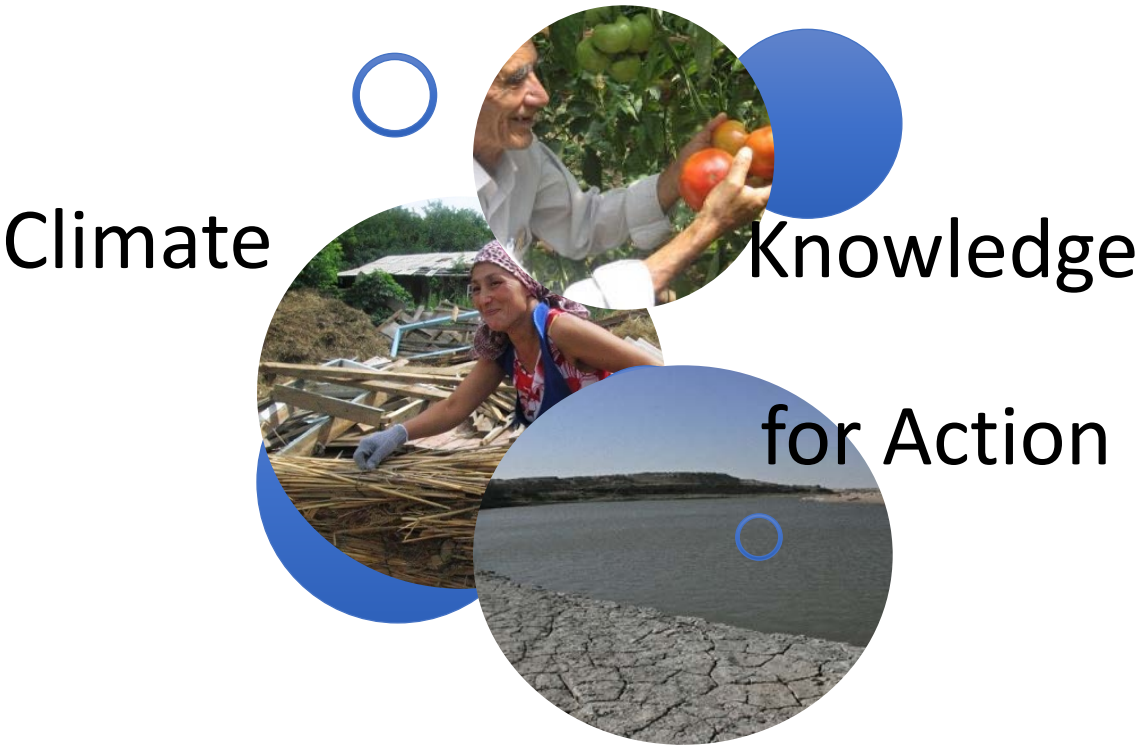
Regional Summary Report



CAMP4ASB Component 1.1
FINAL REPORT
May 2017

This report has been produced with the support of the World Bank, through the Climate Adaptation and Mitigation Program for Aral Sea Basin (CAMP4ASB). The findings, interpretations and conclusions expressed herein are those of the authors and do not necessarily reflect the view of the World Bank Group, its Board of Directors or the governments they represent.

The development objective of the CAMP4ASB Project is to enhance regionally coordinated access to improved climate change knowledge services for key stakeholders (e.g., policy makers, communities, and civil society) in the Central Asian republics, as well as to increase investments and capacity building that, combined, will address climate challenges common to these countries. Please follow the link to learn more about the CAMP4ASB.

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List of Abbreviations Used

ACF	Asian Credit Fund
CAMP4ASB	Climate Adaptation and Mitigation Program for Aral Sea Basin
CAREC	Central Asia Regional Environmental Center
CGIAR	Consultative Group on International Agricultural Research
CIS	Commonwealth of Independent States
ECHO	European Civil Protection and Humanitarian Air Operations (EU)
EU	European Union
GEF	Global Environmental Facility
GIZ	German Agency for International Cooperation (Deutsche Gesellschaft für Internationale Zusammenarbeit)
hydromet	hydrometeorological agency
ICARDA	International Centre for Agricultural Research in Dry Areas
ICBA	International Center for Biosaline Agriculture
ICSD	Interstate Commission on Sustainable Development
IFAS	International Fund for the Aral Sea
INC	Initial National Communication (to the UNFCCC)
MoU	Memorandum of Understanding
OECD	Organization for Economic Cooperation and Development
OSCE	Organization for Security and Cooperation in Europe
SEFF	Sustainable Energy Financing Facility (EBRD credit line)
SNC	Second National Communication (to the UNFCCC)
SWFDP	Severe Weather Forecasting Demonstration Project
TNC	Third National Communication (to the UNFCCC)
UN	United Nations
UNDP	UN Development Program
UNECE	UN Economic Commission for Europe
UNEP	UN Environmental Program
UNESCAP	UN Economic and Social Commission for Asia and the Pacific
UNESCO	UN Educational Scientific and Cultural Organization
UNFCCC	UN Framework Convention for Climate Change
WHO	World Health Organization
WMO	World Meteorological Organization

Executive Summary

The following report was designed to answer two questions: *What kinds of climate-related information and knowledge do stakeholders in Central Asia need, and how would they like to receive and use information?* It draws upon working meetings in Almaty, Dushanbe, and Tashkent with more than one hundred participants; structured interviews with 36 key informants, interviews with 14 representatives of international organizations, and a desk review.

Institutions and Stakeholders

The UNFCCC process has been an important driver in the process of reporting on climate change, and the National Communications are key milestones in collecting and presenting information on climate change. Central Asian countries have two types of institutional arrangements related to climate change information and planning: arrangements related to information and planning within the country, and arrangements related to international institutions where data exchange is governed by treaties and MoUs. Current and prospective users of climate information vary widely by geographic distribution, level of education, language capabilities, and professional functions. Key stakeholders at the country level include hydromet agencies, ministries, scientific and research institutions, academia, NGOs, and the private sector. At other levels, stakeholders include sub-national administrations, farmers, local resource user associations, local NGOs, schools, and households. Actors at the international level include regional government coalitions, international organizations, multilateral development banks, global trust funds, bilateral development assistance programs, and international NGOs. Each organization has a separate system for collecting, managing, and archiving project-generated data and knowledge related to climate change, and there is a lack of standardization regarding data formatting and preservation.

Stocktaking

The stocktaking evaluated capacities to generate, access, and use climate-related information and knowledge, as well as capacity to implement programs and engage stakeholders. The stocktaking exercise found that awareness levels regarding climate change vary by geographic sub-region, socio-economic status, levels of education, and gender. It also identified multiple needs assessments, which indicated that the level of climate data and information exchange varies among countries in the region, as does the type of information that is produced and publicly available. While the stocktaking identified a tremendous volume of information and knowledge available via the internet, these resources were not easily accessible for planning and decision-making. Existing knowledge needs are only partially translated into relevant research strategies and programs, and additional support is needed in order to link research findings to policy development and implementation.

The stocktaking also found that donor-funded initiatives over the past 15 years have generated many curricula, e-courses, and training materials on climate change, but there is no common repository for these materials. It also identified the need to strengthen resource mobilization support the development of stakeholder participation in decision-making.

Gap Analysis and SWOT Analysis

The data/information most frequently requested by the 36 key informants was climate data and weather forecasts and climate projections. All stakeholder groups requested annual forecasts, forecasts relevant to the agricultural sector, and forecasts and projections for specific regions (e.g. river basins, provincial centers). Early warning data and disaster risk-related information were mentioned in responses related to climate data, climate forecasts, maps, and analytical reports. The three most requested training topics were specific adaptation measures, sectoral vulnerability assessment, and general climate change issues, respectively. The two most popular responses were options where training would be customized by sector, which might indicate a preference for customized programs. Food security was also a relatively popular topic, and training on adaptation measures was more frequently requested than mitigation measures. On-site training was the most popular option among all three stakeholder groups, while in-person training courses placed second.

Strengths identified in the SWOT analysis included the data, information, and knowledge from climate change databases and websites online that are relevant to Central Asia, more than 50 large-scale investment and technical assistance projects implemented in participating countries, the long regional tradition of hydro-meteorological data collection and processing, and the capacity of NGOs, particularly in work with rural communities. Good practices regional stakeholder programs are listed in Figure 3. *Weaknesses* included a relatively low rate of project replication, low sustainability of project-based knowledge, constraints due to language barriers, lack of access to the internet, and lack of experience and time.

The project offers several *opportunities*, including the possibility of delivering on-line information and knowledge to key off-line user groups. The project also identified stakeholders in scientific and academic institutions, government agencies, and other organizations with a wide variety of information that they were willing to share. Finally, stakeholders identified agriculture and water resources management as areas where interest in regional cooperation was strong. Primary *threats* to a climate information portal and capacity strengthening initiative included high turnover in climate change staff, especially in state agencies.

Conclusions and Recommendations

The primary challenge facing the platform is contained in the CAMP4ASB Project Development Objective: "To enhance *regionally coordinated access to improved climate change knowledge services* for key stakeholders…."[1] The CAMP4ASB platform can bring value added to the existing body of climate data and information if it focuses on *interface* with its on-line and off-line users. There is a sustained need for in-country experts to package information in a format that stakeholders can understand and use. The platform must reach stakeholders where they are and provide them with the information they need in a format they can use. In short, *the success of the platform will depend as much on communication as on information technology*.

- Recommendation 1: The platform should be a **"Platform +"** (платформ плюс), or a hardware and software platform *plus* skilled intermediaries who can ensure that timely and suitable climate information and knowledge reach the "last user," particularly stakeholders who will not be using the platform directly.

[1] World Bank, 2015: 6.

- Recommendation 2: Activities to strengthen capacity should be linked directly to the gaps identified in the project consultations. They should cultivate intermediary groups such as independent experts, teachers, and NGOs, which already have experience with gathering, analyzing, and communicating climate change information and knowledge in relevant formats and languages. Table 8 suggests specific programming measures.

- Recommendation 3: The platform and interface should include a long-term data management plan to manage and archive information and a mechanism for stakeholder input on the types of information that are collected, archived, and produced for on-line and off-line use.

- Recommendation 4: Both the platform and interface should take men's and women's differing needs into account. Project activities and project management governance mechanisms should be gender-sensitive. Interface mechanisms (printed, audio-visual, person-to-person) should also take gender considerations into account. Finally, any gender-related considerations affecting access to training, participation, and project M&E, particularly in rural areas, should be noted and addressed.

1. Introduction

The following report was developed under Component 1.1 of the Climate Adaptation and Mitigation Program for Aral Sea Basin (CAMP4ASB), which was approved in November 2015 for Kazakhstan, Tajikistan, Turkmenistan, and Uzbekistan. The overall project development objective for CAMP4ASB is as follows: "To enhance regionally coordinated access to *improved climate change knowledge services for key stakeholders (e.g. policy-makers, communities, and civil society)* in participating Central Asian countries as well as to increased investments and capacity building that, combined, will address climate challenges common to these countries."[2] Component 1, Regional Climate Knowledge Services, focuses on the development of "an integrated regional analytical for climate-resilient and low-emission development…"[3] that can support a broad spectrum of stakeholders and inform other project components.

Objective of the Report

The broad stakeholder consultation that is summarized in the following report was designed to answer two questions: 1) what kinds of climate-related information and knowledge stakeholders need; and 2) how they would like to receive and use information. The literature review, analysis, and consultations presented in the following chapters were also conducted with two guiding principles in mind.

First, the authors sought to identify and leverage information and resources that had already been produced. Climate-related monitoring in the Aral Sea Basin has a long history, and donor-supported technical assistance in support of those efforts, while more recent, has been underway for more than two decades. While data and information generated by all of these efforts varies in its availability and comprehensiveness, the authors wanted to avoid "re-inventing the wheel."[4]

Second, the authors sought to identify information and knowledge that were underutilized. Numerous information databases and platforms have been developed through individual projects and programs; however, they are not always accessible. In addition, a variety of good practice approaches in climate change mitigation and adaptation have emerged in each of the participating countries, but rates of replication have been low.

Structure and Methods

The report is divided into four main areas: 1) An overview of climate change institutions and stakeholders in the four participating countries (Chapter 2); 2) An assessment of the

[2] World Bank 2015.

[3] Ibid.: 8.

[4] In addition to in-country and international stakeholder consultations, Annex 4, which maps previous and ongoing projects in the participating countries, and Annex 5, which lists climate information platforms relevant to Central Asia, were compiled in order to avoid duplication with other initiatives.

capacity of the countries to gather, manage, and utilize climate information systems (Chapter 3); 3) A gap assessment and needs analysis for the participating countries, including a SWOT analysis (Chapter 4); and 4) Conclusions and Recommendations (Chapter 5).

Information for the report was compiled from January to April 2017 using the following methods:

- A working meeting with experts from each of the participating countries in January 2017 in Almaty.
- Structured interviews with key informants, which resulted in the completion of 36 questionnaires[5] on climate information and associated capacity.
- Two national stakeholder consultations involving a total of 72 participants held in Dushanbe and Tashkent in March 2017.
- Two national stakeholder consultations, which served as separate working sessions in the context of regular events, involving up to 50 participants held in Ashgabat and Astana in January and April 2017, respectively.
- Loosely-structured interviews with 14 representatives of regional organizations from February to April 2017, including 12 telephone interviews, a written interview, and a face-to-face meeting.
- A literature review that included best practices in climate information services and usage, regional information, country reporting to the UNFCCC, project documentation, and project-supported analysis and lessons learned.
- A two-day regional technical workshop in Almaty in April 2017 involving 60 participants from governments, international organizations, research institutions, and NGOs.

Terminology

The report assumes the following definitions of data, information, and knowledge: **Data** are "facts and figures which relay something specific, but which are not organized in any way;" **information** is "contextualized, categorized, calculated, and condensed data;" and **knowledge** is "know-how, experience, insight, understanding, and contextualized information."[6]

The word "region" in this report refers to the region of Central Asia as a whole. The largest territorial administrative units within individual countries are referred to as **provinces** (Russian *oblasti*, Kazakh *oblystar*, Tajik *viloyatho*, Turkmen *welayatlar*, Uzbek *viloyatlar*) and the largest administrative units within provinces are referred to as **districts** (Russian *rayony*, Kazakh *audandar*, Tajik *nohiyahoi*, Turkmen *etraplar*, Uzbek *tuman*).

[5] See Annex 2.

[6] Definition from Dumitriu 2016 and Frost 2017.

Acknowledgements

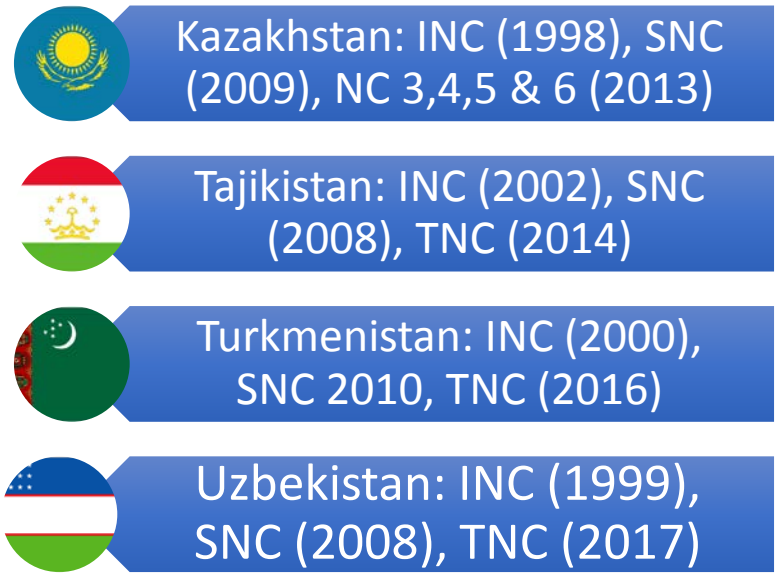
The authors would like to thank the program staff at CAREC for their support throughout the consultation process; the national consultants for their contributions; and all of the stakeholders at both the country level and international level who were very generous with their time and insights.

2. Stocktaking: Institutional Arrangements and Key Stakeholders

Countries in Central Asia have had a stated commitment to gather knowledge on climate change and its impacts since signing the UN Framework on Climate Change (UNFCCC) in the mid-1990s, although they had already been collecting climate-related data long before that.

The UNFCCC process has been an important driver in the process of reporting on climate change, and some of the key milestones in collecting and presenting information on climate change have been the National Communications (NCs), which have been submitted by the countries over the past two decades. The NCs represented an important step for several reasons. First, the process of compiling the NC required the formation of an inter-agency group on climate change, which in some cases marked the first time that sectoral agencies other than environmental agencies were involved in the issue. Second, the format of the NCs, particularly in the area of greenhouse gas inventories, was laid out in such a way as to give countries a roadmap for collecting data in areas ranging from mitigation and adaptation to technology transfer and public awareness. In fact, the NC process continues to form the basis of most country-level summary knowledge collection that is directly related to climate change.

Figure 1: Timing and Status of National Communications to the UNFCCC



At the regional and global level, data and information about Central Asia has been included in the assessment reports of the Intergovernmental Panel on Climate Change,[7] although for the First and Second Assessment Reports, this information was aggregated into a region that encompassed the entire former Soviet Union. Over the past decade, there have also been a number of regional and global reports by international organizations (notably the

[7] IPCC 1990, 1995, 2001, 2007, 2014: https://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml

World Bank's 2007 study *Adapting to Climate Change in Europe and Central Asia* and the UNDP 2007/2008 Human Development Report *Fighting Climate Change: Human Solidarity in a Divided World*)[8] that have taken a multi-country approach to analyzing climate issues and have linked climate change issues to sustainable human development.

Finally, other country-level initiatives have provided a stimulus for collecting and analyzing climate-related information. These include national policy exercises, particularly the development of mitigation and adaptation strategies, low-carbon and green economy strategies, and sectoral development strategies. They also include donor-funded projects in sectors ranging from energy and water to forestry and human health. The combined result of these initiatives is a collection of diverse information with varying degrees of accessibility.

The following chapter provides an overview of the current state of climate change assessment and adaptation planning in Kazakhstan, Tajikistan, Turkmenistan, and Uzbekistan. The overview is designed to serve the following purposes: 1) a snapshot of current activities in the region; 2) an opportunity to study promising initiatives and identify challenges and gaps that can be studied in greater depth; and 3) a baseline against which change due to project interventions can be assessed.

Institutional Arrangements Relevant to Climate Change

Countries in Central Asia have two types of institutional arrangements related to climate change information and planning: 1) Arrangements related to information and planning within the country, which includes country-level institutional arrangements and may also include regional, district, and local planning; and 2) Arrangements related to international institutions, including climate related institutions such as the UNFCCC and the WMO and intergovernmental organizations, such as IFAS and the CIS.

Country-level arrangements

Kazakhstan: Kazakhstan ratified UNFCCC in 1995 as a non-Annex I party, and it expressed its intent to assume binding emission reduction commitments in 1999, and since 2009 it has held special status under the convention. The Ministry of Environment serves as the focal point agency for the UNFCCC. Under the current environmental legal code, the Ministry of Energy, which has a Department of Climate Change, is tasked with overseeing international climate change agreements. The Department includes a Management Unit for Low-Carbon Development and a Management Unit for Climate Change Adaptation and Risk.

Kazakhstan's key policy document is the national Kazakhstan 2050 Strategy, which includes a Green Economy concept. The previous plan, Kazakhstan 2030, and its accompanying national development plan (to 2020), also integrated climate change mitigation and adaptation issues into the planning process, and the country reported that "climate change issues are integrated into the document as part o the strategic direction to

[8] World Bank 2007 and UNDP 2007, respectively.

accelerate the diversification of the economy."[9] In addition to national development plans, there are corresponding plans in each of the 16 regions of the country and strategic plans compiled by local governments.

Furthermore, in 2013, the government launched the pilot phase of a domestic emission trading scheme that included 170 large emitters (those with annual emissions above 20,000 tCO_2). The pilot phase concluded in 2016, and amendments to the system are currently being developed with a view to launching the operational phase of the program on January 1, 2018.[10]

The Ministry of Energy also collects a variety of information related to climate change planning and decision-making. For example, it oversees the system for estimating GHG emissions and maintains the national emissions inventory, and a national GHG registry. In addition, the Ministry is responsible for reviewing, approving, registering and monitoring GHG reduction projects, which provides it with ongoing information on these initiatives.[11]

Kazhydromet, which is housed within the Ministry of Energy, oversees climate monitoring in Kazakhstan, produces forecasts and warnings related to natural disasters, and conducts climate-related awareness-raising. Kazhydromet has an affiliated research institute that conducts drought and flood forecasting, early warning systems, research on the Caspian Sea, and GIS-related research. Other institutions involved in climate change information include the Ministry of Environment, sectoral ministries such as the Ministry of Agriculture and the Ministry of Emergency Situations, research institutes, universities, and non-governmental organizations.

Kazakhstan has a variety of NGOs addressing climate change issues; for example, the EcoForum is a network of more than 100 environmental NGOs, and it provides information on climate change policies and issues through several Aarhus Centers. The Climate Change Coordination Center, another NGO, has been involved in the preparation of several National Communications to the UNFCCC and provides training and workshops to a variety of stakeholders.

