



Kyrgyz Republic

Overview of Climate Change Activities

October 2013



This **Overview of Climate Change Activities in the Kyrgyz Republic*** is part of a series of country notes for five Central Asian countries that summarize climate portfolio in a number of sectors, namely agriculture, forestry, water, health, energy, 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. This note further provides a brief overview of the Kyrgyz Republic 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 as well as suggests potential ways forward that could help the Kyrgyz Republic mainstream climate considerations into development activities and planning and create public demand for climate actions.

**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 the Kyrgyz Republic

- Over 80 percent of the country is within the Tian-Shan mountain chain and 4 percent of this area is permanently under ice and snow.
- Meteorological data series show a steady increase of both annual and winter temperatures since the beginning of the past century of approximately 0.8°C.
- The overall warming trend suggests a likely increase of 2°C in average mean temperature by 2060 and of 4–5°C by 2100.
- The most significant precipitation reduction is expected during the summer months, while the increase in precipitation is estimated for the winter period.
- The glaciers of the Tian Shan Mountains, a critical source of water, have declined sharply in the past 50 years, with an accelerated retreat in the past two decades.
- The projections suggest a likely increase in surface water-flow during the period between 2020 and 2025, which is expected at the expense of glacier melting, followed by the significant reductions in surface flow.

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 of 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.
- **Reinforce** the mission and strengthen the capacity of the existing Climate Change Coordination Committee (CCCC) as well as examine and enhance the role and capacity of the State Agency of Environmental Protection and Forestry.
- **Establish** (or use an existing mechanism) a Regional Central Asian Steering Committee on Climate Change, comprising high-level representatives from the five Central Asian countries. The committee's main responsibilities would be to provide 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.

Kyrgyz Republic at a Glance**

Population (million): 5.582 (2012)
 GDP (current US\$ billion): 6.473 (2012)
 GDP per capita (current US\$) / GDP growth (%): 1,159 / -0.9 (2012)
 CO₂ emissions (kt): 6,398.9 (2010)
 CO₂ emissions (% of world CO₂ emissions): 0.02 (2010)

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

Table of Contents

I Climate Context: Understanding the Implications.....	1
Overview and Historical Trends.....	1
Climate Projections.....	2
II National Policy and Institutional Context for Addressing and Adapting to Climate Change.....	3
Policies.....	3
Institutions.....	5
III Overview of Development Partners' Engagement in Climate-Sensitive Sectors.....	6
Energy.....	6
Agriculture.....	7
Forestry.....	9
Water.....	10
Transport.....	11
Health.....	11
Disaster Risk Reduction.....	12
IV Conclusions.....	13
Looking Ahead.....	14

I Climate Context: Understanding the Implications

Overview and Historical Trends

The Kyrgyz Republic is a landlocked country located in northeastern Central Asia between two major mountain systems, the Tian Shan and the Pamir. It borders Kazakhstan to the north, Uzbekistan to the west, Tajikistan to the southwest, and China to the east. Over 80 percent of the country is within the Tian Shan mountain chain, and 4 percent of this area is permanently under ice and snow.¹ Therefore, a vast majority of the Kyrgyz Republic's population (5.582 million in 2012) inhabits only 20 percent of the country territory (valley and foothill climatic

zones), the area which is considered to be habitable year-round and where most of the economic activity is concentrated.

Approximately 94 percent of the Kyrgyz Republic's territory is located at altitudes higher than 1,000 meters and almost 40 percent at higher than 3,000 meters above sea level. Observed average surface temperatures is directly related to the country's territorial configuration and it ranges from 10°C in the areas at altitude lower than 1,000 meters to -5°C in the areas at altitude higher than 3,000 meters.² In terms of the historical trends related to the average surface temperature, meteorological data series show a steady increase of both annual and winter temperatures since the beginning of the past century of approximately 0.8°C.³

Unlike the average surface temperature, the annual precipitation does not seem to be directly correlated to altitude. The average annual precipitation is comparable for most of the climatic zones in the Kyrgyz Republic; it ranges from 421 millimeters in the northeastern part of the country to 456 millimeters and 521 millimeters in the northwestern and southwestern regions, respectively. A lower annual precipitation of 294 millimeters has been observed within the Tian Shan Mountains.⁴

The Kyrgyz Republic has more than 8,500 glaciers, spanning an area of 8,000 kilometers. The glaciers of the Tian Shan Mountains, a critical source of water, have declined sharply in the past 50 years, with an

¹ Kyrgyz Republic Climate Adaptation Profile, Climate Change Knowledge Portal.

http://sdwebx.worldbank.org/climateportalb/home.cfm?page=country_profile&CCode=KGZ.

² Second National Communication of the Kyrgyz Republic to the United Nations Framework Convention on Climate Change (UNFCCC), 2009.

³ Kyrgyz Republic Climate Adaptation Profile, Climate Change Knowledge Portal.

http://sdwebx.worldbank.org/climateportalb/home.cfm?page=country_profile&CCode=KGZ.

