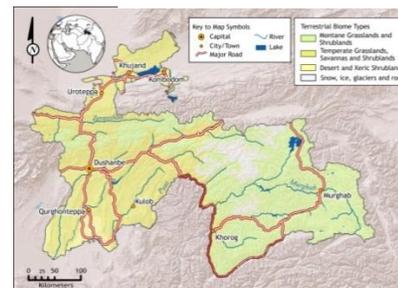




Tajikistan

Overview of Climate Change Activities

October 2013



This **Overview of Climate Change Activities in Tajikistan*** is part of a series of country notes for five Central Asian countries that summarize climate portfolio of the major development partners in a number of climate-sensitive sectors, namely energy, agriculture, forestry and natural resources, water, health, and transport. Recognizing the nature and significance of climate change contribution to an increase in disaster risk, the note also looks into the development partners' approaches and measures in this area. The note further provides a brief overview of Tajikistan's climate context in terms of observed impacts and historical trends as well as climate projections specific to sectors that are considered to be essential to the country's economic development. Finally, the note assesses national policy and institutional context related to climate change and suggests potential ways forward that could help Tajikistan mainstream low-carbon, climate-resilient development.

**This note draws upon publicly available Web information and publications, including the World Bank Climate Change Knowledge Portal, and is intended to provide an overview of development partners' climate portfolio over the past five years.*

Fact Sheet: Climate Change Exposure in Tajikistan

- An increase in mean annual temperature by 0.2–0.4°C is expected in most areas of Tajikistan by 2030 (in comparison with the period 1961–1990). This trend coincides with the tendencies predominant in the country for the last 15–20 years.
- Projected future rainfall is expected to show large variations in terms of change, intensity, and geographical distribution. Summers are expected to be wetter, while winters are expected to be drier, which could result in both floods and longer droughts.
- Many small glaciers of Tajikistan will completely disappear in 30–40 years if the present rate of glacial degradation continues.
- Tajikistan's forestry sector is vulnerable to forest fires and pest and disease outbreaks, both of which could be exacerbated by climate change, and both of which tend to reduce accumulation of carbon by the forest plantations.
- Climate change is expected to result in more extreme weather events and climate-related hazards (such as increased floods and longer droughts from drier winters and wetter summers).

Looking Ahead

Based on the review of national climate context, related challenges, and existing programs and policies, the following areas have been identified for urgent initial actions:

- **Improve** science-based understanding of the nature and magnitude of physical and biophysical climate change impacts under differing scenarios. This will be important in order to gain a better understanding of the timing and magnitude of incidence of several important indicators of climate change in the future, as well as the key vulnerabilities, development impact, and possible adaptation responses.
- **Estimate** cost of inaction as well as key actions across water resources, energy, agriculture, forestry, transport, and health sectors to provide compelling economic arguments and a broad-brush "road map" and the next steps for climate-smart actions
- **Design** and implement climate-smart solutions across sectors at the national and subnational levels as well as for the regional-scale cooperation among countries in Central Asia and emphasize the benefits of collaboration and institution building in the region.
- **Expand** the mandate of the Pilot Program for Climate Resilience (PPCR) Secretariat to coordinate and implement country adaptation projects, and establish a cross-sectoral technical working group that would ensure the implementation of policies and actions on the ground.
- **Establish** (or use an existing mechanism) a Regional Central Asian Steering Committee on Climate Change, comprising high-level representatives from five Central Asian countries. The committee's main responsibilities would be to provide an overall guidance, political support, and leadership and to serve as a platform for continuous coordination of regional efforts to address and adapt to climate change.

Tajikistan at a Glance**

Population (million): 8.009 (2012)
 GDP (current US\$ billion): 6.987 (2012)
 GDP per capita (current US\$) / GDP growth (%): 871 / 7.5 (2012)
 CO₂ emissions (kt): 2,860.26 (2010)
 CO₂ emissions (% of world CO₂ emissions): 0.03 (2010)

**Based on *World Development Indicators*, World Bank
 (<http://devdata.worldbank.org>)

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I Climate Context: Understanding the Implications

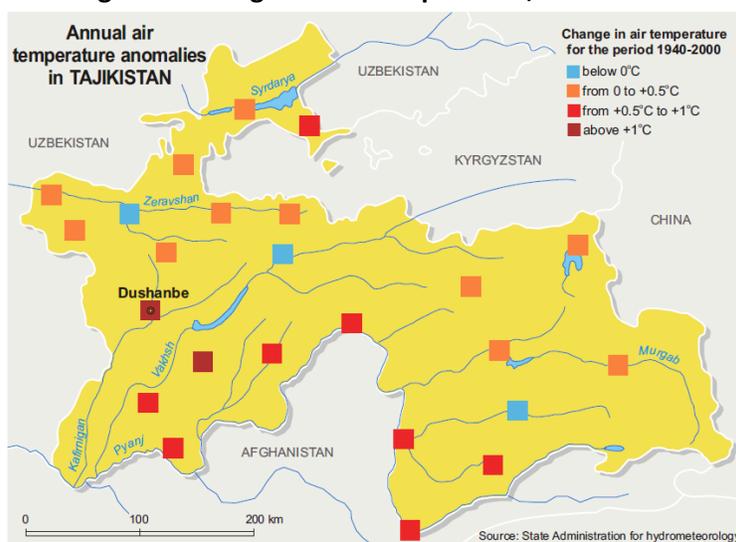
Overview and Historical Trends

Tajikistan is a landlocked country situated in the mountainous part of Central Asia. With a total area of 143,100 square kilometers, it is the smallest country in Central Asia. To the north and west, it borders Uzbekistan and Kyrgyzstan; to the south, Afghanistan; and to the east, China. About 70 percent of its population of around 8 million lives in rural areas.