Tajikistan: Tajikistan ratified the UNFCCC in 1997 as a non-Annex I country. The State Administration for Hydrometeorology (Hydromet), which is under the jurisdiction of the Committee on Environmental Protection (CEP), serves as the UNFCCC focal point agency. Hydromet is the executive body that is tasked with coordinating climate change issues in the country, and it operates the Centre on Climate Change. In addition, there is a Climate Change Secretariat and a permanent working group headed by the Deputy Prime Minister that were established in conjunction with the country's participation in the Pilot Program for Climate Resilience (PPCR).[12]

[9] Third-Sixth National Communication to the UNFCCC, 2013: 63.
[10] UNDP 2013; Zoi 2016.
[11] Ibid.: 57.
[12] Third National Communication to the UNFCCC, 2014: 47; V. Kryukova, 2017 (internal documentation).

The key policy document on climate change is the 2003 National Action Plan for Climate Change Mitigation. The National Adaptation Strategy (which covers the period up to 2030) is under final review by the Government. The strategy takes into consideration climate-related aspects of most of the priorities in the new National Development Strategy for the period 2016-2030. The Third National Communication identifies the need to update the mitigation action plan, approve the adaptation strategy and accompanying action plan, and mainstream climate policies and priorities into sectoral development plans.[13] Other strategies are potentially important to climate change decision-making, such as the National Strategy on Disaster Risk Management (2010).

Other institutions involved in gathering and using information that is relevant to climate change include the CEP (which oversees environmental information systems in general), the Ministry of Economic Development and Trade, which monitors the implementation of action plans and oversees development assistance, the State Statistics Agency, the Ministry of Health, and the Committee on Emergency Situations and Civil Defense (CoES). At the local level, several districts have taken part in participatory scenario development for climate change adaptation (under PPCR-funded activities).[14] Research institutes also provide specialized information, particularly on glaciers and high-mountainous areas, and non-governmental organizations have been involved in collecting qualitative information, particularly in rural areas. Several different types of NGOs are involved in climate change-related activities. For example, the National Smallholder (dekhan) Farming Association, an umbrella group with 109 associations, 36 cooperatives, and 6911 smallholdings, provides some support for extension services. Others include environmental NGOs that carry out training and education on climate change.

At present, one of the PPCR project components involves the development of local adaptation action plans for the country's five most vulnerable rural areas. The proposed actions and measures are being developed in the context of national policies and strategies, and findings from the local level will provide information to decision-makers on next steps.

Turkmenistan: Turkmenistan ratified the UNFCCC in 1995. In 2015, it submitted its intended nationally determined contribution (INDC), and in 2016 it ratified the Paris Agreement. The focal point agency for UNFCCC Activities is the Chair of the Climate Change Group, an intergovernmental body, and is located at the Committee for Environmental Protection and Land Resources.

The primary domestic policy and planning document is the Turkmenistan 2030 Socioeconomic Transformation Strategy. In 2012, the country developed a National Climate Change Strategy, which outlined the main objectives of the country in addressing climate change, set specific goals and outlined measures for reducing emissions, and emphasized the need to focus on adaptation. The 2030 strategy includes a series of measures that will increase the adaptation capacity of the country, as do other national policies such as the National Program of the President of Turkmenistan on the Improvement of Social-Living

[13] Ibid.: 115.

[14] See Bizikova et al., 2014: 6.

Conditions in Villages, Towns, and Regional Centers for the Period until 2020; the National Program for Ensuring Safe Drinking Water in Population Centers in Turkmenistan; the Saglyk National Program for healthcare systems development; the Agriculture Development Program for 2012-2016 and Action Plan; and the National Forestry Program and Action Plan.

In 2014, the updated Law on Nature Protection included a new article (Article 47) on "Climate Protection and Mitigation of its Negative Effects." Climate change considerations have also been integrated into two other pieces of environmental legislation, the Law on Environmental Assessment (2014) and the Law on Waste (2015).[15] However, there is still a need to integrate climate change concerns into sectoral legislation in areas such as agriculture, water resources, and the energy sector.

In 2015, two working groups on climate change – one on mitigation and the other on adaptation – were created under the jurisdiction of the Ministry of Economy and Development. The results of these working groups were compiled into an inter-governmental document, "the National Economic Action Program on Climate Change Adaptation and Mitigation for the Period 2016-2020."

Institutions collecting climate change-related information include the National Committee for Hydrometeorology (Turkmenhydromet), Turkmengeologiya (a state corporation), the Ministry of Agriculture and Water Resources, and the environmental health laboratory at the Ministry of Health. In the area of environmental information, there is an Aarhus Center for the dissemination of environmental information that is managed by Tebigy Kuwwat, an NGO that was founded in 2003.

Uzbekistan: Uzbekistan ratified the UNFCCC in 1993 as a non-Annex 1 party. The UNFCCC focal point agency is the Centre of Hydrometeorological Service at the Cabinet of Ministers of the Republic of Uzbekistan (Uzhydromet)[16] is responsible for hydrometeorological monitoring, observation, and forecasting in Uzbekistan. Uzhydromet oversees the preparation of National Communications and Biennial Update Reports to the UNFCCC, it houses the GEF Focal Point, and it serves as the National Dedicated Authority for projects under the Green Climate Fund. Uzhydromet also hosts the Information Centre on Climate Change and its library.

The primary domestic policy and planning document in Uzbekistan is Vision 2030. A National Low-Emission Development Strategy was developed in 2012 for consideration by the government. The national Rural Development Programme is piloting climate change mitigation in the housing construction that it supports.[17]

[15] Third National Communication, 2015: 29.

[16] Uzhydromet's website is http://www.meteo.uz/eng/

[17] See http://www.uz.undp.org/content/uzbekistan/en/home/operations/projects/environment_and_energy/market-transformation-for-sustainable-rural-housing.html (accessed 28 March 2017).

Institutions that collect data and information relevant to climate change include the Ministry of Economy; the State Committee for Nature Protection (SCNP); the State Committee on Land Resources, Geodesy, Cartography, and the State Cadastre; and others. At the local level, several village administration units (makhallas) and districts have participated in local sustainable development planning. Non-state organizations, such as Energy Centre Uzbekistan and the Association of Producers of Renewable Energy collect information that is relevant for mitigation, and non-governmental organizations such as the Ecological Movement of Uzbekistan and the Uzbek Club on Alternative Energy have experience in awareness-raising activities related to sustainable energy and climate.

Multilateral institutional arrangements

All participating countries in this analysis have institutional arrangements with international organizations that entail some reporting and information exchange. These organizations can be grouped into three categories:

1) International organizations that deal explicitly with climate and climate change, such as the WMO and the UNFCCC Secretariat;[18] and
2) International organizations and networks that include climate information and climate change in their broader activities (the Commonwealth of Independent States, UN agencies, multilateral development banks, the OSCE, and NGO networks).
3) Regional organizations and cooperation among Central Asian governments.[19]

Activities undertaken by organizations in Group 1 and Group 2 are detailed in the chapter on Chapter 3 of this report.

For activities undertaken by organizations in Group 3, it is important to note the special role played by the International Fund for the Aral Sea (IFAS) and the Interstate Commission for Sustainable Development (ICSD). In August, 2016, there was a special IFAS meeting to discuss the proposed Concept for the Turkmenistan Chairmanship of IFAS (2017-2019). Climate change was identified in the concept as a focal area, and the concept was aligned with the Sustainable Development Goals. This meeting was followed by an additional consultation in December 2016 on the project components involving regional cooperation, and the 2017-2019 work plan includes the following focal areas: water efficiency and water resources management; environmental protection; climate change, and the improvement of environmental quality in the Central Asian region. These focal areas each have specific measures designed to support the realization of the sustainable development goals in Central Asia.[20] The ICSD provides documents and climate change country profiles of participating countries in the climate change section of its website.[21]

[18] Data exchange and reporting to these organizations is discussed in the following chapter.

[19] One other category that has not received much analysis in the region is that of private companies that disclose GHG emissions through their corporate social responsibility efforts. Chevron, which has extensive operations in Kazakhstan, and its reporting to the CDF (formerly the Carbon Disclosure Fund) would be an example of this type of stakeholder. See https://www.chevron.com/corporate-responsibility/climate-change/greenhouse-gas-management.

[20] V. Akopova, 2017 (internal documentation).

[21] See www.mkurca.org

It is also important to note that the line between international programs and regional cooperation is often difficult to define. For example, regional-level cooperation on the basis of agreements among hydromet agencies in Caspian Sea littoral states in the region involves both Turkmenistan and Kazakhstan. They exchange data with other participating countries, but the work was originated by the Integrated Program on Hydrometeorology and Environmental Monitoring in the Caspian Sea Region (CASPAS), which itself developed on the basis of a WMO Coordinating Committee that received support from UNESCO for the development of the integrated program in the 1990s.[22]

Key Stakeholder Groups in Climate Information and Knowledge

Current and prospective users of climate information were determined through stakeholder input and a desk review of the relevant country-specific and regional documentation. A defining feature of these user groups is their heterogeneity; they vary widely in many characteristics. Differences in their knowledge and information needs are addressed in the subsequent needs analysis chapter, and a brief description of differences in attributes follows here:

- *Geographic distribution:* the vast majority of policy-makers are based in the capital, with a few in provincial capitals. Farmers and the most vulnerable households are located in rural areas, some of the quite remote. Information availability and the media consumption profile are different between rural and urban areas.[23] Ability to travel to trainings and gender norms related to group participation and travel can also disproportionately affect potential knowledge users in rural areas of some countries.[24]
- *Level of education:* the scientific and research community needs very different kinds of knowledge products and data than local user associations and smallholder farms. Obviously, data methodologies and data presentation will have to be quite different depending on the user groups.
- *Language capabilities:* these are somewhat correlated with education levels (information users with a higher level of educational attainment are more likely be able to access information in multiple languages), but they are also related to government languages, country regions, and age (in general, older users are more likely to have studied Russian, while younger users may be more likely to have studied English and/or Turkish).
- *Professional functions:* user groups include those who focus on climate change as a primary professional interest (e.g. researchers and policy-makers at hydromets or environmental agencies), while others need to understand the impacts of climate on

[22] See http://kazhydromet.kz/ru/mezhd_sotr [in Russian]. Accessed March 27, 2017.

[23] Skochilov 2012.

[24] Hannah 2011.

their various sectors (e.g. other sectoral agencies and insurance companies), and still others need information affecting their livelihoods (e.g. farmers).

Current and prospective users at the country level include:

- UNFCCC Focal Point Agencies (varies by country)
- Hydromet Agencies (all countries)
- Environmental Protection Agencies (structure varies by country)
- Ministries of Agriculture (all)
- Ministries of Water Resources (all)
- Ministries of Energy (KAZ, TAJ, UZB)
- Ministries/Committees Handling Disaster Prevention and Response (all)
- Ministries of Health (all)
- Ministries of Economy (TUK, UZB)
- Academies of Science and Research Institutes (all countries)
- Educational Institutions (e.g. universities and institutes – all countries)
- Continuing education organizations such as agricultural extension (structure varies by country)
- Commercial sector – insurance companies (KAZ)
- Commercial sector – other companies (KAZ, TUK, UZB)
- Environmental and Social NGOs (all countries) and Aarhus Centers (KAZ, TUK, TAJ)
- Resource user associations and farmer associations (structure varies by country)

At other levels (province/district, village level, household), current and prospective users of climate change information and knowledge include:

- Provincial/District/Village Administrations
- Farmers (cooperatives, commercial farms, and smallholdings)
- Local Resource User Associations
- Local NGOs (e.g. women's associations, environmental NGOs)
- Schools
- Households, particularly those at risk for natural disasters

Overview of Stakeholders at the International Level

Stakeholders at the international level contributed to the findings of this report in several ways: 1) through project summaries and other printed materials; 2) through information from their beneficiaries; 3) through participation in in-country stakeholder consultations; and 4) through telephone interviews and written responses to specific questions. A list of these stakeholders is provided in Annex 3. Additional documentation of their work is provided in Chapter 3 through the examples described in the capacity assessment; in Annex 4 of this report, which lists selected climate information-related projects and organizations in Central Asia; and in Annex 5, which documents existing information portals that contain climate information for Central Asia.

At the international level, there are several types of stakeholders:

- **Multilateral government coalitions from the region:** The primary example of this type of organization is the International Fund for the Aral Sea (IFAS); its Executive Committee, which is comprised of member governments from the region; and other related IFAS organizations, such as the Interstate Coordination Water Commission (ICWC). The other significant example is the Commonwealth of Independent States, [25] which conducts activities related to climate information in the area of disaster risk reduction, education, and several other fields.

- **International Organizations:** These organizations include the OSCE and a full complement of UN organizations: FAO, UNECE, UNESCAP, UNDP, UNEP, UNESCO, UNIDO, WHO, and WMO. These organizations contribute to nearly all aspects of climate change activity, such as targeted research (FAO, UNEP, UNESCO, WHO, WMO), ministerials and multi-country programs (UNESCAP and UNECE), piloting adaptation and mitigation measures and knowledge platforms (UNDP), and supporting climate technology development (UNIDO), and support for the preparation of National Communications to the UNFCCC (UNEP and UNDP). Many of these organizations also implement projects funded from the global trust funds mentioned below.

- **Multilateral Development Banks:** Central Asian countries surveyed have received funding from the World Bank (primarily from the IBRD, although Tajikistan also receives funding the IDA), which has been an important supporter in both hydromet service strengthening, investments in climate change mitigation in carbon-intensive sectors, and investments in adaptation in climate-sensitive sectors. Because of Central Asia's location, several countries also receive financing from both ADB and EBRD. Furthermore, the Islamic Development Bank is also active in all of the countries and works in climate-related sectors such as energy, agriculture, and buildings.

- **Global Trust Funds:** The Global Environmental Facility (GEF) has been major source of technical assistance in all countries in the region through the GEF Trust Fund and through the Adaptation Fund. In Tajikistan, the Climate Investments Funds (CIF) have supported participation in the Pilot Program for Climate Resilience (PPCR). Another example is the Global Fund for Disaster Risk Reduction (GFDRR).

- **Bilateral Development Assistance Programs (including the European Union):** While supporting climate-related programs indirectly through contributions to global trust funds, a number of other bilateral donors[26], have also been active in

[25] Kazakhstan, Tajikistan, and Uzbekistan are member states; Turkmenistan is an associate state.

[26] Prominent donors over the past two decades include the European Union (as a whole), Germany, Switzerland, the United States, Japan, Turkey, Great Britain, and France.

Central Asia since the early 1990s. Others, such as China, have become involved more recently. Organizations that are involved in bilateral projects and programs in donor countries include government sectoral offices and development agencies, government contractors, academic and research institutions, and NGOs.

- **International NGOs:** There is currently a wide variety of international NGOs conducting research, providing training and outreach, and managing programs in Central Asia. CAREC is the primary regional NGO, while other NGOs are active internationally but have a regional presence (e.g. ICBA, CGIAR, and SPARE). Funding arrangements are varied: in some cases NGOs implement programs for bilateral or multilateral organizations, and other cases they my conduct their own campaigns but be funded in their founding country in part by government grants.

It is important to note that while some of these organizations participate in efforts to standardize reporting on development assistance through the OECD's Development Cooperation Directorate, **each organization has a separate system for collecting, managing, and archiving project-generated data and knowledge**. It should also be noted that not all organizations have a standard policy for preserving data and knowledge from climate-related projects that are implemented by government project management units or by contractors. In addition, outside of WMO, there are not standard formats for submitting raw data for management and archiving[27]

[27] However, some agencies are moving towards standards for geospatial data collected by the projects they fund. See USAID 2017.

3. Assessment of Existing Capacity Relevant to Climate Change

The intent of this section is to provide an assessment of "human, technical and financial capacity and institutional arrangements relevant to climate change modeling, vulnerability assessment, designing respective adaptation and mitigation measures in countries of Central Asia."[28]

The authors used a desk review of the literature and selected projects, inputs from National Consultants, and structured conversations with regional stakeholders. Because the assigned scope of the capacity assessment was extremely broad, the authors organized findings under seven indicators across three areas that describe the capacity necessary to address climate change effectively at the country level.[29] These areas address both the institutional framework for climate change action and factors that influence the implementation of policies and measures.

Figure 2: Capacity Areas and Indicators

- Capacities to generate, access and use climate-related information and knowledge
  - Indicator 1: Degree of CC awareness of stakeholders
  - Indicator 2: Access to and sharing of climate-related information by stakeholders
  - Indicator 3: Existence of education programs related to climate change
  - Indicator 4: Extent of the linkage between CC-related research/ science and policy development
- Capacities for management and implementation of climate change programs and projects
  - Indicator 5 – Adequacy of the climate information available for decision-making
  - Indicator 6 – Existence and mobilization of resources
- Capacities for stakeholder engagement
  - Indicator 7 – Existence of cooperation with CC stakeholders

Capacities to generate, access and use climate-related information and knowledge

[28] CAREC Project Terms of Reference, 2017.

[29] These indicators and their stages are provided as an annex to this report and are selected and adapted from the scorecard approach for capacity assessment related to multilateral environmental agreements as presented in UNDP's *Monitoring Guidelines for Capacity Development…*(2010).

Indicator 1: Degree of CC awareness of stakeholders

While the level of climate change awareness has increased in all participating countries over time, the extent to which is has been measured varies from country to country. For example, in Uzbekistan, the government has conducted many educational and awareness-raising activities related to Article 6 of the UNFCCC, but it does not appear to have established a baseline level of awareness or to have measured change in awareness levels over time.

Other countries have observed changes in awareness. For example, "During the preparation for the Third National Communication of Turkmenistan on Climate Change, it was found out that the level of public understanding of the importance of this issue had increased compared to the preparation period of previous communications. Such increase was caused by adoption of the National Strategy of Turkmenistan on climate change and measures taken for its implementation."[30]

In Tajikistan, several studies have directly assessed public awareness of climate change. For example, the 2010 P-LITS 2 survey, a national random survey of households commissioned by the World Bank, found that 57% of respondents considered themselves to be "well informed" or "very well informed" about the consequences of climate change – numbers that were comparable to the EU-27 at the time. However, the researchers note that "when asked to select the single-most serious problem confronting the world, only 5-7% of respondents in Tajikistan and Kazakhstan chose climate change (compared to 31 percent in EU-27 countries).[31] Another Bank-funded study in 2012 of farmers in Tajikistan found that 81% of farms with fewer than 25 employees and 84% of farms larger than that had undertaken at least one sustainable/adaptive agricultural measure on their farms.[32]

Levels of awareness vary by geographic sub-region, socio-economic status, levels of education, and gender. They also vary by stakeholder group. For this reason, general public awareness and outreach campaigns have been supplemented with a variety of awareness-raising and training activities for specific stakeholder groups. These groups have ranged from women's groups, villagers, and medical students (Tajikistan) to university students, diplomats, local governments, and rural communities (Uzbekistan). Each of these initiatives can provide interesting training materials and lessons learned to a regional audience.

Conclusion: some stakeholders are aware of climate change issues and how to address them, and a small subset of these stakeholders is participating in implementing steps to address climate change.

[30] Third National Communication, 2015: 125.

[31] Barbone 2010 as cited in Legro 2012: 43.

[32] World Bank 2011 in Abbott 2012: 69.

Indicator 2: Access to and sharing of climate-related information by stakeholders

As with the issue of awareness, there are several aspects to climate information access and sharing. They include information sharing with multilateral organizations, sharing with decision-makers, and sharing with the public.

At the international level, all of the participating countries in this assessment share data with the UNFCCC through their National Communications and their Biennial Update Reports (BURs). In addition, Kazakhstan has adopted Annex 1 requirements to submit an annual GHG inventory. Information that is shared includes statistics on national circumstances, temperature and precipitation data, modeling and scenario findings, data on GHG sources and sinks, and other analysis and commissioned research.

Perhaps the most common example of sharing climate data on an ongoing basis is work conducted under agreements with other hydromet bodies. For example, Uzhydromet has been sending monthly data to the Russian Hydromet World Data Center in Obninsk through 19 exchange stations since the year 2001 (it also transmits data from other countries in the region, including measurements from 34 meteorological stations in Turkmenistan).[33] In total, 75 hydrological stations and posts and 280 meteorological stations provide data that are shared with national hydromet agencies across the region, a structure that was originally part of the unified hydromet service of CIS countries in the past.

As the Second National Communication of Uzbekistan notes, "Information sharing between NHMA is carried using the leased phone communication channels, operational data, received from the adjacent countries, are used for short-term hydro-meteorological forecasts of [Uzhydromet]. Three meteorological stations (Tashkent, Tamdy and Chimbay) are included into the Global Observation network, the data being transmitted using CLIMAT cable on monthly basis to the Global System." Finally, Uzhydromet has been transmitting data on daily atmospheric precipitation levels, maximum and minimum air daytime and nighttime temperature are transmitted to the World data Center in the United States since 2005.[34]

Countries in the region also receive climate information, particularly satellite-generated data that is useful for forecasting. For example, Uzhydromet has access to satellite data from European satellites (through EUMETSAT) and from the United States (through NOAA AVHRR satellite information). The data that is used for forecasts is processed in the real time; however, there are many potential areas of cooperation in the use of satellite data with other government agencies, such as the Ministry of Agriculture and Water Resources and the State Committee on Environmental Protection.[35]

[33] Second National Communication: 129.