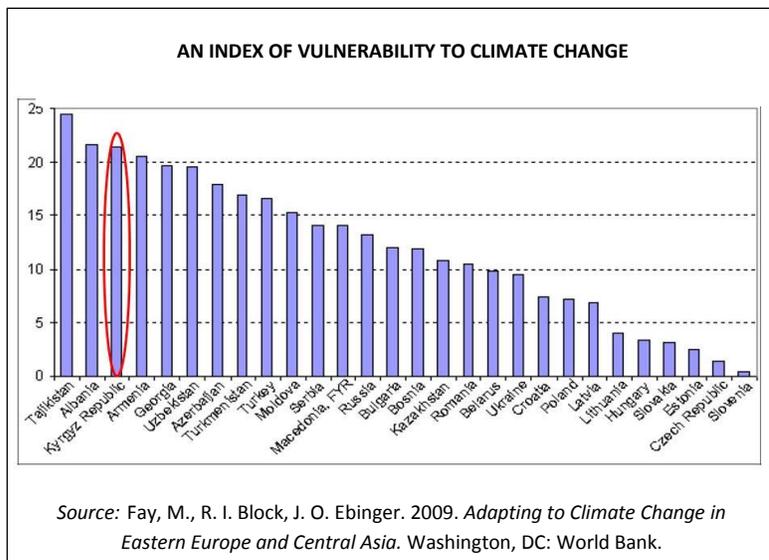
⁴ Second National Communication of the Kyrgyz Republic to the UNFCCC.

accelerated retreat in the past two decades.⁵ Because glaciers provide the large proportion of water flow to the major rivers of Central Asia, this loss has already impacted the water flow.

Climate Projections

The Kyrgyz Republic is significantly threatened by climate change, with serious risks already in evidence. Using the simplified index of vulnerability to climate change, the country ranks as the third most vulnerable among all Europe and Central Asia (ECA) countries due to both the impacts of climate change themselves and the country's social and productive structures.⁶

The summary of climate projections for the Kyrgyz Republic is as follows:



- The trend in temperature increase is expected to continue and further accelerate in the near future, with similar temperature increases foreseen under different climate scenarios. The overall warming trend is indisputable, suggesting an increase of 2°C in average mean temperature by 2060 and that of 4–5°C by 2100.⁷ In addition, it is important to emphasize that projected temperature increase is expected to be higher during summer months, while minimal increase is forecasted for the winter period.⁸ Such estimates suggest that the impacts of increasing temperature are likely to be even more severe than what the yearly averages suggest.
- According to the Intergovernmental Panel on Climate Change's 4th Assessment Report, an increase in winter precipitation and a decrease in summer precipitation are projected for Central Asia. The low resolution of available global circulation models (GCMs), however, inadequately captures the topographic diversity and resulting precipitation dynamics across the Kyrgyz Republic.⁹ In the Second National Communication of the Kyrgyz Republic to the United Nations Framework Convention on Climate Change (UNFCCC), insignificant changes in overall annual precipitation are projected compared to the baseline period between 1961 and 1990. However, in the Kyrgyz Republic, as it is for Central Asia as a whole, the most significant

⁵ Marianne Fay, Rachel I. Block, Jane O. Ebinger, *Adapting to Climate Change in Eastern Europe and Central Asia* (Washington, DC: World Bank, 2009).

⁶ Ibid.

⁷ Kyrgyz Republic Climate Adaptation Profile, Climate Change Knowledge Portal. http://sdwebx.worldbank.org/climateportalb/home.cfm?page=country_profile&CCCode=KGZ.

⁸ Second National Communication of the Kyrgyz Republic to the UNFCCC.

⁹ Kyrgyz Republic Climate Adaptation Profile, Climate Change Knowledge Portal. http://sdwebx.worldbank.org/climateportalb/home.cfm?page=country_profile&CCCode=KGZ.

precipitation reduction is expected during the summer months, while the largest increase in precipitation is estimated for the winter period.¹⁰ Such estimates suggest that the changes in the precipitation regime are likely to have more negative impacts on a number of sectors (most notably on the crop production) than what would changes in overall annual precipitation suggest.

- A significant reduction in the country's glaciers and snowfields is projected, with severe implications for the country's water resources. As glaciers shrink, floods will occur with greater intensity in some areas, while water scarcity will become more acute in others. According to the Second National Communication of the Kyrgyz Republic to the UNFCCC, an increase in surface water flow between 2020 and 2025 is expected (at the expense of glacier melting), followed by the significant reduction in surface flow that is likely to have severe impacts on almost all sectors, the country's ecosystems, and the economy in general.¹¹

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 the Kyrgyz Republic's aspiration to mainstream low-carbon, climate-resilient considerations into its broader sustainable development objectives.