Mountains occupy about 93 percent of Tajikistan's terrain, with about half of the territory situated 3,000 meters above sea level. Tajikistan's geography is characterized by deserts and semideserts in the west and the huge

mountain ranges of the Tibetan plateau, Gindukush, and Tian Shan in the east, creating a great diversity of environmental and climatic conditions. The annual mean temperature, depending on the elevation, ranges from 17°C and above in the south to -6°C and lower in the Pamirs. The Eastern Pamir is known for extreme diversity of climate, with temperature ranges between -63°C and 47°C. Over the period 1940–2000, ground air temperature in most of Tajikistan's districts and high-altitude zones increased between 0.5 and 1°C, with some districts experiencing an increase above 1°C (see Figure 1).¹

Figure 1: Changes in Air Temperature, 1940–2000

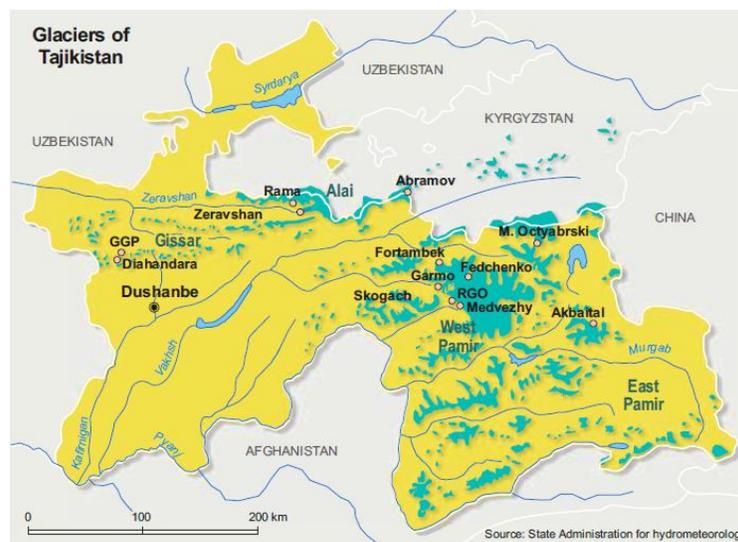


Source: Second National Communication of Tajikistan to the UNFCCC.

¹ Second National Communication of Tajikistan to the United Nations Framework Convention for Climate Change (UNFCCC), 2008.

Tajikistan is considered the main glacial center of Central Asia, and its glaciers occupy about 6 percent of the country's total area (see Figure 2). The glaciers not only retain water, they also regulate river flows and climate, and play an important role in forming the Amudarya River, the biggest water "artery" of the Central Asia and Aral Sea Basin. Together with permafrost, glaciers are the main source of water replenishing the Aral Sea river basins, and water resources formed in Tajikistan are used mainly by the countries situated downstream. The snow stock in Tajikistan varies greatly from year to year and on the elevation of the area: from 100–135 days with snow cover in the high mountains to 45 days in the Eastern Pamir and 245 days in the Gissar mountain range. Altitudes over 4,000 meters have permanent snow and ice. The current warming rates in the high-altitude areas of Tajikistan are already causing significant changes to glaciers, one of the most vulnerable ecosystems. For instance, remote observations showed that within the period 1966–2000, the Fedchenko Glacier system (in the northwestern Pamir) was reduced by 44 square kilometers, that is, 6 percent of the total area.²

Figure 2: Glaciers of Tajikistan



Source: Second National Communication of Tajikistan to the UNFCCC.

Annual precipitation averages from 70 to 160 millimeters in the lowland, hot deserts of northern Tajikistan and the cold mountain deserts of Eastern Pamir. In central Tajikistan, precipitation can exceed 1,800 millimeters per year. Precipitation patterns over the past decades were uneven, with the driest decade for all altitudinal zones lasting from 1941 to 1950, followed by periods of dry weather alternating with periods of humid weather. In some areas a reduction in precipitation can be observed (Eastern Pamir, south lowlands), whereas in others (Western Pamir), opposite trends have been witnessed.³