[34] Ibid.

[35] Ibid.

There is also an example of an international convention that supports access to environmental information at the country level. The Convention of the United Nations Economic Commission for Europe on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (the Aarhus Convention) has been ratified by Kazakhstan, Tajikistan, and Turkmenistan. The signatory countries have participated in programs to support their capacity to implement the convention (OSCE, for example, has provided support in this area), and the countries have established Aarhus Centers, where environmental information, including climate-related information is accessible to the public.

There are 15 Aarhus Centers in Kazakhstan, seven in Tajikistan, and one in Turkmenistan. The centers can perform a variety of functions: as the National Communication of Turkmenistan notes, "…the Arhus Centre implemented a project to enable exchange of information on the environment, as well as the beginning of the dialogue between representatives of government agencies and non-governmental organizations working in the field of environmental protection, taking into account national traditions and conditions to apply provisions of the national environmental legislation in practice."[36] As an example, each Aarhus center in Tajikistan met several hundred requests for information in 2016, and their primary users included civil servants, students, teachers, NGOs, and people working in the private sector.[37] In Uzbekistan, which is not an Aarhus signatory, the Climate Change Information Centre at Uzhydromet serves as a point for distribution information related to climate change.[38]

At the country level, hydromet agencies provide traditional weather forecasts in various formats and information related to climate change. For example, Kazhydromet publishes an annual climate change monitoring bulletin, which is available on its website.[39] However, it also publishes more traditional forecasts, such as a daily agro-meteorological review and information on Kazakhstan's rivers.

At the local level, NGOs can play a very significant role in providing information in rural areas. For example, TajCN, a network of Tajikistan NGOs working on climate change that was founded in 2008, supports information exchange among NGOs and their members and beneficiaries.[40] Another example is the National Smallholder Farming Association of Tajikistan, an NGO that produces *Farmer* magazine for its members and distributes posters, brochures, and instructional materials about climate change. It also has experience in implementing climate change adaptation projects in Southern Tajikistan. There are NGOs in most of the participating countries with experience in implementing these types of projects, often due to small grants from the UNDP-GEF Small Grants Programme (SGP), which provides funding for projects directly to NGOs.[41]

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[36] Third National Communication: 123-4.

[37] Kayumov, 2017.

[38] Second National Communication: 151.

[39] See http://kazhydromet.kz/ru/monitor_kz (accessed March 29, 2017).

[40] More information available here: http://www.tajikngo.tj/tj/ngo-info/-othermenu-41/item/2836-tajcn-%E2%80%93-set-npo-tadzhikistana-po-izmeneniyu-klimata-informatsiya-o-deyatelnosti-i-planah.html (accessed March 29, 2017).

[41] Information and a project database provided here:

Conclusion: Climate information needs have been identified over the course of the National Communications process and through a variety of donor-funded studies and assessment. There is also some information management infrastructure in place to share climate information within countries, regionally, and globally, although this capacity varies by country. There are also ad hoc examples of information sharing at the local level, although knowledge from these initiatives are not readily available in one place. In addition, the level of data and information sharing varies among countries in the region, as does the type of information that is produced and – of that – publicly available.

In terms of the presentation of climate change-related information, there is a tremendous volume of information and knowledge available via the internet, such as published studies, project documentation, and information platforms (including Russian-language websites and materials). However, this information and knowledge is not necessarily easily accessible for country-level and district- and local-level planning and decision-making.

Indicator 3: Existence of education programs related to climate change

Each of the participating countries has undertaken a wide variety of educational and training initiatives related to climate change. These initiatives have frequently come in the form of technical assistance, either in the form of small grants or under larger climate investment projects or other projects in climate-sensitive sectors (such as health or agriculture) and cross-cutting projects related to disaster risk reduction. As a result, the cross-section of stakeholders participating in these activities has been very broad. The table below is indicative, but it only covers a very small sample of the educational activities related to climate change that have been undertaken in the region.

Table 1: Examples of Educational Activities Related to Climate Change

Stakeholder Group	Country	Type of Educational Activity
Hydromet employees	Kazakhstan	Educational seminars over the past five years organized by WMO in Turkey, Finland, China, and India. These courses have provided information on automatic observation systems, meteorological data, analysis of the information quality, climate data management, and long-term climate forecasting.
Government employees	Tajikistan	The PPCR funded training in 2011 on climate change and adaptation planning for officials at the Committee for Environmental Protection. The Tajikistan branch of CAREC has also provided training and educational courses for civil servants on climate change.

https://www.sgp.undp.org/index.php?option=com_content&view=article&id=275&Itemid=238 (Accessed March 29, 2017).

Foreign Affairs Ministry employees	Uzbekistan	The UNDP-funded Low-Carbon Development Project provided several trainings for diplomats on climate change international policy issues prior to UNFCCC CoP meetings.
University Teachers	Kazakhstan	The UNESCO Almaty office, the Center for Sustainable Development and German-Kazakh University have offered training courses on Integrated Water Resources Management.[42]
University Students	Kazakhstan	The UNESCO Almaty office supported the development of a new course on climate risk management for universities in the Kyzylorda Region.
University Students	Kazakhstan/Reg.	German-Kazakh University offers an interdisciplinary masters degree program for students from Central Asia and Afghanistan in international sustainable water resources management.
University Students	Kazakhstan	In 2015, the EU Delegation to Kazakhstan and several European embassies co-sponsored an essay contest for undergraduates on climate change for Climate Diplomacy Day.
University Students	Turkmenistan	The course "Fundamentals of Climatology" is taught in the Department of Meteorology at S. Seydi Turkmen State Pedagogical Institute and at the Ecology and Hydrometeorology Department Magtymguly Turkmen State University.
University Students	Uzbekistan	From 2013-2015, UNDP supported the development of three modules of on-line courses on climate change. They were then made available on CD-ROMs for students; participating students who took the courses came from four universities in Uzbekistan.[43]
Farmers	Kazakhstan	The Farmers Foundation of Kazakhstan provides training for its members and has conducted information campaigns on climate change-related issues. The organization also supports adaptation measures such as irrigation infrastructure that promotes rational water use, crop rotation, and afforestation
Farmers	Uzbekistan	In 2015, a UNDP-supported project opened an extension service center for farmers in

[42] Curriculum available at http://en.unesco.kz/updated-materials-of-the-integrated-water-resources-management-study-course

[43] http://rsr.akvo.org/en/project/528/update/2644/

		Urgench in order to address questions about climate change.[44]
Farmers	Tajikistan	The Tajikistan branch of CAREC worked with Tajhydromet to conduct training and educational courses for farmers.
Local Communities	Multiple Countries	The GEF-funded Small Grants Program has supported multiple NGOs in delivering education and training to communities in Kazakhstan, Tajikistan, and Turkmenistan.

Conclusion: Education programs on climate change are partially developed and partially delivered. Donor-funded initiatives over the past 15 years have provided a variety of promising examples for climate education, but there is no current common repository for educational materials, curricula, e-courses, and training materials. There is also a need to: 1) embed educational efforts into school and continuing education and training curricula, as student and employee turnover necessitates programs that will continue to provide information over time; and 2) evaluate the quality of education and training interventions and refine them on an ongoing basis.

Indicator 4: Extent of the linkage between CC-related research/ science and policy development

A variety of resources for climate change-related research exist in each of the participating countries; these include institutes that are housed in sectoral ministries for applied sectoral research (including hydromet agencies), research institutes under Academies of Sciences, universities, and even non-governmental organizations.

Agency-Affiliated Research institutes: In Kazakhstan, Kazhydromet's Research Scientific Enterprise (КАЗ НИИ) carried out research activities such as cataloging wind-affected phenomena, studying and forecasting droughts in Kazakhstan, developing a climate change monitoring system, and assessing ice cover in the Caspian Sea.[45]

In Uzbekistan, the Hydrometeorological Research Institute (NIGMI) affiliated with Uzhydromet works to improve climate and hydrology monitoring systems (including snow cover and glacier monitoring), agro-meteorology, crop impact assessment, water resources, and extreme weather events.[46]

[44] http://rsr.akvo.org/en/project/528/update/8540/
[45] Third-Sixth National Communication: 190-2.
[46] Second National Communication: 133.

Hydromet research institutes can also play important roles in mitigation research. For example, Kazhydromet's institute studied climatic zoning in order to improve the precision of building performance codes, which affects energy consumption in buildings. NIGMI in Uzbekistan has produced wind maps that can inform the development of wind energy resources.[47]

Other types of agency-affiliated research institutes can also support research on climate change. For example, the Ministry of Health and Social Protection in Tajikistan initiated a study on the impact of climate change on reproductive health in 2008.[48]

Other Research Institutes and Universities: Tajikistan provides an example of how these institutes can contribute to both climate science and applied research to support climate change mitigation and adaptation. While there is not an explicit research program to support climate-related research, the Institute of Water and Environment under the Academy of Science has a dedicated laboratory to study climatology and glaciology, and the Physics and Technical Institute of the Academy of Science has a scientific research center on renewable energy resources.[49] The Strategy of the Government of Tajikistan in science and technology for 2007-2015 supported research in the area of impacts and adaptation, such as a study on the impacts of climate change on biodiversity, ecosystems, and crops.[50] In research with implications for mitigation, the Physics and Technical Institute has worked to develop solar cookers, mini-hydro power plants, mobile micro-hydro power plants, and biogas units.[51]

Turkmenistan provides another example: the scope of research undertaken at the Academy of Sciences includes environmental monitoring and the improvement of climate change modeling and projections.[52]

One example of an international climate change-related research project involving a research institute and several universities is the UK-funded "Climate Change, Water Resources and Food Security in Kazakhstan," which involves more than 30 researchers at universities in the UK and Kazakhstan (nine researchers from the University of Reading; twenty researchers from the Institute of Geography (under the Kazakhstan Ministry of Education); four researchers from Nazarbayev University; and researchers from al-Farabi Kazakh National University.[53] The project "aims to help farmers, representatives of local administration, and members of the Rural Water Users Association in the region under investigation in Kazakhstan to better adapt to current climate changes via dissemination of

[47] Ibid.: 133; and Third-Sixth National Communication: 192.

[48] Third National Communication: 125.

[49] Third National Communication: 48, 125.

[50] Ibid.: 125.

[51] Ibid.: 48.

[52] Third national Communication [TUK]: 111-2.

[53] https://www.britishcouncil.kz/newton-al-farabi/achievements/climate-change accessed 22 Feb 2017

the research results."[54] The project combines research using climate data from automatic weather stations but also works directly with water user associations and farmers.

Universities can also serve as a site for international learning through events such as summer schools. German-Kazakh University in Almaty, for example, held a two-week summer school session on integrated water and land resources management where participants came from Kazakhstan, Krygyzstan, Tajikistan, Turkmenistan, Uzbekistan, and Afghanistan. The summer school, which was funded by the German Federal Foreign Office, offered hands-on training on subjects such as climate change impact assessment, and it was open to university students, junior professors, and researchers.[55]

At the community level, there are examples where NGOs have participated in educational projects, both through awareness-raising campaigns but also through techniques such as participatory rural assessment, particularly in Tajikistan.[56] There is also potential in the region for educational "citizen science" programs with students and interested community members to contribute to the existing body of information on climate and ecosystems, particularly in remote areas. One example is a biodiversity project currently underway in the Tien Shan mountains.[57]

Conclusion: Some applied research needs in the area of climate change have been identified, and in-country institutions have developed research capacity that can inform decision-making in both mitigation and adaptation. However, existing knowledge needs are only partially translated into relevant research strategies and programs. Additional support is needed in order to consistently link research findings to policy development and implementation.

Indicator 5 – Adequacy of the climate information available for decision-making

The stocktaking exercise identified a number of examples of generating climate data for decision-making within governments. For example, in Uzbekistan, Uzhydromet, the State Committee for Environmental Protection, and the Ministry of Agriculture and Water Resources have been publishing an inter-departmental cadastral register of surface and ground water since the year 2000.[58]

In all countries, climate data play a role in early warning systems, and the DRR/DRM sector may be the area where climate data are most frequently used in decision-making. Tajikhydromet, for example, provides real-time information and forecasts for situations that may result in natural disasters; for example, in 2015 air temperature increases and

[54] Ibid.

[55] http://www.fernerkundung.geographie.uni-wuerzburg.de/en/fernerkundung_neu/int_capacity_building/cawa_summer_school_at_german_kazakh_university_in_almaty_cawa_2014/

[56] See Bizikova 2014.

[57] See http://ocsdnet.org/talking-citizen-science-in-remote-communities-of-the-kyrgyz-tien-shan-mountains/ and https://scistarter.com/project/1412-Butterflies-of-Kyrgyzstan.

[58] Ibid.: 128-9.

glacial melting put villages in the Rasht District and the GBAO region at high risk of mudslides, and the real-time information provided to government agencies allowed actions that may have saved many lives.[59] Tajikistan is also participating in the WMO Severe Weather Forecasting Demonstration Project (SWFDP).[60] In Kazakhstan, early warning systems are coordinated with neighboring countries. For example, in case of storm warnings, Kazhydromet informs its counterpart agencies in Russia, Uzbekistan and Kyrgyzstan."[61] At the country level, Kazhydromet publishes avalanche warnings with its mountainous areas forecast on its website.

The primary ongoing effort to support regional integration of hydromet agencies in Central Asia is the World Bank-funded Central Asia Hydrometeorology Modernization Project, which allocated USD 8.7 million for regional activities in addition to USD 6 million to Kyrgyzstan and USD 6 million to Tajikistan (in addition to USD 7 million from the PPCR) to modernize in-country hydromet facilities and operations. The project, which runs through June 2018, has established a platform for the integration of the regional hydromet agencies.[62] The project sponsors a semi-annual meeting for the hydromet agency directors, and the agencies are now using a regional approach to two-year severe weather forecasting work plans. The project has also supported software and equipment installation in the WMO Regional Meteorological Center in Tashkent that will allow it to "receive, process and visualize hydromet information in a unified format that is based on existing agreements between the [hydromets]."[63]

Conclusion: The availability of climate information varies by country, and it is improving. However, access to data is not sufficient to support decision-making processes at national and sub-national levels. In some sectors, there is a sufficient amount of data, while in others there is not. Furthermore, supporting sectoral data are not always sufficient to provide useful scenarios and analysis in support of decision-making. Finally, data may be available but not incorporated into environmental decision-making due to capacity constraints.

Capacities for management and implementation of CC Programs and Projects

Indicator 6 – Existence and mobilization of resources

The existence and mobilization of resources for climate change information varies widely among countries in Central Asia. One obvious reason for this disparity is the economic situation in the region: the difference in GDP among the five Central Asian countries is comparable to the difference among 28 member countries of the EU. In countries with

[59] Kayumov, 2017.

[60] See http://www.wmo.int/pages/prog/www/swfdp/ (accessed March 29, 2017).

[61] Third-Sixth National Communication: 186.

[62] World Bank, 2016: 23.

[63] Ibid.: 5.

higher GDP, more internal resources are devoted to climate change information and capacity strengthening; one example would be the pilot emissions trading system in Kazakhstan, or that country's investments in the Astana "Future Energy" Expo 2017. In Tajikistan, the country is eligible for IDA lending through the World Bank and has mobilized more than USD 150 million for climate change investments and technical assistance through its participation in the Pilot Program on Climate Resilience (PPCR).

In terms of mobilization of resources for collecting and disseminating climate information, WMO projects and initiatives have been a source of resources, as has GEF support for the preparation of national communications to the UNFCCC (while Kazakhstan is no longer eligible due to its adopted Annex I status, it received this support for its first three NCs). The countries studied have also leveraged long-term donor support from bilateral and multilateral donors for capacity strengthening projects and for investments in climate change mitigation and adaptation. The donor and investment profile also differs widely by country. In Kazakhstan, for example, four multilateral development banks have provided financing for projects in climate-sensitive sectors such as energy and agribusiness: ADB, EBRD, Islamic Development Bank, and the World Bank.in Kazakhstan. In Turkmenistan, the majority of climate-related development financing in recent years has been provided by the GEF.[64] A list of major projects and initiatives by donor and by country is provided in Annex 4 of this report.

Examples of private sector support for climate change initiatives and investments are much less common, although there are several examples in the region, such as a metallurgical company in Kazakhstan that is equipping and maintaining reservoirs in order to combat drought and is recycling water.[65] There is also concessional lending available to private enterprises that want to reduce energy consumption (and corresponding greenhouse gas emissions) through the EBRD Sustainable Energy Finance Facility, which operates in Kazakhstan and Tajikistan.[66]

Finally, there are a few examples of micro-lending in the region, such as the work of the Asian Credit Fund (ACF) in Kazakhstan. The fund targets rural women, and it has supported loans for greenhouses and has offered loans for residential energy efficiency.[67]

Conclusion: The funding sources for these resource requirements are partially identified and the resource requirements are partially addressed.

Capacities for Stakeholder Engagement

[64] OECD 2016: 1.

[65] Eurasian Group interview data [add questionnaire date].

[66] See http://seff.ebrd.com/index.html. Accessed April 3, 2017.

[67] Youatt 2014.

Indicator 7 – Existence of cooperation with CC stakeholders

Cooperation with stakeholders varies by country and by stakeholder group. It also varies by the stage of the project or program phase. For example, government and non-governmental stakeholders are usually consulted during the project preparation period for projects that are funded by environmental trust funds, such as the GEF or the CIF.

Furthermore, there is cooperation with various stakeholders in climate-related training and education projects. The majority of countries in Central Asia have used NGOs to provide district-level and community level training on climate change-related issues. Aarhus Centers in Kazakhstan, Tajikistan, and Turkmenistan also provide access to environmental information.

However, stakeholder consultations in policy-making or strategy are not internalized in procedures in the region, and there is not a formal consultation mechanism on climate-related issues in Central Asian countries. Nonetheless, associations and networks of groups have helped to boost awareness of climate change issues and participation in projects. This trend applies to associations of environmental NGOs, such as TajCN, a network of Tajik NGOs focusing on climate change, or EcoForum in Kazakhstan. In addition, other associations such as the National Smallholder Farming Association of Tajikistan and resource user groups in the water and forestry sectors have also participated in these types of activities.

At the international level, donor coordination is more systematized in some countries than in others, and coordination meetings are usually held on an ad hoc basis to address a particular theme or initiative.

Conclusions: Stakeholders are identified but their participation in decision-making is limited and regular consultation mechanisms are not necessarily established.

4. Assessment of Capacity Gaps and Priority Needs

The following chapter provides a summary of capacity gaps and an assessment of needs related to climate information and knowledge based on in-country surveys, structured interviews, telephone interviews, group consultations, and a desk review of available literature and project documentation. The analysis focuses first on self-assessed capacity gaps and priority needs as reported in National Communications to the UNFCCC[68] and then covers aggregated responses to questions submitted to key informants in different potential user groups for the proposed climate knowledge platform.

Findings from National Communications

Kazakhstan: As Kazakhstan's most recent National Communication states, "The main and constant problem of the National Hydrometeorology Service of Kazakhstan at the present stage is inconsistency between the capabilities of the National Hydrometeorology Services and the increasing demand of society for hydrometeorology and other information about the state of the environment as well as a serious lag of technical, processing and human resource base behind the level of the Hydrometeorology Service of the developed countries."[69] The National Communication also provides an estimate of the number of observation stations needed to provide adequate coverage.

The NC also identifies specific gaps and needs for climate information for rural residents given the prominence of the agricultural sector in rural areas. As the NC states, for this group, "…other aspects relating to information on climate change are important, namely the impact of environment and climate on the yield and cattle. Also, this group of people needs to obtain information on the number of days with a stable, unchangeable weather for gathering the harvest or planting. However, the rural population in general does not dispose of such information, especially those remote from regional centres, since public awareness of the weather forecast is mainly with reference to the regional centre. Farmers need customized information and forecasts for the timely response, adaptation and prevention of potential adverse effects. Such information is provided on a fee paid basis or is not available.[70]

Tajikistan: The most recent National Communication of Tajikistan focuses on problems that prevent stakeholder participation in climate change decision-making and in climate change programs and projects. The key barriers to participation identified in the communication as stated include a lack of understanding of environmental and climate policy by NGOs, a lack of effective strategies for public participation; and "digital inequality" among NGOs, or "different levels of access to ICT preventing effective electronic dissemination of information and participation in discussions."[71] The recommendations include organizing

[68] Non Annex-1 countries are to report on these areas in their communications. Kazakhstan, which has assumed Annex 1 status, also listed certain needs in their most recent National Communication, and these were also included.

[69] Third-Sixth National Communication to the UNFCCC, 2013: 187.

[70] Third-Sixth National Communication to the UNFCCC, 2013: 202.