The **National Strategy for Sustainable Development (NSSD) for 2013–17** is the first public document outlining the key directions for political, economic, and social development of the country that has been developed since its independence. The country's strategic vision outlined in this policy document is for the Kyrgyz Republic to become a developed country, governed by the rule of law and with a robust economic growth. Following these broad objectives, the strategy also emphasizes the importance of climate change considerations as part of a sustainable development approach for a sustainable use of natural resources to ensure sustainable economic growth via improvements in national competitiveness, intensification of development, and growing labor productivity. The main objectives related to environmental protection and security outlined in the strategy are the following:

- Improving the legislation on the use of natural resources and corresponding economic mechanisms in order to create favorable conditions for the application of technologies, attraction of "green" investments and adaptation to climate change;
- Ensuring the environmental impact assessment among planned commercial and other development projects;
- Improving a system of parameters for accounting and reporting on environmental pollution;

¹⁰ Second National Communication of the Kyrgyz Republic to the UNFCCC.

¹¹ Ibid.

- Creating a sustainable system of environmental control and monitoring and rationalizing the use of natural resources;
- Introducing new financial tools to promote green technologies via green taxes, customs duties, green procurement practices, and green investments in general;
- Improving energy efficiency and promoting renewable energy sources; and
- Providing support to economic sectors aimed at creating “green” jobs.¹²

The Kyrgyz Republic’s mitigation policies are being coordinated under the UNFCCC.

Legal Base for Implementation of the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol in the Kyrgyz Republic

The Kyrgyz Republic ratified the UNFCCC and the Kyoto Protocol in 2000, following which the necessary legal acts for the Convention implementation (Resolution 369 on the Execution Measures of the UNFCCC) were endorsed. The Kyrgyz Republic produced two national communications (in 2003 and 2009 respectively). The Third National Communication to the UNFCCC is under preparation.

Source: Second National Communication of the Kyrgyz Republic to the United Nations Framework Convention on Climate Change

The **Second National Communication of the Kyrgyz Republic to the United Nations Framework Convention on Climate Change (UNFCCC)** outlines expected climatic change impacts for all regions in the country until 2100. It also provides sector-specific implications of climate change as well as prioritizes the country’s adaptation measures as follows:

- Improving legislation (including the development of a national adaptation strategy to climate change that corresponding development plans across concerned sectors);
- Improving institutional structure through the creation of permanent structures and strengthening coordination among line ministries and departments;
- Developing the capacity and improving knowledge of key institutions and stakeholders; and
- Providing economic incentives for adaptation actions.

As noted above, in the Second National Communication, the Kyrgyz Republic identifies a few national-level policy actions specifically focused on adaptation to climate change. In this regard, the country is developing a **Climate Change Adaptation Plan for the Health Sector** led by the Ministry of Health. The country also created an interagency group tasked with the development of a **National Strategy and**

¹² National Sustainable Development Strategy for the Kyrgyz Republic for the period 2013–17. <http://www.president.kg/files/docs/NSSD-final-version-eng-Feb4.doc>.

Climate Change Adaptation Plan. The National Adaptation Strategy is expected to provide an overall framework for adaptation policies and programs in a number of sectors, namely energy, transport, health care, agriculture, and industry.

The **National Strategy for Ensuring Comprehensive Security of the Public and Territories of the Kyrgyz Republic in Emergencies and Crises for 2010–15**, adopted by the government of the Kyrgyz Republic in 2012, is the main document that determines the public policy related to emergency and crisis responses. It is aimed at ensuring a guaranteed level of protection of the country’s population and territories from emergencies within the range of reasonable risk.

Despite the above-described significant policy developments that have taken place in the Kyrgyz Republic related to its efforts to have a solid legislative basis for climate change mitigation and adaptation actions, there are several challenges in this area—namely, insufficient coordination and harmonization among existing and forthcoming legislative documents as well as the lack of implementation and enforcement of policies and laws.

Institutions

The institutional framework for addressing climate change in the Kyrgyz Republic consists of a number of ministries and agencies, each focusing on different aspects of this complex and multisectoral issue. Among others, they include the Ministry of Agriculture and Melioration, Water Resources and Processing Industry, Ministry of Emergency Situations, Ministry of Health, Ministry of Industry, Trade and Tourism, State Agency on Environmental Protection and Forestry, State Agency on Geology and Mineral Resources, State Inspection on Energy and Gas, and so on. Unlike most of the Central Asian countries, the Kyrgyz Republic is quite advanced in terms of the institutional framework for addressing and adapting to climate change.

The **Ministry of Ecology and Emergency Situations** had been initially appointed as a coordinating institution for the country’s international obligations under the UNFCCC. Under the Resolution of the President of the Kyrgyz Republic 281, dated July 18, 2005, the **National Committee on Climate Change**, with a standing working body (the Climate Change Center), was established and officially registered at the CDM Executive Council at the UNFCCC Secretariat. In accordance with the requirement of the Executive Council of the CDM, the main objective of the committee is the coordination of national activities for the execution of the country’s obligations under the UNFCCC and the Kyoto Protocol. The National Committee on Climate Change has recently been restructured as a Climate Change Coordination Committee (CCCC), with a scope of activities that goes beyond the Convention implementation.

