effective awareness and motivation, information sharing and communication, as well as capacity building.



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