[71] Third National Communication to the UNFCCC, 2014: 139.

public monitoring for climate change programs and projects and the development of a strategy of public participation.[72]

Turkmenistan: The Third National Communication of Turkmenistan has the broadest focus of the communications reviewed on different aspects of capacity gaps and needs. They include the following findings:

- In mitigation: Need to continue to reduce GHG emissions by sector and by region; need to develop and adopt a law on energy efficiency; need to improve energy efficiency norms and standards; need to prepare energy balances on a regular basis in order to provide baseline information; need to creative incentives to use renewable energy
- In vulnerability and adaptation: Need to continue to assess the vulnerability of different economic sectors to CC. Need to develop sectoral adaptation strategies, particularly for highly vulnerable sectors. Need to conduct a cost-benefit analysis of proposed adaptation measures.[73]
- General institutional measures: improving governmental legal and institutional frameworks; updating sectoral legislation in GHG-related sectors such as oil, gas, and electricity; creation of a National Environmental Information System; need to make environmental information collected by statistical departments available on line.
- In inventories and scenario development: constructing a National Inventory System and obtaining sufficient macroeconomic and sectoral data to use common modeling software for scenarios.
- In climate diplomacy: Need to involve experts from ministries and agencies to participate in international climate change meetings, e.g. COPs and other UNFCCC sessions; need to participate in international climate change networks.[74]
- In climate observation and monitoring: Need to strengthen the material-technical base of the National Hydrometeorology Committee of Turkmenistan; need to expand the observation network and the types of observations that are made.
- In education, awareness and outreach: Need additional coverage of climate change issues by the media.[75]

The TNC also provides 20 recommendations for addressing gaps in the system, ranging from developing a National Environmental Information System to translation of international official documents on climate change into the government language and introducing climate change topics into all levels of education curriculum.[76]

Uzbekistan: The Third National Communication of Uzbekistan focuses on capacity gaps that are related to efforts conducted under Article 6 of the UNFCCC.

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[72] Third National Communication to the UNFCCC, 2014: 140.

[73] Third National Communication, 2015: 125.

[74] Third National Communication, 2015: 126.

[75] Third National Communication, 2015: 127.

[76] Third National Communication, 2015: 128.

- Need to strengthen activities related to Article 6 of the UNFCCC, particularly the integration of climate change issues into the curriculum in secondary school, tertiary education, and specialized fields of study. This in turn needs supplementary financing, technical resources, and ongoing government support.
- Inadequate level of information and awareness among stakeholders (both government and non-governmental).
- Lack of teacher training and re-training programs that are necessary to improve climate change education in schools and tertiary educational institutions
- Lack of schoolbooks/curriculum and informational materials about climate change, particularly in the state language.
- A significant part of climate change information/education resources are only available on the Internet, which reduces access to several segments of the population.[77]

Findings from Structured Interviews and Consultations

The following section describes responses to questionnaires completed by 36 key informants from the four participating CAMP4ASB countries. Questionnaires were distributed to three broad groups of key informants: 14 from research institutes and academic institutions; 11 from government agencies; and 11 from other organizations, which included environmental NGOs to a private company, a chamber of commerce, resource user groups, a farming association, and a utility.[78]

Table 2 indicates the type of information needs reported by stakeholders.

Table 2: Self-Reported Information Needs by Type of Information and Stakeholder (shown in number of respondents)[79]

	Research-Academic Organizations	***Government Agencies***	***Other Stakeholders***
Climate Data (24)	"Climate data" (5) "Temperature and precipitation data (2) in .netcdf format" ; weather station data for the Central Asian region in .xls format (1); climate data for provincial population centers (2); data on extreme weather events (1); climate data	"Climate data" (2); temperature and precipitation data for the past 30 years (1); five-year forecasts (1); data on extreme weather events (1)	Temperature and precipitation data (1 resource user group); snowfall and precipitation data (1 utility); local climate data (1 NGO); agrohydromet data (1 NGO)

[77] Third National Communication, 2016: 197.
[78] The number of respondents by country was as follows: Kazakhstan 6; Tajikistan 12; Turkmenistan 4; and Uzbekistan 14.
[79] Source: 36 respondents interviewed February – March 2017.

	for the Syr Darya River basin (1); soil temperature (1)		
Sectoral Data (11)	"Sectoral data" (3)	"Sectoral data" (5); public health data, particularly morbidity statistics (1)	"Sectoral data" (1 private sector); water and land use data (1 NGO); data on renewables and low-carbon technologies (1 chamber of commerce)
Other Data (6)	River flow data (2), water turbidity, suspended sediments (1); glacial data (1); data on natural disasters (1)		Water flow, water volume in reservoirs, snowpack (1 utility)
Information Bulletins (13)	Environmental statistical yearbooks (1): informational bulletins (3); bulletins about new methodologies and technologies (1); monthly meteorological, hydrological and chemical bulletins (1)	National Communications (1); Annual Bulletin on Surface Water Quality (1)	Best practices in CC adaptation in agriculture (1 farming association); bulletins on sustainable water and forestry use (1 reource user association); water, land use, and climate updates (2 NGOs); information bulletins for the general public (1 NGO)
Weather and Climate Change Forecasts and Projections (23)	(4)	Weather forecasts (2); annual forecasts (1); long-term projections (3); projections of extreme weather events (2)	CC projections (1 private sector); forecasts that will allow farmers to select appropriate varieties (1 farming association); annual weather and drought forecasts (1 farming association); general weather forecasts (1 resource user group); weather forecasts for specific climate regions within the country (2 NGOs); forecasts for extreme weather events (1 utility)
Methodologies (14)	(6)	Methodologies (3); Methodologies on impact assessment and adaptation measures, environmental protection methodologies (1)	Methodologies (private sector); methodological guidelines for CC adaptation (2: one resource user group, one NGO); assistance with integrating CC issues into territorial development plans (1 farming association); methodologies for vulnerability assessments such as

			Local Adaptation Plans of Action or Participatory Vulnerability Analysis (1 NGO)
Analytical Reports (18)	(3); assessment of frequency and intensity of extreme weather events (1); assessment of climate risk for branches of the economy (1)	"Analytical reports" (2); population and GDP statistics (1); Vulnerability assessments (3); analysis of multi-year climate trends; calculation of economic losses due to extreme weather events; methods of assessing the effectiveness of early warning systems (1); risk assessments (1); assessment of climate risk for branches of the economy (1); analysis of morbidity and mortality associated with heat waves (1); analysis of nature protection plans (1)	Reports (1 private sector); analysis of economic gains and losses, analysis of climate impacts, and gender analysis (1 NGO)
Maps (14)	Maps (5); Geological, hydrological, and climate maps (1); synoptic maps (1)	Maps (2); Maps that indicate the level of risk from extreme weather events / hazard mapping (2); mapping prevalence of ovarian hyperstimulation syndrome (1); climate change maps for global, regional, and local ecosystems (1)	Maps (1 private sector)
Other Information (11)		Territorial sustainable land use plans (at district and local levels) (1); best practices in adaptation (2); current and planned legal and regulatory framework for CC adaptation (1); scientific and research publications (1); general information on CC for the public (1); early warning bulletins for the public (1); information leaflets for the public on topics such as CC and health (1)	Information on the development of policies and local and country-level adaptation plans (2 NGOs)

The most popular responses for information needs were climate data and weather forecasts and climate projections. Requests that were mentioned across groups included annual forecasts, forecasts relevant to the agricultural sector, and forecasts and projections for specific regions (e.g. river basins, provincial centers). Early warning data and disaster risk-related information were cross-cutting themes, and they were mentioned in responses related to climate data, climate forecasts, maps, and analytical reports. The options in the questionnaire provided seemed to cover most major data needs, as the responses in the "Other" category mostly duplicated other sections (e.g. bulletins). However, there were three requests for plans, such as adaptation plans (two NGOs) and sustainable land use plans (one government agency).

Table 3 indicates the distribution of the responses regarding information needs across the four participating countries.

Table 3: Self-Reported Information Needs by Type of Information and Country (shown in number of respondents)[80]

	Kazakhstan	*Tajikistan*	*Turkmenistan*	*Uzbekistan*
Climate Data (18)[81]	4	6		8
Sectoral Data (13)	2	5		6
Information Bulletins (13)	2	6	1	4
Weather and Climate Change Projections (21)[82]	5	9		7
Methodologies (14)	4	6	1	3
Analytical Reports (9)[83]	2	5		2
Maps (14)	3	4	2	5

Table 4 indicates stakeholder preferences for training topics.

Table 4: Self-Reported Training Needs by Training Content and Stakeholder (shown in number of respondents)[84]

	Research-Academic Organization	*Government Agencies*	*Other Stakeholders*
General Understanding of	(11)	(4)	(6: three NGOs, one

[80] Source: 36 respondents interviewed February – March 2017.

[81] There are fewer responses in the subject category here than in Table 2 for climate data because Table 2 also included requests for climate data that were made under other responses (such as forecasts, reports, bulletins, etc.).

[82] See footnote above.

[83] See footnote above.

[84] Source: 36 respondents interviewed February – March 2017.

Climate Change Issues (21)			resource user association; one chamber of commerce; one utility)
Vulnerability Assessment (with a focus on the sector in which you work) (22)	(6)	(8)	(8: four NGOs, one private sector, one resource user association, one farming association, one utility)
Adaptation Measures (with a focus on the sector in which you work) (23)	(6)	(9)	(8: one private sector, one farming association, one chamber of commerce, four NGOs, one utility)
Food Security (16)	(4)	(7)	(5: four NGOs, one farming association)
GHG Emissions Calculations (10)	(3)	(4)	(3: one resource user association, one farming association, one NGO)
Low-Carbon Development (7)	(3)	(4)	
Development and Interpretation of Maps (10)	(3)	(5)	(2: one NGO and one chamber of commerce)
Other (4)		Public health monitoring and mortality analysis during heat waves (1); Influence of climate change on water resources (1)	Corporate policies on CC (1 private sector); different types of GHG emissions (1 resource user association)

The top three requested training topics were--in order of popularity—specific adaptation measures, sectoral vulnerability assessment, and general climate change issues. It should be noted that the two most popular options indicated that training would be tailored to the sector in which the respondent worked, which may also indicate a preference for customized programs. Food security was also a relatively popular topic, and training on adaptation measures was more frequently requested than on mitigation measures.

Table 5 indicates the distribution of responses across the participating countries.

Table 5: Self-Reported Training Needs by Training Content and Country (shown in number of respondents)[85]

	Kazakhstan	*Tajikistan*	*Turkmenistan*	*Uzbekistan*
General Understanding of Climate Change Issues (21)	1	9	1	10

[85] Source: 36 respondents interviewed February – March 2017. Questionnaire text and format provided in Annex 2.

Vulnerability Assessment (with a focus on the sector in which you work) (22)	5	10	1	6
Adaptation Measures (with a focus on the sector in which you work) (23)	4	11	1	7
Food Security (16)	4	9	1	2
GHG Emissions Calculations (12)	2	4	2	4
Low-Carbon Development (10)	1	3	2	4
Development and Interpretation of Maps (10)	2	3	3	2

When asked about preferred types of capacity strengthening, respondents provided the information in Table 6.

Table 6: Self-Reported Preferences for Capacity Strengthening by Type and Stakeholder (shown in number of respondents)[86]

	Research-Academic Organizations	*Government Agencies*	*Other Stakeholders*
On-site Workplace Programs (e.g. placement of a short-term dedicated expert) (23)	(8)	(11)	(7: one private sector, one resource user association, one farming association, three NGOs; one utility)
Distance Learning (10)	(5)	(5)	(2: one private sector; one NGO)
Courses with In-Person Attendance (20)	(6)	(8)	(6: one resource user association, one farming association, four NGOs)
Summer Schools (7)	(3)	(2)	(2: one farming association, one NGO)
Study Grants or Programs (e.g. masters or doctoral studies) (19)	(6)	(7)	(6: one resource user association; one chamber of commerce; four NGOs)

As the responses indicate, on-site training was the most popular option among all three stakeholder groups. However, the second most popular option was in-person training courses, which showed willingness to dedicate some time and possibly travel to a site. The third most popular option was that of study grants or formal post-graduate programs.

[86] Source: 36 respondents interviewed February – March 2017. Questionnaire text and format provided in Annex 2.

Table 7 indicates the distribution of responses across the participating countries.

Table 7: Self-Reported Preferences for Capacity Strengthening by Type and Stakeholder (shown in number of respondents)[87]

	Kazakhstan	*Tajikistan*	*Turkmenistan*	*Uzbekistan*
On-site Workplace Programs (e.g. placement of a short-term dedicated expert) (26)	6	9	4	7
Distance Learning (12)	4	7		1
Courses with In-Person Attendance (20)	4	9	2	5
Summer Schools (7)	4	2	1	
Study Grants or Programs (e.g. masters or doctoral studies) (19)	3	9	1	6

SWOT Analysis

The following Strengths-Weaknesses-Opportunities-Threats (SWOT) analysis was conducted by categorizing two types of information: 1) written information from project documentation and questionnaires; and 2) in-person feedback from in-person interviews, telephone interviews, and group consultations.

Strengths

- Dozens of climate change adaptation and mitigation information platforms targeted on and relevant for Central Asia already available online, including project based information sources and technology based platforms – integrators opened for third-party information
- Dozens of CC adaptation and mitigation projects implemented in countries of Central Asia significantly improved local knowledge and expertise

[87] Source: 36 respondents interviewed February – March 2017.

- There is a long history of hydro-meteorological data collection and processing, and good expertise in CC accumulated by national hydromets and some other regional and national organizations and their leading experts
- In addition to results and experience gained from projects implemented in CA, there is available international information on CC issues and best practices relevant to CA, namely in adaptation to CC (water and land-use management, farming techniques and technologies for dry areas)
- Available information platforms include:
    - Online CA project results (project reports, fact sheets, policy recommendations, infographics, software tools, videos, e-learning, etc.) – project web sites
    - Online libraries with information on relevant subject from third parties (research papers, projects results on the same/relevant topic from other countries/regions – educational/information materials for farmers, students, etc.)
    - Online research collaboration platforms through development agencies and universities
    - On-line communities of practice for environmental NGOs in the region working on climate issues
    - There are also several information platforms specifically developed on CC in CA – the most relevant/complex is the K-link/K-DMS implemented by GIZ
- NGOs are collecting local information related to climate change and adaptation measures, and in several of the participating countries, they have significant training and outreach experience and could serve as a means of information dissemination for data and knowledge collected for the CAMP4ASB platform.

The authors also identified good practices in climate change information and knowledge presentation and communication in the course of their interviews with international stakeholders. These practices are summarized in the figure below.

Figure 3: Good Practices Employed by Regional Stakeholders in Participating Countries[88]

Good Practices from Regional initiatives

1) Creating regional knowledge networks around climate change and supporting regularly-scheduled in-person meetings to further climate-related knowledge (WB)

2) Using a regional interest in environmental issues to leverage cross-border cooperation (GIZ, USAID, OSCE) for the Fergana Valley; e.g. Aarhus centers in Osh and Khujand, Syr Darya PEER research, and K-link-related Kyrgyz data on agroforestry/forestry for the Ferghana Valley

3) Utilizing in-country NGOs are a resource for training and local outreach, as they are often well trained and have strong local networks (US Government, UNDP)

4) Placing an international expert at an institution over a longer period of time – e.g. GIZ expert placement at Kyrgyz Statistical Committee. (GIZ)

5) Using open source data and coding on websites and platforms (GIZ, USAID)

6) Keeping things low-tech and traditional when conducting outreach to villages (OSCE)

7) Using an information center model to work with target groups, such as young people and women's groups (OSCE)

8) Featuring case studies and good examples from a similar context on an information portal (ESCAP, ICARDA)

9) Providing participating countries with a dedicated workspace within the platform that will allow for the presentation of data that may not be comparable or that are formatted differently. (ESCAP)

10) Using document exchange and good platforms to encourage a shift in organizational culture towards greater transparency (GIZ)

Weaknesses

- Replication rate of implemented projects, delivered results and developed experience is generally still very low (although it differs from country to country), and the replication that occurs is largely due to donor-supported initiatives.
- The sustainability of information and knowledge developed is relatively low. This includes project teams, project documents hosted on project specific web sites, project experience and developed know-how, which "disappear" after the project is closed (as web hosting is terminated, project staff find new jobs, etc.). Only a few initiatives focus on the development of local "institutional memory "of CC know-how and expertise

[88] *Source:* Interviews with regional stakeholders, February – April 2017.

    - Technology/web-based information platforms combined with search tools provide opportunities for effective information and knowledge management, but they heavily depend on active inputs from and on-going participation of third parties (lasting web hosting of information developed by third parties, on-going information updates). This on-going support is not provided in all cases, and typically, existing information platforms do not provide/are not combined with active search for and integration of third-party information, and thus lots of developed information get lost, i.e. it is not publicly accessible, after project termination.
- The capacity of stakeholders to find information they seek on-line is relatively low due to language barriers, lack of access to the internet, and lack of experience and time.
- With the exception of WMO-related temperature and precipitation data, climate change information and knowledge that has been developed is mostly limited to pilot regions/targeted stakeholders and the experts directly involved. It is not disseminated on a large-scale to other regions/countries/stakeholders due to lack of long-term financing.
- Most of CC information is available in English only, a subset in Russian, some isolated information in local major languages, and almost nothing in other local (minor) languages.
- Capacity of local stakeholders in climate change in general is low (except for relatively small number of CC experts) – this includes all types of end-users from all sectors (from farmers to policy makers)
- National procedures for international/regional sharing of hydro-meteorological and climate related data are not fully coordinated, there are restrictions due to different national specification of proprietary information
- The infrastructure for hydro-meteorological and climate related data measurement, remote data transmission, and processing is insufficient and obsolete, although it has undergone partial modernization

Opportunities

- Strengthened capacity of local stakeholders at all levels and sectors in climate change
- Improved climate related and hydro-meteorological data collection, analysis, modeling, reporting, sharing and public access to such data and information (infrastructure upgrades, capacity strengthening, data sharing policies)
- Provision of information services (knowledge, trainings, consulting) that will serve as an intermediary between already available on-line information sources/platforms and information end-users, and will assist end-users and search for them and compile information sources and deliver requested information in an

appropriate format and language (policy paper, draft legislation/policy, training of trainers on best farming practices, etc.)

- Provision of long-term financing to cover web-hosting costs of terminated projects and for long-term provision of information services
- Potential to develop an MoU with key donors to publish all project results and provide long-term web-hosting of information developed

One additional source of information on opportunities was an interview question for key informants that specifically asked about the information that organizations could contribute to a climate information platform. The findings are summarized in Annex 8 of this report, and they indicate that all three categories of stakeholder groups (scientific and academic institutions, government agencies, and other organizations) have a wide variety of information that they are willing to share.

In addition, two other themes emerged during stakeholder consultations:

First, agriculture and water resources management were seen as key sectors for cooperation. Agriculture consists an important part of economy of countries of the Aral Sea Basin and heavily depends on water availability for irrigation systems. The Syr Darya and Amu Darya downstream countries of Uzbekistan, Turkmenistan and Kazakhstan depend on water reserves in mountainous parts of Kyrgyzstan and Tajikistan. This international dependency creates the key driver for regional cooperation, including water management, measurement and sharing of hydro-meteorological data and water resources accumulated in glaciers, and weather forecasts, including extreme weather conditions.

Second, the large number of CC projects implemented and experience gained in the region of Central Asia does not mean that each country has benefitted from the same projects in the same subject area. Some projects have been implemented in all five countries of the region, others only in some of them. Regional sharing of information and experience gained from implemented projects among all countries of Central Asia, as well as interaction between CC experts from different countries, is the most effective way for developing and strengthening capacity in CC and for strengthening impact of implemented projects.

Threats

- High fluctuation of climate change staff especially in state agencies
- Short-term project based financing that often results in loss of information and capacity developed after project termination
- Pure focus on access to CC information will have low impact if not supported with implementation of sustainable scheme for applying/utilization of CC information in/for actual wide-scale CC project implementation – sustainable information and knowledge delivery scheme to final information end-users
- Low flexibility in project implementation, insufficient adaptive management, focus only on activities defined in project documents developed and approved several

years earlier, do not allow to reflect recent developments and changing conditions and to address new opportunities and demand.

- Actual CC mitigation and adaptation depend on effective development, financing and implementation of wide-scale CC mitigation and adaptation projects. Significant state and private investment in project implementation is needed, in addition to international grants. Ability to finance and implement projects primarily by private investors undermine high financial costs and investment risks.

Summary of Capacity Gaps

The following observations were drawn from information provided across the entire consultative process.[89]

- In general, there is no explicit lack of available information on climate change, but there is insufficient ability/capacity of local stakeholders to search for and utilize information already developed and accessible online and to have it delivered in a required format and language to all relevant local end-users (education and targeted trainings, policy papers, draft regulations).

- There is a long tradition of meteorological data collection and corresponding experience in this area. However, some of the data collection infrastructure is obsolete, based on manual readings, and does not have sufficient coverage. Currently, there are projects under way to modernize the infrastructure of national hydromets (automated weather stations, weather radars, digitalization of weather data archives). The level of modernization, as well the level of analytical expertise and data sharing varies between individual countries in Central Asia.

- Low salaries in state agencies result in high turnover rates for staff already trained in climate change.

- Donor-funded CC projects generate a great deal of experience and good practices; however, due to their limited time-frames, and low levels of on-going financing available, replication, sustainability and impact of these projects is not as high as it could be.

[89] Interestingly, there was not a high degree of correlation between gaps and needs identified in the National Communications and those identified through the review of other documentation and consultations with stakeholders. In some cases, this may be due to the different time at which those estimates were made, or through differences in the approach. However, it indicates that future reporting from the project should be shared with the NC preparation teams.