The **Climate Change Coordination Committee (CCCC)**, chaired by the Vice Prime Minister of the Kyrgyz Republic, was established by a government decree in November 2012. Deputy Chairman of the Committee is the director of the **State Agency on Environmental Protection and Forestry**, which functions as the secretariat for the committee. The CCCC is responsible for implementation of inter-ministerial and cross-sectoral coordination as well as for strategic decision making. Although the committee has a well-defined scope of work, it is not yet operating in a systematic way, as it attempts to

respond to the requests from the line ministries and international development partners. Furthermore, the committee appears to lack a well-founded strategic thinking, which would be based on scientific analysis of projected risks and impacts, evaluation of economic and social implications of the climate change, and prioritization of adaptation responses, programming, and monitoring.

Even though there is a formal institutional structure in support of the country's actions aimed at achieving low-carbon, climate-resilient development, effective and efficient collaboration among the relevant ministries and agencies remains a challenge. In particular, there is a need to help the committee become more systematic and evidence-based in its approach to such coordination. Furthermore, the State Agency on Environmental Protection and Forestry has, to some extent, an indistinct mandate for coordination of concerned ministries.

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

According to the Second National Communication of the Kyrgyz Republic to the UNFCCC, there are four major areas of concern regarding climate change vulnerability: (1) water resources, (2) agriculture, (3) human health, and (4) climate-related emergencies.

International development partners have extensive portfolio of adaptation and mitigation projects in a number of climate-sensitive sectors. 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, is needed.

In the following sections, a brief overview of the development partners' major projects and activities is presented.¹³

Energy

The energy sector is one of the most significant sectors of the Kyrgyz economy. It plays an important role in the country's development as a supplier of electricity for the domestic market as well as some export markets. Currently, about 87 percent of generated electricity is consumed locally, with the remaining 13 percent directed for exports.¹⁴ A large share (approximately 90 percent) of the country's current generating capacity is hydropower, developed for the dual purpose of generating electricity and serving as the irrigation water supply.¹⁵ The Kyrgyz energy sector faces several challenges that are only expected to be exacerbated by climate change. Hydroelectric generation cannot meet peak winter demand, thermal generation plants are aging, large portions of the country depend on transmission

¹³ The overview of development partners' climate portfolio in the Kyrgyz Republic 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.

¹⁴ World Bank, "Kyrgyz Republic Climate Change Issues Paper," May 2013.

¹⁵ World Bank Group – Kyrgyz Republic Partnership Program Snapshot, April 2013.

lines that run through other countries, and the infrastructure at every level needs more maintenance.¹⁶ Climate change is expected to further deteriorate the energy sector in the country by reducing hydropower output, increasing demand, and threatening existing infrastructure. In particular, as climate change projections suggest reduction in water flows from 2030 onward, this decreasing hydrological potential combined with a growing economy, as well as overall energy losses and inefficiency, is likely to exacerbate supply problems, requiring imports of some estimated US\$200 million. While the overall warming trend is indisputable, suggesting an increase of 2°C in average mean temperature by 2060 and that of 4–5°C by 2100, the projected temperature increase is expected to be higher during summer months while a minimal increase is forecasted for the winter period. As a consequence, rising temperature will lead to somewhat minor decrease in duration of the heating season, while the duration of the cooling season could become longer by a more significant amount, resulting in an increase in energy demand. Finally, higher temperatures and extreme weather events, as well as natural disasters, could severely damage energy infrastructure in the Kyrgyz Republic.

The **World Bank Group** is playing an active and important role in supporting reforms and investments in the country's energy sector, particularly through the Electricity Supply Accountability and Reliability Improvement Project, which aims to support the implementation of the reform program in the power sector. The Bank is also assisting with the development of export markets (CASA-1000), identifying viable winter heating solutions, and improving financial sustainability. Finally, the Bank is also preparing an investment operation to reduce losses and revenue leakages through the establishment of a transparency and accountability framework in the largest distribution company.

Likewise, the international development partners have a number of engagements in the Kyrgyz energy sector. The **Asian Development Bank** (ADB), among other projects, is implementing the Power Sector Rehabilitation Project in the Kyrgyz Republic with the overall objective to improve energy supply, reduce system commercial losses, identify dam rehabilitation measures, and inform the public on sector developments. The **United Nations Development Programme** (UNDP) has a number of projects with the objective to both improve energy efficiency and scale up the use of renewable energy sources, as demonstrated in the projects Improving Energy Efficiency in Buildings and Small Hydro Power Development. In addition, the **U.S. Agency for International Development** (USAID) has a number of regional energy-related projects, of which the Kyrgyz Republic is a beneficiary, such as the Central Asian Energy Efficiency Support Program and the Regional Energy Security, Efficiency and Trade (RESET).