Climate Projections

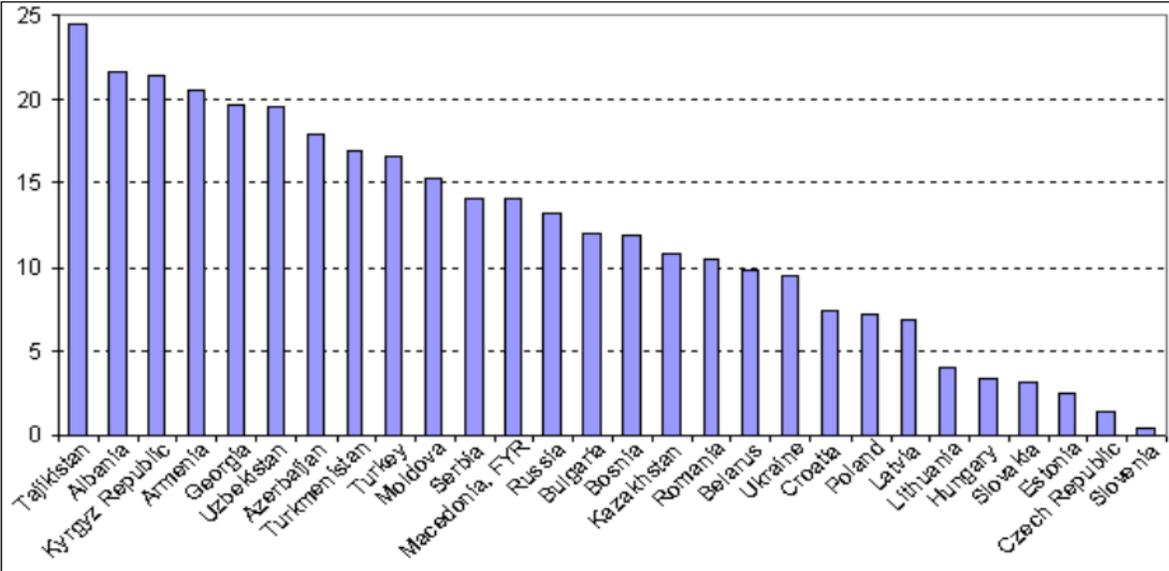
Tajikistan ranks first among Europe and Central Asia (ECA) countries in terms of simplified index of vulnerability to climate change and it is particularly sensitive to climate change due to low adaptive

² Ibid.

³ Ibid.

capacity. By exacerbating current problems (for example, aging infrastructure, feminization of poverty, limited institutional capacity) and posing new risks (for example, new water map, spread of waterborne diseases, and others), climate change will likely challenge the achievement of Tajikistan’s development priorities.⁴ Figure 3 shows that Tajikistan is ranked highest on the index of vulnerability to climate change.

Figure 3: Index of Vulnerability to Climate Change⁵



Source: Fay and Patel (2008).

According to the Second National Communication of Tajikistan to the United Nations Framework Convention on Climate Change (UNFCCC), climate change is expected to result in increased air temperature, more variable precipitation and snow cover, increased rate of ice melt, and more extreme and frequent weather events and climate-related hazards. The summary of climate trends and projections for Tajikistan is as follows:

- An increase in mean annual temperature by 0.2–0.4°C is expected in most areas of Tajikistan by 2030 (in comparison with the period 1961–1990). This trend coincides with the tendencies predominant in the country for the last 15–20 years. The maximum increase of temperature is expected in winter, by 2°C and more.
- Projected future rainfall is expected to show large variations in terms of change, intensity, and geographical distribution. While the irregularity and increase in intensity of precipitations is expected to continue in the future, most of the climate models do not reach consensus with regard to future rainfall projections. However, summers are expected to be wetter, while winters are expected to be drier, which could result in both floods and longer droughts.

⁴ Fay, Marianne; Block, Rachel I.; Ebinger, Jane. 2010. Adapting to Climate Change in Eastern Europe and Central Asia. World Bank.

⁵ Ibid.

- Many small glaciers of Tajikistan are expected to completely disappear in 30–40 years if the present rate of glacial degradation continues, which will adversely affect the river regimes of the Zeravshan, Kafirnigan, Karatag, and Obihingou. The glacial area may be reduced by 15–20 percent compared with the present, resulting in a decrease in water stocks as well.

II National Policy and Institutional Context for Addressing and Adapting to Climate Change

Policies

There are several important legal documents and recent policy developments that form a good basis for Tajikistan’s aspiration to mainstream low-carbon, climate-resilient considerations into its broader sustainable development agenda.

While the **National Development Strategy** (2007–15) does not mention climate variability and climate change explicitly, it includes environmental sustainability as a target sector and identifies problems that are directly related to climate variability and climate change adaptation.⁶

A **National Action Plan for Climate Change Mitigation and Adaptation** was developed during preparations of the First National Communication to the UNFCCC and approved in June 2003 (government decree No. 259) and is currently the only climate policy in effect. The action plan identifies the major directions and priorities of the state policy on reducing greenhouse gas (GHG) emissions and adapting to climate change and provides information on the adverse impacts of climate change on natural resources, the economy, and public health. Key sectors covered include water, land, agriculture, pastures, cotton production, transport infrastructure, and others. The action plan succeeded in implementing response measures to reduce GHG emissions and enhance natural sinks of carbon, including development of renewable energies, promotion of sustainable forest management, and

Legal Basis for Implementation of the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol in Tajikistan

Tajikistan acceded to the UNFCCC in 1998 as a non-Annex I Party and ratified the Kyoto Protocol in October 2008. The government delegated responsibilities and obligations related to UNFCCC implementation to the Ministry of Nature Protection. In addition, Tajikistan established a designated national authority (DNA) for the clean development mechanism (CDM) under the Ministry of Energy and Industry.

The country prepared its First National Communication on climate change in 2002, and developed at the same time the National Action Plan for Climate Change Mitigation and Adaptation, which serves as a strategic document on climate change issues. Tajikistan’s Second National Communication (Dushanbe, 2008) was prepared by the State Entity for Hydrometeorology of the Committee for Environmental Protection, in coordination with key ministries and agencies. The Third National Communication is currently under preparation.