5. Conclusion and Recommendations

As the previous chapters of this report, many organizations in Central Asia are generating climate change data, information, and knowledge every day. There are also many governmental and non-governmental initiatives to address climate change that could be replicated or scaled up. There are even multiple examples of cross-border and regional cooperation on climate issues that could expand. All of these experiences form a strong starting point for a regional climate change information and knowledge platform.

The primary challenge facing the platform is contained in the CAMP4ASB Project Development Objective: "To enhance regionally coordinated ***access to improved climate change knowledge services for key stakeholders***…."[90] The platform must reach stakeholders where they are and provide them with the information they need in a format they can use. In short, the success of the platform will depend as much on communication as on information technology. The following recommendations are made with this approach in mind.

Recommendation 1: The platform should be a "Platform +" (платформ плюс), or a hardware and software platform *plus* skilled intermediaries who can ensure that timely and suitable climate information and knowledge reach the "last user," particularly stakeholders who will not be using the platform directly.

The CAMP4ASB platform can bring value added to the existing body of climate data and information if it focuses on *interface* with its on-line and off-line users. There is a sustained need for a human interface to support the use of the database and information prepared in a format that stakeholders can understand and use.

Policy-makers, researchers, educators, students, and vulnerable communities need **access** to the wide variety of information that is already being generated, much of which is available for public use, and to a large extent accessible on the Internet. A traditional self-contained web platform will meet the needs of only a subset of users. End users need data in a format that they can access and understand. Many recent climate change information initiatives seek to improve user experiences within climate change portals and document management systems by using decentralized storage, help desks, tagging, and peer assist, these programs do not serve off-line users.

In a *Platform +*, the platform should form one part of a *delivery scheme* that brings information and knowledge to users through a network of experts who can provide training, capacity building, and response to individual and organizational requests. Local experts will be able to take information available electronically and present it to users in a culturally-relevant context.

[90] World Bank, 2015: 6.

This approach has several advantages in current operating conditions in the region. First, human interface can address access issues, language and literacy issues, formatting issues, and knowledge issues. Second, climate change specialists can also increase the demand for and use of climate information with effective outreach and long-term relationships with institutions and communities. Third, maintaining and cultivating human capital in intermediaries will have a long-standing impact that extends beyond the life of the project. Fourth, a trained group of climate change experts can support the uptake of the other CAMP4ASB project components. Finally, a *Platform +* with an emphasis on ongoing outreach and human interface, would also address relatively high turnover in stakeholder organizations in the region.[91]

Recommendation 2: Activities to strengthen capacity should be linked directly to the gaps identified in the project consultations and should focus primarily on building the capacity of knowledge providers. Intermediary groups already have experience with gathering, analyzing, and communicating climate change information and knowledge in a format and language that is useful and relevant. For example, NGOs in the region have been providing climate change training for more than a decade. Researchers and teachers are other important user groups; some of them are already involved in education and training, while many more are interested. In addition, regional experts on climate change who work on a project-by-project basis have valuable networks and institutional memory that should be maintained.

The following table explains the linkages between the capacity gaps that were identified and the corresponding program recommendations.

Table 8: Overview of Capacity Gaps and the Corresponding Recommendations

Capacity Gaps	**Recommended Capacity Strengthening Response**
Local stakeholders often lack the capacity to search for and utilize information already developed and accessible on-line and to have it delivered in a format and language that is relevant to them (this applies to education and targeted trainings, policy papers, and draft regulations).	* Training sessions should provide printed materials for participants to keep * Outreach, knowledge products and training *must* be customized to local knowledge needs. * The project should employ knowledge specialists, who should be able to adapt and translate appropriate good practice information, analytical reports, and methodologies for use on the portal and through information points / intermediaries. * The operations budget should include a line item for translation.

[91] That said, the project should coordinate with the ongoing WB Central Asia Hydrometeorology Modernization Project to target areas where climate data collection can be expanded and/or refined.

	* The operations budget should include a line item for publishing, as many target beneficiaries lack access to the internet or prefer hard copies to keep and/or share. *The project should consider radio and text messaging for certain types of information dissemination, particularly for early warning systems and for rural stakeholders.
There is a long legacy of and experience in the collection of meteorological data. However, some of the data collection infrastructure is obsolete, based on manual readings, and does not have sufficient coverage. Currently, there are projects under way to modernize the infrastructure of national Hydromets (automated weather stations, weather radars, digitalization of weather data archives). The level of modernization, as well the level of analytical expertise and data sharing varies between individual countries in Central Asia.	* Training programs for all stakeholders should incorporate expanded and more detailed information from the hydromet agencies in the participating countries. * The information portal should be designed in such a way that it can incorporate expanded data inputs. * The CAMP4ASB project should coordinate closely with the World Bank hydromet modernization project in order to capitalize on the enhanced capacity of the hydromet agencies as soon as improvements occur. *Capacity strengthening programs involving joint research or training should take account of the relative strengths of individual hydromet agencies and should allow for hydromets to share their specific data and skills.
Low salaries in state agencies result in high turnover rates for staff already trained in climate change.	*The project should assume a continued rate of relatively high turnover in state agencies, and introductory trainings for government agencies should be repeated every two years in order to reach new, untrained civil servants. *Capacity strengthening activities should consider the long-term placement of specialists, both local and international experts, on fellowships in order to provide sufficient incentives to stay for a minimum period and to train colleagues as necessary.
Donor-funded CC projects generate a great deal of experience and good practices; however, due to their limited time-frames, and low levels of on-going financing available, replication, sustainability and impact of these projects is not as high as it could be.	*The project should publish an annual report on climate change-related activities in the region and should support efforts to covene an annual regional research conference. *The project should attempt to identify ongoing, long-term support for communities of practice for climate information user groups such as research and academic institutions and environmental NGOs in order to avoid continuity problems when individual projects with capacity strengthening measures come to an end. *The project should liaise on an ongoing basis with donor-led initiatives to archive project data and project documentation. *The project steering committee should develop explicit recommendations about post-project data archiving and preservation related to the platform and should consider long-term options for housing the information platform either at a regional organization or cooperatively through national agencies or libraries.

	*Project events and communities of practice should encourage participation by regional experts even when they are not affiliated with a project at the time and should develop an "expert roster" of independent climate change specialists in Central Asia.

Recommendation 3: The platform and interface should include a long-term data management plan to manage and archive information and a mechanism for stakeholder input on the types of information that are collected, archived, and produced for on-line and off-line use. Any climate information and knowledge system will require a long-term commitment and an active governance role for participating stakeholders. As a major study on environmental data notes, "…for environmental data, both user needs and the data themselves are constantly evolving. Thus, all environmental data management activities, including data archiving and access decisions for specific data sets as well as the development of the overall data management system, should incorporate substantial and ongoing user input."[92] In fact, a major study of regional hydromet services in another region found that effective provision of an "end-to-end services approach"[93] in climate information at a regional level would required "acquisition, installation, maintenance, training, operating funds for 10 years."[94] If this is a standard for hydromet hardware and software, it will be important to think seriously about a similar commitment to the information and knowledge that are generated by a climate change information system.

As the study on environmental data also notes, "…data management activities require continuing costs that extend long after the data are originally collected or generated."[95] A commitment to long-term, post-project support is crucial; it addresses the threat of loss of data and institutional memory from restructuring or project closure. The project implementation work plan should include activities that explicitly deal with resource mobilization for post-project data stewardship.

There are several ways that stakeholders can be involved in the long-term management of the climate change information and knowledge platform: user logs, formal advisory groups, and stakeholder panels and focus groups. A fixed mechanism for providing input will lessen the effects of staff turnover at stakeholder institutions as the project is implemented.

Recommendation 4: Both the platform and interface should take men's and women's differing needs into account. Men and women may experience the impacts of climate change differently in the region.[96] In adaptation, women in the region may be more vulnerable to the impacts of climate change, and they may undertake different roles in disaster risk management, particularly in rural areas. In mitigation, women in

[92] NRC, 2007: 35.

[93] As defined in WMO, 2015;7.

[94] Snow et al., 2016: 27.

[95] NRC, 2007: 35.

[96] Korotenko et. al. 2013 is one example of several studies.

participating countries may have different roles in fuel acquisition and energy purchasing decisions. In all areas, men and women may receive information through different formal and informal social networks and different media formats, and their awareness levels may differ.[97]

Project scoping activities also identified some positive experience with reaching women directly and providing training and capacity strengthening through women's associations.[98] If the Platform + and related outreach efforts are successful in integrating gender issues, they have an opportunity to mainstream gender into climate-related policies and programs. Project activities and project management governance mechanisms should be gender-sensitive. Interface mechanisms (printed, audio-visual, person-to-person) should also take gender considerations into account. Finally, training for specific sub-groups should be aware of gender imbalances, particularly in leadership roles. For example, women form a relatively low percentage of heads of resource user associations.[99] Any gender-related considerations affecting access to training, participation, and project M&E, particularly in rural areas, should be noted and addressed.

[97] World Bank 2010 and Oxfam 2010 as cited in Skochilov, 2012: 6.
[98] The PPCR Phase 1 Activities and the OSCE-supported Aarhus Centres are two examples.
[99] Korotenko et. al. 2010, for example, found that fewer than 10% of clean drinking water users unions (CDWUUs) were headed by women.

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Annex 2: Sample questionnaires

[available separately]

Annex 3: List of stakeholders consulted and meetings held

List of National Stakeholders

[List of national stakeholders to be included]

List of International Stakeholders

Organization/Project	Person	Consultation
International Centre for Agricultural Research in the Dry Areas (ICARDA) under the CGIAR Program for Central Asia and the Caucasus	Akmal Akramkhanov	Spoke 15 Feb.
ICBA (Agriculture for Tomorrow), Research & Innovation	Kristina Toderich (based in Tashkent)	Spoke 15 Feb.
Zoi Environmental Network	Viktor Novikov	Sent written responses to questions 6 March.
CGIAR	Thevs, Niels (ICRAF)	Spoke 15 Feb
GIZ	André Fabian, Head of natural resource management department Benedikt Ibele	Spoke 15 February
UNESCAP	Kim Roseberry, Consultant	Spoke 22 February
U.S. Government	Claire Thomas Economics Officer, USEmb Tashkent	Spoke 28 February
USAID (Contractor)	Glen Anderson, Principal Associate, Abt Associates	Meetings held directly with CAREC and through a group consultation 27-28 with CAREC participation
OSCE Regional Projects	Jenniver Sehring, Environmental Affairs Advisor; Madina Ibrasheva, National Ec. and Env. Officer, Astana Office	Spoke on 10 March
World Bank: CAEWDP	Manon Cassara	Spoke on April 5th.

Annex 4: Table of Recent and Ongoing Projects at the Country and Regional Level Relevant to the Proposed Platform

Project Title	Status, Donor(s)	Financing (USD)	Stakeholders	Objectives, Outputs and Outcomes
KAZAKHSTAN				
Improving the Climate Resiliency of Kazakhstan Wheat and Central Asian Food Security Повышение устойчивости сектора производства пшеницы в Казахстане к изменению климата для обеспечения продовольственной безопасности в Центральной Азии, 2012-2014	Completed in 2017 USAID, UNDP	1.1 million	Минсельхоз РК, Министерство охраны окружающей среды и водных ресурсов РК, АО Казагроинновация, РГП Казгидромет Национальный институт космических исследований	Результат - Разработать комплексные национальные стратегии, касающиеся изменения климата (основное внимание направлено на экономические сектора, подвергающиеся риску, уязвимость экосистем и необходимости для адаптации) для дальнейшей их интеграции в национальные планы развития и стратегии устойчивого развития. Проект основан 3-х компонентах: 1) Улучшение мониторинга и обмена информацией для производства пшеницы устойчивой к климатическим условиям (Казахстан) 2) Усиления противодействия последствиям изменения климата путем интеграции мер по адаптации к изменению климата 3) Оказание поддержки в проведении регионального диалога, касающегося производства пшеницы, изменения климата и продовольственной безопасности в регионе (странах Центральной Азии). Мероприятия: • демонстрация применения адаптационных технологий и подходов в северном Казахстане, изучение фермерами различных технологий возделывания пшеницы, рапса, льна, приобретение опыта о противостоянии засухе этих культур, учет цены на эти культуры и себестоимость производства, выгода

Project Title	Status, Donor(s)	Financing (USD)	Stakeholders	Objectives, Outputs and Outcomes
				выращивания масляничных культур, важность диверсификации своих хозяйств под различные посевы, учет рекомендаций «Казгидромет» о сроках посева. • Консультации фермеров по вопросам более эффективного использования земельных ресурсов, посева различных сельскохозяйственных культур и использования методов, способствующих повышению урожайности и требующих наименьшего вмешательства со стороны человека и финансовых затрат. Использование нулевой обработки почвы наиболее оптимальным в климатических условиях Казахстана, рекомендации по внедрению новых схем агрострахования. Обучение свыше 2 000 фермеров обучение по вопросам влияния климатических изменений на сельское хозяйство • При содействии экспертов проекта проводились работы по выведению засухоустойчивых сортов пшеницы, по диверсификации структуры посевов. • Разработка геопортала космических исследований засухи (АО «Национальный центр космических исследований и технологий» (НЦКИТ) при поддержке ЮСАИД и ПРООН). Главная цель - предоставление акиматам регионов, специалистам, фермерам инструмента, позволяющий получить в удобном и понятном для восприятия виде данные мониторинга и анализа засух с использованием космических технологий. Пользователи могут просматривать и анализировать данные, полученные методом дистанционного зондирования Земли, сопоставлять результаты разных лет и данные, полученные с разных полей, строить таблицы и графики, искать необходимую информацию. • Содействие в разработке специального

Project Title	Status, Donor(s)	Financing (USD)	Stakeholders	Objectives, Outputs and Outcomes
				программного комплекса обеспечения «синоптик-долгосрочник» Автоматизированный подбор года-аналога и конкретизация синоптических процессов. • Проводились выставки «Золотые поля». • Разработаны учебные модули по адаптации сектора производства пшеницы к изменению климата, которые внедрены в программы обучения.
Climate Risk Management in Kazakhstan Управление климатическими рисками в Казахстане	2010-2014, regional GEF (UNDP)	680,000	Министерство охраны окружающей среды Министерство по чрезвычайным ситуациям Комитет по водным ресурсам Министерства сельского хозяйства Акимат Алматинской области	Проект перекликается с предыдущим проектом и некоторые мероприятия проводились совместно. Цель: усиление институциональных рамок, технического потенциала по управлению рисками, связанными с изменением климата, путем интеграции вопросов на национальном, субнациональном и местном уровнях. Задачи: • Усиление стратегий, политики и законодательства, касающихся адаптации к изменению климата, в приоритетных секторах и географических регионах. • Расширение возможностей финансирования на национальном, субнациональном и местном уровнях мероприятий по управлению рисками в стране, связанными с изменением климата. • Информирование об изменчивости климата на национальном, субнациональном и местном уровнях, посредством широкомасштабных мероприятий. В основе проекта лежат государственные программы по Зеленой экономики и Агробизнес 2020. Проект позволит выработать интегрированный подход к управлению рисками и использования возможностей в области изменения климата как на республиканском, так и на областном и местном уровнях, меры по снижению потерь в приоритетных

Project Title	Status, Donor(s)	Financing (USD)	Stakeholders	Objectives, Outputs and Outcomes
				отраслей экономики и географических регионах. Был сфокусирован на трех областях: Акмолинская, Костанайская и Северо-Казахстанская. Проведена сессия на Астанинском экономическом форуме «Проблемы адаптации сельского хозяйства к изменяющемуся климату» Создана информационная Платформа по управлению знаниями в области климатических рисков в Центральной Азии Разработано: Оценка воздействия климатического риска в Центральной Азии, Алматы, 2013; Данное руководство составлено для определения ключевых факторов воздейсвтия изменения климата на местном уровне и разработки мер для разрешения последствий данного воздействия Устойчивое землепользование в условиях изменения климата: традиционные знания и наилучшие практики, Астана, Казахстан, 2012, В сборнике представлены традиционные методы использования земельных и водных ресурсов, применяемые жителями региона Центральной Азии в растениеводстве и животноводстве. Публикация включает описание доступных технологий ресурсосбрежения, используемых в настоящее время отдельными фермерами Казахстана, которые позволяют не только рационально управлять землей, водными источниками и биоразнообразием, но и повышать благосостояние населения и смягчать последствия изменения климата.

Project Title	Status, Donor(s)	Financing (USD)	Stakeholders	Objectives, Outputs and Outcomes
				Пособие для медицинских работников "Изменение климата и здоровье", ЭД "БИОМ", ГЭФ ПМГ, ПРООН, Бишкек 2013, пособие адресовано руководителям и сотрудникам Центров Государственного санитарно-эпидемиологического надзора, Комитетов Укрепления Здоровья и другим работникам системы здравоохранения с целью повышения информированности о глобальном изменении климата и последствиях для здоровья населения. Данная публикация может быть использована для повышения информированности всех групп населения, а также при разработке адаптационных мероприятий как в системе здравоохранения, так и в других секторах.
Sustainable Rangeland Management for Rural Livelihood and Environmental Integrity Устойчивая практика управления пастбищами,	2009 – 2015 UNDP-GEF/ GIZ	3.763 million	Министерство сельского хозяйства, Министерство окружающей среды, Агентство по управлению земельными ресурсами Акимат Жамбылского района Алматинской области, Неправительственные организации	Благоприятная окружающая среда, способствующая устойчивому управлению пастбищными угодьями на центральном и местном уровнях • Усиление потенциал и знаний по интегрированному устойчивому управлению пастбищных угодий местными органами власти, структурами общин и отдельных фермеров • Улучшение местной инфраструктуры, которая обеспечивает лучшие выпасы стадам домашнего скота • Внедрено обучение, оценка и адаптивное управление Проект «Устойчивое управление пастбищными угодьями для сельского хозяйства» концентрирует свои усилия на продвижении созданию благоприятных условий на политическом и регулятивном уровне для комплексного решения проблемы пастбищных угодий, обеспечения подготовки местных органов власти, сельских

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				структур и фермеров о том, как применять интегрированные подходы устойчивого управления пастбищными угодьями.
Support for the Preparation of the National Communication of Kazakhstan to the UNFCCC and the Biennial Update Report Разработка Национального сообщения Республики Казахстана в рамках РКИК ООН и Двухгодичного доклада	2012-2017 UNDP-GEF	852,000	Министерство энергетики РК	Обновление информации о национальных особенностях, инвентаризации парниковых газов и мерах, предпринимаемых для смягчения последствий изменения климата, оценке подверженности к изменению климата и предпринимаемых усилиях по адаптации, информированию общественности, просвещении и подготовке кадров, систематических исследованиях и наблюдениях, передаче технологий. Проектом будет также повышен технический и институциональный потенциал в области подготовки НС/ДД и оказана помощь Правительству в интеграции вопросов изменения климата в отраслевые и национальные приоритеты развития, которые оказывают непосредственное содействие достижению Цели развития тысячелетия №7
Preservation and Management of Steppe Ecosystems Сохранение и устойчивое управление степными экосистемами	2008-2013 UNDP/GEF	2.24 million		Созданы государственный национальный природный парк «Буйратау» и государственный природный резерват «Алтын Дала»; Проведены работы по подготовке обоснований для расширения существующих и создания новых степных ООПТ; В Парламент Республики Казахстан внесены предложения по совершенствованию законодательства в области ООПТ; Система мониторинга и управления знаниями степной экосистемы Иргиз-Торгай-Жыланшик используются для ландшафтного планирования землепользования; Определены механизмы управления экологическими коридорами; Подготовлен ежегодный научный отчет о местах

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				обитания и биологических параметрах популяции сайги на территории пилотных ООПТ; Подготовлен анализ различных моделей финансирования степных ООПТ; Повышен потенциал сотрудников пилотных ООПТ.
DIPECHO VII: Community-Based Disaster Risk Management in South-East Kazakhstan DIPECHO VII: Снижение рисков бедствий на основе сообществ в Юго-Восточном и Восточном Казахстане, 2012-2013, РК	Completed ECHO (EU) / UNDP / Kazakhstan Red Crescent Society	774,133		Риски бедствий адресованы и сокращены на уровне местных сообществ (Текели, Алматинская область) Сокращение рисков бедствий местных сообществ воспроизведено и учтено на всех уровнях Улучшенная подготовка к бедствиям путем повышения способностей отдаленных сообществ и национального общества (ответственный партнер: Общество Красного Креста Казахстана)
Southeast Europe and Central Asia Catastrophe Risk Insurance Facility (SEECA CRIF) Развитие инфраструктуры рынка страхования от последствий стихийных бедствий в Казахстане (Фонд страхования рисков для Юго-Восточной Европы и Центральной Азии)	Under implementa-tion (2016-2019) World Bank / IFC	5.48 million	World Bank	Всемирный банк оказывает техническую помощь Правительству РК в подготовке Закона об обязательном страховании от последствий стихийных бедствий. Проект будет фокусироваться на реализации данного закона посредством разработки инфраструктуры страхового рынка в поддержку продуктов страхования от последствий стихийных бедствий, которые будут предлагаться местным страховым компаниям. Страховые продукты будут покрывать риски наводнений, оползней и землетрясений. Сфера охвата рисков принесет основную пользу аграрного сектору в повышении качества страхового покрытия в целях преодоления негативных последствий экстремальных погодных явлений для отрасли.
Second Irrigation and Drainage Project (IDIP-2), 2013-2021 Улучшение ирригационных и дренажных систем	Under implementa-tion World Bank	343 million total, 102.9 million of that as an IBRD loan	Министерство финансов, Министерство сельского хозяйства	Цель Второго проекта по улучшению ирригации и дренажа для Казахстана заключается в улучшении оказания ирригационных и дренажных услуг для поддержки фермеров. В проекте четыре компонента: 1) восстановление и модернизация