Agriculture

The agriculture sector in the Kyrgyz Republic generates about one fourth of the country's gross domestic product (GDP) and about one third of its employment. Sixty-six percent of the country's population resides in rural areas, but also 76 percent of the country's poor reside in rural areas, and most of them depend on agriculture for their livelihoods.¹⁷ Farm incomes are driven by irrigated agriculture (1.3 million hectares) and pasture-based livestock production (9 million hectares). The sector expanded rapidly between 1996 and 2002, but in the recent years, this growth trend has faced stagnation in terms

¹⁶ Ibid.

¹⁷ World Bank, "Kyrgyz Republic Climate Change Issues Paper," May 2013.

of the share of agriculture in the country's GDP.¹⁸ Agriculture is likely to be the hardest hit sector from a changing climate. Increasing temperatures, increased variability of precipitation, and the probable reduction in surface water are all likely to lead to an increase in aridity and accelerate desertification. The share of arid desert and semiarid areas is expected to increase from approximately 15 percent in 2000 to 23.3–49.7 percent in 2100.¹⁹ Livestock production dependent on grazing lands and the availability of precipitation for pasture growth and regeneration will also suffer, with the size and quality of pastures likely reducing in the inner Tian Shan, in the Ak-Say and Alai Valleys, among other areas.²⁰

The **World Bank** supports the agriculture sector in the Kyrgyz Republic through a number of projects, such as the Second On-Farm Irrigation Project, the Water Management Improvement Project, the Agricultural Investments and Services Project, and the Agricultural Productivity Assistance Project. Some examples of the projects' results include (a) the establishment of 481 water-users associations and the rehabilitation of 175,000 hectares of irrigation schemes; (b) the establishment of 454 pasture-users unions for community-based management of pastures; (c) demarcation of pasture boundaries nationwide, and increased access to an additional 50,000 hectares of pasture through community investment in bridges, tracks, and watering points; (d) training and equipping of over 1,000 private veterinarians and establishment of a veterinary chamber to accredit veterinarians, and (e) the creation of 299 community seed funds.²¹

Several development partners are also engaged in a wide variety of investment, technical assistance, and capacity-building efforts in the Kyrgyz agricultural sector, with the most significant investments aimed at modernizing and upgrading the sector infrastructure. While not all of these engagements were specifically tagged as climate change activities, they certainly contribute to resilience to climate change by enhancing agricultural productivity and efficiency. The **Asian Development Bank** mainly focused on improving the Kyrgyz land productivity. Examples of its projects include the Agriculture Area Development Project and the Southern Agriculture Area Development Project, both aiming at increasing land productivity and profitability. The **Food and Agriculture Organization (FAO)** focused specifically on improving “what and how-to” of agricultural and livestock production. In addition to promoting a national framework for development and food security in the Kyrgyz Republic, the FAO's projects also focused on modernizing agricultural production by moving away from unsustainable practices, such as the use of harmful pesticides, as well as on improving information exchange by supporting the creation of internal databases within the Department of water resources. The **European Union (EU)** targeted sustainable livelihoods, while the **U.S. Agency for International Development** mostly considered the economic implications of land productivity. Finally, the **Consortium of International Agricultural Research (CGIAR) Centers** are also actively supporting the Kyrgyz agricultural research system.

¹⁸ World Bank Group – Kyrgyz Republic Partnership Program Snapshot, April 2013.

¹⁹ Second National Communication of the Kyrgyz Republic to the UNFCCC.

²⁰ Ibid.

²¹ World Bank Group – Kyrgyz Republic Partnership Program Snapshot, April 2013.

Forestry

According to the national forest registry of the Kyrgyz Republic, the area of land under forests was 8,649 square kilometers in 2003, with an additional 3,089 square kilometers accounting for other forest-related lands, such as plantations, sparse forests, and other types of land suitable for reforestation.²² These forest ecosystems provide environmental services and economic benefits to local population (notably in mountainous areas), including access to firewood, timber, and non-timber forest products, such as nuts, berries, fruits, and medicinal herbs. Anthropogenic factors have led to a nearly 50 percent reduction in the area of forest ecosystems compared to the pre-World War II period, and climate change is likely to cause a shift in ecological zones and a potential loss of forest resources. Such shifts may contribute to a higher state of plant vulnerability and inability to adapt to new climate conditions. Coupled with poor forest management, as well as unauthorized and excessive felling, this represents a threat to the country's unique native walnut-fruit tree forests or areas of Schrenk's spruce, among others.

Activities of international development partners in the Kyrgyz forestry sector have focused on adaptation measures and the conservation of forests, as well as their sequestration potential and the sustainable use of pastures and fisheries. In this regard, the **Global Environment Facility (GEF)**-funded project Sustainable Management of Mountainous Forest and Land Resources under Climate Change Conditions aims to contribute to the sustainable management of mountainous silvo-agropastoral ecosystems in the Kyrgyz Republic by securing the flow of multiple ecosystem services. Initiated in March 2013, the project's three main components include (1) strengthening the enabling environment for sustainable forest and land management, (2) enhancing forest carbon stocks, and (3) promoting climate-friendly agriculture.