Source: Second National Communication of Tajikistan to the UNFCCC.

integration of modern technologies on climate change mitigation and GHG reduction.⁷

The State Entity for Hydrometeorology (Hydromet) is currently developing a climate change adaptation strategy for the period up to 2030 and has formed a working group to draft an **Action Plan on Climate Change Adaptation**.⁸

Under Tajikistan's commitments to the UNFCCC, the **First National Communication to the UNFCCC** was prepared in 2002 by the Committee for Environment Protection under the government of Tajikistan with support from the Global Environment Facility and the United Nations Development Programme; it focuses on trends in greenhouse gas emissions, vulnerability of the environment, national economy, and human health. The **Second National Communication** was prepared in 2008 and it particularly informs decision makers, specialists, and the public at large of the pressing climate change issues facing Tajikistan, mainly impacts on fresh water resources and biodiversity. The Third National Communication is currently under preparation.

In 2010, the government of Tajikistan approved a **National Disaster Risk Management Strategy**, to be implemented by the Committee on Emergency Situations and Civil Defense. The primary focus of the strategy is to define actions to reduce the impact of disasters and to integrate disaster risk reduction into all development activities of the Republic of Tajikistan, as well as to improve disaster preparedness and response. The strategy is accompanied by an action plan for 2010–15, which is centered on the strategy's five components: (1) institutional mandates and legal issues, (2) disaster risk assessment, (3) disaster risk management and achievement of sustainable development, (4) disaster preparedness and response; and (5) knowledge management, education, training, and public awareness.⁹

Pilot Program for Climate Resilience for Tajikistan

The Pilot Program for Climate Resilience (PPCR) was developed with participation of multilateral development banks and development partners through a consultative process that involved a broad range of stakeholders (NGOs, research institutes, academia, and so on). It constitutes a chief component in Tajikistan's response to the entwined challenges of climate change and development, as it articulates climate resilience options and national poverty reduction and sustainability goals. PPCR support is focusing on investments to make climate-resilient key water management and hydroelectric infrastructure, to improve institutional capacities for effectively integrating climate resilience into national development and investment planning, and to support land management measures to enhance rural livelihoods through greater resilience to climate-related shocks.

The program comprises two phases. Phase I, approved in June 2010, encompassed a review of technical assistance activities to strengthen Tajikistan's capacity and analytical evidence base. Phase II encompasses needed investments identified under phase I, including pilot climate resilience approaches in the energy, water, agriculture, natural resource management, and other sectors. Specific phase components included the following:

- Phase I: Review of institutional arrangement; climate science modeling; awareness raising; resilience of energy sector; sustainable land management; river basin approach
- Phase II: Capacity building; improvement of hydrometeorological services; enhancing energy sector; sustainable land management; resilience in Pyanj River Basin

Institutions

The institutional framework for addressing climate change in Tajikistan consists of a number of ministries and agencies,¹⁰ each focusing on different aspects of this complex and multisectoral issue.¹¹ Among others, they include the Committee for Environmental Protection, State Entity for Hydrometeorology, Ministry of Economic Development and Trade, Ministry of Energy and Industry, Ministry of Agriculture, and Ministry of Land Reclamation and Water Resources. Other relevant institutions include the Ministry of Health, Ministry of Transport, Committee for Emergency Situations, Committee for Land Use and Geodesy, State Committee for Investments and State Property Management, the Inter-Ministerial Committee, and the Academy of Sciences.

The **Committee for Environmental Protection (CEP)** is responsible for control over natural resource use, land protection, subsoil, forests, water, and other resources and coordinates activities on environmental protection among government agencies. Its decisions on environmental protection are considered to be mandatory for all legal entities and individuals. It also has a mandate for climate change policy, and oversees the State Administration on Hydrometeorology. In addition, it provides advanced staff training on mainstreaming climate change adaptation into environmental legislation and sub-legislation.

The **State Administration on Hydrometeorology** of the Committee for Environmental Protection under the government of the Republic of Tajikistan is the national institution responsible for dealing with climate change issues in Tajikistan. Its director is the national focal point of the UNFCCC. Hydromet leads the preparation of the national communications to the UNFCCC, in coordination with key ministries and agencies, and also houses the Climate Change Center, which handles climate-related research and reporting related to adaptation and mitigation.

The **Pilot Program for Climate Resilience (PPCR) Secretariat** (created in 2011) is responsible for the day-to-day coordination of the PPCR-related activities and reports to the focal points. The secretariat can draw upon inputs from a steering committee, which serves as a liaison group for stakeholders, and a technical group, which is designed to provide on-demand technical expertise. Guidance to the PPCR focal Point is provided through the **Inter-Ministerial Committee**, a governmental body under the leadership of the deputy prime minister, which also includes representatives of sectoral ministries and relevant state agencies.

The **Ministry of Economic Development and Trade** is responsible for overseeing the effective implementation of socioeconomic development priorities for Tajikistan, and has a role in developing sustainable strategies. It is also a co-executive body of the National Action Plan for Climate Change Mitigation and Adaptation. The **Ministry of Energy and Industry** is the chief executive body for implementation of unified state policy and regulations on fuel and energy, natural resources, and renewable energy sources and hydropower development. It is involved in climate change issues through

¹⁰ This note was prepared in October 2013 and does not take into account institutional changes following the November 2013 presidential elections.

¹¹ See World Bank and UNDP, *Building Capacity for Climate Resilience in Tajikistan*.

its role as the designated national authority for clean development mechanism (CDM) projects under the Kyoto Protocol, but also through mainstreaming adaptation issues into all energy legislation.