Project Title	Status, Donor(s)	Financing (USD)	Stakeholders	Objectives, Outputs and Outcomes
Project,WB,2013-2021 *Note:* this project is the successor to IDIP-1, which was implemented from 1996 to 2004.				инфраструктуры систем ирригации и дренажа 2) Устойчивое управление, эксплуатация и техническое обслуживание, а также модернизацию и укрепление МОМ основной ирригационно-дренажной системы. 3) Развитие сельского хозяйства, который будет поддерживать: укрепление потенциала фермеров посредством 4) помощь и обучение. Этот компонент будет включать оперативную поддержку Группы управления проектами (ГУП), которая будет создана в рамках Комитета по водным ресурсам (КВР).
Climate Change, Water Resources, and Food Security in Kazakhstan Изменение климата, водные ресурсы и продовольственная безопасность в Казахстане	Under Implementa-tion	NA	В проекте задействована большая группа ученых, которая состоит из девяти исследователей Университета Реддинга; 20 исследователей Института географии, четырех исследователей Назарбаев университета и исследователей Казахского Национального университета им. Аль-Фараби.	Публикация двух научных работ в журналах с импакт-фактором Две презентации на осеннем заседании Американского геофизического общества (AGU), 2015 Презентация на конференции «Горы будущего мира 2015» Презентация на Центрально-Азиатском форуме Две презентации на международном симпозиуме по гляциологии, май 2015 г. Проводится совместная полевая работа и регулярные визиты по обмену: в 2015-2016 гг; несколько казахстанских исследователей посетили университет Реддинга и стали участниками встреч рабочих групп и семинаров, а также получили практическое обучение от ученых Университета Реддинга. Дальнейшее влияние проекта: Институт исследований и инноваций Назарбаев университета (NURIS) и Университет Реддинга (UREAD) подали совместную заявку на участие в Программе

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				академического обмена в рамках «Эразмус Плюс». Зарине Сайдалиевой из казахстанского Института географии был присужден престижный международный грант на обучение в университете Реддинга. Все вышесказанное также предполагает, что одним из результатов данного проекта будет улучшение исследовательских навыков и деятельности ученых, начинающих свою исследовательскую карьеру. Публикации в рамках проекта: (1) Усманова, З., М. Шахгеданова, И.Северский, Г.Носенко и В.Капица. Оценка изменения площади ледников в бассейне реки Текес, Центральный Тянь-Шань, Казахстан, за период с 1976 по 2013 гг., использование Ландсат и снимки КН-9, подано в «The Cryosphere». (2) Капица, В., М.Шахгеданова, И.Северский, А.Медеу. Описание и оценка изменений в горных озерах Джунгарского Алатау с 2002 по 2014 гг. с использованием снимков Ландсат. Подано в «The Cryosphere». (3) Жумабаев, Д., М. Шахгеданова, Д. Хэйн. Оценка климатических изменений в Казахстане с использованием комплекта климатических моделей высокого разрешения. Подано в журнал «Environmental Research Letters» в июле 2016 г.
Preparedness for Emissions Trading in the EBRD Region (PETER) Проект PETER	2013-2015		EBRD supported a consortium headed by Thomson	Основными целями проекта являются содействие правительствам Республики Казахстан и Украины в: • Понимании затрат и выгод от введения

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			Reuters Point Carbon for implementation ЕБРР поручил консорциуму во главе с Thomson Reuters Point Carbon осуществление проекта PETER.	внутренних систем торговли квотами на выбросы по сравнению с другими инструментами политики смягчения последствий изменения климата; • Анализе вариантов дизайна таких систем и критериев для связи с внешним системами торговли выбросами, такими как EU ETS; • Разработке возможных дорожных карт к (i) внедрению внутренних систем торговли выбросами и (ii) для связи с внешними ограничения выбросов и торговли схем, и • Повышении уровня готовности и предоставлении практических инструментов для создания платформ и структуры потенциального обсуждения вопросов углеродных рынков с внешними партнерами. 17 different reports on emissions trading procedures were prepared under the project on topics such as opportunities for emissions reductions in Kazakhstan, allocation procedures, carbon pricing, and a summary of the pilot trading system in Kazakhstan. http://www.ebrdpeter.info/ru/reports/
Kazakhstan Climate Change Mitigation Program (KCCMP) Казахстанская программа по сдерживанию изменения климата (KCCMP)	2013-2017		USAID	KCCMP является трёхлетним проектом Американского Агентства по Международному Развитию, нацеленным на поддержку Казахстана в деле долгосрочного и устойчивого сокращения удельных выбросов парниковых газов. Программа поддерживает правительство и деловое сообщество Казахстана в реализации политики и мер по сокращению выбросов парниковых газов на проектном, корпоративном и национальном уровнях. Программа так же способствует совершенствованию специализированных обучающих программ для

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				подготовки нового поколения профессионалов в области энергетики и климата в Казахстане. Целями программы являются: Улучшение способности Правительства Казахстана выполнять и контролировать политику и меры по снижению выбросов парниковых газов с помощью процедур и инструментов по реализации национальной системы ограничения и торговли выбросами парниковых газов и законодательства по энергосбережению и повышению энергоэффективности, а также с помощью поддержания диалога между регуляторами и регулируемыми предприятиями. Укрепление способности делового сообщества снижать выбросы парниковых газов за счёт повышения качества управления данными об энергопотреблении и выбросах в атмосферу, подготовки верифицированной отчётности, повышения корпоративных возможностей для оценки, разработки и реализации мер по снижению энергопотребления и выбросов парниковых газов, а также повышения профессионализма аудиторов и верификаторов. Развитие профессиональных программ подготовки кадров в области энергосбережения и изменения климата за счёт организации учебных семинаров, поддержки процесса профессиональной аккредитации и создания центров распространения современных знаний и технологий.
Enhancing climate resilience and adaptive capacity in the	2015-2018 UNECE	NA	Комиссия Республики	Результаты проекта: • Проведен совместный анализ тенденций

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transboundary Chu-Talas basin **Promoting Cooperation to Adapt to Climate Change in the Chu and Talas Transboundary Basin** Содействие сотрудничеству в адаптации к изменению климата в бассейнах рек Чу и Талас: аспекты уязвимости	2010-2013 UNECE/ UNDP/EU		Казахстан и Кыргызской Республики по использованию водохозяйственных сооружений межгосударственного пользования на реках Чу и Талас.	изменения климата в Чу-Таласском бассейне. Сделаны выводы о том, что за последних 20 лет температура в бассейне значительно увеличилась, в результате прогнозируемого изменения климата ледники в обоих бассейнах могут быть полностью исчерпаны к 2100 году. • Изучено воздействие ИК на водное и сельское хозяйство. • Разработаны меры по адаптации и проведена их экономическая оценка, извлечены уроки, определены перспективы. • Взаимодействие между странами помогло осознать последствия изменения климата, текущие и будущие последствия и угрозы в бассейне. • Результаты заложили основу для планирования совместных усилий по адаптации к изменению климата. • Даны рекомендации Комиссии – возглавить и организовать разработку, внедрение конкретных мер и действий по адаптации к ИК в бассейне, в том числе на основе принципов ИУВР. • При анализе ситуации эксперты Казахстана и Кыргызстана отнесли к наиболее вероятным и серьезным последствиям изменения климата в бассейне увеличение засушливости при одновременном снижении доступности водных ресурсов. • Выпущена Информационная Брошюра при содействии ЕЭК ООН и ПРООН. • Обоснована необходимость подготовки пилотных адаптационных проектов. • Возможные адаптационные меры включают: - реабилитацию и модернизацию сети

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				мониторинга; - реабилитацию ирригационных систем в целях снижения потерь воды; - развитие аккумулирующих емкостей и корректировка режима регулирования; - изменение структуры землепользования и диверсификация сельскохозяйственных культур; - использование современных систем орошения; - пересмотр политики субсидий (в том числе ценообразование воды) – для введения стимулов по экономному использованию водных ресурсов; - учет влияния изменения климата при определении норм полива; - предупреждение последствий чрезвычайных ситуаций. • Оценка и реализация предложенных мер адаптации.
Supporting Kazakhstan's transition to a Green Economy Model Поддержка Казахстана по переходу к модели зеленой экономики	2015-2018 EU/UNDP/ UNECE	EUR 7.1 million	Комитет по водным ресурсам Министерства сельского хозяйства РК	Проект, разработанный при взаимодействии с основными заинтересованными сторонами, полностью соответствует главным политическим приоритетам Правительства Казахстана и национальной институциональной структуре и направлен на усиление национального потенциала в долгосрочной перспективе. Проект основан на опыте предыдущих и текущих проектов Европейского Союза, которые нацелены на содействие устойчивому использованию природных ресурсов, в частности региональной платформы ЕС для Центральной Азии по вопросам экологии и водных ресурсов. Проект реализуется в рамках Программы развития Организации Объединенных Наций (ПРООН) в качестве ведущей организации в партнерстве с Экономической комиссией ООН для

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				Европы (ЕЭК ООН). Ожидаемые результаты проекта. • Оказание поддержки в разработке нормативно-правовой и методической базы для устойчивого управления водными ресурсами. • Продвижение современной системы экологического управления с целью создания экономических стимулов для перехода к модели «зеленой экономики с акцентом на водные ресурсы и изменение климата. • Содействие во внедрении «зеленых» практик управления водными ресурсами на местном уровне с учетом факторов изменения климата.
TAJIKISTAN				
Building Climate Resilience in the Pyanj River Basin: Components 1 (Irrigation) and 2 (Flood Management) Проект «Обеспечение устойчивости бассейна реки Пяндж к изменениям климата» (компонент 1-2). Номер проекта 45354-002 G0352	2014-2020 ADB	22.3 million (for both components)		Objective: Улучшенные средства жизнеобеспечения общин расположенных в бассейне реки Пяндж, которые уязвимы к изменчивости и изменению климата Results: Ожидаемым результатом является снижение негативных последствий изменчивости и изменения климата среди целевых общин, расположенных в бассейне реки Пяндж.
Improvement of weather, climate and hydrological service delivery Улучшение предоставления услуг и данных по погоде, климату и воде	Ongoing World Bank (IBRD)	15 million WB		Objective: улучшения национальной системы гидрометеорологического мониторинга и предоставления своевременных оповещений об опасных явлениях. Results: Улучшенный потенциал Таджикистана для подготовки к возможным последствиям изменения климата
Tajikistan Climate Science and	2011-2013	375,000	Hydromet	Objective: Цель инвестиционной программы в рамках

Project Title	Status, Donor(s)	Financing (USD)	Stakeholders	Objectives, Outputs and Outcomes
Impact Modeling Partnership	ADB			Фазы 2 по моделированию климата является развитие и усиление потенциала Таджикистана по использованию и управлению климатических рисков, Results: разработаны климатические модели до 2010 г
Building Capacity for Climate Resilience	Ongoing ADB	3 million		
Enhancing the Climate Resilience of the Energy Sector Усиление климатической устойчивости в энергетическом секторе	2010-2013 EBRD	11 million EBRD; 65 million in other investment financing		Obejctive: Модификация установленной мощности в свете проектируемых изменений в речном стоке и других климатически обусловленных явлений в течении всего периода пригодности оборудования. Results: будет способствовать безопасности дамбы и улучшению качества и количества энергоснабжения, а также усилению потенциала национальных институтов
Environmental Land and Management and Rural Livelihoods (ELMARL) Сельское хозяйство и устойчивое управление земельными ресурсами	2015-2018 WB (IBRD)	9.5 million		Objective: Инвестиции окажут содействие фермерам и сообществам разрешить существующие проблемы воздействия изменения климата путем улучшения местного жизнеобеспечения, Results: окажут позитивное воздействие на продуктивность урожая и увеличат устойчивость к неблагоприятным воздействиям изменения климата.
National Human Development Report	2012 UNDP	NA		Goal: Изменение климата рассматривается как растущая угроза для окружающей среды в Таджикистане. Results: Опубликован Отчет, в которой осуществлена попытка освещения возможного влияния изменения климата на социально–экологические процессы с учетом гендерного фактора
Qairokkum Hydropower Rehabilitation Project	2015-2019 EBRD, CIF	Appr. 71 million initially[101]		Goal: Улучшить надежность производства ГЭС; Продлить срок службы ГЭС; Objectives: Улучшить надежность производства ГЭС; Продлить срок

[101] Appr. 50 million (1st phase loan); total investment estimated at EUR 157 million; CIF is providing a grant of 11 milion and a concessional loan of 10 million.

Project Title	Status, Donor(s)	Financing (USD)	Stakeholders	Objectives, Outputs and Outcomes
Реабилитация Кайраккумской ГЭС				службы ГЭС;
Resource Savings and Cleaner Technologies Ресурсосбережение и более чистые технологии. Позиция Мамадалиева Б.- руководитель проекта по Таджикистану	2010-2013 TEKNA[102]	NA	TEKNA – Норвежское общество дипломированных специалистов -- Международный (Россия, Азербайджан, Украина и Таджикистан)	Results: Проведены обучающие семинары в ряде крупных промышленных предприятий Министерсва промышленности, ПО Таджиккомунсервис, Министерсва сельского хозяйства и др. Обучено более 100 специалистов методам Более чистых технологий (БЧП), разработано более 50 пилотных проектов направленных на ресурсосбережение и снижение воздействия промышленности на окружающую среду
Development of a Municipal Solid Waste Strategy for Dushanbe Разработка стратегии «Управление Твердыми бытовыми отходами города Душанбе»,	2010 EBRD	650,000	Municipal-level project	Results: Подготовлены отчеты по результатам исследований и представлены в ЕБРР и администрацию города. Организован ЦРП и проект успешно реализован.
Nurek Solid Waste Sub-Project under the EBRD Tajikistan Solid Waste Framework Реконструкция полигона ТБО в г. Нурек.	2014- EBRD	Appr. 5.3 million (including investment and TA grants)	Municipal-level project	Results: Подготовлен отчет и представлен ЕБРР и администрации города Нурек. Проект успешно реализован.
Economics of Climate Change in Central and West Asia RDTA-8119 REG «Экономика изменения климатав Центральной и Восточной Азии» реализован компанией CARDNO	2015-2016 (TAJ comp.) ADB, implemented by CARDNO	USD 1.2 million	Regional project Региональный (Таджикистан, Афганистан и Кыргызстан	Results: Подготовлен и представлен отчет с рекомендациями более 10-пилотных проектов для инвестирования. Отчет по проектупредставлен АБР и Правительство Республики Таджикистан.
Regional coordination and support	2014-2020	Funding	Regional project	Разработка адаптационных мер посмягчению

[102] www.tekna.no

Project Title	Status, Donor(s)	Financing (USD)	Stakeholders	Objectives, Outputs and Outcomes
for the EU – CA enhanced regional cooperation on Environment, Water and Climate Change Программа по воде, климату и развитию для Кавказа и Центральной Азии	EU	varies by year		последствий климатических изменений в водном и сельскохо-зяйственном секторе, демонстрация водосберегающих технологий полива сельскохозяйственных культур в системекруглогодичногоиспользованияорошаемыхземель и повышения уровня знаний водопользователей региона. Outputs: Исследование; Оценка Публикации,
Climate Risk Management Part of the multi-country Central Asia UNDP Programme on Climate Risk Management (CA-CRM)	2012-2015 UNDP	Appr. 1.5 million for regional project	Проект Региональный, МЭЦ выполнял работу на Национальном, местном уровне	Objectives: Снижение уязвимости пилотных общин, МЭЦ- разработка Планов Действий. Outputs: Публикации, отчет, Планы действий
Adaptation to Climate Change in Rural Communities of Southern Tajikistan «Адаптация к изменению климата в сельских общинах южного Таджикистана»	3 years ACT Central Asia		Local-level project	Goal: Снижение уязвимости общин, повышение осведомленности фермеров по мерам адаптации. Results: Создано 5 общинных центров, поддержано более 100 общинных проектов по внедрению мер адаптации, улучшено плодородие земель, внедрены меры водосбережения, построено более 30 теплиц.
Regional programme for sustainable and climate sensitive land use for economic development in Central Asia Региональной программы «Устойчивое Землепользование с учетом Изменения Климата для Экономического Развития в Центральной Азии»	2016-2019 Germany[103]	5.63 million	Regional Таджикистан: Душанбе; Пенчикент, Казахстан, Кыргызстан, Узбекистан, Туркменистан	Проект нацелен на то, чтобы разные земли пользователи, государственные учреждения и частные сектора в Центральной Азии принимают комплексные, экономически и экологически устойчивые формы развития землепользования, принимая во внимание изменение климата.
Ecosystem-based adaptation to	2015-2019	4 million	Таджкистан:	Проект является частью Международной

[103] German Federal Ministry for Economic Cooperation and Development (BMZ)

Project Title	Status, Donor(s)	Financing (USD)	Stakeholders	Objectives, Outputs and Outcomes
climate change in high mountainous regions of Central Asia (Regional Project) Региональный проект «Экосистемный подход для адаптации к изменению климата в высокогорных регионах Центральной Азии »	Germany[104]		Душанбе; ГБАО, Казахстан, Кыргызстан	климатической инициативы инаправлен на внедрение экосистемного подхода, основанного на адаптации к изменению климата, где люди продолжают использовать природные ресурсы для обеспечения их средств к существованию, не нанося вреда окружающей среде. Это позволит экосистеме в долгосрочной перспективе предоставлять услуги, важные для выживания людей.
Adaptation to Climate Change through Sustainable Forest Management Проект по Адаптации к Изменению Климата путем Устойчивого Управления Лесами	2013-2017 Germany (BMZ)	2.8 million	Фархор; Ховалинг; ГБАО; Дангара и Пенчикент	Проект нацелен на то, чтобы Государственное лесное агентство, лесхозы и лесопользователи совместно работают по охране и восстановлению лесов, чтобы они использовались на устойчивой основе.
Climate Finance Readiness Programme (CF Ready) Программа Готовности к Климатическому Финансированию	2012-2018 Germany (GIZ)	15.3 million (for global project)	Таджикистан: Душанбе Бангладеш, Камбодия, Гренада, Ямайка, Марокко, Намибия,Перу, СевернаяАфрика, Сант-Китс и Невис, Сант-Люсия, Танзания, Уганда, Вьетнам, Замбия	В Таджикистане программа поддерживает создание Национального компетентного органа для Зеленого климатического фонда в рамках Комитета по охране окружающей среды и поддерживает Министерство сельского хозяйства в рамках подготовки стратегических рамок для разработки и определения приоритетности инициатив в области адаптации к изменению климата в сельскохозяйственном секторе в Таджикистане
Biodiversity and Ecosystem	2016-2020	4 million	Таджикистан:	Целью проекта является укрепление потенциала в

[104] German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety. (BMUB)

Project Title	Status, Donor(s)	Financing (USD)	Stakeholders	Objectives, Outputs and Outcomes
Services in Agricultural Landscapes (global project involving Tajikistan, India, and Kenya) Глобальный проект по биоразнообразию и экосистемных услуг в агроландшафтов	GIZ, German Agro Action		Душанбе, Рашт, Айни Индия, Кения	области сохранения биоразнообразия и экосистемных услуг в агроландшафтов.Подходы в области землепользования, содействующие сохранению биоразнообразия в сельском хозяйстве будут оцениваться и пилотироваться в трех странах. Полученный опыт станет основой для дальнейшего развития институциональной структуры на региональном и национальном уровне. Задачи и результаты в сохранении или улучшении биоразнообразия и экосистемных услуг всельскохозяйственных ландшафтов будут обменены в региональном диалоге; выводы и рекомендации будут распространены на международном уровне
Programme for Sustainable Use of Natural Resources in Central Asia Программа по устойчивому использованию природных ресурсов в Центральной Азии.	2002-2015 Germany (BMU) / EU		Казахстан, Кыргызстан, Таджикистан, Туркменистан, Узбекистан	В 2013-2014 гг. в результате пилотных мероприятий по включению мер по адаптации в управление лесами в Ванчском районе в Таджикистане были оценены уязвимость как лесных экосистем, так и населения, зависящего от этих лесов.
Khatlon Province Flood RIsk Management Project Проект «Управление рисков селевого потока в Хатлонской области»	Completed ADB	NA		Goal: Снижение риска от селевых потоков. Отчет Региональной Системы Мониторинга и Раннего Оповещения при исполнительном органе государственной власти Хатлонской области за июль 2015 года
Topinambur (Jerusalem artichoke) cultivation in agriculture Топинамбур перспективная культур в сельском хозяйстве	2015 (6 months) CARITAS	7,800	Местный в Муминабадском районе	Размножение и доставления новой культуры топинамбура для сельских фермеров. Outputs: Публикации книгу по технологию выращивания топинамбура и создание фильма об топинамбуре (167 страниц)
Local cultivars and traditional knowledge Местные сорта культур и традиционные знания	2015 (8 months) Aga Khan Fund in Tajikistan	10,000		Objective: Сохранение биоразнообразия и традиционных знаний на местах Outputs: Публикация одну книги по традиционным знаниям и биоразнообразие для населения, фермеров и ученых. Сбора научной и практической