The **Food and Agriculture Organization** has been implementing a number of projects in the Kyrgyz forestry sector, such as the project Capacity Building for National Forest and Tree Resource Assessment and Monitoring, with the objectives to advance national efforts for the conservation and promotion of sustainable use of the forest and tree resources and to support translating international processes and principles into innovative national-level policies and programs. The **United Nations Development Programme** has also been active in the sector, as demonstrated in a number of GEF-financed projects that it has been implementing. Another example of UNDP engagement in the sector is the Rehabilitation Riparian Forests of Kyrgyzstan project, which aims at increasing the involvement of local communities in riparian forests management as well as at improving the activities on riparian forests rehabilitation located in the country's pilot territory. The **German Federal Enterprise for International Cooperation (GIZ)** is one of the most active organizations in the Kyrgyz forestry sector. Examples of GIZ-implemented projects on behalf of the **German Federal Ministry of Economic Cooperation and Development** and co-funded by the **European Union** include those on sustainable use of natural resources, such as forest, pasture and wildlife.

²² Second National Communication of the Kyrgyz Republic to the UNFCCC.

Water

Water reserves in the Kyrgyz Republic are concentrated in its glaciers, lakes, rivers, and underground reservoirs. There are about 3,500 rivers in the country; they form eight major hydrological basins that provide water not only for local needs but also for a large part of Central Asia. The Kyrgyz Republic uses around a quarter of its water resources for irrigation (93 percent of water intake), human consumption (4.6 percent), and productive purposes (2 percent), with the rest being subject to international water allocation treaties and allocation to Tajikistan, Uzbekistan, Kazakhstan, and China. In addition, water contributes to the generation of approximately 90 percent of the country's electricity.²³ Climate change is expected to have significant impacts on water resources. As noted above, estimates indicate that in the medium term (up to 2025), the country can expect an increase in water flow to about 55 cubic kilometers, deriving primarily from intensification in the melting of glaciers. In the long run (up to 2100), due to the glaciers melting, the projections suggest that the water flow will be reduced to about 20–42 cubic kilometers per year (using the current baseline of approximately 50 cubic kilometers).²⁴

The **World Bank Group** is playing an active and important role in supporting reforms and investments in the country's water resource sector. Since 2000, Bank financing has contributed to improved water and urban services in Bishkek, Osh, 23 small towns, and over 200 villages. Another example of the Bank's engagement in the Kyrgyz water sector includes the Second Rural Water Supply Project, which has so far completed works on the implementation of eight schemes and begun work in Chelpek, as well as made significant progress in supporting the government to develop the National Water Supply and Sanitation Sector Strategy.²⁵

International development partners are also actively supporting the improvements in the Kyrgyz water sector. The **Asian Development Bank** is implementing the Issyk-Kul Sustainable Development Project, with the objective to support environmental management and to improve urban service delivery in the Issyk-Kul Oblast. The ADB and government collaboration in Issyk-Kul is expected to ensure that urban services interventions will increase access to potable water and safe sanitation, including use of proven technologies for treatment and disposal of solid and liquid waste. The **European Bank for Reconstruction and Development** (EBRD) also has a number of projects in the sector, such as the Kyrgyz Republic Water and Wastewater Rehabilitation, which aims to improve access to basic public utilities; introduce tariff reform within affordability limits, including support to low-income groups; increase collection rates; and establish the contractual arrangement between the cities and the water companies. In addition, the Kyrgyz Republic is a beneficiary of several regional projects that are being implemented by a number of international development partners. Examples of such regional initiatives include the **European Commission's** project on Promoting Integrated Water Resource Management (IWRM) and Fostering Transboundary Dialogue in Central Asia, the **FAO's** Capacity Building for Sustainable Management of Mountain Watersheds in Central Asia and the Caucasus, and the **GIZ's** Transboundary Water Management in Central Asia (on behalf of the **German Federal Foreign Office** and the **European Union**), to name a few.

²³ Second National Communication of the Kyrgyz Republic to the UNFCCC.

²⁴ Ibid.

²⁵ World Bank Group – Kyrgyz Republic Partnership Program Snapshot, April 2013.

Transport

Due to its mountainous terrain and the lack of navigable waterways, road transportation is the main means of in-country transportation. The country's road and railroad systems are divided into two parts. The northern part is integrated with the transportation networks of Kazakhstan, and the southern part is integrated with the networks of Uzbekistan. The transport sector, which is primarily dominated by road transport, accounts for approximately a third of the total greenhouse gas (GHG) emissions in the Kyrgyz Republic.²⁶

A number of development partners are active in supporting the Kyrgyz transport sector. The **World Bank Group** is implementing a National Road Rehabilitation (Osh-Batken-Isfana) Project, with the objective of reducing transport costs and travel time along the Osh-Batken-Isfana road corridor, improving road safety planning and road asset management, and repairing and rehabilitating road infrastructure.