The **Ministry of Land Reclamation and Water Resources** is in charge of water policy and the national irrigation system. It is participating in the development of the national water strategy based on the Millennium Development Goals (MDG).

The **Academy of Sciences**, originally established in 1951 as the highest scientific body in Tajikistan, encompasses 15 research institutes, including on climatology, glaciology, hydrology, hydropower, biodiversity, conservation, and water resource management. The academy is the main source of scientific information and data and serves governmental agencies through its research. It also has the capacity to develop long-term action plans in different sectors of the economy, and contributed to the development of the National Action Plan for Climate Change Mitigation and Adaptation.

III Overview of Development Partners' Engagement in Climate-Sensitive Sectors

International development partners have an extensive portfolio of adaptation and mitigation projects in a number of climate-sensitive sectors in Tajikistan. These, to some extent uncoordinated efforts, do not necessarily address all the challenges that the country is facing on its path to low-carbon, climate-resilient development. In this regard, an additional level of screening of the climate portfolio, which will include the identification of gaps, outline future national and regional actions, and estimate the investment resources required, is needed.

In the following sections, a brief overview of the development partners' major projects and activities is presented.¹²

Energy

Lack of a reliable (year-round) electricity supply is a major bottleneck to Tajikistan's development, with severe economic, social, and environmental implications. Approximately 70 percent of the population suffers from extensive electricity shortages during winter, estimated at a quarter of winter electricity demand. In addition, the economic cost of electricity load shedding and unmet demand is estimated at about 3 percent of gross domestic product (GDP). Only 5 percent of the country's estimated technical potential for hydropower has been developed, and new projects have been identified for energy security and possibly power exports to the region. However in order to safeguard Tajikistan development, it is essential that the country's hydropower potential be developed in a climate-resilient way, as the sector stands to be highly vulnerable to climate change. Ninety-eight percent of Tajikistan power comes from hydroelectric sources, and the river basins in which hydropower facilities are located depend upon glacial meltwater and snowmelt. Climate models predict significant changes in the

¹² The overview of development partners' climate portfolio in Kazakhstan is based on publicly available Web information and is not meant to be comprehensive. It is intended to provide an overview of the main climate-related activities that have been supported by the development partners over the past five years. For more information on the specific projects, refer to respective institutional websites.

dynamics of Tajik glaciers, snowmelt, and precipitation over the coming decades as the climate warms. The impacts of climate change on hydrology need to be taken into account in the design, rehabilitation, and management of hydropower facilities to ensure that they are able to cope with more frequent extreme events, such as floods and mudslides, and continue to generate electricity safely, efficiently, and reliably under a range of projected climate change scenarios.

The **World Bank Group's** overall engagement in the energy sector supports the government of Tajikistan's strategy to ensure reliable supply to consumers, deal with the severe winter energy shortages, reduce electricity system losses, and strengthen the financial management system to improve the financial condition of the energy sector, as well as develop a regional trade scheme to achieve sustainable export of summer surplus electricity. The World Bank is also currently preparing a power supply options study for Tajikistan. This study will assess the energy supply options available to Tajikistan, taking into account power, economic, environmental, social, and water management considerations. The Energy Loss Reduction Project in Tajikistan has components factoring in mitigation-related activities. Its main objective is to reduce commercial losses in the electricity and gas sectors and increase their financial viability.

The **Asian Development Bank (ADB)** has made significant investment in upgrading and repairing existing energy infrastructure, including two ongoing projects in the region: the Nurek Switchyard Reconstruction project and the Regional Power Transmission project. In addition, the Access to Green Finance Project will leverage Tajikistan's sound microfinance system to provide credit for households and microenterprises for energy efficient and environment-friendly homes. The **United Nations Development Programme (UNDP)** is active in the development of small-scale hydropower and supporting the enabling legal and regulatory framework as well as capacity building. As part of the PPCR phase II, the **European Bank for Reconstruction and Development (EBRD)** is supporting the Rehabilitation of Kayrakum Hydro Power Plant, a project that aims to strengthen the climate resilience of Tajikistan's energy sector, which is dominated by hydropower.

Agriculture

Tajikistan's agricultural resource base is characterized by limited arable land (roughly 20 percent of the country's agricultural land), a heavy reliance on irrigation for crop production (85 percent of arable land is irrigated, but only 62 percent is currently in use due to deterioration of the irrigation and drainage infrastructure, waterlogging, and salinization), and substantial areas of permanent pasture. Climate change, in the form of reduced water availability and increased temperatures, is expected to put increased stress on Tajikistan's land resources. The impacts for the country's uplands and rain-fed farming areas are likely to include reduced water inflows, diminishing crop and rangeland productivity (with crop yields in some regions expected to fall by up to 30 percent by 2100), changes in crop and forage quality, and the spread of pests and diseases. Irrigated agriculture will also experience additional water stress, with the need for enhancements in water storage capacity and management. These changes will put additional pressure on a sector that already faces numerous technical and financial challenges and will put at risk major sources of exports, like cotton, as well as food security in some regions.