Project Title	Status, Donor(s)	Financing (USD)	Stakeholders	Objectives, Outputs and Outcomes
				информации о биоразнообразие в Раштской долине (100 страницы)
Preparation of the Third National Communication to the UNFCCC	2011-2014 UNDP-GEF	400,000		Objectives: Третье Национальное Сообщение Республики Таджикистан по Рамочной Конвенции ООН об Изменении Климата подготовлено в соответствии со Статьями 4.1 и 12.1 РК ИК ООН согласно требованиям для Сторон Конвенции, не включенных в Приложение 1, для Сторон конвенции, заинтересованных лиц и широкого круга читателей. Outputs: отчет, публикации книг и монографии
Sustainable Agrobiodiversity in a Changing Climate Устойчивое агробиоразнообразие в условиях изменения климата	2009-2015 UNDP-GEF	1.2 million	Бальджуван, Шуробод, Рашт и Зеравшан	Objectives: Основная цель проекта направлена на сохранение глобально-значимого агробиоразнообразия и его адаптацию в условиях изменения климата, а также внедрение продуктов агробиоразнообразия в сельскохозяйственные практики и политику по развитию сельских сообществ на национальном и местном уровне в Таджикистане. Results: В результате применения гомологичного подхода и, таким образом, климатического прогноза, ожидается, что долгосрочные адаптационные мероприятия будут включать меры эффективного внедрения практики по сохранению агробиоразнообразия, усиления потенциала для устойчивого управления природными ресурсами и ведения сельского хозяйства
Support for the National Biosafety Framework Document of the Republic of Tajikistan Поддержка в реализации Национального Рамочного Документа по Биобезопасности Республики Таджикистан	GEF	400,000		Goals: Основная цель проекта состоит в том, чтобы помочь Республике Таджикистан в реализации Национальной Программы по биобезопасности, чтобы выполнить ее обязательства в качестве Стороны Конвенции по биоразнообразию. Results: Разработка национальной стратегии и плана действий по биобезопасности Республики Таджикистан
Proposed project on increasing	Under	500,000		АБР выделил Таджикистану полмиллиона долларов

Project Title	Status, Donor(s)	Financing (USD)	Stakeholders	Objectives, Outputs and Outcomes
productivity of the dairy industry and improving its resilience in the face of climate change Повышение производительности молочной промышленности и ее устойчивости к изменению климата.	development ADB	(feasilibity study)		на разработку проекта по улучшению молочной промышленности. В рамках предлагаемого проекта будет подержано государственно-частное партнерство. Ожидается, что проект будет представлен на одобрение Советом директоров АБР в конце 2017 года.
FLERMONECA Forest and Biodiversity Governance Including Environmental Monitoring	2013-2015 European Union Regional Ecological Program for Central Asian countries (EURECA)	Appr. EUR 4.4 million		
Land registration and cadastral system for sustainable agricultural development project	2009-2010 WB/IDA	USD 60 million (for region)	Regional project	Subcomponent on environmental land management
Support to local initiatives on Integrated Water Management	2011-2014 Ministry of Ecology of Norway	1 million		The Project goal: 1.Increase of capacity and support to local initiatives to promote integrated water management (AsparRiver) 2. Promote the concept of payments for ecosystem services; 4. Promote Regional Cooperation in the pilot basins
Multilateral cooperation on joint decision-making issues: The development of cross-border cooperation on small watersheds in Central Asia	2012-2015 USAID	2 million	Regional Project	Increase of capacity for IWRM through trainings, study visits, demonstration tours to pilot areas
Increasing capacity on basin planning for appropriate organizations and their joint structures	2012-2014 GIZ	265,000		

Project Title	Status, Donor(s)	Financing (USD)	Stakeholders	Objectives, Outputs and Outcomes
Central Asia Hydrometeorology Modernization Project (regional) Проект модернизации гидрометеорологического обслуживания в центральной азии	2011-2016 WB (IBRD)	19 million (of that 7 million WB)		снижение рисков, связанных с неблагоприятными погодными и климатическими явлениями, для жизни людей и для экономики посредством улучшения гидрометеорологического и климатического обслуживания для экономического развития всего региона.
TURKMENISTAN				
Preparation of the Second National Communication to the UNFCCC «Туркменистан: подготовка 2-го Национального сообщения по РКИК ООН»	2006-2009 GEF-UNEP	NA		Подготовка Второго Национального сообщения по РКИК ООН, Выполнено: -Национальная инвентаризация ПГ. -Оценка уязвимости и анализ адаптации к возможному ИК. -Анализ смягчения последствий ИК.
Central Asian Countries Initiative for Land Management (CACILM), Phase 1	2006-2009 UNDP-GEF / GIZ	2.865 million from GEF		Goal: Развитие информационных систем ИС-УУЗР Results: Разработка ИФС – интегрированной финансовой стратегии в области УУЗР. Выпущен документ – Устойчивое управление
CACILM Phase 2 Региональный проект по повышению потенциала УУЗР 2 этап	2007-2010 UNDP-GEF-FAO			Управление знаниями. УЗ-УУЗР Разработка ИФС – интегрированной финансовой стратегии в области УУЗР. Выпущен документ – Устойчивое управление земельными ресурсами. Анализ состояния и перспектив развития. Разработаны проекты и меры в области УУЗР.
CACILM Phase 3 Региональный проект по прикладным исследованиям для УУЗР 3 этап	2008-2009 ADB/ INCARDA		Regional project	Р Прикладные исследования. И-УУЗР разработка ИФС – интегрированной финансовой стратегии в области УУЗР. Выпущен документ – Устойчивое управление земельными ресурсами. Анализ состояния и перспектив развития. Разработаны проекты и меры в области УУЗР.

Project Title	Status, Donor(s)	Financing (USD)	Stakeholders	Objectives, Outputs and Outcomes
Sustainable Forest and Pasture Management in Turkmenistan *Note:* Implemented under **Sustainable and Climate Sensitive Land Use for Economic Development in Central Asia**, an umbrella project for Central Asia Устойчивое управление лесными ресурсами в Туркменистане	2009-2012 GIZ	Appr. EUR 2 million	All five Central Asian countries participated	Goal: Проведение оценки климатических рисков на лесные ресурсы. Results: Проведено облесенение на территории 200 Га. Подготовлен МР (брошюра) по устойчивому управлению лесными ресурсами. Внесены поправки в Лесной Кодекс. Для местных сообществ подготовлен пример Плана управления лесными ресурсами.
Climate Risk Management Part of the multi-country Central Asia UNDP Programme on Climate Risk Management (CA-CRM) Управление климатическими рисками	2011-2014 UNDP-GEF	Appr. 1.5 million		Основной целью является проведение оценки климатических рисков и уязвимости к опасностям на уровне местных сообществ, и выполнение картирования в 3 пилотных районах
Support to the Introduction of Sustainable Development Policies and Rational Use of Natural Resources in the Energy-Environment Sectors in Turkmenistan Содействие внедрению стратегий устойчивого развития – рациональное использование природных и энергетических ресурсов в Туркменистане.	2013-2016 EU	EUR 2.1 million		Улучшение управления энергетическими ресурсами и устойчивое развитие Туркменистана в соответствии с долгосрочными целями экономического роста.
Supporting Climate Resilient Livelihoods in Agricultural Communities in Drough-Prone Areas	2012-2016 UNDP-GEF (Adaptation Fund)	3 million		Objectives: Поддержка климатически устойчивой экономической жизнедеятельности сельскохозяйственных сообществ, проживающих в Лебапском и Дашогузском велаятах Туркменистана

Project Title	Status, Donor(s)	Financing (USD)	Stakeholders	Objectives, Outputs and Outcomes
«Реагирование на риски, связанные с ИК, на систему фермерского хозяйства в Туркменистане на национальном и местном уровнях»				Anticipated Results: Данный проект нацелен на внедрение долгосрочных решений, в целях оказания поддержки правительству в целях выполнения целей в области адаптации к изменению климата и нахождению решений на местном и национальном уровнях. План действий проекта включает в себя меры, нацеленные на поддержку повышения производительности с/х работ, улучшения подготовки по дефициту воды путем внедрения альтернативных источников дохода. План также предусматривает исследования и инновации. Новые технологии и адаптация к климату, принесет улучшение системы водопользования и производства урожая.
National Biodiversity Strategy and Action Plan (BSAP) Стратегия по биоразнообразию (BCAP)	UNDP-GEF Секретариат КБР	Appr. 400,000		Разработка Плана действий по биоразнообразию. Подготовлен План действий по биоразнообразию и меры
FLERMONECA FLERMONECA «Управление лесами и биоразнообразием, включая мониторинг состояния окружающей среды в Центральной Азии»	2013-2015 Germany (GIZ and LHF) /Austrian Environmen-tal Agency (UBA)			Решение вопросов устойчивого использования природных ресурсов, управления лесами и биоразнообразием, включая мониторинг состояния окружающей среды, посредством решения вопросов по изменению климата, управлению лесами (процесс FLEG) и восстановлению окружающей среды, сбора, обмена, мониторинга и оценки экологических данных. Улучшение сотрудничества и партнерства в регионе. Произведено облесение на большой территории. Проведено обучение специалистов по черенкованию. Разработка экологических показателей.
Improving Energy Efficiency in the Residential Building Sector	2011-2016 UNDP-GEF	2.5 million		Проект способствует сокращению выбросов ПГ путем улучшения управления энергоресурсов и сокращения

Project Title	Status, Donor(s)	Financing (USD)	Stakeholders	Objectives, Outputs and Outcomes
«Улучшение энергоэффективности в секторе жилых зданий Туркменистана»				потребления Разработка методов стимулирования по строительству энергоэффективных зданий. Разработка мер по энергоэффективности и их включение в национальные программы по строительству жилых зданий.
Transboundary Water Resource Management in Central Asia «Трансграничное управление водными ресурсами в Центральной Азии»	2008 (with Germany / EU projects starting in 2012		Regional program under the Berlin Process	В рамках «Водной инициативы для Центральной Азии» (Берлинский процесс). Развитие и укрепление трансграничного сотрудничества в водной сфере.
An Ecosystem Approach to Land and Forest Management in the AmuDarya Region Экосистемный подход в управлении земельными и лесными ресурсами в районе р.Амударья	2015-2017 Zvukov Fund / GIZ			Проект направлен на улучшение жизни местного сообщества, устойчивое управление природными ресурсами в условиях ИК. Повышение уровня жизни сельского населения; восстановление засоленных земель; сокращение потребления воды и антропогенного пресса на ареалы распространения тугайных лесов.
Energy Efficiency and Renewable Energy for Sustainable Water Management «Энергоэффективность и возобновляемые источники энергии для улучшения управления водными ресурсами в Туркменистане"	2015-2020 UNDP-GEF	6.185 million		Focus: Управления водными ресурсами на основе энергоэффективности и возобновляемых источников энергии (ЭЭ / ВИЭ). Activities: Использование ВИЭ. Демонстрация наилучших практик в данной области.
UZBEKISTAN				
Promoting the Development of the Renewable Energy Sector in Uzbekistan	2006-2007 UNDP-GEF	63,000	Минэкономики РУз	Проведена оценка потенциала развития ВИЭ в стране

Project Title	Status, Donor(s)	Financing (USD)	Stakeholders	Objectives, Outputs and Outcomes
Содействие развитию сектора возобновляемой энергии Узбекистане				
Promoting the Development of Biogas Technologies in Uzbekistan Содействие развитию биогазовых технологий в Узбекистане	2006-2008 UNDP	221,900	Минэкономики РУз	Построена и введена в эксплуатацию биогазовая установка в хозяйстве «Milk agro» (Зангиатинский район, Ташкентской области), налажено производство удобрений
Promoting Energy Efficiency in Public Buildings Повышение энергоэффективности в зданиях социального назначения в Узбекистане	2006-2015 UNDP-GEF	13 638 000 (2.9 million from GEF)	Госархитект-строй РУз	Проведена оценка перспектив повышения эффективности использования энергии в зданиях, а также потенциала экономии энергии и связанных с его реализацией социально-экономических выгод на период до 2015 г.
Clean Development Mechanism (CDM) Capacity Building Развитие потенциала для Механизма Чистого Развития	2007-2009 UNDP	1,390,300	Миэкономики РУз/ Узгидромет	Повышение потенциала специалистов всех уровней для эффективного использования МЧР
CDM Projects Проекты Механизма Чистого Развития	2007-2016 Govt. and private investors	24,400,000	Ведомтсва РУз/ частные инвесторы	15 МЧР проектов зарегистрировано в РКИК , еще 2 – на этапе регистрации. По результатам реализации проектов введено в обращение 15 млн тонн CO_2-экв ССВ
Supporting Uzbekistan in Transition to a Low-Emission Development Path Поддержка Узбекистана в переходе на путь низко-углеродного развития национальной экономики	2011-2016 UNDP	2,250,000	Миэкономики РУз	Разработана стратегия низко-углеродного развития Республики Узбекистан и Дорожная карта на среднесрочную и долгосрочную перспективу. В рамках проекта подготовлен электронный курс по изменению климата, предназначенный для участников международных климатических переговоров, студентов и широкой публики; публикации, презентации и инфографика, направленные на повышение уровня знаний лиц, принимающих решения, представителей министерств, ведомств и общественности по

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				вопросам предотвращения изменения климата через разработку стратегии «зеленого роста», укрепления институционального потенциала и совершенствования правовой базы в сфере энергоэффективности и возобновляемой энергетики. Проведена работа по популяризации биогазовых технологий в фермерских хозяйствах Узбекистана.
Solar Energy Development Развитие солнечной энергии	2011-2016 ADB	2,250,000	Минфин Руз	Создана законодательная основа для развития солнечной энергии. Разработана Дорожная карта NAMA, подготовлено ТЭО для проекта «Самаркандская солнечная электростанция»
Economics of Climate Change in Central and West Asia RDTA-8119 REG (Regional) Экономика изменения климата в Центральной и Западной Азии. Компонент смягчения ИК **Региональный**	2013-2014 ADB	1,100,000	Минэкономики РУз	Проведена оценка стоимости мероприятий по смягчению последствий изменения климата в энергетическом секторе и на транспорте
Regional Project to Support UNCCD Implementation in Central Asia Поддержка выполнения Конвенции ООН по борьбе с опустыниванием (КБО ООН) в Азии **Региональный**	2001-2007 BMZ/GTZ	5.2 million	Казахстан, Узбекистан	Оказана поддержка в развитии потенциала для выполнения обязательств по Конвенции ООН по борьбе с опустыниванием в Узбекистане.
CACILM: Land Resource Management Initiative for Central Asian Countries – UNCCD Program Инициатива Центрально Азиатских стран по управлению земельными ресурсами (ИСЦАУЗР) – Программа КБО ООН	2007-2010 UNDP, ADB, GEF, UNCCD, and other donors	30 million	Правительство РУЗ	Реализован ряд проектов по улучшению продуктивности земель, при сохранении их экологических функций и повышению эффективности водопользования как меры адаптации

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CACILM: Achieving Ecosystem Stability on the Exposed Aral Seabed and the Kyzylkum Desert, Uzbekistan: Phase 1 Достижение стабильности экосистем в республике Каракалпакстан и в пустыне Кызылкум	2008-2012 UNDP-GEF	2.9 million	МСВХ РУЗ	Проведена оценка и тестирование инновационных подходов к устойчивому управлению земельными ресурсами, усилена институциональная и юридическая база.
GEF Small Grants Programme Программа малых грантов	2008-2015 UNDP-GEF	2.3 million	NGOs, local governments	Реализовано 78 проектов, направленных на поддержку деятельности ННО и местных гражданских организаций по адаптации и смягчению изменения климата. Внедрение водосберегающих технологий (капельное орошение), биогазовых технологий для выработки электроэнергии, тепла и производства удобрений на экологически устойчивой основе; внедрение метода лазерной планировки, обеспечивающий равномерное распределение ограниченных водных ресурсов на полях и высокую урожайность
Strengthening Disaster Risk Management Capacities in Uzbekistan Укрепление потенциала Республики Узбекистан по управлению рисками стихийных бедствий	2010-2014 UNDP, EU	1,867,200	МЧС РУз, АН РУз, Узгидромет	Проведение семинаров по демонстрации важности проведения превентивных мер по снижению рисков землетрясений в своих домах, школах, больницах и на рабочих местах, которые могут спасти человеческую жизнь и избежать материального ущерба вследствие землетрясения. В рамках поддержки инициатив Правительства Республики Узбекистан по повсеместному внедрению ИКТ в деятельность государственных органов республики, а также с целью автоматизации деятельности МЧС в вопросах снижения рисков стихийных бедствий, проектом оказано содействие в создании системы видеоконференцсвязи (ВКС). Создан учебно-документальный фильм «Как построить сейсмостойкий дом?» с целью повышения

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				осведомленности среди населения и индивидуальных застройщиков о правилах сейсмостойкого строительства. Разработаны брошюры и руководства – «Снижение ущерба от землетрясений» и «Правила поведения до, во время и после землетрясения» с целью повышения подготовленности населения к возможным землетрясениям.
Climate Risk Management Part of the multi-country Central Asia UNDP Programme on Climate Risk Management (CA-CRM) Проект ПРООН «Управление климатическими рисками в Узбекистане» (ЦА-УРИК) **Региональный**	2011-2014 UNDP	800,000	Узгидромет, Минэкономики и др.	Проект Реализован в Кашкадарьинской области: разработана система раннего оповещения засух, улучшено водопотребление для фермеров на местном уровне. Проведены тренинги по демонстрации хороших практик по водосбережению и смягчению последствий засухи. Опубликованы и распространены ежеквартальные бюллетени по вопросам управления климатическими рисками в рамках Системы раннего предупреждения засухи. Подготовлены публикации «Профиль климатических рисков», «Руководство по оценке климатических рисков в Узбекистане», «Подходы к оценке водообеспеченности в Узбекистане в условиях изменения климата», «Практическое пособие по лазерной планировке земель» Повышен потенциал сотрудников Центра мониторинга засухи в Узгидромете
Central Asia Hydrometeorology Modernization Project (regional) Модернизация гидрометеорологического обслуживания в Центральной Азии Региональный	2012-2016 WB	2 million	Узгидромет	Укрепление систем и методик раннего предупреждения опасных явлений в горных районах Центральной Азии; оснащение оборудованием для международной передачи и интерпретации метеоданных, в том числе с использованием модели КОСМО
Developing Climate Resilience of Farming Communities in the	2014-2019 UNDP-GEF	5,190,878	Узгидромет	Развитие институционального и технического потенциала для управления засухой и ее раннего

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Dought Prone Parts of Uzbekistan Обеспечение климатической устойчивости фермерских и дехканских хозяйств, расположенных в засушливых районах РУз	(Adaptation Fund),			предупреждения; осуществление мер по внедрению климатоустойчивых практик в рамках фермерских хозяйств Республики Каракалпакстан; разработка доступных для широкого круга пользователей знаний о климатоустойчивых практиках ведения растениеводства и животноводства на засушливых землях.
GCF Readiness Programme Программа подготовки Узбекистана к доступу к ресурсам Зеленого климатического фонда	2016-2017 Germany (BMUB, GIZ) UNDP, UNEP, WRI	1,372,458	Узгидромет	Оказание содействия Правительству Узбекистана в укреплении национального потенциала для эффективного доступа, управления, использования и мониторинга климатического финансирования, в частности из средств ЗКФ. Создание и наращивании институционального потенциала национальных органов и институтов в Узбекистане, с фокусом на прямой доступ к ЗКФ. Содействие в подготовке инвестиционных стратегий, программ и проектов, направленных на предотвращение изменения климата и адаптацию к его последствиям, включая активное вовлечение частного и финансового секторов.

Annex 5: Sample of Information Platforms Relevant to Climate Change in Central Asia

Organization	Web site	Brief Description
CGIAR (formerly the Consultative Group for International Agricultural Research)	www.cgiar.org www.cgiar.org/resources http://library.cgiar.org	Global research partnership for a food-secure future, consortium of 15 independent research centers. On-line library and other info resources.
ICARDA - International Center for Agricultural Research in the Dry Areas	www.icarda.org	CGIAR Research Center Research, tools and technologies, capacity development, publications, e-learning
CACILM - the Central Asian Countries Initiative for Land Management	www.cacilm.org	Extensive resource of information in Russian (and in English) and a knowledge hub on land management in CA for policymakers and other stakeholders to develop sustainable strategies addressing land degradation. Includes articles, publications, tools for decision makers, donors and farmers, visualization of technologies (not fully functional). Project led by ICARDA.
IWMI - International Water Management Institute	www.iwmi.cgiar.org	Headquartered in Sri Lanka, with regional offices across Asia and Africa, IWMI is a CGIAR Research Center and leads the CGIAR Research Program on Water, Land and Ecosystems. Extensive library, including models, software, mobile phone application. Project results in Tajikistan and Uzbekistan.
CGIAR **CAC Program** Regional Program for Sustainable Agricultural Development in Central Asia and Caucasus (CAC)	www.cac-program.org	CGIAR initiative: Consortium of eight National Agricultural Research Organizations, eight CGIAR Centers and three other research institutions, including for example ICBA Research and publications available on-line.
ICBA - International Center for Biosaline Agriculture	www.biosaline.org	Projects in CA, publications on-line, genebank Knowledge hubs under development to utilize the latest digital technologies to enable virtual meetings, workshops, conferences, webinars, e-forums, and the establishment of a knowledge repository that will contain open learning materials and information.
ZOI Environmental Network	www.zoinet.org	Swiss based international NGO. Country Fact sheets on CA and Storyboards online – limited scope.
ICRAF - International Center for Research in Agroforestry	www.worldagroforestry.org	World Agroforestry Centre, Kenya based, CGIAR center. Rich resources: publications, toolkits, tree database online
GIZ – Deutsche Gesellschaft für Internationale Zusammenarbeit	www.giz.de www.giz.de/en/mediacenter/publications.html	German Development Agency, number of climate change projects in the region. Ecosystem-based adaptation to climate change in high mountainous regions of Central Asia – KZ, KG, TJ.