The **Asian Development Bank** has a number of projects in its portfolio related to the transport sector in the Kyrgyz Republic, with the most significant investments being made in the CAREC Transport Corridor 1 project. The **European Bank for Reconstruction and Development**, among others, is supporting the Bishkek Public Transport Project, aimed at developing and modernizing the trolleybus infrastructure in Bishkek.

Health

Among the Central Asian countries, the Kyrgyz Republic is relatively advanced in the recognition of the implications of climate change on health, as demonstrated in a report on the impact of climate change on the health of the population that was finalized in 2012. According to the report findings, climate change is likely to have direct impacts on human health through higher incidence of cardio-vascular diseases, increased rates of intestinal infections, and increased areas of high potential of malaria and spread of tick-borne diseases.²⁷ There are also likely to be indirect impacts related to food security, food and water safety, and increases in weather-related disasters.

The **World Bank Group** has an ongoing Health and Social Protection Project and the recently approved Second Health and Social Protection Project. These projects are designed with a great degree of flexibility and are based on annual work programs agreed upon by the Ministry of Health and donors. Hospital building codes are emerging as one of the priorities of these work programs, and climate change considerations are expected to be captured in the process of upgrading the codes. The development of contingency plans could also be implemented under these projects, along the lines of improved delivery of medical services and the targeting of specific conditions and diseases. For example, the Second Health and Social Protection Project specifically targets public health improvements related to cardiovascular diseases, as they represent one of the most salient health concerns in the context of a changing climate.

²⁶ Second National Communication of the Kyrgyz Republic to the UNFCCC.

²⁷ Adaptation Strategy in the Health Care Sector of the Kyrgyz Republic.

International development partners have also undertaken a range of activities in supporting climate change and health-related policies and programs. The **World Health Organization** (WHO), for instance, has conducted Health Vulnerability and Climate Change Adaptation Assessments that provided national-level evidence of the links between climate and health, improved understanding of local and specific health risks and vulnerabilities, supported capacity development activities, and served as a baseline analysis to monitor how health risks may be influenced by a changing climate over time.

Disaster Risk Reduction

The Kyrgyz Republic is exposed to a number of climate-related risks, including mudflows, floods, landslides, avalanches, sudden and sharp increases in wind speed, hail, snowstorms, heavy storms, and so on. Available data suggests that natural hazards constitute a major part of all economic losses in the country, with costs between 0.5 and 1.3 percent of annual GDP.²⁸ The highest incidence of emergencies comes from mudflows and floods (29 percent), followed by avalanches (11 percent) and landslides (6 percent). Vulnerability is exacerbated by inefficient infrastructure as well as expansion of human settlements into high-risk areas.²⁹ For instance, 3,103 rivers and 800 lakes in the high mountains are considered at risk for flooding from heavy rains and snowmelt. Between 1990 and 2008, more than 850 incidents of floods and mudslides were registered, 92 of which occurred during the first nine months of 2009. The Jalal-Abad, Osh, Batken, Chui, Issyk-Kul, and Talas regions face the highest risk of floods and mudflows.³⁰ This situation in terms of the Kyrgyz Republic's vulnerability to climate-related disasters is expected to worsen in the future. If disaster damage increases at the rate of population growth (1.1 percent per year), disaster damage from climate-related disasters could amount up to US\$156 million by 2032.³¹

The **World Bank Group** actively supports the Kyrgyz Republic to build resilience against future disasters. One example of the Bank's engagement in the country is the Disaster Hazard Mitigation Project (DHMP), with the objectives to minimize the exposure of humans, livestock, and riverine flora and fauna to radionuclides associated with abandoned uranium mine tailings and waste rock dumps in the Mailuu-Suu area, improve the effectiveness of emergency management and response by national and subnational authorities and local communities to disaster situations, and reduce the loss of life and property caused by hazardous landslides. An additional example is the Central Asia Hydrometeorology Modernization Project (CAHMP), aimed at improving the accuracy and timeliness of hydromet services in Central Asia, and focusing particularly on the Kyrgyz Republic and Tajikistan. Other examples include projects on upgrading of the management information system and early warning system, strengthening the Kyrgyz Republic's disaster risk reduction and response institutions.

²⁸ Kyrgyz Republic Climate Adaptation Profile, Climate Change Knowledge Portal.
http://sdwebx.worldbank.org/climateportalb/home.cfm?page=country_profile&CCode=KGZ.

²⁹ David Rogers, Marina Smetanina, and Vladimir Tsirkunov, *Improving Weather, Climate and Hydrological Services Delivery in Central Asia (Kyrgyz Republic, Republic of Tajikistan and Turkmenistan)* (Washington, DC: World Bank)

³⁰ Kyrgyz Republic Climate Adaptation Profile, Climate Change Knowledge Portal.
http://sdwebx.worldbank.org/climateportalb/home.cfm?page=country_profile&CCode=KGZ.