Key **World Bank Group** contributions in Tajikistan include the Tajikistan Environmental Land Management and Rural Livelihoods Project, which will directly benefit 21,000 rural households or 126,000 people in selected project sites, of which at least 40 percent are expected to be women. The project builds on the achievements of the closed Community Agriculture and Watershed Management Project, where villages reaped tangible benefits, including increased income, from project-supported rural production and land management investments. This will be done by providing small grants to villages for climate adaptation measures and sustainable land management, engaging civil society organizations to work with communities on these issues, and supporting analytical work and capacity building in areas related to climate change risks and adaptation; integrated land, water, and grazing management; and incentive-based approaches for sustainable land management. The Emergency Food Security and Seed Imports Project (closed in May 2013) supported Tajikistan to increase domestic food production and reduce the loss of livestock to help the poorest households; improve the ability of poor households to deal with seed shortages due to poor crops; and promote private commercial farming in order to increase food production and agriculture diversification. To address the issue of water availability in agriculture, the Bank also has been supporting a number of irrigation projects aimed to improve on-farm and off-farm irrigation infrastructure water management and strengthening of embankments, as well as enhanced water management security and efficiency at the basin level at the Kayrakum dam and reservoir (Ferghana Valley Water Resources Management Project).

Other development partners that are active in Tajikistan's agriculture sector include the **Asian Development Bank**, which has focused on rural livelihoods, improving the sustainability of cotton and upgrading irrigation infrastructure. The **Food and Agriculture Organization (FAO)** has had a diverse range of activities, addressing irrigation, training in agricultural techniques, market development, and rural livelihood development. The **U.S. Agency for International Development (USAID)** is training farmers in modern technologies and management of water and irrigation networks, benefiting 5 percent of the country's farmers. With USAID's assistance, the country's land code was amended to allow ownership and sale of land use rights while improving the security of land tenure for women and men. Tajikistan is also a focus country under the U.S. government's global hunger and food security initiative "Feed the Future."

The responses of international organizations in the agriculture sector overlap significantly with forest and water sectors and have largely focused on increased irrigation especially in areas with sandy soils and deeply located ground waters, productivity and sustainability of cotton cultivation, anti-erosion measures, bank protection works, establishment of forest protection zones, anti-hail systems, and effective use of available technical resources and application of best practices.

Forestry

Forests in Tajikistan are critical for biodiversity, soil protection, climate regulation, and rural livelihoods, and they also have value as a source of medicinal products production and raw materials. At present, the total area of state forest reserves is 1.8 million hectares; some 23 percent of which are under tree

plantations.¹³ Forests in Tajikistan occupy an area of 410 thousand hectares, constituting close to 3 percent of total land area (including inland water bodies).¹⁴ Tajikistan's forestry sector is vulnerable to forest fires and pest and disease outbreaks, both of which could be exacerbated by climate change, and both of which tend to reduce accumulation of carbon by the forest plantations. Changes in climate parameters could also cause the extinction of unique natural ecosystems and species, such as the *Marmota menzbieri* found in northern Tajikistan.

The **World Bank Group** supported the forestry sector through a south-south exchange with Moldova, which linked forestry institutions and individuals who had fallen out of contact after the collapse of the Soviet Union, and helped forest management officials and experts in Tajikistan implement trial afforestation programs and learn how to register for the CDM.

The **German Federal Enterprise for International Cooperation (GIZ)** funded by the **German Federal Ministry for Economic Cooperation and Development** and the **European Union** have supported Tajikistan through a Program for the Sustainable Use of Natural Resources, with the objective to promote the improvement of laws and regulations, as well as reorganization of relevant public agencies and other governmental organizations in the framework of forest, pasture and wildlife management in Central Asia. GIZ is also implementing a new project on climate change adaptation through forestry management. The financial cooperation component carried out by **KfW** (a German government-owned development bank) is currently under preparation.

Water

Climate change in Tajikistan is mostly about water, bringing more variability and instability to the large water resources of the country, with growing risks for water availability for power production in winter, agriculture downstream in summer (coupled with higher evapotranspiration), and a rise in extremes (glacial melt outburst, floods, and droughts). Some of these impacts are described under agriculture or energy or disaster. Communities will also likely suffer critical water shortages, since total water stock are expected to fall amid chronic degradation of water supply and sanitation infrastructure. The availability of sustainable drinking water and sanitation services is a challenge in both urban and rural areas, with only 59 percent of the population having access to a public water supply (versus the 79 percent MDG target for 2015). Water quality in most systems does not meet national drinking standards. Furthermore, only 14 percent of the population has access to centralized sanitation services (44 percent in urban areas and 3 percent in rural areas). Water supply and sanitation infrastructure is therefore in need of rehabilitation and expansion that will take into account future risks brought by climate change.

The **World Bank Group** is engaged in Tajikistan's water sector through the Central Asia Energy-Water Development Program (CAEWDP), which aims to improve diagnostics and analytical tools to support the countries of Central Asia in well-informed decision making to manage their water and energy resources, strengthen regional institutions, and stimulate investments. The main components of CAEWDP are energy development to promote highest-value energy investments and management; energy-water

¹³ Second National Communication of Tajikistan to the UNFCCC.

¹⁴ Global Forest Resources Assessment. 2010. Country Reports. Tajikistan. Food and Agriculture Organization of the United Nations.

links to improve the understanding of the energy-water nexus at the national and regional levels; and water productivity to enhance the efficiency of water use in both the agriculture and energy sectors. In response to a request by the government of Tajikistan, the World Bank is also supporting assessment studies for the proposed Rogun Regional Hydropower Project, evaluating the viability of the project according to international standards. In addition, the Bank is supporting Tajikistan to improve the climate resilience of drinking water supplies in several cities through rehabilitation of water supply infrastructure.