		Publications and online library. K-link tool to integrate available platforms and data sources. K-DMS – Document Management System.
Asia Pacific Energy Portal	http://asiapacificenergy.org	United Nations Economic and Social Commission for Asia and the Pacific (UN ESCAP) initiative under the Asian and Pacific Energy Forum (APEF) provides implementation support, facilitates knowledge exchange, and reviews and assesses progress leading up to APEF 2018. All CA countries are members. Statistics, legislation, strong visualization.
PPCR - Pilot Program for Climate Resilience – TJ (KG under development)	http://www-cif.climateinvestmentfunds.org/fund/pilot-program-climate-resilience www.ppcr.tj	Funded by the Strategic Climate Fund (SCF) of the Climate Investment Funds (CIF) of WB, ADB, EBRD, AfDB, IDB. Seven 100+ mil USD projects.
Climate Smart Planning Platform	https://www.climatesmartplanning.org/	"The mission of the Climate-Smart Planning Platform (CSPP) is to help developing-country practitioners strengthen their climate-smart planning so that it leads to better policy and investment implementation. The CSPP does this by making it easier for practitioners to locate and access the tools, data, and knowledge that they need for climate-smart planning." It includes 320 tools, datasets, and knowledge products and is funded in part by the World Bank. "Integrates" the Bank's Climate Change Knowledge Portal (see separate entry below).
CCKP - Climate Change Knowledge Portal	http://sdwebx.worldbank.org/climateportal/	This portal provides "information, data, and reports about climate change around the world." Central Asian countries are included in the climate-related data sets and profiles provided through the portal.
ClimateWizard	www.climatewizard.org	Climate change maps online (rainfall, temperatures)
IUCN - International Union for Conservation of Nature	www.iucn.org	Membership Union composed of both government and civil society organizations. It provides public, private and non-governmental organizations with the knowledge and tools that enable human progress, economic development and nature conservation to take place together. CA members: three NGOs from TK, KZ, KG. Online library catalogue, online publications, some information on CA available online.
WOCAT - World Overview of Conservation Approaches and Technologies	www.wocat.net	Sustainable Land Management (SLM) global network. Framework for documentation, monitoring, evaluation and dissemination of SLM knowledge, covering all steps from data collection, to a database and to using the information for decision support. Knowledge base information on technologies,

		approaches, mapping, publications and videos for public and for registered members on SLM.
Natural Resource Management and Development Portal	https://rmportal.net	US AID sponsored Resource Management (RM) and FRAME portal with online library, trainings, project results, videos
CAREC Program - Central Asia Regional Economic Cooperation Programme **CAREC Institute**	www.carecprogram.org www.carecprogram.org/index.php?page=carec-institute	Partnership of 11 countries and six multilateral development partners working to promote development through cooperation, leading to accelerated economic growth and poverty reduction in the priority areas of transport, trade facilitation, trade policy, and energy. Online CAREC publications. CAREC Institute provides web-based information and knowledge products, and supporting trainings and events.
CAREC – Regional Environmental Center for Central Asia	http://carececo.org Former (active) web page: www.old.carecnet.org	Regional NGO established by 5 CA countries, EU and UNDP is a regional cooperation platform for sustainable development. CAREC Knowledge Hub on Low-Carbon Development, Energy Efficiency Education, River Basin Management and I-web project (strengthened partnerships between business, regulatory and academic sectors at the national and international level through their joint development and the teaching of master's and doctoral programs in integrated surface and groundwater management). Online CAREC project documents and publications.
ICWC - Interstate Commission for Water Coordination of Central Asia	http://sic.icwc-aral.uz	They provide support to the CAWATER-info.net project (jointly with EC IFAS)
FAO - Food and Agriculture Organization of the UN	www.fao.org www.fao.org/pastoralist-knowledge-hub	Extensive online library, statistics, knowledge hubs, regional networks (include Pastoralists Assembly of Central Asia - PACA), and a forum for registered members.
Climate Change Data	http://cmip.tamu.edu	World wide climate change data in SWAT format based on global climate model simulations (CMIP3).
AARHUS CLEARINGHOUSE for Environmental Democracy	https://aarhusclearinghouse.unece.org	The web portal showcases information on laws and practices relevant to the public's right to: • access environmental information • participate in environmental decision-making, and • achieve justice on environmental matters It includes some information specific to Central Asia.
CARnet	www.caresd.net	UNDP funded digital network on environmental and sustainable development practice and policy in Central Asia and the neighboring regions of

		Russia (partially not updated).
CAWater-Info - Portal of Knowledge for Water and Environmental Issues in Central Asia	www.cawater-info.net	Comprehensive information portal on water related issues in Central Asia in Russian and in English, for policy makers, water professionals, researchers, students and media. The portal includes database, analytics (for members only), tools, knowledge base, links to relevant organizations, and projects.
SIC ICWC - knowledge portal on Water and Land Resources Use in the Aral Sea Basin	http://sic.icwc-aral.uz	Scientific-Information Center (SIC) of the Interstate Coordination Water Commission of Central Asia (ICWC) established in 1992 on water resources regulation, rational use and protection. Project results, regulations, scientific papers, trainings, knowledge base on "Water and Land Resources Use in the Aral Sea Basin", partly shared with CAWater-info.net, online database of historical water intakes at different points in individual river basins.
ICT & DRR Gateway Information and Communications Technology and Disaster Risk Reduction division of the UN Economic and Social Commission for Asia and the Pacific (UN ESCAP).	http://drrgateway.net	The portal provides information on ICT, DRR, space application and advisory services, including integration of DRR and climate change adaptation. In 2016, the Centre for Emergency Situations and Disaster Risk Reduction was established in Almaty as collaborative effort of Kazakhstan and Kyrgyzstan.
ADRC – Asian Disaster Reduction Center	www.adrc.asia	Includes also information on climate change adaptation and disaster risk reduction and the Central Asia region.
Eco Portal - Environment and Sustainable Development in Central Asia	www.mkurca.org Alternative address: www.ecoportalca.kz	Official site of the Interstate Commission for Sustainable Development of the International Fund for Saving the Aral Sea (IFAS). Most information in Russian. Library and maps on Sustainable development, Water resources, Air pollution, Green economy, Biodiversity, Land degradation, Climate change, Waste management, Mountain ecosystems
EC IFAS – Executive Committee of the International Fund for saving the Aral Sea	http://ec-ifas.waterunites-ca.org	EC IFAS web page with information on the Aral Sea, Integrated Water Resources Management (IWRM), Environment, Climate Change, Socio-economic development, legislation and institutions and the Aral Sea Basin Programme (partially not functional).
Regional Pasture Knowledge Exchange Network	https://pasture.klink.asia/dms/projects/pasture-network/en	GIZ supported platform/library of documents open partly for public and fully for registered members. Translates documents from English into Russian. Only partly operational.
Sustainable and Climate Sensitive Land Use for Economic Development in Central Asia	www.naturalresources-centralasia.org	Website of the GIZ project in CA countries with publications, project fact sheets and videos for download.

GFRAS – Global Forum for Rural Advisory Services	www.g-fras.org	Extensive information and links on ICT , communication (agro radio), e-learning in rural development, best practices, networks.
CIARD - Coherence in Information for Agricultural Research for Development	http://ring.ciard.net/	Facilitated by GFAR. Movement, whose objective is to make agricultural research information publicly available and accessible to all. Meta data information platform and resources. Info on CA.
GFAR -	www.gfar.net	Network, multi-stakeholder global forum on agricultural research and innovation. Online GFAR documents. **GCARD** - Global Conference on Agricultural Research for Development, Organized by the Global Forum on Agriculture Research (GFAR) and the CGIAR
CKB – Climate Knowledge Brokers	www.climateknowledgebrokers.net	Alliance of 150 leading global, regional and national knowledge brokers specialising in climate and development information. Climate search, Knowledge navigator, Climate tagger tools.
RE Explorer – Renewable Energy Explorer	www.re-explorer.org	On-line renewable energy resource data and other geographic information system (GIS) data, trainings, remote technical assistance and interactive tutorials. Renewable Energy (RE) Data Explorer, facilitates renewable energy decision-making, investment, and deployment through a dynamic, online analytical tool. Information on Kazakhstan. Requires installation of a RE Data Explorer tool.
Climate Links	www.climatelinks.org	A US AID funded Global Knowledge Portal for Climate Change & Development Practitioners. Includes webinars, library, tools, including software. Global coverage including Central Asia.
Central Asia Knowledge Network	http://www.worldbank.org/en/events/2016/05/31/central-asia-knowledge-network-presentation-of-results#7	World Bank sponsored, CAREC implemented project on Central Asia Knowledge Network and Communities of Practice for Water-Energy and Climate Change Management. Includes presentation of results in English and/or in Russian.
UN CC: e-Learn	https://unccelearn.org/	Free UN online course on climate change and REDD+ (reducing emissions from deforestation and forest degradation in developing countries)
ALM Adaptation Learning Mechanism	www.adaptationlearning.net	This platform contains 79 resources and 323 projects related to CCA. Facilitated by UNDP in partnership with the UNFCCC, the World Bank, UNEP, FAO, and others. The platform focuses on adaptation practices and capacity building.
WECF International	www.wecf.eu	Women in Europe for a Common Future – climate relevant projects in CA
RFILC Rural Finance and Investment Learning Centre	http://www.ruralfinanceandinvestment.org/	While on-line trainings do not include climate change directly, their database and event schedule cover resilient agriculture and CCA for

		smallholder farmers.

Example of information platforms from other regions (not covering Central Asia)

EEA - European Environment Agency	www.eea.europa.eu	Example of a complex environmental information on mainly European countries only. Online data, maps, indicators, and publications.
Climate-ADAPT – European Climate Adaptation Platform	http://climate-adapt.eea.europa.eu/	Comprehensive information site on policies, projects, knowledge, and networking. Includes case studies and 126 information portals related to adaptation, 473 research and knowledge products, and 123 maps, graphs, and datasets.
EPOMM - European Platform on Mobility Management	www.epomm.eu	Example of an information platform. EEPOMM is network of governments in European countries that are engaged in Mobility Management (MM)

Selected Examples of Information on Regional Climate Change Projects in Central Asia

GEF – Global Environment Facility	www.thegef.org www.thegef.org/publications	Established after the 1992 Rio Summit, provides strategic investment/grants to improve environment… Online publications on GEF sponsored projects as well as guides, experience learned on specific topics. The project database provides project documents for each approved GEF project.
UNDP – UN Development Programme	www.undp.org	UNDP climate change projects and initiatives in the region. Links to web sites of UNDP country programmes with more detail on specific projects.
BEECA - Projects on Buildings Energy Efficiency in Central Asia and Armenia	http://beeca.net	Info on UNDP/GEF Projects on Buildings Energy Efficiency in Armenia, Kazakhstan, Kyrgyzstan, Uzbekistan and Turkmenistan. Library of project results for download.
KazREFF – Kazakhstan Renewable Energy Financing Facility	www.kazreff-ser.com	EBRD concessional financing facility to finance renewable energy in Kazakhstan
KyrSEFF – Kurgyz Sustainable Energy Financing Facility	www.kyrseff.kg	EBRD/EU IFCA facility to finance energy efficiency in Kyrgyzstan Online information on required performance of insulation and other materials and recommended suppliers and installers
World Wildlife Fund Russia and Central Asia	www.wwf.ru/about/where_we_work/asia/eng	Information on WWF projects on CC in Central Asia

Sources: Internal web research and interviews; information provided by Ms. Nailya Mustaeva, Programme Manager, CAREC; and Vertemati 2016.

Annex 6: Sample themes and detailed topics for capacity building

Outline of capacity building program

The need for capacity strengthening was identified across all interviewed institutions, all expert levels of stakeholders (except for relatively small group of experienced local experts), and across all sectors, with agriculture being the priority. Thus, the capacity building program is designed as a long-term, ongoing process, rather than a one-time activity to be implemented within few years only.

Due to the need of a long-term capacity strengthening delivered to a large number of diverse participants, the proposed program is based on training of local experts/trainers and utilization of already existing infrastructure and institutions involved in capacity strengthening and vocational training.

Availability of long-term financing for provision of these information, knowledge and capacity strengthening services is essential, as well as a proper targeting of specific trainings to appropriate audience/target groups.

Capacity building program will need to be flexible enough to reflect development of specific local needs, priorities and opportunities. Thus, the specific content of capacity building programs in individual countries will be updated annually.

The following outline reflects the priority areas for capacity strengthening identified by local stakeholders. The need for capacity strengthening covers all sectors and types of stakeholders. The priority area, however, is strengthening capacities in agricultural sector as the most vulnerable sector, and also as the main income-generating sector in rural areas.

Types of capacity building programs

- Vocational education and trainings for experts from governmental ministries and state agencies, including hydromets – series of trainings targeted at specific needs and level of knowledge of local experts, both short-term intensive and long-term trainings
    - Specific trainings on hydro-meteorological and climate data monitoring, including primary data measurement, analysis, reporting, climate modeling and weather and water availability forecasting, including extreme weather forecasting, and public access to hydrometeorological data and information
- Mobile trainings delivered to farmers in regions on suitable farming and irrigation practices and technologies and drought resistant plants
- On-site on-the-job training and support of local community pioneers in farming – pilot sites for demonstration in regions

- Trainings on specific project development and financing skills, including basic financial literacy for farmers
- Targeted educational programs/curricula on climate change, and on adaptation and mitigation for different types of schools, diverse majors and student ages (kindergarten, grammar school, college and universities, post-graduate studies)
- Support for international scholarships in the area of climate-related postgraduate studies
- Targeted internship programs for students and entry-level professionals with international organizations, including NGOs, that support work on climate change
- Tailored consulting on specific CC issues for key policy makers and governmental officers
- Regional "summer schools" for students, and "summer studies" for experts

An important part of three-level capacity building programs and trainings is continuous feedback from stakeholders participating in trainings. This is an integral part of the proposed capacity building program, which will allow to adjust trainings to changing specific needs as well as to incorporate "learning by doing" experience.

Scheme of training design

Regional level: Data/info/knowledge Collection -> Analysis -> Product development and visualization -> Data stewardship, archive, and on-line publication

National level: Translation of information products into national languages -> Data stewardship, archive, and on-line publication -> Knowledge delivery: national trainings on a central level and trainings of trainers

Province (область) level:
Knowledge delivery – mobile trainings in provinces for farmers, and local stakeholders

Feedback from trainings to regional and national level, modification of information products and trainings at regional and national/district levels

Examples of trainings

Name	Format	Target group	Frequency	Content
Series of vocational trainings on climate change	Trainings for state institutions	Governmental officers, experts from state agencies	Weekly 1-2 lessons at premises of the targeted institutions	Series of basic, advanced and specific topic training courses on climate change tailored to specific needs of participating institution. Basic course: introduction to CC, vulnerability, international treaties and

				national policies and regulations, mitigation and adaptation options and priorities, GHG monitoring and reporting methodologies. Example of a specific courses: Food security and adaptation of farming to CC: risks to farming, farming best practices, drought-resistant plants, pasture management, water management and irrigation. Renewable energy and energy efficiency technologies, technical potential, costs, market barriers, policies and legislation, financing.
Mobile trainings on best farming practices	On-site trainings in farming communities	Farmers	Series of one day trainings in low-season	Training courses delivered in district communities and pilot sites on practical experience in transforming to best farming practices, including suitable draught-resistant plants, farming techniques, irrigation upgrades, basics in financing
Curriculum on climate change for university students	Lessons	University students	Weekly one lesson	Introduction to Climate Change, drivers and risks specific to CA, international treaties and national policies and regulations, mitigation and adaptation opportunities, best practices from the region
Regional Summer School on climate change	Intensive on-site international summer camp	College and university students	Once a year	Intensive course on climate change with specific focus on selected topics (farming practices, renewable energy, …) combined with on-site demonstration and on-the job training

Annex 7: CC Information Capacity Areas, Indicators, and Stages

Capacity Indicator	Staged Indicators
Indicator 1 – Degree of CC awareness of stakeholders	Stakeholders are not aware of CC issues and possible steps to address them
	Stakeholders are aware of CC issues but not the possible steps to address them
	Stakeholders are aware of CC issues and the possible solutions but do not know how to participate
	Stakeholders are aware of CC issues and are actively participating in the implementation of related solutions
Indicator 2 – Access to and sharing of climate-related information by stakeholders	Climate-related information needs are not identified and the information management infrastructure is inadequate
	Climate-related information needs are identified but the information management infrastructure is inadequate
	Climate information is partially available and shared among stakeholders but it does not cover all aspects of the issue and/or the information management infrastructure to manage and give information access to the public is limited
	Comprehensive climate-related information is available and shared through an adequate information management infrastructure
Indicator 3 – Existence of education programmes related to climate change	No education programmes related to climate change are in place
	Education programmes related to climate change are partially developed and partially delivered
	Education programmes related to climate change are fully developed but partially delivered
	Comprehensive education programmes related to climate change exist and are being delivered
Indicator 4 – Extent of the linkage between CC-related research/ science and policy development	No linkage exists between CC policy development and science/research strategies and programmes
	Research needs for CC policy development are identified but are not translated into relevant research strategies and programmes
	Relevant research strategies and programmes for CC policy development exist but the research information is not responding fully to the policy research needs

	Relevant research results are available for CC policy development
Indicator 5 – Adequacy of the climate information available for decision-making	The availability of climate information for decision-making is lacking
	Some climate information exists but it is not sufficient to support decision-making processes
	Relevant climate information is made available to decision-makers but the process to update this information is not functioning properly
	Political and administrative decision-makers obtain and use updated climate information to make environmental decisions
Indicator 6 – Existence and mobilization of resources	Organizations working on CC don't have adequate resources for their programs and projects and the requirements have not been assessed
	The resource requirements are known but are not being addressed
	The funding sources for these resource requirements are partially identified and the resource requirements are partially addressed
	Adequate resources are mobilized and available for the functioning of the lead environmental organizations
Indicator 7 – Existence of cooperation with CC stakeholders	Identification of CC stakeholders and their participation/involvement in decision-making is poor
	Stakeholders are identified but their participation in decision-making is limited
	Stakeholders are identified and regular consultations mechanisms are established
	Stakeholders are identified and they actively con decision- 3 making processes

Annex 8: Climate-Related Information Available to Share

(Self-Reported by Type of Data/Knowledge and by Stakeholder)[105]

	Scientific-Research Organization	*Government Agency*	*Other Stakeholders*
Data	Climate data (2)	Climate norms (1); temperature and precipitation data in electronic format (1); other sector data (1); health sector data, including data correlated with CC (1); sampling data for the water sector and use of water resources at the country level (1)	Agro-hydrometeorological data, water and land use data, community-level data, and impacts data at the village and district level (1 NGO)
Projections	regional projections (1); country-level projections (1)	CC projections, including changes in temperature, precipitation, vegetation period, frost-free days, and heating season through 2100 (1)	
Bulletins		"information bulletins" (2); national GHG inventory (2); national communications to the UNFCCC (1); climate change annual report (1); Daily agro- hydro- and meteorological bulletins; short-term, medium-term, long-term and seasonal forecasts (1); daily air quality bulletin by region [in paper format] (1)	Climate change digest (1 NGO)
Methodologies	Methodologies for developing projections (1); general methodologies (1)	Methodological developments (1)	Methodologies for evaluating the impact of CC on water and forestry resources (1 resource user association); local adaptation methodologies (1 NGO)
Analytical Reports	(2); analysis of water-saving technologies in agriculture	Reports, monographs (1)	Brochures, reports, and policy briefs (1 farming association); reports on climate change risk management and capacity development (1 NGO); reports on research results (1 NGO)
Other		Climate risk maps (1); recommendations for sustainable land management (1); booklets and brochures on	Experience with CC adaptation and best practices, outreach to farmers, and implementation of adaptation measures in agriculture (1 farming

[105] Source: 35 respondents interviewed February – March 2017. Questionnaire text and format provided in Annex 2.

	local-level CC adaptation projects in agriculture (1)	association); conference materials and training materials (1 farming association); resource maps for water resources (rivers, lakes, and glaciers) and forestry resources (1 resource user association); experiences in training CC trainers and conducting trainings at national and regional levels, grassroots mobilization and experience sharing for adaptation (1 NGO); experience with adult education and professional development for NGO employees (1 NGO); database of country-related environmental protection legislation (1 NGO)