³¹ Kyrgyzstan Climate Risk Profile, CAMP Alatoo in collaboration with UNDP Central Asia Climate Risk Management Program, August 2013.
<http://cdkn.org/wp-content/uploads/2013/08/Kyrgyzstan-Climate-Risk-Profile-Report.pdf>.

International development partners are also active in the field of disaster risk reduction and management. One example of a disaster risk and management project is the **United Nations Development Programme's** Climate Risk Management Project, aimed at strengthening the resilience of herder communities in the Susamyr Valley by improving climate risk management (CRM). This project is expected to enable stakeholders to overcome the main barriers through the implementation of strategic activities in terms of creating an enabling environment for integration of CRM at systemic, institutional, and individual levels; demonstrating climate-resilient pasture management in the Suusamyr Valley; and managing knowledge and generating lessons from CRM.

IV Conclusions

The Kyrgyz Republic is significantly threatened by climate change, with serious risks already in evidence. The trend in temperature increase is expected to continue and further accelerate in the near future, with the overall warming trend suggesting an increase of 2°C in average mean temperature by 2060 and that of 4–5°C by 2100. As is the case for Central Asia as a whole, in the Kyrgyz Republic the most significant precipitation reduction is expected during the summer months, while the increase in precipitation is estimated for the winter period. A significant reduction in the country's glaciers and snowfields is projected, with severe implications for the country's water resources.

Currently, there are several important legal documents and recent policy developments that are a good basis for the Kyrgyz Republic's aspiration to mainstream low-carbon, climate-resilient considerations into its broader sustainable development objectives. The National Strategy for Sustainable Development (NSSD) for 2013–2017 is the first public document outlining key directions for political, economic, and social development of the country that has been developed since the Kyrgyz Republic's independence. Other important documents include the Second National Communication of the Kyrgyz Republic to the United Nations Framework Convention on Climate Change (UNFCCC), the National Strategy for Ensuring Comprehensive Security of the Public and Territories of the Kyrgyz Republic in Emergencies and Crises for 2010–2015, and the currently under preparation National Adaptation Strategy. Despite these significant policy developments, however, there are still several challenges related to the Kyrgyz Republic's efforts to have a solid legislative basis for climate change mitigation and adaptation actions. Among others, they include the insufficient coordination and harmonization among existing and forthcoming legislative documents as well as the lack of effective implementation and enforcement of policies and laws.

The institutional framework for addressing climate change in the Kyrgyz Republic consists of a number of ministries and agencies, each focusing on a different aspect of this complex and multisectoral issue. The Kyrgyz Republic is quite advanced in terms of the coordination of the national mitigation and adaptation actions, as demonstrated in the recently established Climate Change Coordination Committee, which is responsible for implementation of interministerial and cross-sectoral coordination as well as for strategic decision making. Even though there is a formal institutional structure in support

of the country's actions aimed at achieving low-carbon, climate-resilient development, an effective and efficient collaboration among the relevant ministries and agencies remains a challenge.

Looking Ahead

The Kyrgyz Republic, 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 the Kyrgyz Republic 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.

Enhancing National Coordination Mechanism on Climate Change

The emerging climate change impacts in the Kyrgyz Republic 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. 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 reinforce the mission and strengthen capacity of the existing **Climate Change Coordination Committee**. While the committee's role of ensuring the integration of low-carbon, climate-resilient considerations into development planning by providing overall guidance, political support, and leadership is an important first step in the process, the committee's ability to become more systematic and evidence-based in its approach to coordination, priority setting, resource allocation, and results monitoring would need to be improved.

In order to facilitate the operationalization of the committee's mission, the role and capacity of the **State Agency on Environmental Protection**, which currently serves as the secretariat for the committee, would also need to be examined and enhanced.

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 the Kyrgyz Republic 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 systems 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 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.

The note was prepared by a team led by Jitendra Shah, Climate Change Coordinator in Europe and Central Asia Sustainable Development Department (ECSEN), and comprising Maja Murisic (WBICC), Nina Rinnerberger (ECSEN), and Tamara Ashley Levine and Jitendra Srivastava (Consultants). Contributions were received from Malcolm Childress (ECSEN), Philippe Ambrosi (ECSEN), and Meerim Shakirova, Sai Sudha Kanikicharla, Flavius Mihaies, and Lesley Pories (Consultants). The report was prepared under the overall guidance and supervision of World Bank management, including Saroj Kumar Jha (Regional Country Director, Central Asia), Laurent Debroux (Sector Leader, Sustainable Development Sector Unit), Alexander Kremer (Country Manager, Kyrgyz Republic), and Kulsum Ahmed (Sector Manager, Environment and Natural Resources). Editorial support for e-Publishing was received from Sydnella Kpundeh (ECSSD) and Jane Sunderland (Consultant). Comments and inputs from the governmental agencies and other stakeholders who have contributed to this draft report are much appreciated. Funding for the report was provided by the Central Asia Energy-Water Development Program (CAEWDP) and the World Bank.

Notes