Other international development partners are also actively supporting improvements in the Tajik water sector. The **German Federal Enterprise for International Cooperation (GIZ)** on behalf of the **German Federal Foreign Office** and co-funded by the **European Union** is supporting transboundary management of water resources in Central Asia, including Tajikistan, and the **Food and Agriculture Organization** is working on sustainable use of water and energy resources for agricultural production and livelihood improvement as well as capacity building for sustainable management of mountain watersheds. As part of the PPCR phase II, the **Asian Development Bank** is working with the Ministry of Land Reclamation and Water Resources to reduce the vulnerability of some of the most vulnerable communities in the Pyanj River Basin to droughts, floods, and other climate-related risks.

Health

Health indicators in Tajikistan are among the lowest in the ECA region, with poor health outcomes, misallocation of staff and other resources, inequality of access between urban centers and rural areas, inefficient production of care, and hospital overcapacities. Climate change could translate into new or more severe health risks, such as water/vector-borne diseases on low-lying areas or heat stress. Scarcer and warmer water in rivers could facilitate the spread of waterborne diseases like cholera or malaria (which are already rising because of both biological and chemical factors), particularly in low-elevation areas, while high-elevation areas could experience an increased vulnerability to malaria and infectious and noninfectious diseases with increased warming. Rise of extreme summer temperatures could also lead to higher infant and adult mortality. There is a need to improve existing programs on enhancement of maternal and infant health, taking into consideration climate change factors, as well as to develop research on the impacts of climate change on human health.

The **World Bank Group** has supported Tajikistan to improve access to safe, clean drinking water and better sanitation. In addition, the Bank has been engaged in providing better health care services through renovating parts of the Primary Health Care network and provision of primary health care services.

A few development partners are involved in health-related activities in Tajikistan, including the **Swiss Agency for Development**, which is supporting Tajikistan's health sector reform in a number of ways, among them by working with the Ministry of Health to develop family medicine services. Re-training and support is being offered to health professionals, along with assistance in the necessary rehabilitation of

primary health care facilities. Advice is also being provided on how to finance health services in an efficient and transparent manner.¹⁵

Transport

The transport network of Tajikistan plays a critical role for shipping goods, services, and individuals through a complex mountainous terrain that is characterized by the considerable remoteness of many residential settlements and industrial clusters. The transport system includes railroads of 500 kilometers and 13.5 thousand kilometers of automobile roads, while other major projects are nearing completion, enabling a year-round transport circulation and communication within the main regions of Tajikistan and its neighbors. Climate change could put these infrastructures at risk through mudslides, landslides, and flood brought by permafrost thawing and glacial outburst, and new or more severe or frequent climate-induced hazards must be taken into account to safeguard such infrastructure.

Among the development partners, the **Asian Development Bank** has a large portfolio in the transport sector aimed at improving local and regional connectivity, such as supporting road improvement through rehabilitation and reconstruction of the road between Ayni-Panjakent and the border with Uzbekistan. The ADB is also leading the dialogue of the CAREC Program, mainly aimed at improvement of CAREC Corridors 3 and 5 and the sub-network connectivity, as well as institutional strengthening of project management, contract supervision, and efficient road maintenance. The **European Bank for Reconstruction and Development**, through the Municipal and Environmental Infrastructure project, is providing advice on the restructuring of the institutional and regulatory framework for public transport in Dushanbe. The **United Nations Development Programme** and the **Global Environment Facility** are working with the Ministry of Transport to reduce GHG emissions and to improve access to public transportation services in Dushanbe.

Disaster Risk Reduction

Tajikistan is a country prone to natural disasters. From 1997 to 2009, natural disasters led to the loss of 933 lives and damages amounting to 1.15 billion somoni. The floods of 1998 and 1999 were especially devastating, causing 32 deaths and agricultural and infrastructure damage estimated at US\$55 million. Tajikistan's worst drought was in 2000 and affected about 3 million people (or half the country population at that time). Most of the floods occur during heavy rain in springtime or snowmelts in summer. Flash floods can be very destructive in the valleys. Some 85 percent of Tajikistan's area is threatened by mudflows and 32 percent of the area is situated in high mudflow zones. Almost all of the hazards that threaten Tajikistan in the short term are linked with climate and weather conditions. Rainfalls cause avalanches, mudflows, floods, and severe winter storms that very often result in landslides.

The **World Bank Group**, under the PPCR phase II, is supporting the Improvement of Weather, Climate and Hydrological Service Delivery project. Due to the high level of precipitation in winter 2011/2012, the

¹⁵ See http://www.swiss-cooperation.admin.ch/centralasia/en/Home/Activities_in_Tajikistan/HEALTH_CARE_PROGRAM.

World Bank also provided support to the Tajikistan government to mitigate forecasted spring flood risks in 2012. The **Asian Development Bank** is supporting Tajikistan through several projects on flood risk management, including the Community Participatory Flood Management project in Khatlon province. The **German Federal Enterprise for International Cooperation** (GIZ) is implementing projects for stabilizing livelihoods through disaster management and climate change adaptation in Tajikistan.

IV Conclusions

Tajikistan is significantly threatened by climate change, with serious risks already in evidence. The trend of temperature increase in Tajikistan is expected to continue, leading to a rise in annual average temperature of 0.2–0.4°C by 2030. In addition, more variable precipitation and snow, increased aridification and desertification, glacier melt and permafrost thawing, and more extreme weather events and climate-related hazards will pose additional challenges to an already vulnerable country. Recent droughts and weather extremes have pointed out inadequacies in the climate resilience of major sectors. Economic losses related to these events are on average around 1 percent of GDP per year. Threats to agricultural production and rural livelihoods (from degradation of arable land and pastures) will increase with projected higher temperatures, reduced rainfall, melting glaciers, and increased frequency of extreme events such as floods, droughts, and storms.

Looking Ahead

Tajikistan, in collaboration with international development partners, is implementing several adaptation and mitigation projects in a number of climate-sensitive sectors. These, to some extent piecemeal efforts, do not necessarily address all the challenges that the country is facing on its path to low-carbon, climate-resilient development. In this regard, an additional level of screening of climate portfolio, which will include the identification of gaps, outlining future national and regional actions, and estimating the investment resources, is needed.

Based on the review of national climate context, related challenges, and existing programs and policies, several areas have been identified for urgent initial actions that could help Tajikistan mainstream climate considerations into development activities and planning as well as create public demand for climate actions.

Improving Science-Based Understanding of Climate Change Impacts

In order to initiate and strengthen an evidence-based dialogue on climate action among key stakeholders, further science-based analysis of the nature and magnitude of physical and biophysical climate change impacts under different scenarios is needed. Such analysis will provide a better understanding of the timing and magnitude of incidence of several important indicators of climate change in the future, as well as identify the key vulnerabilities, development impacts, and possible adaptation responses. Finally, the scientific analysis will also serve as a basis for further identification of

development responses at the national and regional levels as well as for institution building, priority setting, implementation, and results monitoring.

Estimating Cost of Inaction

The analysis of climate change impacts and associated economic costs across water, energy, agriculture, forestry, transport, and health sectors is necessary in order to provide compelling economic arguments in favor of climate action. Furthermore, such analysis is needed in order to inform the national and regional planning on appropriate policy responses that are likely to reduce GHG emissions as well as strengthen local adaptive capacity needed to improve climate resilience. Finally, the economic analysis of cost of inaction is also needed to form a basis for a broad-brush “road map” and the next steps for climate-smart actions.

Designing and Implementing Climate-Smart Solutions

Meeting the challenges of climate change offers numerous “no regrets” sectoral, climate-conscious strategies that can enhance climate resilience while generating immediate development benefits. An identification and effective implementation of climate-smart solutions (such as those related to improved disaster risk management, hydromet services, climate risk assessments, water resource management, climate resilient agriculture, performance of water utilities and energy systems, and others) also have significant global co-benefits, such as contributing to global efforts to reduce GHG emissions. Finally, such solutions form a necessary basis for enhanced regional collaboration and a foundation for national and regional institution building.

Expanding the Pilot Program for Climate Resilience (PPCR) Secretariat’s Mandate on Climate Change

Even though the emerging climate change impacts in Tajikistan are well recognized and the country, with support from development partners, is implementing a number of activities aimed at reducing vulnerability and mitigating climate change impacts, these issues do not yet receive the priority they need within the existing policy and institutional contexts. In order to integrate and effectively implement low-carbon, climate-resilient considerations into development planning, national coalition building efforts and cross-sectoral participation among relevant stakeholders would need to be strengthened and scaled up. Such efforts would, in turn, improve the country’s institution readiness and associated capacity.

To support and facilitate such process, there is a need to expand the **PPCR Secretariat’s** mandate to coordinate and implement country-supported adaptation projects. Currently, the PPCR Inter-Ministerial Committee—chaired by the deputy prime minister—the Steering Group, and the PPCR Secretariat oversee PPCR activities. This expanded role aims to ensure the integration of low-carbon, climate-resilient considerations into development planning by providing overall guidance, political support, and leadership, ensuring adequate resource allocation and monitoring the results related to national efforts to address and adapt to climate change.

In order to ensure its operationalization, the roles of the existing **Steering Committee** and **technical working group** would need to be expanded to match that of the PPCR Secretariat. The technical working group would be empowered by the Steering Committee's decisions, comprise technical staff from the line ministries and agencies, and ensure the implementation of policies and actions on the ground.

Enhancing Regional Coordination Mechanism on Climate Change

Climate change poses a common challenge to all countries in Central Asia, making regional and international collaboration essential to achieving low-carbon, climate-resilient growth in each of them. Despite a number of important national-level adaptation and mitigation actions that Tajikistan is undertaking, the country will be better equipped to address climate change impacts within a framework for scaled-up regional collaboration on climate-related data sharing, disaster risk management system and crisis responses, development of climate-resilient infrastructure, technology transfer, and others. As a result, regional programs would be leveraged for effective implementation of national actions.

In order to enable such processes, a **Regional Central Asian Steering Committee on Climate Change** would need to be established. The committee would comprise high-level representatives from the five Central Asian countries and international development partners as its members. The committee's main responsibilities would be to provide an overall guidance, political support, and leadership and to serve as a vehicle for continuous coordination of regional efforts to address and adapt to climate change.

In order for the broad policy directions to be implemented, such regional committee would need to be supported by a **Regional Central Asian Secretariat on Climate Change**, which would be jointly established by the five Central Asian countries and international development partners. The secretariat would be headquartered in a given Central Asian country (to be determined by the countries themselves) and function either as an independent unit or within an existing regional institution. It would serve as a facilitation unit and support governance bodies of the committee, carry out regional communication and resource mobilization efforts, help establish or host regional centers of excellence, and work with the national-level committees.

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Notes
